

## **VERIFICATION REPORT**

Remedial Works at West Pond, Barry Waterfront Development

20/06/2014 Revised: 26/09/2014

# **Quality Management**

Issue/revision	Issue 1	Revision 1	Revision 2
Remarks	Regulatory Review	Final (incl Regulatory Approval)	
Date	20/6/2014	26/9/2014	
Prepared by	S Poulton	S Gronow	
Signature	Hutat		
Checked by	S Gronow	S Gronow	
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Authorised by	R Pollock	R Pollock	
Signature	MP		
Project number	39784		
Report number	VR01		
File reference	39784.VR01		

Project number: 39784 Dated: 20/06/2014 Revised: 26/09/2014

## **VERIFICATION REPORT**

## Remedial Works at West Pond, Barry Waterfront Development

20/06/2014

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Cuddy Group

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## 1 Introduction

### 1.1 Instruction

WSP Remediation Ltd (WSP) was instructed by Cuddy Group (Cuddy) to undertaken remedial works at West Pond, Barry Waterfront Development, Barry, South Wales (the Site). The instruction required WSP to complete the execution of an approved remediation strategy, which was designed by a third party; QDS Environmental Ltd (QDS). The strategy was based on LNAPL removal and the treatment of dissolved phase contaminants in groundwater.

#### 1.2 Initial Site Assessment

A number of previous site investigation works have been undertaken at the site, the findings of which have informed the design of the remediation strategy. Further details of the works previously completed are summarised in the following reports:

- Geo-Environmental Site Investigation Report West Pond, Over Arup and Partners Ltd (Report Ref: 08/7383, September 2008);
- Barry Waterfront Development West Pond Controlled Water Risk Assessment, Earth Science Partnership (Report Ref: ESP4563s/1636, June 2010); and
- Barry Waterfront Development West Pond Supplementary Controlled Water Risk Assessment (Rev 1), Earth Science Partnership (Report Ref: ESP4563s/1636a, October 2010);

Following on from this, QDS completed environmental delineation and testing of the soil and groundwater that were identified as impacted with hydrocarbons in the area of West Pond, Barry Waterfront. The findings of these works are included within the following report:

■ Proposed Remediation Strategy Report – West Pond, Barry Waterfront, Barry South Wales (Report Ref: 5007/4/3758/JH, September 2012).



## 2 Site Information

Full details of the site can be found in QDS's Proposed Remediation Strategy Report; however, for reference a summary is included below.

### 2.1 Site Details

The Site is located to the west of Barry No. 1 dock on Barry Waterfront, Barry and occupies an area of approximately  $0.2 \text{km}^2$ . Historically, the site was reclaimed land from the sea, with parts used as a municipal landfill site. A tank farm was developed in the east of the site in the late 1930's for the storage of fuel (e.g. heavy fuel oil) and other substances (e.g. coal tars and cashew nut shell liquid). These tanks were decommissioned in the 1980's. In the 1960's, railway wagons and engines were stored and dismantled in the area. Presently, the site is open land comprising a sand and mud surface with abundant overgrown plants.

The geology beneath the site, as documented on QDS trial pit logs, is Made Ground to 5m bgl. No further information is provided at trial pits were not advanced beyond this depth. The Made Ground typically comprised sandy clay with frequent gravels, which grades with depth into occasional cobbles. It is understood that superficial deposit underlay the Made Ground; the alluvium consisting of predominantly of clay, silt and sand.

Two groundwater bodies have been identified at site; perched shallow groundwater within the Made Ground at approximately 1m bgl, and a deeper body within the alluvium at approximately 3.5 – 4.0m bgl. The Controlled Waters Risk Assessment undertaken by Earth Science Partnership in 2010 identified a possible link between the perched water in the made ground and the groundwater within the alluvium. In 2012, QDS undertook a series of hydrogeological tests which indicated a variable hydraulic conductivity of 0.03 to 0.58 m/d in the wells monitoring on site. A peizometric survey undertaken by QDS identified groundwater flow direction in both shallow and deep groundwater bodies to be in a west / south west direction. Groundwater depth measurements at high and low tide varied in the same well by a maximum of 0.03m, therefore it is considered that there is no significant tidal influence on the shallow groundwater on site.

### 2.2 Contaminant Profile

Historic site investigation works have identified up to 0.05 m of Light Non-Aqueous Phase Liquid (LNAPL) on the groundwater to the east of the site, beneath the former tank farm. The most recent historic investigation however did not detect a measurable quantity of LNAPL.

QDS advanced 10no. trial pits to 5m bgl in 2012 in order to collect soil data and also to observe any free product ingress when encountering groundwater. This exercise identified visual and olfactory evidence of hydrocarbon impacts in soil from all trial pits at 1.6m bgl to 5m bgl (extent of investigation depth), in the east of the site. Headspace testing was undertaken using a Flame Ionisation Detector (FID) at every 1m within trial pits; the maximum observed reading was 4,500 ppm within TPQ06 at 1.0 – 2.0m bgl.

Chemical testing results revealed samples most impacted by Total TPH were TP02, TP04 and TP07, with concentrations ranging between 1,426 and 9,692 mg/kg. The analysis indicated the presence of heavy end hydrocarbons, predominantly C10 – C35 indicating diesel to heavy oil contamination which is in line with substances previously used in the area. Analysis in TPQ04 (3 - 4m) and TPQ08 (2 - 3m) identified Total PAH concentrations of 1,719 and 111 mg/kg respectively.

4no. monitoring wells screened within the deeper alluvium across the site have exhibited elevated concentrations of hydrocarbons within the groundwater, with maximum total TPH concentrations of 9,062 and 8,464 µg/l in BHE5 (deep) and BH25 (deep) respectively. Although no evidence of the presence of LNAPL was identified, the concentrations of hydrocarbons in groundwater are at levels indicative of LNAPL being present. No elevated hydrocarbon concentrations were identified within the monitored shallow wells. BHE5 (deep) was the only well to contain phenol, with a concentration of 0.27 mg/lg.

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## 3 Proposed Remediation Approach

### 3.1 Identified Pollutant Linkages

The main sources of contamination have been identified as the old tank farm, the former pond area, the landfill area and the tank wash building area.

The lack of tidal influence on the groundwater as identified during peizometric tests indicated that the dock wall is of a low permeability, therefore it has been concluded that the hydraulic linkages between the dock water in Dock 1 to the east of the site and the site was limited. As such, QDS considered the groundwater beneath the site to be of no significant risk to nearby water bodies.

It is also considered that the infiltration of rainwater and the subsequent migration of contaminants will be greatly reduced by the development of buildings and extended areas of hardstanding, in addition to construction of a capping layer to raise the ground level for flood prevention purposes.

The Geo-Environmental Site investigation Report (Ove Arup and Partners Ltd, 2008) and the DQRA enclosed within have concluded that the areas proposed for commercial end-use may be redeveloped without the need for remedial works. The areas in the more impacted (south) eastern areas of the site; however, which are proposed to be redeveloped as residential end-use will require remediation to address the LNAPL impact and reduce the contaminant load of the groundwater, thus removing the risk currently posed by the site.

## 3.2 Remedial Methodology

The Remediation Strategy concluded that, although perched groundwater impact does not present a significant risk to nearby water bodies, hydrocarbon concentrations were at levels indicative of LNAPL being present and that there was a requirement for remediation work to address the LNAPL impact and reduce the contaminant load on the perched groundwater. QDS derived a Remedial Action Plan relating to the discharge of Part 4 of condition 40 of planning permission 2009/00946/OUT and correspondence from Mr Gwion Thorpe (Ref. SE/2012/115884/03-L01, see Appendix E) confirmed that the information was sufficient to recommend discharge of this conditions. The targets of the works are:

- To remove any identified LNAPL to the maximum possible extent within the limitations of the geology.
   LNAPL removal works would continue until asymptotic conditions were achieved where recovery rates were too low for further remediation works to be of significant benefit; and
- To reduce the dissolved phase contaminant mass within the perched groundwater by pumped mass recovery.

Similarly to QDS's proposal following a review of all previous documentation relating to the site, the following scope of works was recommended:

- Excavate circa 50no. trial pits to approximately 5m below ground level, which equates to approximately 2m below the water table across the impacted area;
- De-water these locations with a diesel pump into a holding lagoon (circa 200m³);
- Pump these waters through a water treatment plant comprising particular removal, oil/water separation and activated carbon filtration;
- Discharge treated water to sewer under appropriate consent from Dŵr Cymru (see Appendix E);
- Install approximately 15no. 100mm diameter HDPE boreholes to a depth of approximately 5.0 7.0m bgl. the boreholes will be left proud of the surface and designed to enable the installation of pneumatic groundwater and product skimming pumps;
- Develop all wells and undertake groundwater sampling for laboratory analysis (TPH, BTEX, Phenol and PAH), including 2no. rounds of product thickness monitoring and product / groundwater recharge testing;



- Install a combination of pneumatic groundwater and product only pumps to concurrently target the 10no. most impacted wells at any one time; and
- Install pipework, compressor and control system to allow an automated water treatment system.

## 4 Remedial Works

### 4.1 Phase One Works

WSP undertook the first phase of works between 18<sup>th</sup> and 26<sup>th</sup> June 2013, which comprised the excavation of 52no. trial pits on a circa 10m grid to approximately 5m bgl. Ground conditions encountered were consistent with those previously reported, and comprised variable clayey sandy and gravelly made ground. Following the identification of gross contamination, an LNAPL skimmer and a groundwater treatment plant was deployed to recover contaminants direct from trial pits and open excavations. Further details of these works are presented below.

#### 4.1.1 Contamination Assessment

The trial pits encountered limited evidence of NAPL impacted soil; the evidence of visual and / or olfactory is provided in Table 4.1 below. A Photo-Ionisation Detector (PID) was used throughout excavation works to record total volatile organic compounds (VOC's). The trial pit locations are illustrated on Figure 1 and the logs are provided within Appendix A.

Table 4.1 - Visual / Olfactory Evidence of NAPL impact

Trial Pit	Observations
<b>A</b> 1	Slight hydrocarbon odour 3.2m (0.2ppm) and 4.3 (0.5ppm)
А3	Slight hydrocarbon odour at 3m (11.1ppm)
A4	Hydrocarbon odour and sheen at 2.3m (7ppm)
A5	Slight hydrocarbon odour at 2.5m (0.1ppm) and at 3.3m (7ppm)
A6	Slight hydrocarbon odour at 2.2m (0.2ppm), hydrocarbon odour at 4m (8.7ppm) and visible pockets of product
A7	Hydrocarbon odour and sheen at 2.1m (33ppm) with oily sludge ingress
A8	Strong hydrocarbon odour and oily sludge at 1.9m (3.2ppm), hydrocarbon odour at 2.7m (42.3ppm) and oily sludge ingress (115ppm)
В3	Slight hydrocarbon odour at 1.8m (0ppm), at 3.2m (0.2ppm) and at 3.5m (0.6ppm)
B4	Hydrocarbon odour at 2.1m (1.2ppm), hydrocarbon odour and sheen at 2.9m (17.4ppm)
B5	Hydrocarbon odour at 2m (0.1ppm), at 2.5m (0.7ppm), at 3.5m (1.4ppm) and at 4.1m (1.9ppm)
В6	Hydrocarbon odour and sheen at 2.8m (11.8ppm)
B7	Hydrocarbon odour and sheen at 2.6m (1.2ppm) and at 3.6m (13.2ppm)
B8	Slight hydrocarbon odour at 3.1m (0ppm) and at 3.6m (1.8ppm)
В9	Slight hydrocarbon odour at 3.7m (0.2ppm)
<b>C</b> 7	Strong hydrocarbon odour at 3.3m (156.7ppm)
D5	Hydrocarbon odour at 3m (61.2ppm)
D6	Hydrocarbon odour at 2.8m (41.2ppm)

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D7	Slight hydrocarbon odour at 2.5m (0ppm) and free product at 3.9m (1.7ppm)
E3	Slight hydrocarbon odour at 3.65m (2.6ppm)
E4	Oily sheen on water at 3.8m
E5	Slight hydrocarbon odour at 2.1m (4.4ppm)
E6	Slight hydrocarbon odour at 3.1m (0ppm)
F1	Hydrocarbon odour at 2.7m (14.2ppm), sheen at 3m with very strong hydrocarbon odour (315ppm)
F2	Slight hydrocarbon odour at 3.1m (27.2ppm), free product at 3.6m (21.5ppm)
F3	Strong hydrocarbon odour at 1m (1241ppm), oily sheen at 2.8m (101ppm), free product at 3.7m

#### 4.1.2 Groundwater Treatment Plant

A Water Treatment Plant was established and agreed under WSP's Environmental Permit and comprised particulate removal (lamella plate separator), oil / water separator and activated carbon filtration vessels. The plant included an automated system of pumps and level controls to enable the treatment and discharge of water.

#### 4.1.3 Excavation Works

The trial pits remained open, for up to two weeks, to allow groundwater ingress and they were subsequently dewatered using a 3-inch diesel powered trash pump. The impacted groundwater was removed to a holding lagoon prior to treatment and consented discharge to foul sewer. Trial pits exhibiting the presence of LNAPL remained open for up to two weeks to allow continued de-watering, whilst pits where soil arising's showed some visual / olfactory evidence of contamination, but no evidence of LNAPL were backfilled after three days. Trial pits that were installed in areas where no contamination was evident were backfilled immediately after logging and collection of samples. Approximately 50m<sup>3</sup> of groundwater was pumped from the trial pits and approximately 50 litres of LNAPL was recovered.

#### 4.1.4 Phase One Results

The TPH results of the initial round of sampling are illustrated in Figure 2 and copies of the chemical analysis results are included in Appendix B. Initially, boreholes BH01, BH04, BH05, BH06 and BH11 were found to contain LNAPL, with a maximum thickness of 7mm (BH05) and a maximum concentration of  $334\mu g/l$  TPH recorded in BH05. LNAPL was observed to be heavy end and this was also evidence in the speciated analysis where results were predominantly within the C10 – C35 aromatic hydrocarbon range.

#### 4.2 Phase Two Works

The second phase of LNAPL recovery commenced on 15<sup>th</sup> August 2013 following the installation of dedicated recovery wells in the locations where LNAPL was encountered in trial pits. An automated full-time (24 hour) groundwater abstraction and LNAPL recovery system was installed and operated for 4 months until LNAPL recharge into the wells ceased. Further details are on the Phase 2 works are presented below.



#### 4.2.1 Borehole Installation

Following the initial phase of product recovery, all remaining trial pits were backfilled by 1<sup>st</sup> August 2013 in preparation for the installation of dedicated LNAPL recovery wells. 15no. boreholes were drilled to a depth of approximately 6 – 7m bgl and 100mm diameter HDPE abstraction wells constructed between 2<sup>nd</sup> and 8<sup>th</sup> August 2013. The boreholes were constructed in the positions of trials pits A6, A7, A8, B5, B6, B7, C7, D5, D6, E4, E7, F1, F2, F3 and F4. The abstraction wells were purged and developed prior to an initial round of monitoring and sampling being undertaken; samples were analysed for TPHCWG, BTEX, phenol and PAH).

#### 4.2.2 Groundwater Treatment System

The existing groundwater treatment plant (as outlined in Section 4.1.2) was modified to receive effluent from 10no. pneumatic borehole pumps. The modifications included the installation of a manifold, a network of pipework, compressor and a level/pressure control system. A header pipe, together with gated spurs was also installed to allow the transfer of impacted groundwater to the WTP.

A total of 10no. top-loading total fluids pneumatic pumps were installed in the most impacted wells. This comprised boreholes BH01, BH02, BH03, BH04, BH05, BH06, BH08, BH11, BH12 and BH13. A flow-meter was installed down-gradient of the GAC filters to measure the combined volume of water being treated and discharged to sewer. Treatment was maintained throughout the treatment period with the exception of shutdowns associated with refuelling of the generator and scheduled breaks to allow recharge and monitoring of groundwater levels and LNAPL thickness.

#### 4.2.3 System Monitoring

Regular monitoring of the system was undertaken to ensure that pumps remained working and that the water treatment system and environmental permit was being appropriately managed. Analysis of influent and effluent was undertaken on a monthly basis to monitor the treatment performance and satisfy Dŵr Cymru's consent to discharge. Correspondence from Dŵr Cymru is included in Appendix C. Following a six week period (beginning of October), the pumps from BH08, BH12 and BH13 were transferred to boreholes BH09, BH10 and BH15.

#### 4.2.4 Phase Two Results

Abstraction and treatment terminated on 15<sup>th</sup> November 2013. LNAPL was not observed during monitoring since 15<sup>th</sup> October 2013. LNAPL was also not observed to be present within the influent to the groundwater treatment plant from 15<sup>th</sup> October 2013. Samples were retrieved from the boreholes and monitoring continued on a regular basis to measure groundwater level and presence of LNAPL. The chemical analysis results from samples retrieved on 15<sup>th</sup> November 2013 and subsequently on 16<sup>th</sup> December 2013 record a significant improvement in groundwater quality compared to the results pre-remediation and the most impacted boreholes (BH1 - BH6) generally record at least an order of magnitude in improvement. A table providing a summary of TPH results for BH1-BH6 is provided as Table 4.2 below and Graph 1 overleaf. The results for all boreholes are also illustrated on Figures 2 - 4. Full copies of chemical analysis certificates are provided as Appendix B.

Table 4.2 - Summary of TPH (mg/l) results for BH1 - BH6

Well ID	August 2013	November 2013	December 2013
BH1	23.5	27	12.7
BH2	4.68	0.478	0.365
ВН3	51.9	0.728	0.033
BH4	38.5	17.6	23.7
BH5	334	22.8	11
BH6	9.77	1.68	0.01

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400 350 300 **-**BH1 PH concentration mg/I 250 BH2 200 BH3 150 BH4 100 BH5 50 BH6 0 Aug-13 Sep-13 Oct-13 Nov-13 Dec-13 Date

Graph 1 – TPH concentrations in impacted wells

In total 2,502m<sup>3</sup> of perched groundwater has been abstracted, treated and discharged during the treatment period. Monitoring post remediation has recorded no presence of LNAPL within any of the abstraction wells. A table showing the groundwater levels and LNAPL monitoring is provided as Table 4.3 overleaf.

### 4.3 Contaminant Mass Removal

The Total TPH and Total PAH mass removed from the 2,502m³ of water passed through the water treatment system has been calculated as 75kg. This is based on an assumption of negligible concentrations of Total PAH and Total TPH discharged from the water treatment system as per the chemical testing results for the effluent, sampled in October 2013 (contained in Appendix B, Report No. 246363). Concentrations of Total TPH and Total PAH within the influent passing into the system were 28,100 and 1,860 µg/l respectively. In addition, approximately 550 litres of LNAPL, including emulsified oil / water has been recovered during the second phase, together with the wash down and cleansing fluids from decommissioning the system. Assuming a density of 0.8 kg/l, this is an additional 440kg of product recovered from the site, resulting in a total recovered mass of 515 kg. The LNAPL and wash down materials have been disposed off-site. All waste documentation is contained in Appendix D.



Table 4.3 – Groundwater Levels and LNAPL Monitoring

		15/	8/13	16/	9/13	15/1	0/13	15/1	1/13	28/1	1/13	11/1	12/13	20/1	2/13	7/1	/14	20/	1/14	4/2	2/14
Date > Borehole v	Depth to Base of Borehole	Depth to LNAPL	Depth to Water																		
BH01	7.36	2.810	2.811	-	2.46	-	2.142	-	1.69	-	1.85	-	1.88	-	1.61	-	2.18	-	1.85	-	1.71
BH02	7.35	-	6.108	-	2.145	-	1.943	-	1.84	-	1.66	-	1.715	-	1.51	-	1.44	-	1.58	-	1.46
BH03	7.24	-	2.085	-	2.354	-	2.346	-	2.28	-	2.72	-	2.755	-	2.35	-	1.52	-	1.63	-	1.49
BH04	7.25	2.836	2.838	-	2.503	-	2.416	-	2.16	-	2.36	-	2.42	-	2.18	-	2.04	-	1.95	-	1.87
BH05	7.29	3.573	3.58	2.556	2.556	-	2.42	-	2.12	-	2.35	-	2.42	-	2.08	-	1.94	-	1.93	-	1.84
BH06	7.19	3.454	3.455	-	2.665	-	2.515	-	2.2	-	2.51	-	2.611	-	2.035	-	2	-	1.98	-	1.97
BH07	7.18	-	2.868	-	2.894	-	2.754	-	2.93	-	3.64	-	3.119	-	3.11	-	2.71	-	2.64	-	2.58
BH08	6.98	-	3.02	-	3.15	-	3.083	-	3.1	-	3.86	-	3.28	-	3.28	-	2.91	-	2.78	-	2.65
BH09	6.98	-	3.11	-	3.24	-	3.105	-	3.15	-	3.91	-	3.35	-	3.355	-	2.94	-	2.79	-	2.68
BH10	7.00	-	6.745	-	3.458	-	3.234	-	2.98	-	3.61	-	3.188	-	2.77	-	2.43	-	2.38	-	2.36
BH11	7.00	2.940	2.941	-	2.976	-	2.88	-	2.65	-	2.91	-	2.895	-	2.77	-	2.76	-	2.54	-	2.52
BH12	6.65	-	2.928	-	2.808	-	2.927	-	2.7	-	3.4	-	2.891	-	2.88	-	2.491	-	2.27	-	2.19
BH13	6.70	-	2.697	-	2.82	-	2.736	-	2.65	-	3.36	-	2.845	-	2.85	-	2.43	-	2.24	-	2.17
BH14	6.80	-	2.618	-	2.845	-	2.783	-	2.72	-	3.43	-	2.935	-	2.916	-	2.51	-	2.3	-	2.35
BH15	6.50	-	2.663	-	2.83	-	2.804	-	2.7	-	3.48	-	3.018	-	3.05	-	2.525	-	2.32	-	2.41

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## 5 Environmental Monitoring

A PID was used to monitoring VOCs throughout the works; no readings >0ppm were recorded at any monitored locations along the site boundary. The PID readings during headspace analysis are contained in Table 4.1 within this report.

As per the agreed Environmental Monitoring Plan (contained within Appendix E for reference), no dust or noise monitoring was undertaken at site as it was considered that none of the permitted activities occurring on site were likely to give rise to dust or noise emissions.

## 6 Rebound Monitoring

Post remediation monitoring was undertaken over the agreed 3 month period to check the presence of LNAPL rebound. An oil water interface meter, accurate to 1mm (Geotech instruments), was lowered within each borehole to determine groundwater level and presence of LNAPL. The probe contains an infra-red emitter and infra-red detector to determine if the probe is within air or liquid. At the same time, two conductivity probes are testing for conductivity. If the fluid does not conduct electricity then the probe is in product and a solid tone is emitted from the instrument. If the fluid conducts electricity (i.e. within water), then the instrument emits an intermittent tone. The rebound phase of monitoring was undertaken between 15<sup>th</sup> November 2013 and 4<sup>th</sup> February 2014 (as illustrated in Table 4.3) and demonstrates that there has been no evidence of LNAPL rebound. In addition, no sheen or staining on the interface probe was evident during the rebound monitoring.

## 7 Conclusions

A maximum of 7mm (BH5, 15<sup>th</sup> August 2013) of LNAPL was recorded prior to remediation works and the presence of recordable LNAPL was limited to five of the fifteen boreholes, predominantly within the southern area.

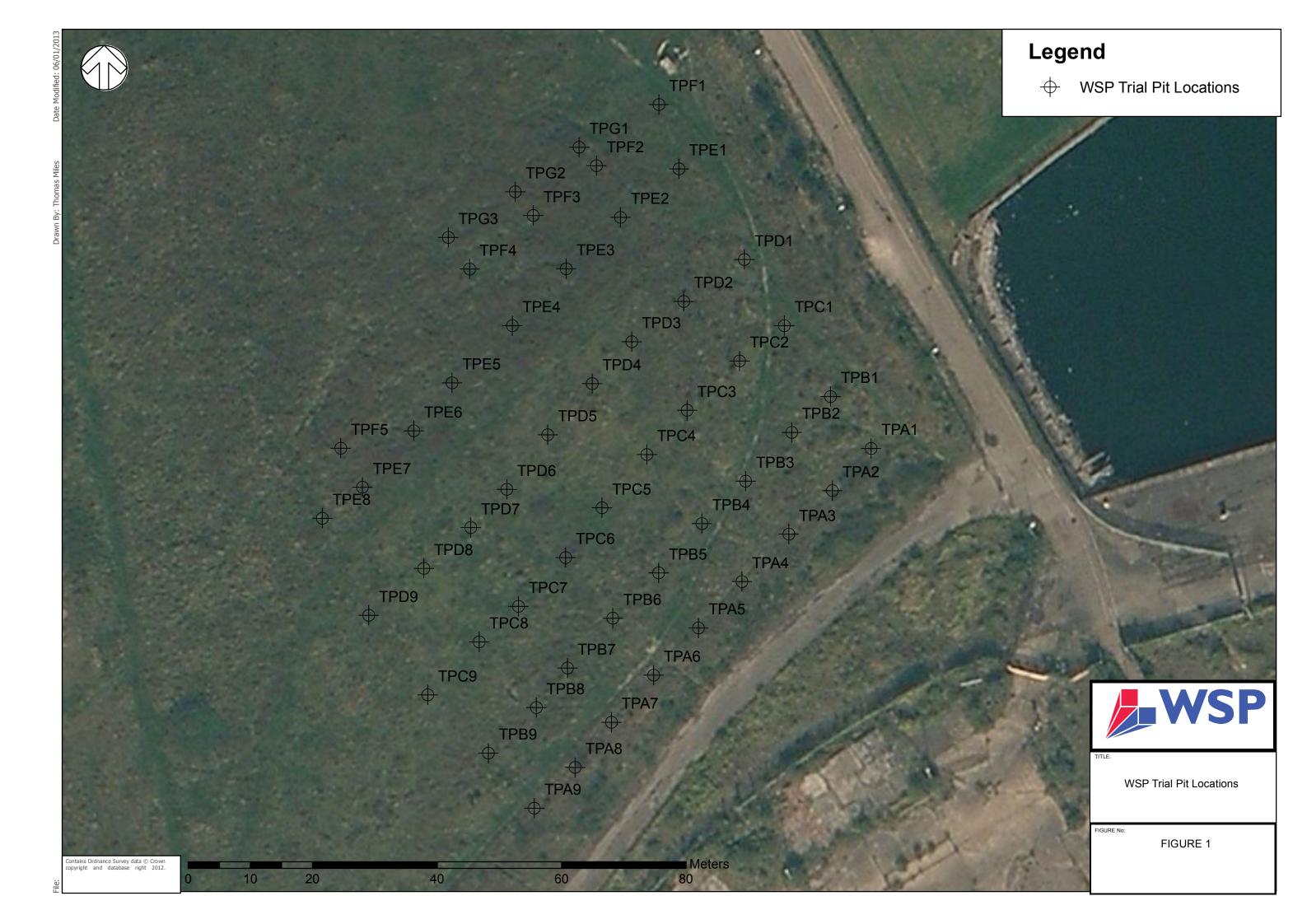
A total of 2,502m<sup>3</sup> of perched groundwater has been abstracted, treated and discharged during the treatment period. A total of 600 litres of emulsified oil/water and LNAPL from the two phases has been recovered and disposed from site, together with the wash down and cleansing fluids from the groundwater treatment kit.

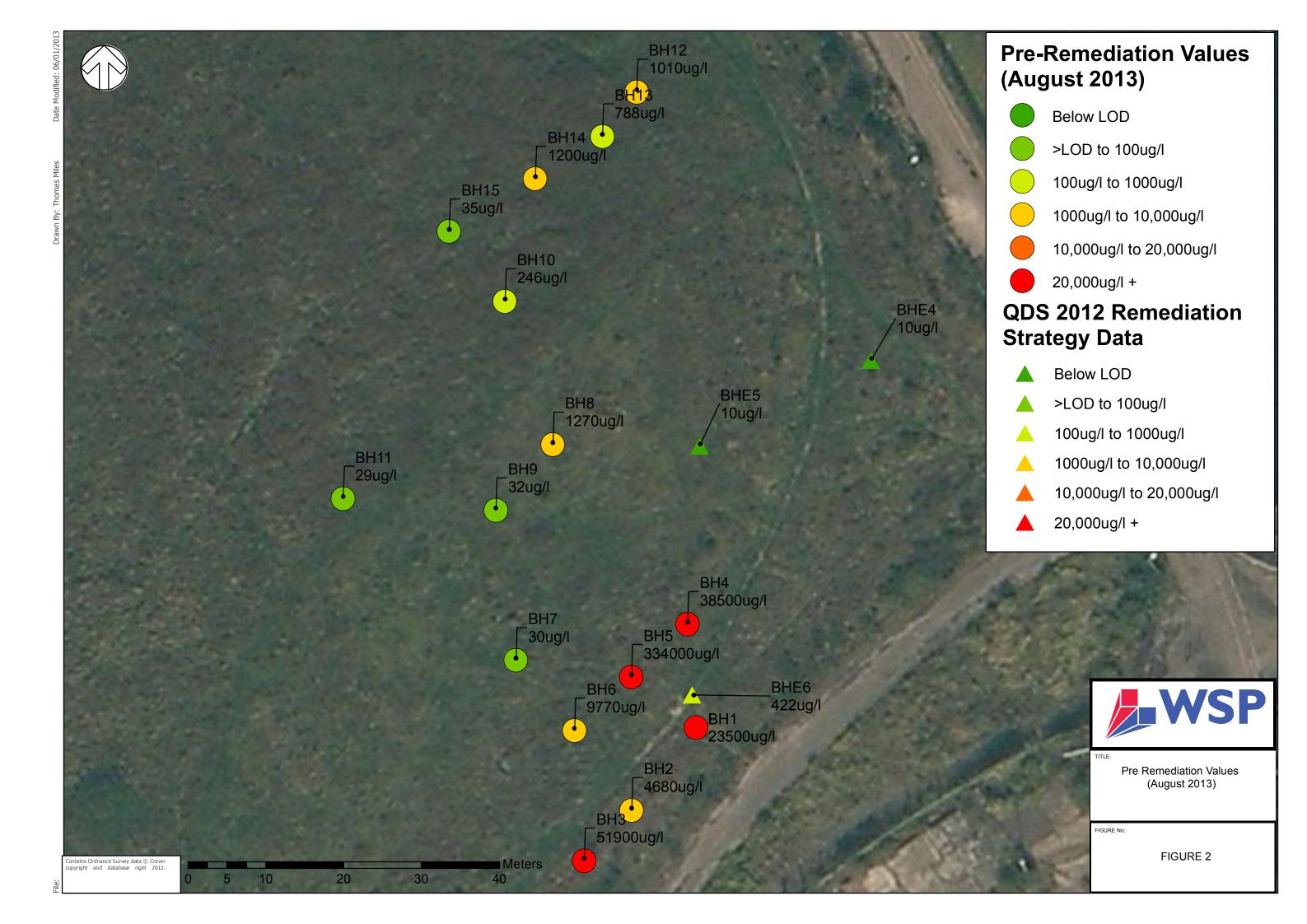
LNAPL recovery diminished following two months of active abstraction (15<sup>th</sup> August to 15<sup>th</sup> October 2013). Abstraction continued for a further month (15<sup>th</sup> October to 15<sup>th</sup> November 2013), during which time LNAPL recovery was not observed. Monitoring continued for a 3 month period, in which time no LNAPL rebound was observed.

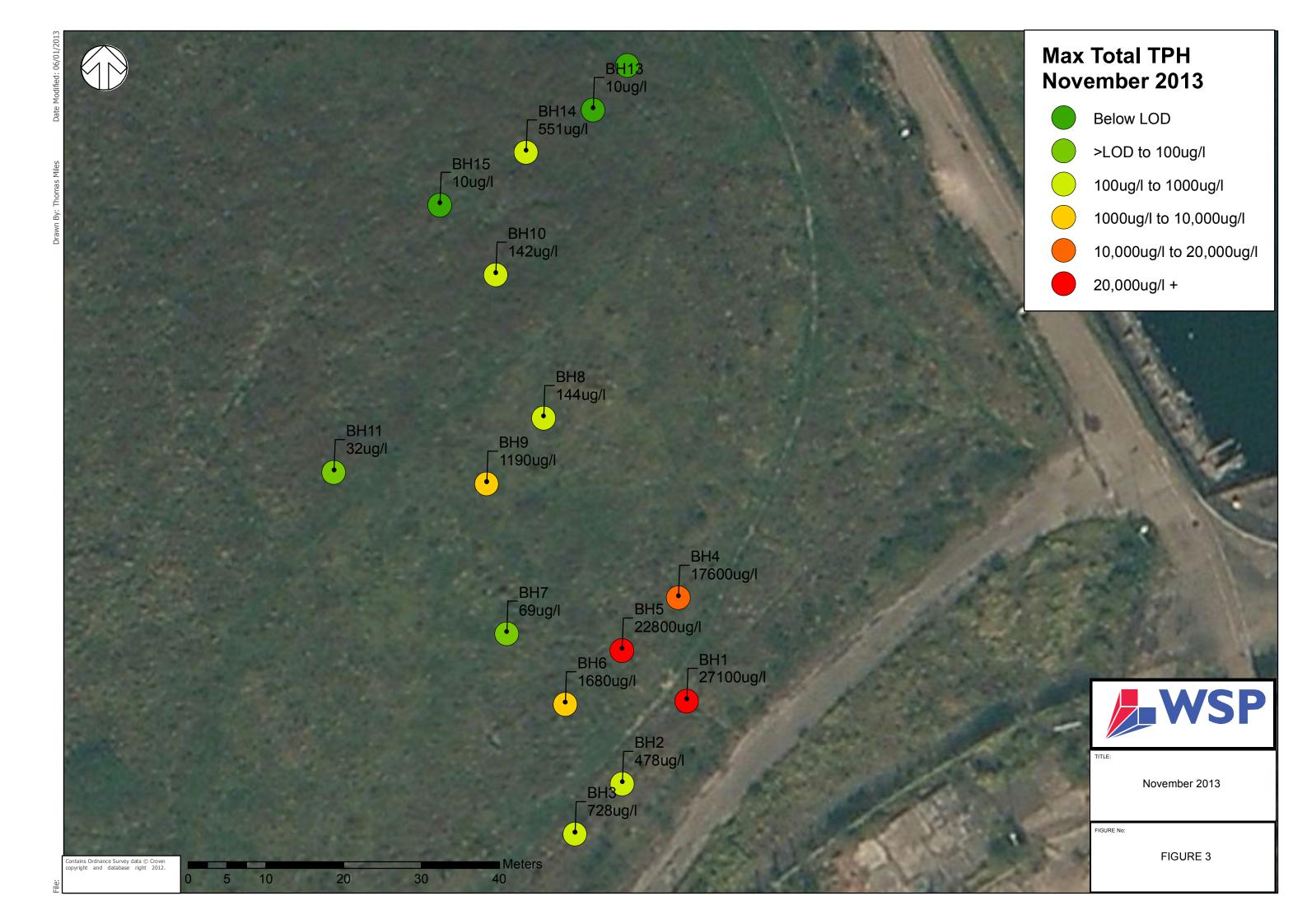
The remediation works have successfully achieved the objectives set out, i.e. achieved a reduction in the dissolved phase contaminant mass and removal of identified LNAPL to maximum possible extents.

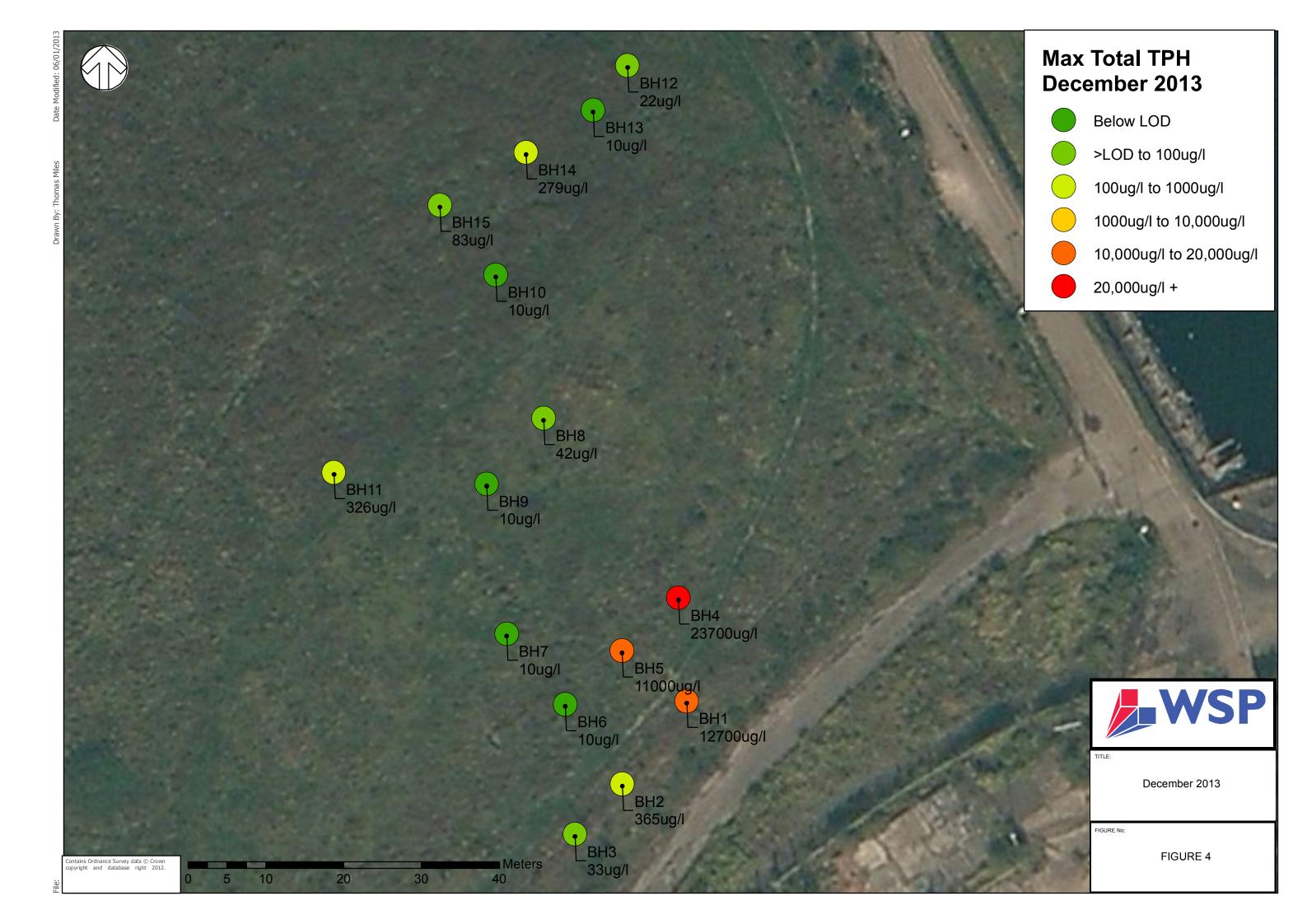


# Figures









Appendix A – Trial Pit Logs

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	TRIAL PIT LOG  WSP Remediation								Hole No.									
Regus ( Cardiff Telepho	Cardiff I Bay, C	Bay, Fardiff 4 (0)2	alcon CF10 4 9 2036	on Drive 10 4RU 036 6300 Project Barry Waterfront Development										Sheet 1 of 1				
Job No	Job No Client Cuddy Group										Date 18-06-13 18-06-13							
Contracto	r / Dri	ller			Met	thod/Plant L	nod/Plant Used Logged By Co-Ordinates (NGR)							Ground Level (m				
						360 Ex	cava	tor	CR		E 311363.387 N 167190.208							
SAMI	PLES	& TE	STS						.TA					Install / Backfill				
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD) (Th	Depth nick ess)				Legend	Geology	Jaonini					
-						-(0	.60)	coarse, an	Loose, dark brown, slightly clayey, gravelly, fine to coarse SAND. Gravel is fine to coarse, angular to subangular, concrete and brick. MADE GROUND. 0.4-0.5mbgl cocket of loose, black, ash SAND. MADE GROUND.									

SAMF	PLES	& TE	STS							STRATA						Insta Back
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD	Depth (Thick -ness)			Des	cription			Legend	Geology	
							-(0.60)	coarse, a	ark brown, slightly angular to subangu f loose, black, ash	ılar, concrete a	and brick. MAI	se SAND. Gr DE GROUND	avel is fine to . 0.4-0.5mbgl		NODATA	
							0.60	0041/5	rey, slightly sandy, MADE GROUND	fine to mediu	m, angular to	subrounded, s	stone and brick		NODATA	
							0.80	Firm, red	d brown, slightly sa lar, stone, limestor	ndy, gravelly (			se, angular to			
-							(0.40)								NODATA	
							(0.40)		ose, brown, sandy, fine to coarse, angular to subangular, stone, clinker and brick AVEL. MADE GROUND.							
							1.60		ellow brown, grave ADE GROUND.	lly SAND. Gra	vel is fine to c	oarse, angula	r to rounded,			
-							- - - - - -		ustre on gravel and	d grains, depo	sited on glove	after handlin	g.			
-							- -(2.40) - - - - - - -	Damp, s	light HCO. 0.2ppm	headspace te	est.				NODATA	
							4.00									
-							4.05	Wet, loo	se, dark grey, grav D.	elly SAND. Gr	avel is fine to	coarse, angul	ar stone. MAD		NODATA	
							(0.45)	Wet, loo	CO. 0.5ppm heads se, brown, sandy, f		ı, angular, sto	ne GRAVEL.	MADE		NODATA	
							(0.50)		se, lack and grey, s	sandy SILT. M	ADE GROUN	D.			NODATA	
							5.00									
							Length		Shoring/Support:		I		Strikes			_
<b>4</b>		· 2.5r	m —		<b>→</b>	<b>T</b>	Width	5mm		Date	Time	Strike	Minutes	Standing	Ren	narks
D		<del>-   -</del>	- z			B 1m		mm	Stability:	General Ren	narks					
		С						on grees from north								
									1							

WSP Remediation		TRIAL PIT I	LOG	Hole N	TPA2				
Regus Cardiff Bay, Falcon Dri Cardiff Bay, Cardiff CF10 4R Telephone: +44 (0)29 2036 63 Fax: +44 (0)29 2036 6399	U   ····	Project Barry Waterfront Development							
Job No 39784	Client	Cuddy Group	)	Date	18-06-13 18-06-13				
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	G	Ground Level (m AOD)				
	360 Excavator	CR	E 311357.131 N 167183.442						

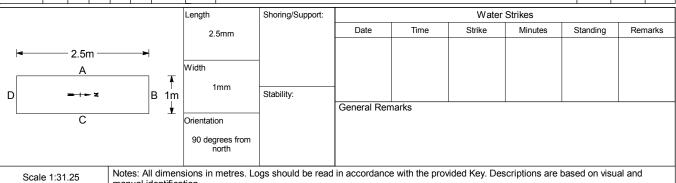
SAMI	PLES	& TE	STS	3				STRATA			Instal
Depth	Туре			P.Pen	Water	Elev. (mAOD)		Description	Legend	Geology	Back
							-ness) - (0.50) - 0.50	Loose, dark brown, slightly clayey, gravelly SAND with few concrete Cobbles. Gravel is fine to coarse, angular to subangular, brick, concrete and stone. MADE GROUND.		NODATA	
							0.65	Loose, slightly sandy, angualr to subrounded, stone and brick GRAVEL. MADE GROUND.		NODATA	
							(0.35)	Black geotextile membrane.  Loose, black, gravelly, ash SAND. Gravel is fine to coarse, angular to subangular, clinker, brick and stone. MADE GROUND.		NODATA	
							- - -	Black geotextile membrane.  Loose, brown, slightly sandy, fine to medium, angular to subangular, stone, brick and clinker GRAVEL. MADE GROUND.		> > >	
							-(1.00) - - - - 2.00			NODATA	
							- - - - -(1.20)	Loose, slightly clayey, sandy, fine to coarse, angular to subangular, stone, brick, concrete and clinker GRAVEL. MADE GROUND.		NODATA	
							3.20			> > > >	
							- - - -	Damp, loose, gravelly SAND. Gravel is fine to coarse, angular to rounded, brick, stone concrete and clinker.		> > >	
							_(1.30)  - -			NODATA	
							4.50	Wet, loose, gravelly, fine to coarse SAND. Gravel id fine to coarse, angular to		+	
							(0.30) 4.80	rounded, brick, pipework, stone and concrete. MADE GROUND.		NODATA	
							-	Wet, loose, grey and dark grey, slightly gravelly, silty, fine to coarse SAND. Gravel is fine to medium, angular to subangularstone and brick. MADE GROUND.		NODATA	
							Length	Shoring/Support: Water Strikes			

Length Shoring/Support: Water Strikes Date Time Strike Minutes Standing Remarks 2.5mm 2.5m Width 1mm B 1m Stability: General Remarks • С Orientation 90 degrees from north

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

														Hol	e No.					
	<b> </b>									TRIAL	PIT LC	)G			C INO.	TPA	2			
Regus C Cardiff Telephon Fax:	SP Recardiff Education Bay, Canal Ca	Ray F	alcon	Drive	,	Proje	ect		В	arry Water	front Develo	pment		She	Sheet 2 of 2					
Job No	39	784				Clien	nt			Cud	ldy Group			Da	Date 18-06-13 18-06-13					
Contractor	r / Dril	ler			Meth			it Used		Logged By	CR	Co-Ordi	nates (NGR) E 311357.131		Ground Level (m AOD)					
CANA	21.50	0 TE	ото					LXCave				DATA	N 167183.442	33.442						
SAMF		_	_	_	Ja	Ele	ev.	Depth				RATA			 					
Depth	Туре	∃ld (bbm	KN/N	P.Pen (kN/m2)	Water	-ness)						fine to coarse S			Legend	Geology				
								5.20	Tine to me	edium, angular	to subangularst	one and brick	k. MADE GROUN	ND. (com	<i>(tinued)</i>		NODATA			
								Length		Shoring/Suppor	t: Date	Time	Water Strike	Strikes Minute	28	Standing	Rei	marks		
D		2.5ı A			<b>&gt;</b>	Н В 1	<b>T</b>	Width	.5mm 1mm	Stability:	Date	Time	Suike	iviinute	<del>-</del>	Statiuing	Kel	marks		
		С					¥		on grees from north	. 9	General Re	marks					1			
Scale	e 1:31	.25		Note	es: A	ll dim	ens	ions in	metres. Lo	gs should be r	ead in accordan	ce with the pi	rovided Key. Des	criptions	are ba	sed on vis	sual and	l		



WSP Remediation		TRIAL PIT L	.OG	Hole No. TPA3					
Regus Cardiff Bay, Falcon Driv Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399	1	Project Barry Waterfront Development							
Job No 39784	Client	Cuddy Group		Date 18-06-13 18-06-13					
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)					
	360 Excavator	CR	E 311350.145 N 167176.437						

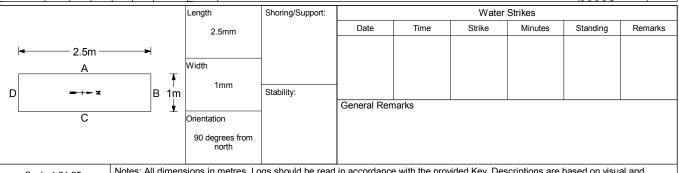
SAMF					-		Depth			STF	RATA					Insta Bacl
Depth	Туре	PID (ppmV)	HSV (KN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)				Des	cription			Legend	Geology	
							(0.50)		lark brown, slightly ılar, brick, concrete				oarse, angular to		NODATA	
							0.50	Loose, s GROUN	lightly sandy, angu D.	alr to subroun	ded, stone and	d brick GRAV	EL. MADE		NODATA	
							(0.35)	Loose, b	eotextile membrand black, gravelly, ash brick and stone. M	SAND. Grave	l is fine to coa	rse, angular to	o subangular,		NODATA	
					-		(0.70)	Black Ge Loose, b	eotextile membrand prown, slightly claye GRAVEL. MADE GI	e. ey, sandy, fine		gular to subar	ngular, stone and		NODATA	
							(0.30)	Cohesive coarse,	e, red and grey mo angular, stone and	ttled, slightly s clinker. Pocke	andy, gravelly ets of loose bla	CLAY. Grave ack ash. MAD	el is fine to E GROUND.		NODATA	
							- -(0.80)	Soft, blu SAND at	e/grey mottled CLA t 2.5mbgl. MADE G	Y. MADE GR ROUND.	OUND. Pocke	t of wet, grey,	fine to medium		NODATA	
							-(1.20)		nesive, blue brown CO. 11.1ppm head		tly sandy SILT	. MADE GRO	UND.		NODATA	
							-									
							Length		Shoring/Support:			Water	Strikes		<u> </u>	=
<b>4</b>		2.5r A			—≠   	7	Width	5mm mm	Stability	Date	Time	Strike	Minutes	Standing	Ren	mark
D		C	- Z			3 1m <u>↓</u>		on grees from	Stability:	General Rer	 marks					
				Niete	AII	.0			ogs should be read			ided Kerr De				

WSP Remediation			TRIAL PIT LO	3	Hole	e No.	TPA	4	
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		Project Ba	nent	Sheet 1 of 1					
Job No 39784		Client	Cuddy Group		Dat		18-06- 18-06-	-	
Contractor / Driller	Meth	nod/Plant Used	Logged By	Co-Ordinates (NGR)		Ground	d Level	(m AOE	D)
		360 Excavator	CR	E 311342.610 N 167168.835					
SAMPLES & TESTS			STRA	ATA					Install / Backfill
Depth Type United Age (28 / 18 / 18 / 18 / 18 / 18 / 18 / 18 /	ater	Depth Elev.	Descr	intion			Legend	Geology	

					360	Excava	ator	C	R	N	167168.835	5			
SAMPLES	& TE	STS							STF	RATA					Ins Ba
Depth Type	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick			Des	cription			Legend	Geology	
			)			-ness) - - (0.50)	Loose, da	rk brown, slightly coarse, angular to	clayey, gravel subangular, t	ly SAND with f orick, concrete	few concrete ( e and stone. M	Cobbles. Gravel IADE GROUND		NODATA	
						0.50 0.60	Loose, bla	ack gravelly, ash S	SAND. Gravel	is fine to medi	ium, angular (	Clinker. MADE		NODATA	
						-	Loose, bro	otextile membrane own, slightly claye brick GRAVEL. N uncovered along	y, sandy, fine MADE GROUN	ND.				>	
						-(3.40)	Water ing 7ppm in h	ress at 2.2mbgl. I eadspace test.	HCO and shee	en observed. F	PID reading =	0.1ppm and		NODATA	
						4.00									
						-			Г						
						Length		Shoring/Support:	Date	Time	Water Strike	Strikes Minutes	Standing	Rer	 nark
<b> </b>	- 2.5r A	n —		<b></b>		Vidth	5mm							1.5	
D	A = +=	- z			 B 1mm		mm -	Stability:							
	С				<u>*</u>	Orientatio	on		General Ren	narks					
							rees from north								

WSP Remediation		TRIAL PIT LOC	3	Hole No. <b>TPA5</b>
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Sheet 1 of 2
Job No 39784	Client	Cuddy Group		Date 18-06-13 18-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)
	360 Excavator	CR	E 311335.624 N 167161.369	

SAMF	PLES	& TE	STS	3				STRATA			Insta Back
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen	(kN/m2) Water	Elev. (mAOD	Depth (Thick -ness)	Description	Legend	Geology	
							(0.50) - - - - - 0.50	Loose, dark brown, slightly clayey, gravelly SAND with few concrete Cobbles. Grave is fine to coarse, angular to subangular, brick, concrete and stone. MADE GROUND		NODATA	
							0.60	Loose, black gravelly, ash SAND. Gravel is fine to medium, angular Clinker. MADE	XX	NODATA	
							- - - - -	GROUND.  Black Geotextile membrane.  Loose, dark brown, sandy, fine to coarse, angular to subangular, brick and concrete GRAVEL. MADE GROUND.  Re-bar present.  Steel rope uncovered and removed.		> > > >	
							- -(1.80) - - - - -			NODATA	
							2.40	Soft, grey black mottled, slightly gravelly CLAY. Gravel is fine to medium, angular clinker. MADE GROUND. Slight HCO. PID reading = 0.1ppm.		× × × × × × × × × × × × × × × × × × ×	_
							- - -(1.80) - - -			NODAT#	
							4.20	Wet, grey, silty, fine SAND. MADE GROUND.			
							-(0.40) - 4.60	HCO. PID reading = 0.8ppm.		NODATA	
							- -(0.60)	Soft, grey black mottled, slightly gravelly CLAY. Gravel is fine to medium, angular clinker. MADE GROUND.		NODATA	
							Length	Shoring/Support: Water Strikes	KXXXX	<u>k</u>	

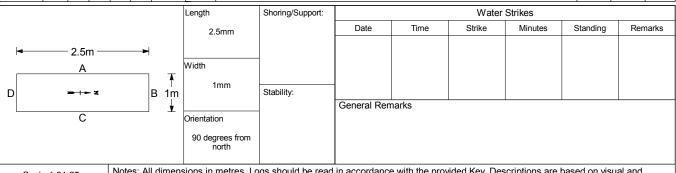


Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

WSP Remediation		TRIAL PIT LOC		Hole	TPA5
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399	1.19,000	arry Waterfront Developn	nent	Shee	et 2 of 2
Job No 39784	Client	Cuddy Group		Date	18-06-13 18-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)		Ground Level (m AOD)
	360 Excavator	CR	E 311335.624 N 167161.369		

SAIVIE	PLES						Depth			• • • • • • • • • • • • • • • • • • • •	RATA					Inst Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2	P.Pen (kN/m2	Water	Elev. (mAOD					cription			Legend	Geology	
							5.20	Soft, gre clinker.	y black mottled, sli MADE GROUND. (	ghtly gravelly (continued)	CLAY. Gravel	is fine to med	ium, angular		NODATA	
							Length	5mm	Shoring/Support:	Date	Time	Water Strike	Strikes Minutes	Standing	Rer	mark
<b>-</b>		2.5r A	m —		<b>→</b>	<b>T</b>	Width	mm								
D		<del>- +-</del> C	- z			B 1m <u>▼</u>	Orientati		Stability:	General Rer	 marks					



WSP Remediation		TRIAL PIT LOC	3	Hole No. <b>TPA6</b>
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Sheet 1 of 1
Job No 39784	Client	Cuddy Group		Date 19-06-13 19-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)
	360 Excavator	CR	E 311328.452 N 167153.782	

SAMP			_				D#			STF	RATA			_		Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							(0.50)	Loose, da subangu	ark brown, slightly lar, brick, concrete	clayey, gravel and stone. M	ly SAND. Grav ADE GROUNI	vel is fine to co D.	oarse, angular to		NODATA	
							0.50	Loose, g	rey, slightly sandy,	fine to mediu	m, angular to	subangular, st	tone GRAVEL.		NODATA	
							- 0.75	Loose, b	lack gravelly, ash S	SAND. Gravel	is fine to med	ium, angular (	Clinker. MADE		NODATA	-
							- 0.95  - -	Geotextil Loose, b	e membrane. rown, slightly silty, o subangular, ston	gravelly, fine t e and brick. M	to coarse SAN IADE GROUN	ID. Gravel is find.	ine to medium,		>	
							- [(1.15) - -								NODATA	
							- - 2.10								<b>&gt;</b>	
							(0.30)		oose, brown, silty, f			E GROUND.			NODATA	
							-(2.60)								NODATA	
							-	8.7ppm h	d sheen visible. Po neadspace. of product decreas	·		·	-			
							5.00 Length		Shoring/Support:			Water	Strikes	<u> </u>	1	
<b>-</b>		2.5r A	n —		<b>→</b>	<b>T</b>	_	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
D	:	<del>- +-</del> C	- z			B 1m <u>↓</u>	Orientation	on grees from	Stability:	General Rer	narks					
Scale	: 1:31.	.25				I dimens	90 deg	rees from orth	ngs should be read	in accordanc	e with the prov	vided Key. Des	scriptions are ba	sed on vis	sual and	

<b>WSP</b> Remediation		TRIAL PIT LOC	3	Hole N	TPA7
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399	1. 10,000	arry Waterfront Developn	nent	Sheet	1 of 1
Job No 39784	Client	Cuddy Group		Date	19-06-13 19-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	G	fround Level (m AOD)
	360 Excavator	CR	E 311321.662 N 167146.221		

							5.00								
-							-(3.00)	Wet, loo HCO and maximur	lo HCO.  HCO, no sheen.  se, grey, silty, fine d sheen visible. Pl m 33.0ppm headsp	D readings = r pace.	maximum of 1:		edge and	NODATA	
-							- - - - -(1 20)	GROUN	lack gravelly, ash D. le membrane.	SAND. Gravel	is fine to med	lium, angular d	clinker. MADE	NODATA	
							-(0.80) - - - 0.80							NODATA	
Depth	1 Туре	Id (bbu	HSV (kN/m2)	P.P (KN/	Water	(mAOD)	(Thick -ness) - -	Loose, d is fine to	ark brown, slightly coarse, angular to		cription  Ily SAND with brick, concrete	few concrete e e and stone. M	Cobbles. Gravel IADE GROUND.	Geology	

WSP Remediation		TRIAL PIT LOC		Hole	TPA8
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Shee	et 1 of 1
Job No 39784	Client	Cuddy Group		Date	19-06-13 19-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	(	Ground Level (m AOD)
	360 Excavator	CR	E 311315.844 N 167138.972		

SAMF	PLES			_							STRA	ATA					Install Backfil
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen	(kN/m2)	Water	Elev. (mAOD)	Depth (Thick			Descr	iption			Legend	Geology	
								-ness) - - -(0.60)	Loose, da subangul	ark brown, slightly ar, brick, concrete	clayey, gravelly e and stone. MAI	SAND. Gravel is DE GROUND.	s fine to coarse, ano	gular to		NODATA	
								0.60	Loose, gr	rey, slightly sandy,	medium, stone	GRAVEL. MADE	E GROUND.			NODATA	
								- (1.20)	GROUNI		SAND. Gravel is	fine to medium,	angular clinker. M	ADE		NODATA	
						_		2.00					ding 3.2ppm. n centre of TP. MAE	DE		NODATA	
								-	MADE G				dium, angular clink	er.			
								_(1.50) - - - -	TP edge;	ge ingress in Wes 115ppm headspa ge ingress on all s	ice.	PID readings = r	maximum of 15.2pp	om at		NODATA	
								4.00							<b>X</b> X		
								Length		Shoring/Support:	1		Water Strikes				

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

WSP Remediation		TRIAL PIT LOC		Hole	TPA9
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Shee	et 1 of 1
Job No 39784	Client	Cuddy Group		Date	e 19-06-13 19-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)		Ground Level (m AOD)
	360 Excavator	CR	E 311309.269 N 167132.430		

CAM	AMPLES & TESTS									CTE	ATA					Insta
SAIVII				_			Depth			317	WIA			т —		Back
Depth	Туре	E M	HSV (kN/m2)	Pen V/m2	Water	Elev. (mAOD)				Desc	cription			Legend	Geology	
		a	노동	- 동	. 3	(MAOD)	-ness)				•					
								Wet, loos	se, grey, sandy, fin	e to coarse, a	ngular to suba	angular, concr	ete and brick	$\times$		
								GRAVEL	. MADE GROUND							
							(0.50)							$\langle \rangle$	NODATA	
							0.50							$\langle \rangle \rangle$		
							0.00	Loose, da	ark brown, slightly	clayey, gravel	y SAND. Grav	vel is fine to co	parse, angular to	XX		
							(0.30)	subangul	ar, brick, concrete	and stone. Ma	ADE GROUN	D.	_	$\langle \rangle \rangle$	NODATA	
							0.80							$\longrightarrow$		
							0.90		ey, sandy, mediun					XX	NODATA NODATA	
							1.00	Loose, bi GROUNI	ack gravelly, ash S	SAND. Gravel	is fine to med	ium, angular o	clinker. MADE	$\stackrel{\times}{\sim}$	NODATA	
							h		e membrane.				/	$\langle \rangle \rangle$		
							İ l	Cohesive	, brown, clayey fin	e to coarse SA	AND. MADE G	ROUND.		XX	,	
							L							XX	]	
														$\times \times$		
							-(1.20)								NODATA	
							-							$\langle \rangle$	1	
							f							$\langle \times \rangle$	1	
															,	
							- 1							XX	,	
							2.20	Damp Io	ose, brown, slightl	v gravally SAN	ID GEraval is	fine to coarse	angular to	$\times$		
							-		clinker and pebble		ib. Gi iavei is	ille to coarse	s, arigular to		,	
							-		·					XX		
														XX		
							- 1							$\times \times$	1	
							-(1.20)								NODATA	
							-							$\langle \rangle \rangle$	1	
							- 1							$\langle \times \rangle$	1	
															,	
							- 1							XX	,	
							3.40	\A/-+ I		CAND Carrie	l := £== t= ===			$\times$	-	
							- 1		se, brown, gravelly ADE GROUND.	SAND. Grave	i is line to coa	arse, angular t	o subangular ol		,	
							-(0.40)	Wet, but	no HCO or sheen.	PID reading =	0.8ppm.			XX	NODATA	
							3.80	Water in	gress. PID reading	= 1.2ppm hea	idspace.			$\times \times$		
							ļ									
							- 1									
							-									
							<u> </u>									
							ļ									
							-									
														$\perp$		
							Length		Shoring/Support:			Water	Strikes			
							2.5	5mm		Date	Time	Strike	Minutes	Standing	Ren	nark

Length Shoring/Support: Water Strikes

2.5mm

Date Time Strike Minutes Standing Remarks

Width Imm Stability:

C General Remarks

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

WSP Remediation		TRIAL PIT LOC		Hole N	TPB1
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399	Project Ba	arry Waterfront Developn	nent	Sheet	t 1 of 1
Job No 39784	Client	Cuddy Group		Date	19-06-13 19-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311356.871	G	Ground Level (m AOD)
	300 Excavator	CIX	N 167198.565		

SAMF				1			D/'	1		STI	RATA			_		Inst Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD	Depth (Thick -ness)			Des	cription			Legend	Geology	
							(0.50)	Loose, d subangu	ark brown, slightly llar, brick, concrete	clayey, gravel and stone. M	ly SAND. Gra ADE GROUN	vel is fine to co D.	oarse, angular to		NODATA	
							0.50	Looso	rey, slightly sandy,	modium and	ular to sub an	gular stone an	d brick		-	
							0.70	GRAVEI	MADE GROUND	).	ulai to sub air	guiai storie ai	U DITCK		NODATA	
							- 0.85		le membrane. lack gravelly, ash S	SAND Gravel	is fine to med	lium angular d	linker MADE		NODATA	
							Ĺ	GROUN	D					/‱		
							(0.75)	Firm, red	le membrane. d, gravelly CLAY. G d clinker. MADE G	Gravel is fine to ROUND.	o coarse, angu	ular to subrour	nded, brick,		NODATA	
							1.60		rwon, gravelly SAN	ID Gravel is f	ine to coarse	angular to sul	prounded stone	+		
							-(0.40)		ker. MADE GROUN		ine to coarse,	angular to sui	orounded, storie		NODATA	
							2.00	Loose, y	ellow brown, fine to	coarse SAN	D. MADE GRO	DUND.		$\Rightarrow \Rightarrow$		
							-(2.00)	Wet. No	HCO. PID reading	= 0.0ppm he:	adspace.				NODATA	_
							Length	5mm	Shoring/Support:	Date	Time	Water Strike	Strikes Minutes	Standing	Rer	marl
<b>-</b>		2.5r	n —		<b>-</b>											
		Α				<u> </u>	Width		1							
D	į	-   -	- z			F 1m		mm	Stability:	-						
	<u> </u>								1	General Rer	marks	1	1			
C						Orientati 90 deç	on grees from north									
	Length Shoring/Support: Water Strikes  Date Time Strike Minute  2.5mm  Width  Imm Stability:  General Remarks  Scale 1:31.25  Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions manual identification.															

	0D D								TRIAL F	PIT LO	G		Н	ole No.	TPB	2	
Regus	SP Re Cardiff I f Bay, C ne: +44 +44 (0	Bay, Fa	alcon CF10	Drive 4RU	- 1	Project		В	arry Waterfro	nt Develop	ment		St	neet	1 of	1	
Job No	39	784				Client			Cuddy	Group			D	ate	19-06-1 19-06-1		
Contracto	or / Dri	ller			Meth		nt Used		Logged By	R	E	ates (NGR) 311350.622 167192.810		Grou	nd Level (	m AOI	D)
SAM	PLES	& TE	STS							STF	RATA						Instal Backt
Depth	Туре	PID (ppmV)	HSV (N/m2)	P.Pen (N/m2)	Water	Elev. (mAOD	Depth ) (Thick			Des	cription				Legend (	Geology	
		J)	<u>*</u>	- 3		,	-ness) - - -(0.60)		rown, slightly claye arse, angular to si							NODATA	<b>A</b>
							0.60	Loose, bl	lack gravelly, ash	SAND. Gravel	is fine to med	ium, angular c	linker. N	MADE		NODATA	
							-	Geotextil	o. e membrane. rown red, slightly o led, concrete, bric	clayey, gravelly k and stone. F	r SAND. Grave ew Cobbles o	el is fine to coa f stone. MADE	arse, an	gular to IND.			
							(1.85) 									NODATA	<b>A</b>
							2.60		se, light brown, gra led, of concrete, si	avelly SAND. ( tone and brick	Gravel is fine to Occasional s	to coarse, ang subangular, sto	ular to one cob	bles.		NODATA	
							- - -(0.80) -	No HCO, Wet, san	or sheen. PID ready, gravelly, angullar stone. MADE G	ar stone COBI		is fine to coars	se, angu	ular to		NODATA	
							3.60	subround MADE G	se, light brown, gra ded, of concrete, si ROUND. gress. TP collapse	tone and brick				bles.		NODATA	-
							- - - -										
	-					•	Length	•	Shoring/Support:	D-4:	T	Water		utaa .	Cto		
<b>-</b>		- 2.5n A	n —		<b>→</b>	¦   <b>∓</b>	Width	5mm		Date	Time	Strike	Minu	ites	Standing	Rer	marks
D	C C					B 1m <u>▼</u>	Orientation		Stability:	General Ren	 narks						
Sca	le 1:31	.25		Note	es: Al	II dimena dentifica	sions in		ogs should be read	in accordance	e with the prov	rided Key. Des	cription	s are ba	sed on visu	ual and	

<b>WSP</b> WSP Remediation		-	TRIAL PIT LO	G	Hole		TPB	3	
Regus Cardiff Bay, Falcon Driv Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	Shee	et	1 of	1	
Job No 39784		Client	Cuddy Group		Date	1	19-06- 19-06-	-	
Contractor / Driller	Met	hod/Plant Used	Logged By	Co-Ordinates (NGR)		Ground	d Level	(m AOE	))
		360 Excavator	CR	E 311343.229 N 167184.979					
SAMPLES & TESTS			STRA	ATA					Install / Backfill
Depth Type Depth Type Depth Type Depth Type Depth Depth Type Depth	Water	Elev. (mAOD) (Thick	Descr	iption			Legend	Geology	

					<u> </u>	1										
SAMF				_			Depth			STF	RATA					Insta Back
Depth	Туре	PID (ppmV)	HSV (KN/m2)	P.Pen	Water	Elev. (mAOD)				Desc	cription			Legend	Geology	
							(0.50)		rown, slightly claye parse, angular to si						NODATA	
							0.50	Loose, g	rey, slightly sandy, D.	medium, angu	ular to subang	ular, stone Gl	RAVEL. MADE		NODATA	1
							-(0.30) - 0.85	GROUN	lack gravelly, ash S D. e membrane.	SAND. Gravel	is fine to medi	ium, angular d	linker. MADE		NODATA	
							(0.75)	Loose, b	rown, slightly cobb lar, stone. MADE (	ily, gravelly SA GROUND.	ND. Gravel is	fine to coarse	e, angular to		NODATA	
							1.60		ellow, slightly grav	elly, SAND. Gr	avel is fine to	medium, angi	ular, clinker.			
							- -(0.60) -		ROUND. CO. PID reading =	0.0ppm.					NODATA	
							2.20	Firm, bro	own CLAY. MADE	GROUND.					× ×	
							-(0.80)								NODATA	
							3.00	Wet, loo	se, grey and black	, silty, fine to c	oarse SAND.	MADE GROU	ND.		NODATA	
							3.30	Wet, loo	CO and visible she se, brown, fine to c se, grey and black	coarse SAND.	MADE GROU	ND.	JD.		NODATA	
							(0.70)		D reading = 0.6ppr	-	idise SAND. I	VIADE GROOI	ND.		NODATA	
															) )	
							4.00									
							-									
							-									
							1.		T	1						
							Length		Shoring/Support:	Dete	Ties -		Strikes	Ctorli		
<b> -</b>		- 2.5	m —			ł	2.	5mm		Date	Time	Strike	Minutes	Standing	Ken	narks
		0							+			1	1			

Length
2.5mm

A

Width
1mm
Crientation
90 degrees from north

Length
2.5mm

Shoring/Support:

Date
Time
Strike

Water Strikes

Date
Time
Strike

Minutes
Standing
Remarks

General Remarks

General Remarks

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

WSP Remediation			TRIAL PIT L	.OG	ì	Hole	e No.	TPE	84	
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399	0	Project I	Barry Waterfront Deve	elopme	ent	She	eet	1 of	1	
Job No 39784		Client	Cuddy Group			Dat	•	19-06- 19-06-		
Contractor / Driller	Me	thod/Plant Used 360 Excavator	Logged By CR	(	Co-Ordinates (NGR) E 311336.197 N 167178.163	,	Ground	d Level	(m AOI	O)
SAMPLES & TESTS	<u> </u>	Depth		STRAT	¯A					Install / Backfill

						300	Excava			K	I N	I 167178.16	3			
SAMF	PLES							i		STI	RATA					Ins Ba
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick			Des	cription			Legend	Geology	
							-ness) - - -(0.60)	Loose, bro	own, slightly claye ar, brick, concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		NODATA	
							0.60	Loose, gr	ey, slightly sandy,	fine to mediu	m, angular to	subangular st	one and brick	$\rightarrow$	NODATA	
							- 0.75	GRAVEL. Loose, bla	MADE GROUND ack gravelly, ash	).					NODATA	
							 _(0.65) _	GROUND Geotextile	o. e membrane.						NODATA	
							1.40	Loose, bro	own, slightly claye ar stone.	ey, gravelly SA	ND. Gravel is	fine to coarse	e, angular to			
							-(0.60) -								NODATA	1
							2.00		, brwon, black and reading = 1.2ppr			IADE GROUN	ID.			
							-(0.80) - -								NODATA	
							2.80 - - -		grey CLAY with p sheen. PID readi			nd. MADE GR	OUND.			
							- (1.20) - -								NODATA	
							4.00									
							- - -									
							Length		Shoring/Support:	Date	Time	Water	Strikes	Standing	Rer	
<b></b>		2.5r	m				2.	5mm		Date	Tille	Suike	iviiilutes	Standing	Rei	
		2.5i A	-		_		Width									
D		<del>-</del> +-	- z			F 1m	1	mm	Stability:							
		С				<u> </u>	Orientati	on		General Rer	marks					
		J					90 deg	grees from north								
	Scale 1:31.25 Notes: All dimensions in metres. Logs															

WSP Remediation		TRIAL PIT LOC		Hole I	TPB5
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399	1	arry Waterfront Developn	nent	Shee	t 1 of 1
Job No 39784	Client	Cuddy Group		Date	19-06-13 19-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	C	Ground Level (m AOD)
	360 Excavator	CR	E 311329.247 N 167170.243		

SAMF				_			l Bl	STRATA	_		Instal Back
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen	Water	Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	
							(0.70)	Loose, brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subangular, brick, concrete and stone. MADE GROUND.		NODATA	
							0.70	Laces black providly, ask CAND, Crowl is fire to gradient, appropriate MADE			
							- - -	Loose, black gravelly, ash SAND. Gravel is fine to medium, angular clinker. MADE GROUND.  Geotextile membrane.			
							-(1.20)			NODATA	
							1.90				
							_ -(0.40) _ 2.30	Damp, soft, grey CLAY. MADE GROUND. HCO. PID reading = 0.1ppm.		NODATA	
							- - -	Wet, soft, grey CLAY with pockets of dark grey, fine to coarse SAND. MADE GROUND. PID reading = 0.7ppm			
							(1.70)	Water present.		NODATA	
							- - -	PID reading = 1.4ppm.			
							4.00	PID reading 1.9ppm.			
							- - -				
							-				

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

WSP Remediation			Hole No.  TPB6  Sheet  1 of 1						
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Ba							
Job No 39784		Client	Date 19-06-13 19-06-13						
Contractor / Driller	Met	hod/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311321.905 N 167162.937		Ground	ınd Level (m AOD)		
SAMPLES & TESTS  Depth Type Q Q (X H) (X H	Nater	Elev. (mAOD) (Thick	STRA Descr		· · · · · · · · · · · · · · · · · · ·		Legend	Geology	Install / Backfill

											_					
SAMPLE			_							STF	RATA					Instal Back
Depth Ty	уре	PID (ppmV)	HSV (kN/m2)	P.Pen	Water	Elev. (mAOD)	Depth (Thick -ness)			Desc	cription			Legend	Geology	
							- -(0.60) -	Loose, bi subangul	rown, slightly claye ar, brick, concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUNI	fine to coarse D.	, angular to		NODATA	
							0.60 - - - - - - - - - - - - - - - - - -	Gravel is	lack gravelly, ash the fine to medium, a e membrane.	SAND with occ ngular clinker.	asional cobbl MADE GROU	es of concrete JND.	and stone.		NODATA	
							1.50	Concrete	slah					P 6 4	NODATA	-
							- 1.65 - - -		tiff, grey, red and I	prown mottled	CLAY. MADE	GROUND.			NODATA	-
							_ _(1.05) _ _ _								NODATA	
							2.70		se, grey and black I sheen. PID readi			MADE GROU	ND.			
							[ (1.50)	HCO and	d sheen. PID readi	ng = 3.7ppm.					NODATA	
							4.20									-
							- - -									
				_												
				_			Length		Shoring/Support:			Water	Strikes	Standing		<u> </u>

Length 2.5mm

Length 2.5mm

Length 2.5mm

Length 2.5mm

Norientation 90 degrees from north

Length 2.5mm

Shoring/Support: Water Strikes

Date Time Strike Minutes Standing Remarks

General Remarks

General Remarks

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

1.0	WSP Remediation								TRIAL F	PIT LO	G		Hole I	No.	<b>37</b>	
Regus ( Cardiff Telephor Fax:	ardiff F	Ray Fa	alcon	Drive		Project		В	arry Waterfro	nt Develop	ment		Shee	t 1 of	1	
Job No	39	784				Client			Cuddy	Group			Date	19-06- 19-06-		
Contracto	· / Dril	ler			Meth		nt Used Excava		Logged By	R	E	ates (NGR) 311314.594 167154.950		Ground Level	(m AOI	D)
SAMF	PLES	& TE	STS	;						STR	ATA					Install Backfi
Depth	Туре	PID (ppmV)	HSV (KN/m2)	P.Pen (KN/m2)	Water	Elev. (mAOD	Depth (Thick -ness)			Desc	cription			Legend	Geology	
							(0.60) - (0.60) - (0.60) - (0.70 - (1.30) - (0.30) - (0.30) - (0.30) - (1.70) - (1.70) - (1.70) - (1.70) - (1.70)	Loose, gr GROUNI Geotextil Loose, bl GROUNI Geotextil Firm, bro Damp, co	e membrane. lack gravelly, ash \$	medium, angu SAND. Gravel  GROUND.  In and grey, cla to coarse SAN ng = 1.2ppm h	ayey, SAND. M	ular, stone Gl	RAVEL. MAD	DE DE	NODATA NODATA NODATA	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
-							<u> </u>		01	T		)A/-1	Obilia			
							Length 2.	5mm	Shoring/Support:	Date	Time	Water Strike	Strikes Minutes	Standing	Rer	marks
<b>!</b>		2.5r A	n —		<b>→</b>		Width									
D	D = +- ≥ B 1m					1	1	Imm	Stability:	General Dem	narke					
		С				<u>*</u>		on grees from north		General Ren	Idrks					
Scal	Scale 1:31.25 Notes: All dim manual identif							metres. Lo	gs should be read	in accordance	e with the prov	vided Key. Des	scriptions ar	re based on vis	sual and	

WSP Remediation		TRIAL PIT LO		Hole	TPB8
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399	1	arry Waterfront Developn	nent	Shee	et 1 of 1
Job No 39784	Client	Cuddy Group		Date	20-06-13 20-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311309.591 N 167148.586	(	Ground Level (m AOD)

SAMP			_	_			Depth			STF	RATA					Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)					cription			Legend	Geology	
							- - -(0.60)	Loose, t subangu	orown, slightly claye ular, brick, concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		NODATA	
							0.60	000111	grey, slightly sandy,	medium, ang	ular to subang	jular, stone G	RAVEL. MADE		NODATA	
					_		0.80	Geotexti Loose, t GROUN	ile membrane. black gravelly, ash \$	SAND. Gravel	is fine to med	ium, angular (	clinker. MADE			-
							-(1.00) - - - - 1.80								NODATA	
							(0.70)		own, slightly gravell ADE GROUND.	y CLAY. Grave	el is fine to me	dium, angula	r, clinker and		NODATA	ı
	Firm red brown, gravelly CLAY. Gravel is fine to medium, angular to rounded of brick, clinker and pebbles. MADE GROUND.							NODATA								
					-		3.00	subangu	ose, dark grey, grav ular, stone and brick ydrocarbon odour P	k. MADE GRO	UND.	coarse, angul	ar to			
							-(1.00) - - - - 4.00	Slight hy	ydrocarbon odour P	ID reading = 1	I.8ppm heads	pace.			NODATA	
							-									
							Length	_	Shoring/Support:	Date	Time	Water	Strikes	Standing	Do	nark
<b>-</b>		2.5r A	m —		<b>→</b>	<b>T</b>	Width	5mm		Date	Time	Juine	WIIITULES	Clanding	r.el	i i al F
D	:	<del>- +-</del> C	- z		E	3 1m <u>↓</u>	Orientation	on grees from	Stability:	General Rer	narks					

WSP Remediation		TRIAL PIT LO	3	Hole No. <b>TPB9</b>
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Sheet 1 of 1
Job No 39784	Client	Cuddy Group		Date 20-06-13 20-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)
	360 Excavator	CR	E 311301.918 N 167141.290	

- 1		& TE					Donth	ı			RATA					Inst Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							-	Firm, bro	own slightly sandy, s, stone and brick. I	gravelly CLA	/. Gravel is me	edium to coars	se, angular,			
							(0.50)	COHOICE	, storic and brick. I	WINDE CITOO!	<b>10</b> .				NODATA	
							- 0.50									
							0.50	Loose, g	rey, slightly sandy,	medium, ang	ular to subang	jular, stone Gl	RAVEL. MADE	$\times \times $	NODATA	
							0.70		D. le membrane.					+	, TOB/TI	-
								Loose, b	lack gravelly, ash S	SAND with occ	casional angul	ar concrete co	obbles. Gravel is		ł	
							-		edium, angular clir le membrane.	iker. Made G	ROUND.					
							-									
							-(1.20)								NODATA	
														$\times$		
														XX	,	
							1.90								}	
							-	Loose, re	ed brown, clayey, g lar, stone. MADE 0	ravelly SAND	. Gravel is fine	to medium, a	ngular to			
								Subangu	iai, storie. MADE C	SINOUND.				$\times$		
							_	Wet							<b>\</b>	
							-									
							-									
							(2.30)								NODATA	
														$\times$		
							-								<b>\</b>	
							ļ								}	
							-	Wet, slig	ht hydrocarbon od	our PID = 0.2p	opm.				ł	
							-								<u> </u>	
							-									
							4.20							$\longrightarrow$	1	
							-									
							-									
							Length		Shoring/Support:			Water	Strikes			_
							_	5mm	3	Date	Time	Strike	Minutes	Standing	Rer	narl
<b>-</b>		2.5r	n —		<b></b>											
		Α	_				Width		-							
D		-   -				B 1m	1	mm	Stability:	-						
						ь IIII			- Stubinty.	General Rer	narks	<u> </u>				
		С					Orientati									
							90 deg	rees from north								
									1	1						

WSP Remediation		-	TRIAL PIT LOC	3	Hole	e No.	ГРС	:1	
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She		1 of	1	
Job No 39784		Client	Cuddy Group		Date	2	:0-06- :0-06-	-	
Contractor / Driller	Meti	nod/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311349.456 N 167209.951		Ground	Level	(m AOE	0)
SAMPLES & TESTS			STRA	ATA					Install / Backfill
Debth Library (Ving 2)	Water	Elev. (mAOD) (Thick -ness)	iption			Legend	Geology	, Sudikiiii	

																lne
SAMF				_			Depth	1		STF	RATA					Ins Ba
Depth	Туре	PID (ppmV)	HSV (kN/m2	P.Pen (kN/m2	Water	Elev. (mAOD	1			Des	cription			Legend	Geology	
							-(0.60)	Loose, br subangul	rown, slightly claye ar, brick, concrete	ey, gravelly SA e and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	, angular to		NODATA	
							0.60		ey, slightly sandy,	medium, and	ular to subano	gular, stone Gl	RAVEL. MADE	$\rightarrow$	NODATA	
							- 0.75	GROUNI	D. e membrane.					-	NODATA	
							(0.65)	MADE GI	ack gravelly, ash s ROUND. e membrane.	SAND. Gravel	is fine to med	lium, angular o	clinker and brid	k. 🔀	NODATA	
							1.40								}	
							-		rey, slightly cobbly are angular to sub	, sandy, fine to pangular stone	coarse, angu . MADE GRO	ular, stone and UND.	brick GRAVE	XX		
							-(0.80)								NODATA	
							2.20		Loose, light brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angu							
							-	Loose, lig	ght brown, slightly ar, stone and bric	oarse, angular	to X					
							-	Wet. No	HCO. PID reading							
							-									
							-(2.00)								NODATA	
							- - -								>	
							4.20								<b>&gt;</b>	
							-									
							-									
							Length		Shoring/Support:				Strikes			
							2.	.5mm		Date	Time	Strike	Minutes	Standing	Rer	marl
<b> </b> ◀		2.5r A	n —		-		Width									
D		<del>-</del> +-	- z			F 1m	1	1mm	Stability:	-						
		С				<u> </u>	Orientati	on		General Rer	narks	•				
		-					90 deg	grees from north								
							İ		İ	1						

WSP Remediation		TRIAL PIT LO	3	Hole	TPC2
Regus Cardiff Bay, Falcon Driv Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Barry Waterfront Developr	ment	Shee	1 of 1
Job No 39784	Client	Cuddy Group		Date	20-06-13 20-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	(	Ground Level (m AOD)
	360 Excavator	CR	E 311342.243 N 167204.283		

	SAMPLES & TESTS							STRATA			Install / Backfill			
	Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen	Water	Elev. (mAOD)	Depth (Thick			Description	gend	Geology	
- - - -								_ness) _ _ _(0.55) _ _ _ 0.55	Loose, b subangu	rown, slightly claye lar, brick, concrete	y, gravelly SAND. Gravel is fine to coarse, angular to and stone. MADE GROUND.		NODATA	
-								- 0.75	Loose, g GROUN		medium, angular to subangular, stone GRAVEL. MADE	X	NODATA	
								(0.60)	Loose, b MADE G	le membrane. lack gravelly, ash S ROUND. le membrane.	SAND. Gravel is fine to medium, angular clinker and brick.		NODATA	
-								(0.45)	stone. G		velly, cobbly, SAND. Cobbles are angular to subangular se, angular to subangular, stone, concrete and brick.		NODATA	
								- - - -(1.20) - -	coarse, a		nd brown, slightly clayey, gravelly SAND. Gravel is fine to lar, brick and stone. MADE GROUND.  = 0.0ppm.		NODATA	
-								(0.50)	Loose, ye	ellow, fine to coars	e SAND with pockets of firm grey clay. MADE GROUND.		NODATA	
								3.50	medium,		n, slightly clayey, gravelly SAND. Gravel is fine to ular, stgone and brick. MADE GROUND. ppm.		NODATA	
								4.20	Water in	gress into base of	TP.	$\propto$		
-								Length		Shoring/Support:	Water Strikes			

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

,	V P Po			2					TRIAL F	PIT LO	G		Hole		PC3	
Regus C Cardiff Telephor	SP Re ardiff E Bay, Ca e: +44 +44 (0)	Bay, Fardiff (	alcon CF10 2036	Drive 4RU 6300	,  -	Project		Ba	arry Waterfro	nt Develop	ment		Shee		of 1	
Job No	39	784				Client			Cuddy	Group			Date	20-0	06-13 06-13	
Contractor	· / Dril	ler			Meth	nod/Plar 360	nt Used		Logged By	R	E	ates (NGR) 311333.831 167196.370		Ground Le	vel (m /	<del>/</del> OD)
SAMF	I FS	& TF	STS	<u> </u>		<u> </u>				STF	RATA	107 190.570				Ins
Depth			_	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick				cription			Lege	end Geo	Ba logy
							-ness) - - -(0.60) -	subangula	own, slightly claye ar, brick, concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse, D.	angular to		NOE	IATA
-						0.60  Loose, grey, slightly sandy, medium, angular to subangular, stone GRA' GROUND.  Geotextile membrane. Loose, black gravelly, ash SAND with occasional cobbles of brick and st is fine to medium, angular clinker and brick. MADE GROUND.  Geotextile membrane.							-	NOE	ATA	
							(1.15)	is fine to medium, angular clinker and brick. MADE GROUND.							NOE	ATA
							1.90 Loose, brown, slightly gravelly, clayey SAND. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.							to X	Nor	)ATA
							(2.10)	Wet, loos	slab in east end o	clayey, gravell	y SAND. Grav	vel is fine to co	arse, angu	lar to	NOE	MATA
							Length		Shoring/Support:		I	Water				
<b>-</b>	2.5m → A					<b>T</b>	Width	5mm		Date	Time	Strike	Minutes	Stand	ing	Remar
D						<u>*</u>	Orientation		Stability:	General Ren	 narks					
Scale	e 1:31.	.25				II dimens		metres. Log	gs should be read	in accordance	e with the prov	vided Key. Des	criptions a	re based or	n visual	and

	<b> </b>							-	TRIAL PIT L	OG		Hole No.	TPC	4	
Regus ( Cardiff Telephor Fax:	Bay, C.	Bay, F	alcon CF10 4	Drive 4RU		Project		Ва	rry Waterfront Deve	opmer	nt	Sheet	1 of	1	
lob No	39	784				Client			Cuddy Group			Date	20-06- 20-06-		
Contracto	r / Dri	ler			Met	hod/Plar 360	it Used Excava		Logged By	Co	D-Ordinates (NGR) E 311327.353 N 167189.238	Gro	und Level	(m AOI	) )
SAMF	PI FS	& TF	STS						<u> </u>	STRATA					Insta
Depth	De Signature (C) Line						Depth (Thick			escriptio			Legend	Geology	Back
							(0.65)							NODATA	
							- 0.75 - _(0.25) 1.00	GROUND. Geotextile Loose, black MADE GROUND.	membrane. ck gravelly, ash SAND. Gra				· / ×	NODATA NODATA	
							- -(1.00) - -	Concrete s	slab and angular cobbles of	sotne an	nd concrete.			NODATA	
							2.00 - -(0.40) - 2.40	Loose, yellow, gravelly SAND. Gravel is fine to coarse, angular to subangular of stone. MADE GROUND.						NODATA	
							- (0.90)	stone and	e, grey, gravelly SAND. Grav brick. MADE GROUND. HCO. PID reading 0.0ppm.		to coarse, angular to suba	angular,		NODATA	

Length Shoring/Support: Water Strikes Date Time Strike Minutes Standing Remarks 2.5mm 2.5m Width 1mm Stability: B 1m General Remarks **V** С Orientation 90 degrees from north

(0.70)

4.00

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 77/14

Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.

Wet, loose, grey, slightly gravelly, fine to medium SAND. Gravel is fine to coarse, angular to rounded, pebbles and shell fragments. MADE GROUND.

NODATA

WSP Remediation		TRIAL PIT LOC		Hole N	TPC5
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn		Sheet	1 of 1
Job No 39784	Client	Cuddy Group		Date	20-06-13 20-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311320.151 N 167180.670	G	iround Level (m AOD)

SAMP				_			Depth			STI	RATA				1	Insta Bac
Depth	Туре	(ppmV)	HSV (KN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD	1 '			Des	cription			Legend	Geology	
							(0.65)	Loose, b subangu	orown, slightly claye ılar, brick, concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		NODATA	
							- 0.65									
							0.85	GROUN	grey, slightly sandy, ID. Ie membrane.	medium, ang	ular to subang	ular, stone G	RAVEL. MADE		NODATA	1
							 - - - (1.15) - -	Loose, b angular	lo membrane Joack, gravelly SAN to subangular, clinl le membrane.	D with angula ker, brick and	r stone cobble stone. MADE	s. Gravel is fii GROUND.	ne to coarse,		> > > > > > > >	\ \
							2.00	Loose	ellow and brown, s	lightly clavey	aravelly SANF	) with angular	stone cobbles			
							- -(0.40) - 2.40		s fine to coarse, an						NODATA	
							-	angular	sse, grey brown, sli <sub>t</sub> to subangular, bric id. No HCO. PID re	k, concrete ar	d stone. MAD	Gravel is fine E GROUND.	to coarse,		>	
							-(1.40) - - - -								NODATA	
							3.80		se, grey, slightly gr to subangular ston	avelly, fine to e. MADE GRO	coarse SAND DUND.	. Gravel is fine	e to coarse,		NODATA	•
							-									
		<u> </u>					Length		Shoring/Support:			Water	Strikes			<u> </u>
<b>-</b>		2.5r A	m —		<b>→</b>	<b>T</b>	2. Width	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
D	:	<del>- +-</del> C	- z			B 1m ↓	Orientatio	on grees from	Stability:	General Rer	marks					
								orth								

WSP Remediation			TRIAL PIT LO	G	Hole	e No.	TPC	6	
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		Project Ba	arry Waterfront Developr	ment	She	eet	1 of	1	
Job No 39784		Client	Cuddy Group		Dat	2	20-06- 20-06-	-	
Contractor / Driller	Meth	nod/Plant Used	Logged By	Co-Ordinates (NGR)		Ground	d Level	(m AOE	D)
		360 Excavator	CR	E 311314.309 N 167172.701					
SAMPLES & TESTS			STRA	ATA					Install / Backfill
Depth Type (Nam (Nam (Nam (Nam (Nam (Nam (Nam (Nam	ater	Elev. (Thick	Descr	ription			Legend	Geology	

Depth   Type   Great   Break	SAMPI	LES	& TE	STS	S							STF	RATA					Install Backf
Loose, brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subangular, brick, concrete and stone. MADE GROUND.    Description of the property of the p	Depth	Туре	PID (ppmV)	HSV	(KIN/IIIZ) P Pen	(kN/m2)	Water	Elev. (mAOD)	(Thick			Des	cription			Legend	Geology	
Lose, place, gray, slightly sandy, medium, angular to subangular, stone GRAVEL MADE GROUND.  Geotextile membrane.  Lose, black, gravelly SAND with angular brick cobbles. Gravel is fine to coarse, angular to subangular, clinker, brick and stone. MADE GROUND.  160  Firm to stiff, slightly sandy, gravelly CLAY. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.  Lose, yellow, gravelly SAND. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  Water Strikes  Length Shoring/Support: Water Strikes															, angular to		NODATA	
Geotextile membrane.  Lose, black, gravelly SAND with angular brick cobbles. Gravel is fine to coarse, angular to subangular, clinker, brick and stone. MADE GROUND.  1.60  Firm to stiff, slightly sandy, gravelly CLAY. Gravel is fine to medium, angular to subangular, stone and brick. MADE GROUND.  Lose, yellow, gravelly SAND. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  2.60  Sand is wet at 2.5mbgl.  2.70  Lose, yellow, slightly gravelly, fine to coarse SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  Lose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  Water Strikes  Largth Shoring/Support: Water Strikes									0.65								1	
Loose, black, gravelly SAND with angular brick cobbles. Gravel is fine to coarse, angular to subangular, clinker, brick and stone. MADE GROUND.  160  Firm to stiff, slightly sandy, gravelly CLAY. Gravel is fine to medium, angular to subangular, stone and brick. MADE GROUND.  100  Loose, yellow, gravelly SAND. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.  Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  2.60  Sand is wet at 2.5mbgl.  2.70  Loose, grey brown, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, angular to subrounded, brick and stone. MADE GROUND.  1.00									0.80			medium, angi	ular to subang	jular, stone Gi	RAVEL. MADE		NODATA	
Firm to stiff, slightly sandy, gravelly CLAY, Gravel is fine to medium, angular to subangular, stone and brick. MADE GROUND.  Lose, yellow, gravelly SAND. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.  Lose, gray brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  2.50 Sand is wet at 2.5mbgl.  2.70 Loose, yellow, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, angular, stone. MADE GROUND.  Loose, grey brown, slightly gravelly, fine to coarse SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  (1.30)  Loose, grey brown, slightly gravelly, fine to coarse SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  NODATA  NODATA  NODATA  Water Strikes										Loose, bl angular t	ack, gravelly SAN o subangular, clin	D with angular ker, brick and s	brick cobbles stone. MADE (	s. Gravel is find GROUND.	e to coarse,		NODATA	
Loose, yellow, gravelly SAND. Gravel is fine to medium, angular to subangular of brick and stone. MADE GROUND.  Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  Sand is wet at 2.5mbgl.  Loose, yellow, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, angular stone. MADE GROUND.  Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  [1.30]  [1.30]  Length Shoring/Support: Water Strikes									-(0.40)					e to medium, a	angular to		NODATA	-
Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  2.60 Sand is wet at 2.5mbgl.  2.70 Loose, yellow, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, angular, stone. MADE GROUND.  Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  (1.30)  Loose, grey brown, slightly gravelly, fine to coarse SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  Water Strikes									2.00				ne to medium	ı, angular to sı	ıbangular of	$\Rightarrow \Rightarrow$	NODATA	
subrounded, brick and stone. MADE GROUND.  2.60  2.70  Loose, yellow, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, angular, stone. MADE GROUND.  Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  (1.30)  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA  NODATA									2.20				v SAND Grav	el is fine to co	arse angular to	+	105/11/	-
2.70 Loose, yellow, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, angular, stone. MADE GROUND.  Loose, grey brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subrounded, brick and stone. MADE GROUND.  (1.30)  NODATA  4.00  Length Shoring/Support: Water Strikes									L` ′	subround	led, brick and stor	e. MADE GRO	OUND.		aree, angular te		NODATA	
Length Shoring/Support: Water Strikes										Loose, ye	ellow, slightly grav		arse SAND. G	ravel is mediu	m to coarse,		NODATA	
Data Time Obliga Minutes Charling Deposit									- - - -	Loose, g	rey brown, slightly	clayey, gravell	y SAND. Grav DUND.	vel is fine to co	parse, angular to		NODATA	
Data Time Obliga Minutes Charling Deposit											Sharing/Support	T		Water	Strikos			
2.5mm Date Title Strike Williams Standing Remark									_		Gnorng/Support:	Data	Timo			Standina	Don	narko
									2.	5mm		Date	rime	Sulke	iviiriu(es	Standing	Ken	ııarKS

Length
2.5mm

A

Date Time Strike Minutes Standing Remarks

Note that the strike of th

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS GPJ WSPETEMPLATE1.03.GDT 77/14

WSP Development					TRIAL F	PIT LO	G		Hole		PC7	,	
WSP Remediatio Regus Cardiff Bay, Falcon Cardiff Bay, Cardiff CF10 Telephone: +44 (0)29 2036 Fax: +44 (0)29 2036 63	Drive 4RU 6 6300	Project		Ва	arry Waterfro	nt Develop	ment		Shee		of 1		
Job No 39784		Client			Cuddy	Group			Date	20	-06-13 -06-13		
Contractor / Driller	Ме	thod/Pla	nt Used		Logged By	R	E	ates (NGR) 311306.745 167164.850		Ground L	evel (m	1 AOD	))
SAMPLES & TESTS	5					STR	ATA						Instal Back
Depth Type Q d d S H S N S H S	P.Pen (kN/m2) Water	Elev. (mAOD	Depth (Thick			Desc	cription			Le	gend Ge	eology	Buon
			-ness)(0.60)(0.60)(0.65)(1.10)(0.25)(0.25)(0.30)(0.30)(0.30)	Loose, gr. GROUNE Geotextile Loose, bla at 0.9mbg MADE GF Geotextile Loose, da brick and Loose, da brick and Loose, da brick and Wet, soft, subangula Strong HG 43.2ppm Loose, ye stone. MAWet, soft,	e membrane. ack, gravelly SANI gl. Gravel is fine to	medium, anguardium,  angular to subangular to suban	cobbles and cular, clinker, brarse, angular to coarse, angular to headspace, subangular to	o subangur to subrounder subrounder	ADE  ocks one.  gular,	NC NC	DDATA  DDATA  DDATA  DDATA  DDATA		
2.5m — A		► A T M B 1m	Width	5mm	Shoring/Support:	Date Concret Por	Time	Water Strike	Strikes Minutes	Stan	nding	Rem	narks
С		<b>」</b> <u>▼</u>		on grees from north		General Ren	Iarks						
Scale 1:31.25		All dimen		metres. Lo	gs should be read	in accordance	e with the prov	ided Key. Des	criptions a	re based o	on visua	al and	

WSP Remediation		TRIAL PIT LOC	3	TPC8
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Barry Waterfront Developn	nent	Sheet 1 of 1
Job No 39784	Client	Cuddy Group		Date 20-06-13 20-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)
	360 Excavator	CR	E 311300.436 N 167159.152	

SAMF				_			Donth			STI	RATA					Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							- - -(0.60)	cobbles.	lightly clayey, grav Gravel is fine to co ROUND.	elly SAND witl oarse, angula	n few concrete r to subangula	and brickwor r, brick, concr	k, angular ete and stone.		NODATA	
							0.60	Loopo	rey, slightly sandy,	fine to modiu	m angular ta	aubrounded o	atono and brick	+		
							0.80	GRAVE	L. MADE GROUND		in, angular to	subrounded, s	Storie and brick		NODATA	
							- - - -(1.40)	Loose, b	le membrane. black, gravelly SAN d stone. MADE GR le membrane.	D. Gravel is fii OUND.	ne to coarse, a	angular to sub	angular, clinker		NODATA	
							_									
							2.20									
							-(0.40)	Cohesiv	e, grey, sandy SILT	with wood fra	agments. MAD	E GROUND.			NODATA	
							2.60	Wet, col	nesive, slightly gra	velly, sandy S	ILT. Gravel is	fine to mediur	m, subangular t	· 💥		
							-(0.40) - 3.00	Wet	ded storie. MADE (	SKOUND.					NODATA	
							- - -(1.00)	Loose, r subangu	ed, slightly clayey, ılar stone. MADE C	gravelly SANE ROUND.	J. Gravel is fin	e to coarse, a	ngular to		NODATA	
							4.00								<b>)</b>	
							4.20	***	se, slightly sandy, GROUND.	fine to coarse	, angular to su	bangular, stor	ne GRAVEL.		NODATA	
							-									
	<u> </u>						Length		Shoring/Support:			Water	Strikes			<del>'</del>
<b>—</b>		2.5r A	n —		<b>→</b>		2. Width	5mm	-	Date	Time	Strike	Minutes	Standing	Rer	mark
D			- z			B 1m	1	mm	Stability:							
		С				<u> </u>	Orientatio	on	+	General Rer	marks					
							90 deg	rees from orth								
							1		I	1						

WSP Remediation		TRIAL PIT LOC		Hole	TPC9
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	She	eet 1 of 1
Job No 39784	Client	Cuddy Group		Dat	e 21-06-13 21-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311292.169		Ground Level (m AOD)
	300 Excavator	CK	N 167150.610		

SAMF				_			Depth			SIF	RATA					Inst Bac
Depth	Туре	PID (ppmV)	HSV (KN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD				Des	cription			Legend	Geology	
							- - _(0.55)	cobbles.	slightly clayey, grave Gravel is fine to co GROUND.	elly SAND with parse, angular	n few concrete to subangula	and brickwor r, brick, concr	k, angular ete and stone.		NODATA	
							- 0.55									
							0.75		rey, slightly sandy, L. MADE GROUND	fine to mediu	m, angular to	subrounded, s	stone and brick		NODATA	
							-	Loose, b	le membrane. black, gravelly SANI angular to subangu	D with few and lar, clinker, br	gular, stone, coick and stone.	obbles Grave	el is fine to JND.			
							(0.75)	Geotexti	le membrane.						NODATA	
							1.50	Loose, g	grey, silty, fine SAN	D. MADE GRO	DUND.					
							- -(1.00)								NODATA	
							2.50									
							-	Loose, b subangu	orown, slightly claye ılar, concrete, brick	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		>	
							(1.70)		8.0mbgl. NO HCO.	_					NODATA	
							4.20								>	
							-									
							Length		Shoring/Support:			Water	Strikes			
h <del>a</del>		2.5r	m				2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
		A.SI				<b>T</b>	Width	mm								
D	:	<del>-</del> +-	- *			B 1m <u>▼</u>			Stability:	General Rer	narks					
		С						on grees from north								

	WSP Remediation		-	TRIAL PIT LO	<b>G</b>	Hole		TPD	1	
Regus Cardif Cardiff Bay, Telephone: +	f Bay, Falcon Drive Cardiff CF10 4RU 44 (0)29 2036 6300 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She	et	1 of	1	
Job No	9784		Client	Cuddy Group		Date	2	21-06- 21-06-	-	
Contractor / D	riller	Met	nod/Plant Used	Logged By	Co-Ordinates (NGR)		Ground	d Level	(m AOE	D)
			360 Excavator	CR	E 311343.015 N 167220.575					
SAMPLES	S & TESTS			STRA	ATA					Install / Backfill
Depth Typ	PID (ppmV) HSV (kN/m2) P.Pen (kN/m2)	Water	Elev. (mAOD) (Thick	Descr	iption			Legend	Geology	

Depth Type	Legend Ge	
Loose, slightly clayey, gravelly SAND with few con		eology
MADE GROUND.	angular, brick, concrete and stone.	DDATA
0.60 Loose, grey, slightly sandy, fine to medium, angula 0.75 GRAVEL. MADE GROUND.	alar to subrounded, stone and brick	DATA
Geotextile membrane. Loose, black, gravelly SAND. Gravel is fine to coal brick and stone. MADE GROUND. Geotextile membrane.		DDATA
- 1.65 - Loose, grey and yellow, slightly clayey, gravelly SA	SAND. Gravel is fine to coarse,	
angular to subangular, brick, clinker and stone. Ma (0.55)	IX XI	DDATA
2.20 Loose, light brown, slightly gravelly, silty, fine SAN	ND. Gravel is fine to coarse, angular	
to rounded, stone, brick and clinker. MADE GROUNT (1.60)  Wet. No HCO. PID reading = 0.0ppm.	NC	DDATA
Wet, loose, grey, clayey, fine SAND. MADE GROU	DUND.	DATA
_ Water ingress		
Length Shoring/Support:	Water Strikes	<u> </u>

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

WSP Remediation		TRIAL PIT LOC		Hole	TPD2
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Shee	et 1 of 1
Job No 39784	Client	Cuddy Group		Date	21-06-13 21-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	(	Ground Level (m AOD)
	360 Excavator	CR	E 311333.265 N 167213.818		

SAMF							D45	STRATA			Instal Back
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen	Water	Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	
							- - - - (0.65)	Loose, slightly clayey, gravelly SAND with few concrete and brickwork, angular cobbles. Gravel is fine to coarse, angular to subangular, brick, concrete and stone. MADE GROUND.		NODATA	
							- 0.65 - 0.75	Loose, grey, slightly sandy, fine to medium, angular to subrounded, stone and brick	XX	NODATA	
							- - - - - - -	GRAVEL. MADE GROUND.  Geotextile membrane.  Loose, black, gravelly, cobbly SAND. Gravel is fine to coarse, angular to subangular, clinker, brick and stone. Cobbles are angular to subrounded, brickwork, concrete and stone. MADE GROUND.  Geotextile membrane.		NODATA	
							1.50 (0.30) 1.80	Loose, grey, lightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subangular stone. MADE GROUND.		NODATA	
							1.95	Soft, grey and brown mottled CLAY. MADE GROUND.		NODATA	
							(0.55)	Loose, grey, lightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subangular stone. MADE GROUND.		NODATA	L
							2.50	Cohesive, grey, silty, fine SAND. MADE GROUND.			
								Wet. Slight HCO. PID reading = 0.0ppm.		NODATA	
							- - - -	Water Ingress (slow) from SW corner of TP.			
							4.20				
							Length	Shoring/Support: Water Strikes			

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

200 Function CD E 3113						
			TRIAL PIT LO		Hole	TPD3
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630		•	rry Waterfront Developn	nent	Sheet  1 of 1  Date 21-06-13 21-06-13  Ground Level (m AOD)	
		Client	Cuddy Group		Dat	21-06-13
Contractor / Driller	Met		,	Co-Ordinates (NGR) E 311324.939 N 167207.360		Ground Level (m AOD)
CANADI EO A TEOTO			OTD.	Т.		Install /

SAMF							Donth			STI	RATA				1	Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							-	Loose, b subangu	rown, slightly claye lar, brick, concrete	ey, gravelly SA e and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to			
							-(0.60)								NODATA	
							0.60	Loose, g	rey, slightly sandy,	medium, ang	ular to subang	gular, stone G	RAVEL. MADE		NODATA	
							-	Geotexti Loose, b angular	le membrane. lack, gravelly SAN to subangular, clinl le membrane.	D with angula ker, brick and	r brick cobbles stone. MADE	s. Gravel is fin GROUND.	e to coarse,		>	
							_(1.05) - -								NODATA	
							1.80		rown, gravelly, silty	y, fine SAND.	Gravel is fine	to medium, ar	ngular to		NODATA	
							2.00	Soft, gre	y, slightly gravelly, , stone and clinker.	sandy CLAY.	Gravel is fine	to medium, ar	ngular to			
							- -(0.80) - -								NODATA	
							2.80	Wet, loo	se, black, sandy, fi	ne to coarse,	angular to sub	pangular, ston	e GRAVEL.			-
							-(1.20)	Wet at 2	ROUND. .8mbgl.						NODATA	
							4.00	Ingress	of water from SW o	corner of TP.					>	
							-									
							Length		Shoring/Support:			Water	Strikes			
<b>-</b>		2.5r	n —				2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
		A				<b>T</b>	Width 1	mm								
D	:	<del>-  -</del> C	- z			B 1m			Stability:	General Rer	marks					
		U						rees from								
	e 1:31	25		Note	ıs. Al	l dimen	sions in	metres Lo	gs should be read	Lin accordanc	e with the pro	vided Kev De	scriptions are	hased on vis	sual and	

WSP Remediation		TRIAL PIT LOC		Hole	TPD4
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399	1	arry Waterfront Developn	nent	Shee	1 of 1
Job No 39784	Client	Cuddy Group		Date	21-06-13 21-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	(	Ground Level (m AOD)
	360 Excavator	CR	E 311318.600 N 167200.621		

SAMF			_				Depth			STI	RATA					Insta Bacl
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)				Des	cription			Legend	Geology	
							- - _(0.55)	cobbles.	lightly clayey, grav Gravel is fine to co GROUND.	elly SAND witl oarse, angula	h few concrete r to subangula	and brickwor r, brick, concr	k, angular ete and stone.		NODATA	
							- 0.55									
							0.70		rey, slightly sandy, L. MADE GROUND		m, angular to	subrounded, s	stone and brick		NODATA	
							- - - -(1.20)	Loose, b clinker, b brickwor	le membrane.	obbles 1.4-1.9	mbgl. Cobbles	arse, angular s are angular	to subangular, to subrounded		NODAT#	
							1.90								<b>)</b>	
							2.10		orown, clayey, graved d stone. MADE GR		avel is fine to	coarse, angula	ar to subangula	ır,	NODATA	
							-	Loose, b	plack, slightly claye llar of brick and sto			fine to coarse,	angular to		>	
							(0.90)	Wet. Slid	ght HCO. PID read	ing = 0.0ppm					NODATA	
							3.00									
							(0.70)		y, slightly gravelly, ilar, stone. MADE (		Gravel is fine	to coarse, anç	gular to		NODATA	
							(0.30)	Wet, loo to mediu	se, grey, slightly gr ım, angular to roun	ravelly, slightly ded, stone, pe	clayey, fine to bbles and she	coarse SAN ell fragments.	D. Gravel is fin	e	NODATA	
							-									
							Length		Shoring/Support:			1	Strikes			
<b>-</b>		2.5r A	n —		<b>→</b>	<b>T</b>	Width	5mm	_	Date	Time	Strike	Minutes	Standing	Rei	mark
D	:		- z			B 1m <u>↓</u>		mm	Stability:	General Rer	marks					
		С						on grees from north								
									ogs should be read							

WSP Remediation		-	TRIAL PIT LOC	3	Hole	TPD5
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Bar	rry Waterfront Developn	nent	She	eet 1 of 1
Job No 39784		Client	Cuddy Group		Dat	21-06-13 21-06-13
Contractor / Driller	Met	:hod/Plant Used	Logged By	Co-Ordinates (NGR)		Ground Level (m AOD)
		360 Excavator	CR	E 311311.445 N 167192.419		
SAMDLES & TESTS			STDV	\TA		Install /

						360	Excava	itor		R	N	I 167192.419	9			
SAME		_								STI	RATA				1	Ins Ba
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							(0.50)	Loose, b subangu	rown, slightly clay lar, brick, concrete	ey, gravelly SA e and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		NODATA	
							0.50									
							0.70	GROUN	rey, slightly sandy D. e membrane.	, medium, ang	ular to subang	gular, stone G	RAVEL. MADE		NODATA	
							-	Loose, b coarse, a	lack, gravelly SAN angular to subang e membrane.	ID with occasion	onal angular b rick and stone	rick cobbles. ( . MADE GRO	Gravel is fine to UND.		<b>&gt;</b> >	
							(1.30)								NODATA	
							2.00	Loose, g	rey, slightly gravel	ly, silty, fine S	AND. Gravel is	s fine to mediu	ım, angular to			-
							-(2.00)		lar of stone. MADI		Pppm				NODATA	-
					<u> </u>		Length		Shoring/Support:			Water	Strikes			<u> </u>
							2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
<del> </del>		2.5r A	n —		-		Width		_							
D	:	<del>-   -</del>	- z			<b>⊼</b> B 1m	1	mm	Stability:	General Rer	marke					
		С				*	Orientatio	on	-	General Ref	iidi KS					
							90 deg	rees from orth								
									gs should be read	ĺ						

WSP Remediation		TRIAL PIT LOC		Hole	TPD6
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Shee	1 of 1
Job No 39784	Client	Cuddy Group		Date	21-06-13 21-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	(	Ground Level (m AOD)
	360 Excavator	CR	E 311304.866 N 167183.666		

			-								
			2.00	Loose, g stone. M	rey, slightly gravell IADE GROUND.	y, silty, fine SA	AND. Gravel is	s fine to coarso	e, anguolar of		
			- - (2.00) - - -	Slight oo	dour. PID reading =	1.1ppm at TP	edge. PID rea	ading = 41.2pp	om headspace.	NODATA	
			4.00								-
			-								

WSP Remediation		TRIAL PIT LO	OG	Hole I	TPD7
Regus Cardiff Bay, Falcon Dr Cardiff Bay, Cardiff CF10 4F Telephone: +44 (0)29 2036 6 Fax: +44 (0)29 2036 6399	RU   1 1 9 9 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Barry Waterfront Develo	pment	Shee	t 1 of 1
Job No 39784	Client	Cuddy Group		Date	21-06-13 21-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)		Ground Level (m AOD)
	360 Excavator	CR	E 311299.080 N 167177.496		

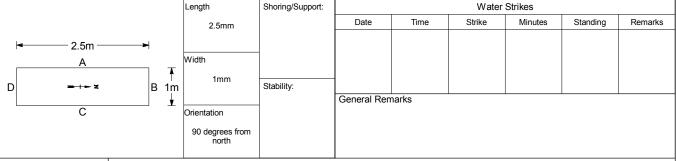
SAMF				-			Depth			511	RATA			T		Insta Bac
Depth	Туре	PID (ppmV	HSV (kN/m2	P.Pen (kN/m2)	Water	Elev. (mAOD)				Des	cription			Legend	Geology	
							- - -(0.60)	Loose, b angular t	rown, slightly claye o subangular, bric	ey, slightly cob k concrete and	bly, gravelly S d stone. MADE	AND. Gravel i GROUND.	s fine to coarse,		NODATA	
							0.60									
							0.80	Loose, g GROUN	rey, slightly sandy, D.	medium, ang	ular to subang	ular, stone G	RAVEL. MADE		NODATA	
							-	Loose, b angular t	e membrane. lack, gravelly SAN o subangular, clinl e membrane.	D with angular ker, brick and	r stone cobble stone. MADE	s. Gravel is fir GROUND.	ne to coarse,		·	
							-(1.00) -								NODATA	
							1.80	Cohesive	e, grey, slightly gra	velly silty fine	SAND Grave	al is fine to me	edium angular			
							- -(0.60)		r, grey, stigritly gra unded, stone. MAD		, S. L.ID. Oldvi	. io inio to me	warii, arigulal		NODATA	
							2.40	Oak	and all shift.		CAND	lia Em- t-				
							(0.25)	rounded,	e, grey, slightly gra clinker and stone.	MADE GROU	JND.				NODATA	
							-		t, grey and yellow r ADE GROUND. ght HCO. PID read			ghout, slightly	gravelly, sandy			
							_ _(1.05) _ _								NODATA	
							3.70									
							(0.50)		r, soft, sandy CLAY gress at base of T						NODATA	
							4.20									-
							-									
							Length		Shoring/Support:			Water	Strikes			_
							2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	nark
<b>-</b>		2.5r A	n —		<b>→</b>	т	Width									
D	:	- +-	- <b>z</b>			 B 1m	1	mm	Stability:	0						
		С				<u>*</u>	Orientatio	on		General Rer	narks					
								rees from orth								
									gs should be read							

WSP Remediation		TRIAL PIT LO	3	Hole No. TPD8
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399	VSP Remediation s Cardiff Bay, Falcon Drive iff Bay, Cardiff CF10 4RU ione: +44 (0)29 2036 6300 x: +44 (0)29 2036 6399  Client	arry Waterfront Developn	nent	Sheet 1 of 1
Job No 39784		Cuddy Group		Date 24-06-13 24-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)
	360 Excavator	CR	E 311291.535 N 167170.931	

SAMP	I FS	& TF	STS							STI	RATA					Inst
Depth	Туре				Water	Elev.	Depth (Thick				cription			Legend	Geology	Ba
·		d)	<u></u>	(K)	>	(MAOL	-ness) - - -(0.60)	Loose, b angular	orown, slightly claye to subangular, bricl	y, slightly cob	bly, gravelly S	AND. Gravel E GROUND.	is fine to coarse		NODATA	
							0.60		rey, slightly sandy, D.	medium, ang	ular to subang	jular, stone G	RAVEL. MADE		NODATA	_
							(0.50)	Geotexti Loose, b brick and	le membrane. black, gravelly SANI d stone. MADE GR le membrane.	D. Gravel is fir OUND.	ne to coarse, a	angular to sub	pangular, clinker,		NODATA	
							(0.25)	Soft to fi	rm, brown grey mo	ttled, slightly	gravelly, sandy	CLAY. MAD	E GROUND.		NODATA	1
							- 1.55 	Wet, loo Gravel is Water In	rey, slightly gravell SROUND.  HCO, PID reading  se, brown and greys is fine to coarse, and gress (slow) at basingress (fast) at basingress (fast)	0.0ppm. o, gravelly SAI gular stone. N se of TP.	ND with ocasic	onal angular			NODATA	
							-		Tay is no	T						
							Length 2.	5mm	Shoring/Support:	Date	Time	Wate Strike	r Strikes Minutes	Standing	Rei	mark
<b>-</b>		2.5r A	m —		<b>→</b>	<del>_</del>	Width	mm								
D	:	<del>- +-</del> C	- 3			B 1m	Orientation	on grees from north	Stability:	General Rer	narks					
				<b>N</b> 1 - 1 -			<u> </u>		ogs should be read	<u> </u>	201- 10	ided Key De				

WSP Remediation		-	TRIAL PIT LOC	3	Hole	TPD9
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She	eet 1 of 1
Job No 39784		Client	Cuddy Group		Dat	24-06-13 24-06-13
Contractor / Driller	Met	hod/Plant Used 360 Excavator	Logged By  CR	Co-Ordinates (NGR) E 311282.687 N 167163.394		Ground Level (m AOD)
OAMBUEO A TEOTO			OTDA			Install /

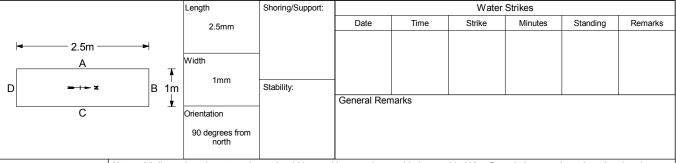
SAMF	PLES	& TE	ES <sup>-</sup>	TS					STRATA			Instal Back
Depth	Туре	PID (ppmV)	HSV	(kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)	Description	Legend	Geology	Duon
								-	Loose, brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angular to subangular, brick concrete and stone. MADE GROUND.			
								(0.65) - - - 0.65			NODATA	
								- 0.85	Loose, grey, slightly sandy, medium, angular to subangular, stone GRAVEL. MADE GROUND.		NODATA	
								1.00	Geotextile membrane.  Loose, black, gravelly SAND with few angular stone cobbles. Gravel is fine to coarse,		NODATA	
								-	angular to subangular, clinker, brick and stone. MADE GROUND.  Geotextile membrane.  Rebar present at 0.9mbgl.		>	
								-(0.80) -	Concrete slab. TP widened to remove. MADE GROUND.		NODATA	
								1.80	Lange group dighth, grouply, dayou CAND, MADE COOLIND			
								-	Loose, grey, slightly gravelly, clayey SAND. MADE GROUND.  Damp, Wetness increases with depth. No HCO. PID reading = 0.0ppm.			
								- - - - -			>	
								-(2.60) - - - - - -	Wet. Slight HCO. PID reading = 0.0ppm.		NODATA	
								- - 4.40			>	
								- - -				
	1							Length	Shoring/Support: Water Strikes	1		-



08 WSP TP LOG STANDARD BARRY TRIAL PITS.GPJ WSPETEMPLATE1.03.GDT 777/14

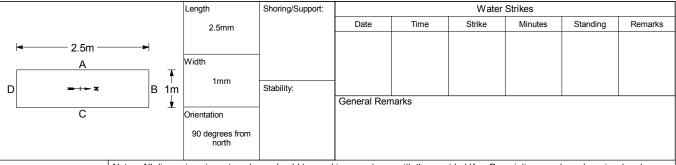
WSP Remediation		TRIAL PIT LOC		Hole N	TPE1
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Sheet	1 of 1
Job No 39784	Client	Cuddy Group		Date	24-06-13 24-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311332.495 N 167235.129	G	round Level (m AOD)

SAMF							Dont			STF	RATA					Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							- - - (0.65)	Loose, b subangu	orown, slightly claye llar, brick concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUND	fine to coarse ).	, angular to		NODATA	
							- 0.65									
							- 0.85	GROUN		medium, ang	ular to subrou	nded, stone G	RAVEL. MADE		NODATA	
							1.00	Loose, b	le membrane. black, gravelly SAN angular to subangu	D with rare, ar ılar, clinker, br	ngular, concret	te cobbles. Gi MADE GROI	ravel is fine to JND.		NODATA	1
							-	Cohesive	le membrane. e, grey, slightly gra angular to subroun	velly, clayey, f ded, stone bri	ine to medium ck and concre	SAND. Grave te. MADE GR	el is fine to OUND.			
							-	Damp. N	No HCO. PID readin	ng = 0.0ppm.						
							- -(3.40) - -	Wet at 2	t.9mbgl. No HCO. I	PID reading =	0.0ppm.				NODATA	
									igress in SW corne							
							- - -	water in	gress at base of T	P. NO HCO. F	PID reading = (	J.Uppm.				
							Length		Shoring/Support:			Water	Strikes			_
<b> </b>		2.5r A	n —		<b>→</b>	<b></b>	Width	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
D	:	<del>- +-</del> C	- z			T B 1m ↓	Orientatio	on grees from	Stability:	General Rer	marks					
							r	orth	ogs should be read							



<b>WSP</b> Remediation		TRIAL PIT LO	3	TPE2
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Sheet 1 of 1
Job No 39784	Client	Cuddy Group		Date 24-06-13 24-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Level (m AOD)
	360 Excavator	CR	E 311323.120 N 167227.323	

				P.Pen (kN/m2)			-ness)	Loose, b	prown, slightly clayed	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUND	fine to coarse	e, angular to			
							(0.65)								NODATA	
							- 0.65		Palellarand	P	dente extrem					
							- 0.85	GRAVE	rey, slightly sandy, L. MADE GROUND le membrane.	medium, ang	uiar to subrou	naea, stone, o	concret and brick		NODATA	
							(0.40)	brick and	olack, gravelly SAN d stone. MADE GR le membrane.	D. Gravel is fil OUND.	ne to coarse, a	angular to sub	angular, clinker,		NODATA	
							- - - - -	Cohesive	e, grey, slightly gra , stone, concrete, t	velly, clayey S prick, clinker a	AND. Gravel i nd shell fragm	s fine to coars nents. MADE (	se, angular to GROUND.			
							- - (2.15) - - -								NODATA	
							- - - - - 3.40		HCO. PID reading		Gravel is fine	to coarse, an	gular to			_
							- -(0.80) - -		rey, slightly gravell ded of stone and sl gress at base of T						NODATA	
							4.20									
							Length		Shoring/Support:	1		Water	Strikes			<u>_</u>
<b> </b>		2.5r A	n —		<b>→</b>	<b>T</b>	2. Width	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
D	:	<del>-</del>	- z			B 1m ↓	1 Orientatio	mm	Stability:	General Rer	marks					



WSP Remediation		TRIAL PIT LOC		Hole	TPE3
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Shee	1 of 1
Job No 39784	Client	Cuddy Group		Date	24-06-13 24-06-13
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	(	Ground Level (m AOD)
	360 Excavator	CR	E 311314.403 N 167219.079		

SAIVIF	PLES						Donth	1		SIF	RATA					Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD	Depth (Thick -ness)			Des	cription			Legend	Geology	
							- - -(0.60)	Loose, to Gravel is GROUN	orown, slightly clayes s fine to coarse, an ID.	ey, gravelly SA gular to subar	ND with few a gular, brick co	ngular, concre oncrete and st	ete cobbles. one. MADE		NODATA	
							0.60	Loose, g	grey, slightly sandy,	medium, ang	ular to subrou	nded, stone G	RAVEL. MADE		NODATA	
							0.80		ID. ile membrane.					+	NODAIA	
							(0.50)	Loose, to	plack, gravelly, ash oarse, angular to si ile membrane.	SAND with an ubangular, clir	gular, brick ar nker, brick and	nd concrete co stone. MADE	obbles. Gravel i GROUND.	s	NODATA	
							1.30	Loose, b	orown grey, clayey	SAND. MADE	GROUND.			$\times$		
							[(1.70)	Damp. N	No HCO. PID readir	ng = 0.0ppm.					NODATA	· ·
							3.00									
							- - - -(1.00)	subangu	ose, grey, slightly cl ular, stone. MADE ( ngress in base TP.	GROUND.					NODATA	
							4.00		ngress from SW co	rner of TP. Sli	ght HCO. PID	reading = 2.6	ppm.			
							  -  -  -  -  -  -  -									
							Length	l	Shoring/Support:			Water	Strikes			<u> </u>
							2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	nark
-		2.5r	n —		<b></b>											
		Α				<b>T</b>	Width									
D	:	- +-	- <b>z</b>			T B 1m	1	Imm	Stability:							
						<u> </u>	0-1			General Rer	narks					
		С					Orientati	on grees from								
								north								

WSP Remediation		TRIAL PIT LO	G	Hole No	TPE4	
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399	1.19,551	Barry Waterfront Develop	ment	Sheet	1 of 1	
Job No 39784	Client	Cuddy Group		Date	24-06-13 24-06-13	
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Gro	ound Level (m AO	D)
	360 Excavator	CR	E 311305.750 N 167209.949			
SAMPLES & TESTS		STR	ATA			Install / Backfill

					_											
SAMP	LES	& TE	STS	5						STF	RATA				1	Instal Back
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen	(KIN/MZ) Water	Elev. (mAOD	Depth (Thick -ness)			Des	cription			Legend	Geology	
							(0.50)	Loose, b concrete	rown, slightly claye , brick, stone and c	y, gravelly SA dinker. MADE	ND. Gravel is GROUND.	fine to coarse	, angular,		NODATA	
							0.65		lack, gravelly, ash ick and concrete.			rse, angular to	rounded,		NODATA	
							- 0.85	Cohesive	e, slightly gravelly, lar, clinker, brick a	clavey SAND.	Gravel is fine	to coarse, an	gular to		NODATA	
							1.00	Loose, s	lightly sandy, fine to ROUND.				stone GRAVEL.		NODATA	
							-(0.60)	Geotextil Loose, b coarse, a	e membrane. lack, gravelly SANI angular to subangu e membrane.	D with angular lar of brick an	r, brick and sto d stone. MAD	one Cobbles. ( E GROUND.	Gravel is fine to		NODATA	
							1.60	coarse, a	e, grey and brown rangular to rounded ROUND.						NODATA	
							2.10		rey, slightly gravell							
							- - - - - - -	angular t	co, nightly given or rounded, brick an CO. PID reading = 1	nd stone. MAD			o to occurse,			
							(1.90)	Fast wat	er ingress from No	rth side of TP	, with oily she	en.			NODATA	
							4.00							XX		
							Length		Shoring/Support:			Water	Strikes			
							2	5mm		Date	Time	Strike	Minutes	Standing	Ren	narks

Length 2.5mm

Length 2.5mm

Length 2.5mm

Length 2.5mm

Norientation 90 degrees from north

Length 2.5mm

Shoring/Support: Water Strikes

Date Time Strike Minutes Standing Remarks

General Remarks

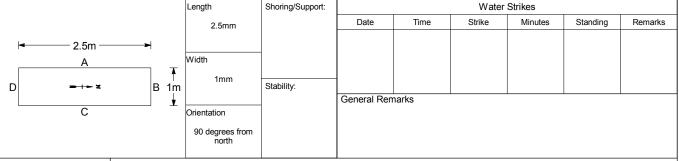
General Remarks

Scale 1:31.25

08 WSP TP LOG STANDARD BARRY TRIAL PITS GPJ WSPETEMPLATE1.03.GDT 77/14

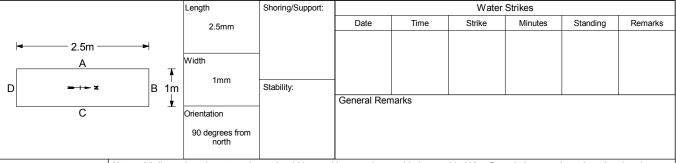
WSP Remediation		-	TRIAL PIT LO	3	Hole	TPE5
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She	et 1 of 1
Job No 39784		Client	Cuddy Group		Dat	e 24-06-13 24-06-13
Contractor / Driller	Met	hod/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311296.071 N 167200.768		Ground Level (m AOD)
SAMPLES & TESTS			STRA	ΔΤΔ		Install /

Гуре	OIA (Vmdd)	HSV (KN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth			_				Legend	Geology	
			_		, - ,	-ness)			Des	cription			Legena	Coology	
						(0.50)	concrete	rown, slightly claye cobbles Gravel is e. MADE GROUNI	s fine to coars	obly, gravelly S se, angular to s	AND with occ subrounded, b	asional angular rick concrete		NODATA	
						0.50		rey, slightly sandy, MADE GROUND		ular to subang	ular, stone ar	nd brick,		NODATA	
						- - - -	Loose, b angular t	le membrane. lack, gravelly SANI to subangular, clink le membrane.	D with angula ker, brick and	r stone cobble stone. MADE	s. Gravel is fir GROUND.	ne to coarse,			
						(1.35)								NODATA	
						2.00	and clink	er. MADE GROUN	ID.			o rounded, stone			
						-(1.80)	Wet at 3	.1mbgl. No HCO. F	PID reading =	0.0ppm.				NODATA	
						3.80 - -(0.40) - 4.20			. Gravel is fin	e to coarse, ar	ngular stone. I	MADE		NODATA	
						-									
						Length		Shoring/Support:			Water	Strikes	1	<u> </u>	_
	2.5r A	m —		<b>→</b>	<b>T</b>	2. Width	5mm		Date	Time	Strike	Minutes	Standing	Rer	nark
=	C	- 3				Orientation	on grees from	Stability:	General Rer	marks					
	3	A	C	A C C	A C C	A  B 1m  C  Notes: All dimens	2.00 -(1.80) -(1.80) -(1.40) -(1.420) -(1.40) -(1.420) -(1.40)	2.00  2.00  Soft, gre and clinh Slight hy  (1.80)  (1.80)  (1.80)  (1.40)  (1.40)  Loose, g GROUN  (2.5mm  Width  1mm  C  C  Orientation 90 degrees from north  1.31 25  Notes: All dimensions in metres. Lo	2.00  Soft, grey, slightly gravelly of and clinker. MADE GROUN Slight hydrocarbon odour a	2.00  Soft, grey, slightly gravelly CLAY. Gravel and clinker. MADE GROUND. Slight hydrocarbon odour at 2.1m PID re  (1.80)  Wet at 3.1mbgl. No HCO. PID reading =  (0.40)  Loose, grey, gravelly SAND. Gravel is fin GROUND.  4.20  Length 2.5mm  Shoring/Support:  Date  Date  C  General Rer  Orientation 90 degrees from north  Notes: All dimensions in metres. Logs should be read in accordance.	2.00  Soft, grey, slightly gravelly CLAY. Gravel is fine to mediand clinker. MADE GROUND. Slight hydrocarbon odour at 2.1m PID reading = 4.4ppi  (1.80)  Wet at 3.1mbgl. No HCO. PID reading = 0.0ppm.  Loose, grey, gravelly SAND. Gravel is fine to coarse, and GROUND.  Loose, grey, gravelly SAND. Gravel is fine to coarse, and GROUND.  Length 2.5mm Shoring/Support: Date Time  Orientation 90 degrees from north  Notes: All dimensions in metres. Logs should be read in accordance with the province of the province	2.00  Soft, grey, slightly gravelly CLAY. Gravel is fine to medium, angular to and clinker. MADE GROUND. Slight hydrocarbon odour at 2.1m PID reading = 4.4ppm  Wet at 3.1mbgl. No HCO. PID reading = 0.0ppm.  Loose, grey, gravelly SAND. Gravel is fine to coarse, angular stone. I GROUND.  Loose, grey, gravelly SAND. Gravel is fine to coarse, angular stone. I GROUND.  Length 2.5mm  Midth 1mm Strike  C  Slability: General Remarks  General Remarks  Orientation 90 degrees from north Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Delay.	Soft, grey, slightly gravelly CLAY. Gravel is fine to medium, angular to rounded, stone and clinker. MADE GROUND. Slight hydrocarbon odour at 2.1m PID reading = 4.4ppm  (1.80)  Wet at 3.1mbgl. No HCO. PID reading = 0.0ppm.  Loose, grey, gravelly SAND. Gravel is fine to coarse, angular stone. MADE GROUND.  4.20  Length Shoring/Support: Water Strikes  Date Time Strike Minutes  Vidth Imm Stability: General Remarks  General Remarks  Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on t	Soft, grey, slightly gravelly CLAY. Gravel is fine to medium, angular to rounded, stone and clinker. MADE GROUND. Slight hydrocarbon odour at 2.1m PID reading = 4.4ppm  (1.80)  Wet at 3.1mbgl. No HCO. PID reading = 0.0ppm.  Loose, grey, gravelly SAND. Gravel is fine to coarse, angular stone. MADE GROUND.  Loose, grey, gravelly SAND. Gravel is fine to coarse, angular stone. MADE GROUND.  Length 2.5mm  Stability:  C  General Remarks  General Remarks  General Remarks	Soft, grey, slightly gravelly CLAY. Gravel is fine to medium, angular to rounded, stone and clinker. MADE GROUND.  Slight hydrocarbon odour at 2.1m PID reading = 4.4ppm  (1.80)  Wet at 3.1mbgl. No HCO. PID reading = 0.0ppm.  Loose, grey, gravelly SAND. Gravel is fine to coarse, angular stone. MADE GROUND.  A COMMITTER Strikes  Length 2.5mm  A Shoring/Support: Water Strikes  Date Time Strike Minutes Standing Ren  Width Stability: General Remarks  General Remarks  General Remarks



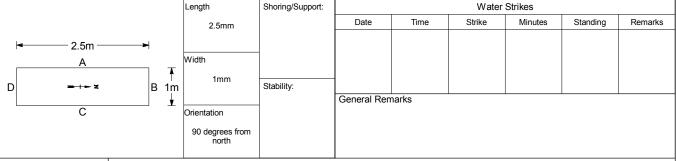
					الماد	e No.
WSP Remediation		•	TRIAL PIT LO		HOIE	TPE6
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She	eet 1 of 1
Job No 39784		Client	Cuddy Group		Dat	24-06-13 24-06-13
Contractor / Driller	Met	hod/Plant Used	Logged By	Co-Ordinates (NGR)		Ground Level (m AOD)
		360 Excavator	CR	E 311289.939 N 167193.032		
CAMPLES & TESTS			CTDA			Install /

			-	Loose, b angular t	e membrane. lack, gravelly SAN o subangular, clin e membrane.	D with angula ker, brick and	r brick cobbles stone. MADE	s. Gravel is fin GROUND.	e to coarse,			
			_(1.25)								NODATA	
			1.90	Loose, g	rey, slightly clayey ed, stone, pebble,	, slightly grave	elly SAND. Gra	avel is fine to c	coarse, angular			
			_	to round		cnor and bit	5 172 DE 511					
			_	Damp, S	light HCO. PID rea	ading = 0.0ppr	n.					
			-	Wet. Sliç	ght HCO at 3.1, Pl	D reading = 0.	Оррт.					
			(3.10)								NODATA	
			-									
			5.00									
			Length	5mm	Shoring/Support:	Date	Time	Water	Strikes	Standing	Ren	



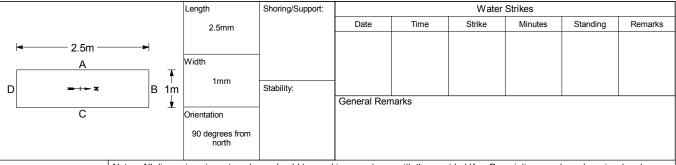
WSP Remediation		-	TRIAL PIT LO	3	Hole	TPE7
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She	eet 1 of 1
Job No 39784		Client	Cuddy Group		Dat	24-06-13 24-06-13
Contractor / Driller	Met	hod/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311281.682 N 167183.967		Ground Level (m AOD)
SAMPLES & TESTS			STRA	ΔΤΔ		Install /

	PLES	& TE	STS	1						STF	RATA					Inst
Depth		_		P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick			Des	cription			Legend	Geology	Ба
							-ness) - - -(0.60)	Loose, be	rown, slightly clayed ded, brick concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		NODATA	
							-(0.60)								NODATA	
							0.60		rey, slightly sandy, MADE GROUND	medium, ang	ular to subang	jular, stone an	nd brick,		NODATA	
							1.00	Geotextil Loose, b	e membrane. lack, gravelly SAN	D with angular	brick cobbles	s. Gravel is fin	e to coarse,		NODATA	
							-(0.40) -1.40	Geotextil Loose, a	o subangular, clini e membrane. ngular to subangul CO. PID reading =	lar, brickwork			E GROUND.		NODATA	
							-	Loose, b	lack, slightly cobbl coarse, angular to cket uncovered. M	y, gravelly SAI subangular, o	clinker, brick a	nd stone. Occ	ckwork. Gravel casional metal			
							(0.90)								NODATA	
							2.30		asbestos encount	tered, trial pit t	erminated.					
		<u> </u>			<u> </u>		Length		Shoring/Support:		I		Strikes			
		2.5r	n —		<b>→</b>	<del></del>	2. Width	5mm		Date	Time	Strike	Minutes	Standing	Rer	nark
<b>-</b>		<u>A</u>				<b>T</b>	1	mm	Stability:	_						
<b>⊢</b>	:	A	- z			B 1m				Concret	marka					
D	:		- z			B 1m <u>↓</u>		on grees from		General Rer	narks					



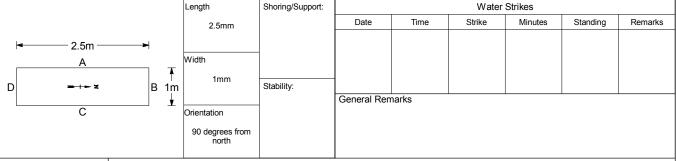
WSP Remediation		-	TRIAL PIT LOC	3	Hole	e No.
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		Project Ba	rry Waterfront Developn	nent	She	eet 1 of 1
Job No 39784		Client	Cuddy Group		Dat	te 25-06-13 25-06-13
Contractor / Driller	Met	hod/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311329.312 N 167245.439		Ground Level (m AOD)
SAMPLES & TESTS			STRA	ATA		Install /

SAMF							Donth			STI	RATA				1	Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							- - -(0.60)	Loose, b subroun	prown, slightly clayed ded, brick concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	e, angular to		NODATA	
							0.60									
							0.80	0041/5	rey, slightly sandy, MADE GROUND		ular to subang	ular, stone ar	nd brick,		NODATA	
							0.90	Geotexti	le membrane. black, gravelly SAN	D with angula	r brick cobbles	. Gravel is fin	e to coarse,		NODATA	
							(0.50)	Geotexti Loose, b	to subangular, clini le membrane. prown, clayey, grave ld brick				lar to rounded,		NODATA	
							-	Soft, gre	y, slightly gravelly, , clinker and stone	sandy CLAY. MADE GROU	Gravel is fine	to medium, ai	ngular to		X	
							(2.60)	Wet at 3	HCO. PID reading = 5.0mbgl. Visible sh PID reading at edo m. slow Water ingr	een. Very stro	ng HCO. PID r = 17.7ppm. P	eading at edg	ge of TP =	2.	NODATA	
							- - -	-	CO remains. PID re		om				× × × × × × ×	
							4.00		D reading = 15.6pp to collapse.	om at TP edge	e. PID reading	= 764ppm he	adspace. End	of		
							- - - -									
							Length		Shoring/Support:			Water	Strikes			<u></u>
<b>—</b>		· 2.5r A	n —		<b>→</b>	<del>-</del>	2. Width	5mm	_	Date	Time	Strike	Minutes	Standing	Rer	nark
D	=+-× B 1m							1mm Stability: General Remarks								
		С						rees from								
						north										



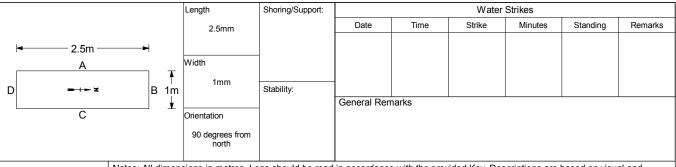
WSP Remediation		TRIAL PIT LOC	3	Hole No.	F2
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 630 Fax: +44 (0)29 2036 6399		arry Waterfront Developn	nent	Sheet 1 o	f 1
Job No 39784	Client	Cuddy Group		Date 25-06	-
Contractor / Driller	Method/Plant Used	Logged By	Co-Ordinates (NGR)	Ground Leve	el (m AOD)
	360 Excavator	CR	E 311319.273 N 167235.649		

(Amad)	HEVY HEVY (KN/M2)	P.Pen (KN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)(0.60) - 0.60	subroun	orown, slightly claye ded, brick concrete	y, gravelly SA	cription ND. Gravel is ADE GROUN	fine to coarse D.	, angular to	Legend	Geology	
					-(0.60) - 0.60	subroun	orown, slightly claye ded, brick concrete	ey, gravelly SA and stone. M	ND. Gravel is ADE GROUN	fine to coarse D.	angular to			
						Loose							NODATA	
						Loose								
						GRAVE	rey, slightly sandy, MADE GROUND	medium, ang	ular to subang	jular, stone an	id brick,		NODATA	
			- 1		-(0.40)	Loose, b	le membrane. black, gravelly SANI to subrounded, clin	O with angular	brick cobbles	Gravel is fin	e to coarse,		NODATA	
		1 1			1.20	Geotexti	le membrane. e slab. MADE GRO		Storie. MADE	GROUND.		$\longrightarrow$		
					- -(0.60)	Concrete	o slab. IVI/IDE SINO	OND.					NODATA	
					1.80									
					-	Cohesiv	e, grey, slightly grav	velly, silty SAN	ND. MADE GR	OUND.				
					- -(2.00) - - - -			ading = 2.2pp	m at TP edge.	PID reading	= 27.2ppm		NODATA	
					3.80	Water Ir reading	ngress (fast) with fre = 21.5ppm headspa	ee product vis ace.	ible. PID readi	ng = 2.2ppm	at TP edge. PIC			
					- - -									
					-									
						5mm	Shoring/Support:	Date	Time	Water Strike	Strikes Minutes	Standing	Ren	
			<b>→</b>	<b>T</b>	Width		_							
	- z		ı	B 1m	1	mm	Stability:	Constille						
С	,			*			_	General Rer	narks					
					o ueg n	orth								
	<u>-</u> +	- 2.5m - A - 1 - 2 C	A C Note:	A C C Notes: Al	A  B  Implication of the second of the secon	2.5m	Cohesive ————————————————————————————————————	Cohesive, grey, slightly graves and compared to the compared t	Cohesive, grey, slightly gravelly, silty SAN  -(2.00)  Damp. Slight HCO. PID Reading = 2.2pp headspace.  Water Ingress (fast) with free product vis reading = 21.5ppm headspace.  Length 2.5mm  Shoring/Support:  Date  C  General Rer  Orientation 90 degrees from north  Notes: All dimensions in metres. Logs should be read in accordance.	Cohesive, grey, slightly gravelly, silty SAND. MADE GR  -(2.00)  Damp. Slight HCO. PID Reading = 2.2ppm at TP edge. headspace.  Water Ingress (fast) with free product visible. PID readireading = 21.5ppm headspace.  Length 2.5mm Shoring/Support:  Date Time  Stability:  General Remarks  Notes: All dimensions in metres. Logs should be read in accordance with the product of the product visible. PID readireading = 21.5ppm headspace.	Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cause   Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly Ground.   Cohesive, grey, slightly Ground.   Cohesive, grey, slightly Ground.   Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.   Cohesive, grey, slightly gravelly, silty slightly.   Cohesive, grey, slightly gravelly, silty slightly.   Cohesive, grey, slightly gravelly, slightly.   Cohesive, grey, slightly gravelly, slightly.   Cohesive, grey, g	Cohesive, grey, slightly gravelly, silty SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, slightly slightly slightly gravelly slightly slig	Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.    Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, grey, slightly gravelly, sity SAND. MADE GROUND.   NODATA   Cohesive, gravelly, sity SAND. MADE GROUND	



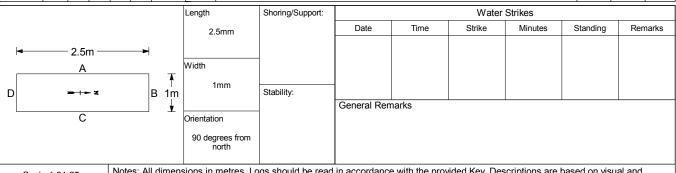
WSP Remediation		TRIAL PIT LOC		Hole	TPF3
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399	1. 10,000	arry Waterfront Developn	nent	Shee	et 1 of 1
Job No 39784	Client	Cuddy Group		Date	25-06-13 25-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311309.086 N 167227.637		Ground Level (m AOD)

SAME	LES						Donth			STI	RATA			_		Insta Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							-		orown, slightly grave				e, angular to			
							_(0.55)	oubungu	mar, otorio, coriorot	o and brion. W	ADE ONCON	υ.			NODATA	
							- 1									
							- 0.55 - 0.65	Loose, o	rey, fine to medium	n, angular to s	ubrounded. st	one and brick	GRAVEL.	+	NODATA	
							- 0.03	MADE G	ROUND.	., aga.a. to o			0.0.0.22.			
							(0.35)		le membrane. black, gravelly SANI	O with occasion	onal re-bar. an	d few angular	. stone Cobbles		NODATA	
							1.00	at 0.9mb GROUN	ogl. Gravel is fine to D.	coarse, angu	ılar to subangı	ular, stone an	d brick. MADE			
							Ĺ		le membrane. e blocks containing	re-har MADE	- GROUND			$\times$		
							-	Strong h	ydrocarbon odour.					XX		
							- -(1.20)	1.8ppm 11.6ppm 46.2ppm	at TP edge at TP edge after 1n 2m downwind of s at stockpile. n headspace.	ninute. stockpile.					NODATA	
							-	12119911	ппоицорисс.							
							2.20	Loose, b	olack, gravelly SANI	D. Gravel is fir	ne to coarse, a	angular to sub	angular, stone	$\longrightarrow$		1
							-(0.60)	and brick	k. MÁĎE GRÓUND	).		ū			NODATA	
							2.80	Loose, g	rey, silty SAND. MA	ADE GROUNI	D.					
							- -(1.20)								NODATA	
							4.00		ngress. Free produc = 43.8ppm headspa		ID reading = 3	3.4ppm at TP	edge. PID		> >	
							(0.30)	Wet, oily	se, grey, slightly gr y sheen still visible. n headspace.				PID reading =		NODATA	
							-									
							Length		Shoring/Support:		1		Strikes			
<b> </b>		2.5r	m —		<b></b>		2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
		Α				<b>T</b>	Width									
D	— + ► ≥ B 1m				1	mm	Stability:									
						<u> </u>		General Remarks						-		
		С						on grees from north								



WSP Remediation		TRIAL PIT LO		Hole No	TPF4
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399	1.19,550	arry Waterfront Developn	nent	Sheet	1 of 1
Job No 39784	Client	Cuddy Group		Date	25-06-13 25-06-13
Contractor / Driller	Method/Plant Used 360 Excavator	Logged By CR	Co-Ordinates (NGR) E 311298.880 N 167219.054	Gro	ound Level (m AOD)

SAMF	PLES						D- "			SII	RATA					Inst Bac
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology	
							- - - -(0.55)	Loose, be	rown, slightly grave ded, stone, concret	elly, clayey SA te and brick. N	ND. Gravel is IADE GROUN	fine to coarse ID.	, angular to		NODATA	
							-								ł	
							- 0.55 - 0.65	Loose, g	rey, slightly sandy,	stone and bri	ck GRAVEL. N	MADE GROUN	ND.	$\rightarrow \Diamond \Diamond$	NODATA	
							Ĺ	Geotextil	e membrane.							
							-	clinker. C	lack, gravelly, ash Cobbles at 1.0mbgl e membrane.	SAND. Grave I. MADE GRO	is fine to coa	rse, angular, s	tone brick and			
							- - - -									
															NODATA	
							-	Wet, No	HCO, no sheen. P	ID reading = (	).0ppm.					
							-	Water in 3.5mbgl.	gress from North s No HCO, no shee	ide of pit at 3. n, PID reading	0mbgl. Speed g = 0.0ppm.	of water ingre	ess increased	at		
							3.50	Wet soft	t, grey CLAY. MAD	E GROLIND						-
							(0.30)								NODATA	
							- - -	Cohesive	e, grey brown, sligh ded to rounded, pel	ntly gravelly, si bbles and sto	Ity, fine to coa ne. MADE GR	rse SAND. Gr OUND.	avel is fine,			
							(1.10)	End TP a	at 4.2 due to sides	collapsing fro	m 2.0mbgl.				NODATA	
							4.90									
				•		•	Length		Shoring/Support:			Water	Strikes			
<b>-</b>		2.5r	n —		<b></b>		2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	mark
		Α				<b>T</b>	Width									
D	:	<del>-</del> +-	- z			B 1m	1	mm	Stability:	General Rer	narks					
		С				<u>*</u>	Orientation	on		General Ker	IIIINO					
							90 deg	rees from								
	Scale 1:31 25 Notes: All dimensions in metres. Logs should be read in accordance with the															



WSP Remediation		-	Hole No. TPG1				
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6301 Fax: +44 (0)29 2036 6399		Project Ba	Sheet 1 of 1				
Job No 39784		Client	Date 25-06-13 25-06-13				
Contractor / Driller	Met	hod/Plant Used Logged By Co-Ordinates (NGR)  360 Excavator CR E 311316.460 N 167238.591			Ground Level (m AOD)		
SAMPLES & TESTS			STRA	ATA		Install /	

						l			'							Τ.
SAMF			_		-		Donth	1		STF	RATA					Ins Ba
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)		Description  oose, brown, slightly clayey, gravelly SAND. Gravel is fine to coarse, angualar to						Geology	,
							-11655)	Loose, bi	rown, slightly claye	ey, gravelly SA	ND. Gravel is	fine to coarse	, angualar to	$\times$		
					subangular, stone, brick and concrete. MADE GROUND.									NODATA	4	
							0.50								ł	
							0.65	Loose, gi MADE G	rey, fine to mediun ROUND.	n, angular to s	ubrounded, st	one and brick	GRAVEL.		NODATA	4
							ļ.	Geotextil	e membrane.						×	
							_	brick, cor	ack, gravelly SAN ncrete and clinker.	MADE GROU	IND.	arigular to sub	ourided, storie			
							-		e membrane. at 1.0mbgl.							
							(1.35)								NODATA	1
							-									
							F									
							2.00									
							Loose, grey, slightly grvelly, clayey, fine to coarse SAND. Gravel is fine to medium, angular to rounded, stone and pebble. MADE GROUND.									
							-	angular t	o rounded, storie a	and pebble. W	ADL GROOM	J.				
															}	
							-									
							-									
							-									
							-(2.20)								NODATA	λ
							-									
							-									
								Wet. No	HCO. PID reading	= 0.0ppm He	adspace.				}	
							_									
							4.20									
							-									
							-									
							-									
							Length		Shoring/Support:	Water Strikes						
							2.	5mm		Date	Time	Strike	Minutes	Standing	Rer	marl
<b> </b>		2.5r	n —		-		140 LC									
		A				<b>T</b>	Width	Imm								
D		<del>-</del> +-	- z			B 1m			Stability:	General Remarks						
		С				1	Orientati	on		20.101411101						
							90 deg	grees from north								
									i	•						

WSP Remediation										Hole No. TPG2						
Regus Cardiff Bay, Falcon Drive Cardiff Bay, Cardiff CF10 4RU Telephone: +44 (0)29 2036 6300 Fax: +44 (0)29 2036 6399								В	Shee	Sheet 1 of 1						
Job No Client									Cuddy	Date	Date 25-06-13 25-06-13					
Contractor / Driller Method/Pi							nt Used Excava		Logged By	R	E	ates (NGR) 311306.223 167231.429		Ground Level	(m AOI	D)
SAM	IDI ES	& TF	STS	:						STR						Install /
Depth						Elev. (mAOD)	Depth (Thick -ness)				cription			Legend	Geology	Backfill
-								Loose, g GRAVEL Geotextil	rown, slightly clayeded, stone, concre rey, slightly sandy, MADE GROUNE e membrane.	te and brick. M. fine to mediun ).	ADE GROUN	D. subrounded, sto	ne and b	rick,	NODATA NODATA	
							(3.10)	Loose, b coarse, a Geotextil	lack, gravelly, ash angular to subangu e membrane.	llar, brick, conc	or cobbles of correte and stor	oncrete. Gravel	is fine to		NODATA	
							Length 2	5mm	Shoring/Support:	Date	Time	Water S Strike	trikes Minutes	Standing	Rei	marks
D	2.5m A D =++= × C			B 1m	Width  1  Orientati  90 dec	on grees from	nm Stability:  General Remarks  nees from									
Sca	ale 1:31	.25				All dimens identifica		metres. Lo	ogs should be read	ın accordance	with the prov	riaea Key. Desc	riptions a	ire based on vis	sual and	

WSP Remediation									Hole No	TPG	3						
Regus ( Cardiff Telephor	ardiff E	Bay, F ardiff (	alcon CF10 2036	Drive 4RU 6 6300		Project  Barry Waterfront Development								1 of 1			
Job No	39	784				Client			Cuddy	Cuddy Group					25-06-13 25-06-13		
Contracto	r / Dril	ler			Meti	hod/Plar 360	nt Used Excava		Logged By	R	Co-Ordina E	Gro	und Level	(m AOI	) )		
SAMF	PLES	& TE	STS	3						STF	RATA				Install Backfi		
Depth	Туре	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick -ness)			Des	cription			Legend	Geology		
- - -							(0.50)		rown, slightly claye lar, concrete, ston				angular to		NODATA		
							0.50	Loose, g MADE G	rey, fine to mediur ROUND.	n, angular to s	ubrounded, st	one and brick G	RAVEL.	XX	NODATA	1	
							(3.15)	Loose, b coarse, a Geotextil	e membrane. lack, gravelly, ash angular to subangu e membrane.  visual or olfactory	ılar, concrete,	brick and stor	ne. MADE GRO			NODATA	A	
- - - - - - - -							- -(0.40) - 4.20 - - -	Wet, coh	nesive, grey, silty S	AND. MADE (	GROUND.				NODATA	-	
							Length		Shoring/Support:	Data	Time	Water S		Standing	D.e.	marks	
<b>⊢</b>	:	2.5r A	m —		-	B 1m	Width	5mm mm	Stability:	Date Canaral Par	Time	Strike	Minutes	Standing	Kei	marks	
		С				J <u>↓</u>		on grees from north		General Rer	marks						
Scal	e 1:31	.25				II dimens dentifica		metres. Lo	ogs should be read	I in accordanc	e with the prov	vided Key. Desc	riptions are l	ased on vis	sual and		

## Appendix B – Chemical Analysis Certificates

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden

> Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701 email: mkt@alcontrol.com Website: www.alcontrol.com

WSP Remediation Fairway House Paramount Business Park St Mellons Cardiff South Glamorgan CF3 0LW

Attention: Steve Gronow

### **CERTIFICATE OF ANALYSIS**

 Date:
 30 August 2013

 Customer:
 H\_WSP\_CDF

 Sample Delivery Group (SDG):
 130816-80

 Your Reference:
 39784.001

 Location:
 Barry Waterfront

 Report No:
 240124

We received 15 samples on Friday August 16, 2013 and 15 of these samples were scheduled for analysis which was completed on Friday August 30, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan
Operations Manager







Validated

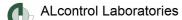
23336/39784/001/SG SDG: 130816-80 Location: **Barry Waterfront** Order Number: 240124 Job:

H\_WSP\_CDF-63 WSP Remediation **Customer:** Report Number: 39784.001 Client Reference: Attention: Steve Gronow Superseded Report:

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7945544	BH1	EW		15/08/2013
7945545	BH2	EW		15/08/2013
7945547	ВН3	EW		15/08/2013
7945548	BH4	EW		15/08/2013
7945550	BH5	EW		15/08/2013
7945551	BH6	EW		15/08/2013
7945552	ВН7	EW		15/08/2013
7945553	BH8	EW		15/08/2013
7945554	ВН9	EW		15/08/2013
7945559	BH10	EW		15/08/2013
7945560	BH11	EW		15/08/2013
7945561	BH12	EW		15/08/2013
7945564	BH13	EW		15/08/2013
7945566	BH14	EW		15/08/2013
7945567	BH15	EW		15/08/2013

Only received samples which have had analysis scheduled will be shown on the following pages.



Validated

 SDG:
 130816-80
 Location:
 Barry Waterfront
 Order Number:
 23336/39784/001/SG

 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation
 Report Number:
 240124

 Client Reference:
 39784.001
 Attention:
 Steve Gronow
 Superseded Report:

Client Reference: 39784.00	ł1	Attention	1:	Ste	eve	Gro	now							3	uper	sea	a K€	eport
LIQUID Results Legend X Test	Lab Sample I	No(s)	/945544	704	7945545	7945547	7945548	7945550	7945551	7000467	7940000	7945554	/ 940008	7045550	794000	1000	7045564	7045566
No Determination Possible	Customer Sample Reference				BH2	ВН3	BH4	BH5	BH6	07.		B H		B 0			B 0	B BH
	AGS Refere	nce	П	1	ΕW	EW	EW	EW	EW	П	1 1	л п Х	! П	п	] [	֓֞֞֞֜֞֓֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	п п	п п
	Depth (m	ı)																
	Containe	r	11 Glass bottle (ALE	1l Glass bottle (ALE	Vial (ALE297)	Vial (ALE297)	Vial (ALE297) 1l Glass bottle (ALE	Vial (ALE297) 1l Glass bottle (ALE	Vial (ALE297) 1l Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE	11 Glass bottle (ALE
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15	X	X		×.	X	x	X	X	X	X	X	X	X	x	X	X
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15	x	X	2	×.	X	X	x	X	X	X	X	x	X	x	x	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 15	×	<b>(</b>	X	X	x	×	×	<b>)</b>	( )	( ×	(	<b>(</b> )	( )	<b>(</b> )	x >	<b>(</b> )
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15	X	X		×.	X	X	X	X	X	X	X	X	x	X	x	X
Phenois by HPLC (W)	All	NDPs: 0 Tests: 15	X	X	2	×.	X	x	X	X	X	X	X	X	X	X	X	X
TPH CWG (W)	All	NDPs: 0 Tests: 15	x	X	2	×	X	X	x	X	X	X	X	x	x	X	×	X
VOC MS (W)	All	NDPs: 0 Tests: 15	×	<b>(</b>	X	X	X	X	X	. >	( )	( ×	( )	<b>(</b> )	( )	<b>(</b> )	x )	<b>(</b> )



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number:

Results Legend		Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
# ISO17025 accredited.  M mCERTS accredited.			5	52	55	5	55	5
aq Aqueous / sottled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.  * recovery of the surrogate standa	ard to	Depth (m) Sample Type Date Sampled Sampled Time	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013
check the efficiency of the method results of individual compounds w samples aren't corrected for the re (F) Trigger breach confirmed	ithin	Date Received SDG Ref Lab Sample No.(s)	16/08/2013 130816-80 7945544	16/08/2013 130816-80 7945545	16/08/2013 130816-80 7945547	16/08/2013 130816-80 7945548	16/08/2013 130816-80 7945550	16/08/2013 130816-80 7945551
1-4&+§@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Units							
Phenols, Total Detected	<16 µg/	/I TM259	23700	100	1740	12700	105000	20
monohydric			2#	2#	2#	2#	2#	2#
	<u>L</u>							
		_						



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number:

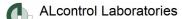
Results Legend		Customer Sample R	BH7	BH8	BH9	BH10	BH11	BH12
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	<u>:</u>	<u> </u>	<u> </u>		<u>.</u>	<u>:</u>
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time						
results of individual compounds w	ithin	Date Received SDG Ref	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80
samples aren't corrected for the re-	covery	Lab Sample No.(s)	7945552	7945553	7945554	7945559	7945560	7945561
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	AGS Reference ts Method	EW	EW	EW	EW	EW	EW
Phenols, Total Detected	<16 µg		80	<16	<16	<16	<16	<16
monohydric	γ το μg	1101255	2#	2#	2#	2#	2#	2#
,								
		_						
	_							



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number:

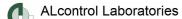
Results Legend		Customer Sample R	BH13	BH14	BH15		
# ISO17025 accredited.  M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	<u>.</u>	·	·		
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013		
** % recovery of the surrogate stands check the efficiency of the method		Sampled Time					
results of individual compounds w	ithin	Date Received SDG Ref	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80		
samples aren't corrected for the re (F) Trigger breach confirmed	covery	Lab Sample No.(s)	7945564	7945566	7945567		
1-4&+§@ Sample deviation (see appendix)	L OD/Unit	AGS Reference	EW	EW	EW		
Component Phenols, Total Detected	LOD/Unit		240	<16	<16		
monohydric	<16 µg	J/1 11VIZ59	240 2#	2#	2#		
o.io.i.yu.io			Σπ	2 #	Σ #		
	<u></u>					 	
		_					
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Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number:

PAH Spec MS - Aqueous								
Results Legend # ISO17025 accredited.	ď	Customer Sample R	BH1	BH2	ВН3	BH4	BH5	BH6
M mCERTS accredited. aq Aqueous / settled sample.		Depth (m)						
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
* Subcontracted test.     ** % recovery of the surrogate standa	rd to	Date Sampled Sampled Time	15/08/2013	15/08/2013	15/08/2013	15/08/2013	15/08/2013	15/08/2013
check the efficiency of the method.	The	Date Received	16/08/2013	16/08/2013	16/08/2013	16/08/2013	16/08/2013	16/08/2013
samples aren't corrected for the red		SDG Ref	130816-80 7945544	130816-80 7945545	130816-80 7945547	130816-80 7945548	130816-80 7945550	130816-80 7945551
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Units	Method						
Naphthalene (aq)	<0.1 µg/	/I TM178	<2.5	0.105	105	22.1	22100	4.3
Acenaphthene (aq)	<0.015	TM178	<b>♦ #</b>	<b>♦ #</b> 0.0293	<b>♦ #</b> 581	<b>♦ #</b>	<b>♦</b> #	<b>♦ #</b> 23.4
Aceriapriliterie (aq)	νο.σ15 μg/l	1101176	160	0.0293	561 <b>♦</b> #	02 <i>1</i> ♦#	//o ◆#	23.4
Acenaphthylene (aq)	<0.011	TM178	15.3	0.0528	31	40.3	124	2.8
	μg/l		<b>+</b> #					
Fluoranthene (aq)	<0.017	TM178	177	0.222	85.5	54.7	263	508
	μg/l		<b>♦</b> #					
Anthracene (aq)	<0.015	TM178	20.7	0.222	54.8	41.6	143	25
Phononthrono (ag)	μg/l <0.022	TM178	<b>♦ #</b>	<b>♦ #</b>	<b>♦ #</b> 544	<b>♦</b> #	<b>♦ #</b> 876	<b>◆#</b>
Phenanthrene (aq)	νυ.υ22 μg/l	1101176	100	0.097	544 <b>♦</b> #	459 <b>♦</b> #	070 <b>♦</b> #	+#
Fluorene (aq)	<0.014	TM178	39.1	0.0177	376	325	450	13.3
, "	μg/l		<b>♦</b> #	<b>♦</b> #	<b>♦</b> #	<b>→</b> #	<b>♦</b> #	<b>♦</b> #
Chrysene (aq)	<0.013	TM178	19.8	0.111	7.31	2.9	95.1	65.5
	μg/l	1	<b>♦</b> #	<b>♦</b> #	<b>+</b> #	<b>♦</b> #	<b>♦</b> #	<b>♦</b> #
Pyrene (aq)	<0.015	TM178	123	0.171	55.8	34.5	195	347
Danza(a)anthracana (ag)	μg/l	TM178	<b>♦</b> #	<b>♦</b> # 0.0508	<b>♦ #</b> 6.36	<b>♦</b> #	<b>♦</b> #	<b>♦ #</b> 62.1
Benzo(a)anthracene (aq)	<0.017 µg/l	1101170	18.9 <b>♦</b> #	0.0506	6.36 <b>♦</b> #	2.21	oo.s <b>♦</b> #	62.1
Benzo(b)fluoranthene (aq)	<0.023	TM178	4.64	0.167	<2.3	<1.15	67.2	31.2
(,	μg/l		<b>↓</b> #	<b>♦</b> #	<b>→</b> #	<b>+</b> #	<b>◆</b> #	<b>♦</b> #
Benzo(k)fluoranthene (aq)	<0.027	TM178	6.04	0.117	<2.7	<1.35	78.7	32.8
	μg/l		<b>♦</b> #	♦#	♦#	<b>♦</b> #	♦#	<b>♦</b> #
Benzo(a)pyrene (aq)	<0.009	TM178	5.48	0.0936	1.21	<0.45	63.6	28.7
Dihanna(a h)anthuanan	μg/l	TN4470	<b>♦</b> #	• #				
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.619 ◆#	0.0178 ◆#	<1.6 • #	<0.8 •#	67.6 <b>♦</b> #	3.67
Benzo(g,h,i)perylene (aq)	<0.016	TM178	1.52	0.0498	<1.6	<0.8	56	7.91
(9,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	μg/l		<b>↓</b> #	<b>♦</b> #	<b>+</b> #	<b>+</b> #	<b>↓</b> #	<b>*</b> #
Indeno(1,2,3-cd)pyrene	<0.014	TM178	1.44	0.0477	<1.4	<0.7	61.9	8.14
(aq)	μg/l		<b>♦</b> #					
PAH, Total Detected	<0.247	TM178	720	1.57	1850	1610	25500	1310
USEPA 16 (aq)	μg/l		•	•	<b>*</b>	•	•	•

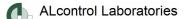


Validated

 SDG:
 130816-80
 Location:
 Barry Waterfront
 Order Number:
 23336/39784/001/SG

Job: H\_WSP\_CDF-63 Customer: WSP Remediation Report Number: 240124
Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

PAH Spec MS - Aqueou Results Legend								
# ISO17025 accredited.  M mCERTS accredited.	'	Customer Sample R	BH7	BH8	BH9	BH10	BH11	BH12
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.  * % recovery of the surrogate standa	ard to	Depth (m) Sample Type Date Sampled Sampled Time	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013
check the efficiency of the method results of individual compounds w samples aren't corrected for the re (F) Trigger breach confirmed 1-4&+\$@ Sample deviation (see appendix)	ithin	Date Received SDG Ref Lab Sample No.(s) AGS Reference	16/08/2013 130816-80 7945552 EW	16/08/2013 130816-80 7945553 EW	16/08/2013 130816-80 7945554 EW	16/08/2013 130816-80 7945559 EW	16/08/2013 130816-80 7945560 EW	16/08/2013 130816-80 7945561 EW
Component Naphthalene (aq)	LOD/Unit		0.166	<0.1	<0.1	<0.1	<0.1	<0.2
			<b>+</b> #	<b>♦</b> #	<b>+</b> #	<b>+</b> #	<b>♦</b> #	<b>♦</b> #
Acenaphthene (aq)	<0.015 μg/l		0.0402 ◆#	0.0644 ◆#	<0.015 •#	<0.015 •#	0.0178 ◆#	63.3 <b>♦</b> #
Acenaphthylene (aq)	<0.011 µg/l	TM178	0.0142 ◆#	0.038 ◆#	<0.011	<0.011 • #	0.0183 •#	2.43 ◆#
Fluoranthene (aq)	<0.017 µg/l	TM178	0.134 ◆#	0.138 ◆#	0.0296 ◆#	<0.017 • #	0.14 <b>♦</b> #	15.5 <b>♦</b> #
Anthracene (aq)	<0.015 μg/l	TM178	0.0483 •#	0.0369 ◆#	<0.015 •#	<0.015 •#	0.0308 •#	0.951 ◆#
Phenanthrene (aq)	<0.022 μg/l	TM178	0.167 ◆#	0.178 ◆#	0.031	<0.022 • #	0.135 ◆#	<0.044 • #
Fluorene (aq)	<0.014 μg/l	TM178	0.0412	0.0684	<0.014	0.0342	0.0381	9.05
Chrysene (aq)	<0.013	TM178	<b>♦ #</b> 0.0908	<b>♦#</b> 0.0995	<b>♦#</b> 0.0463	<b>♦#</b> <0.013	• # 0.0785	0.409
Pyrene (aq)	μg/l <0.015	TM178	<b>♦#</b> 0.119	<b>♦</b> #	<b>♦#</b> 0.114	<b>♦#</b> <0.015	<b>♦#</b> 0.111	<b>♦#</b>
Benzo(a)anthracene (aq)	μg/l <0.017	TM178	<b>♦</b> #	<b>♦</b> #	<b>♦ #</b> <0.017	<b>♦#</b> <0.017	<b>♦</b> # 0.053	<b>♦#</b> 0.488
Benzo(b)fluoranthene (aq)	μg/l <0.023	TM178	• # 0.0702	<b>♦ #</b> 0.0481	<b>♦ #</b> <0.023	<b>♦ #</b> <0.023	<b>♦ #</b> 0.0594	<b>♦</b> # 0.0577
Benzo(k)fluoranthene (aq)	μg/l <0.027	TM178	<b>♦ #</b> 0.0535	<b>♦ #</b> 0.0595	<b>♦ #</b> <0.027	<b>♦</b> # <0.027	<b>♦</b> # 0.057	<b>♦ #</b> 0.0789
Benzo(a)pyrene (aq)	μg/l <0.009	TM178	<b>♦</b> # 0.0614	<b>♦ #</b> 0.0564	<b>♦</b> #	<b>♦</b> # <0.009	<b>♦ #</b> 0.0563	<b>♦</b> # 0.0623
Dibenzo(a,h)anthracene	μg/l <0.016	TM178	<b>♦</b> #					
(aq)  Benzo(g,h,i)perylene (aq)	μg/l <0.016		<b>♦#</b>	<b>♦</b> #	<b>♦</b> #	<b>♦</b> #	• # 0.0566	<b>♦ #</b>
Indeno(1,2,3-cd)pyrene	μg/l <0.014		◆ # 0.037	• # 0.0379	<b>♦</b> #	<b>♦</b> #	• # 0.0511	◆ # <0.028
(aq)	μg/l		<b>+</b> #	<b>♦</b> #	<b>+</b> #	<b>+</b> #	<b>♦</b> #	<b>+</b> #
PAH, Total Detected USEPA 16 (aq)	<0.247 μg/l	TM178	1.14	1.16	<0.247	<0.247	0.903	109



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number:

PAH Spec MS - Aqueous	s (W)						
Results Legend # ISO17025 accredited.		Customer Sample R	BH13	BH14	BH15		
M mCERTS accredited.							
diss.filt Dissolved / filtered sample.		Depth (m) Sample Type	Mater/CM//SM/)	\\\otor(C\\\/\C\\\)	Motor(CM/(CM/)		
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Date Sampled	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013		
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time Date Received	16/08/2013	16/08/2013	16/08/2013		
results of individual compounds wi samples aren't corrected for the rec		SDG Ref	130816-80	130816-80	130816-80		
(F) Trigger breach confirmed 1-4&•§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	7945564 EW	7945566 EW	7945567 EW		
Component	LOD/Unit						
Naphthalene (aq)	<0.1 µg	/I TM178	<0.1	<0.1	<0.1		
			<b>♦</b> #	<b>♦</b> #	<b>♦</b> #		
Acenaphthene (aq)	<0.015	TM178	<0.015	<0.015	<0.015		
Acenaphthylene (aq)	μg/l <0.011	TM178	<b>◆</b> #	<b>♦</b> # 0.0157	<0.011		
Acenaphunyiene (aq)	μg/l	1101170	<b>♦</b> #	0.0137	<b>♦</b> #		
Fluoranthene (aq)	<0.017	TM178	<0.017	<0.017	0.0371		
	μg/l		<b>♦</b> #	<b>+</b> #	<b>+</b> #		
Anthracene (aq)	<0.015	TM178	0.0189	<0.015	<0.015		
Dhanasthuana (an)	μg/l	TN4470	<b>♦</b> #	♦#	<b>♦</b> #		
Phenanthrene (aq)	<0.022 µg/l	TM178	<0.022 • #	<0.022 •#	0.0384 ◆#		
Fluorene (aq)	<0.014	TM178	<0.014	0.0385	<0.014		
, "	μg/l		<b>♦</b> #	<b>♦</b> #	<b>♦</b> #		
Chrysene (aq)	<0.013	TM178	0.0744	0.125	0.0227		
2 ( )	μg/l		<b>♦</b> #	<b>♦</b> #	<b>♦</b> #		
Pyrene (aq)	<0.015	TM178	0.254	0.257	0.034		
Benzo(a)anthracene (aq)	μg/l <0.017	TM178	<b>♦ #</b> 0.0475	<b>♦</b> #	<b>♦</b> # <0.017		
Delizo(a)antinacene (aq)	μg/l	1101170	0.0475	0.0470	<0.017 ♦#		
Benzo(b)fluoranthene (aq)	<0.023	TM178	0.132	0.19	<0.023		
	μg/l		<b>♦</b> #	<b>+</b> #	<b>♦</b> #		
Benzo(k)fluoranthene (aq)	<0.027	TM178	0.104	0.14	<0.027		
Panza(a)nyrana (ag)	μg/l <0.009	TM178	<b>♦ #</b> 0.119	<b>♦</b> #	<b>♦ #</b> 0.0145		
Benzo(a)pyrene (aq)	νο.υυ9 μg/l	1101170	0.119	0.155	0.0145		
Dibenzo(a,h)anthracene	<0.016	TM178	0.0237	0.0423	<0.016		
(aq)	μg/l		<b>♦</b> #	<b>+</b> #	<b>+</b> #		
Benzo(g,h,i)perylene (aq)	<0.016	TM178	0.0888	0.112	<0.016		
Indone(4.0.0 ad)nimens	μg/l	TN4470	<b>♦</b> #	<b>♦</b> #	♦#		
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.0828 <b>♦</b> #	0.1 <b>♦</b> #	<0.014 • #		
PAH, Total Detected	<0.247	TM178	0.946	1.22	<0.247		
USEPA 16 (aq)	μg/l		•	•	•		



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 240124 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference: TPH CWG (W)

TPH CWG (W)								
Results Legend # ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample.		Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.  ** % recovery of the surrogate standa	ırd to	Depth (m) Sample Type Date Sampled Sampled Time	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013
check the efficiency of the method. results of individual compounds wi samples aren't corrected for the re- (F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)	ithin	Date Received SDG Ref Lab Sample No.(s) AGS Reference	16/08/2013 130816-80 7945544 EW	16/08/2013 130816-80 7945545 EW	16/08/2013 130816-80 7945547 EW	16/08/2013 130816-80 7945548 EW	16/08/2013 130816-80 7945550 EW	16/08/2013 130816-80 7945551 EW
Component	LOD/Unit	s Method						
GRO Surrogate % recovery**	%	TM245	105	114	109	103	105	108
GRO >C5-C12	<50 µg/	TM245	20100 #	4390 #	18000 #	17400 #	27900 #	4990 #
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Aliphatics >C5-C6	<10 µg/	TM245	131	81	36	13	16	20
Aliphatics >C6-C8	<10 µg/	TM245	335	124	58	56	133	28
Aliphatics >C8-C10	<10 µg/	TM245	1780	408	1260	1450	1940	226
Aliphatics >C10-C12	<10 µg/	TM245	5990	1180	8080	6760	11500	2530
Aliphatics >C12-C16 (aq)	<10 µg/	TM174	15	<10	229	155	50500	84
Aliphatics >C16-C21 (aq)	<10 µg/	TM174	36	<10	213	143	6040	86
Aliphatics >C21-C35 (aq)	<10 µg/	TM174	105	14	200	83	1000	244
Total Aliphatics >C12-C35 (aq)	<10 µg/	TM174	156	14	642	381	57600	414
Aromatics >EC5-EC7	<10 µg/	TM245	1670	383	326	778	1830	58
Aromatics >EC7-EC8	<10 µg/	TM245	2210	427	721	1100	2010	83
Aromatics >EC8-EC10	<10 µg/	TM245	4040	997	2110	2710	2900	355
Aromatics >EC10-EC12	<10 µg/	TM245	3990	789	5380	4510	7640	1690
Aromatics >EC12-EC16 (aq)	<10 µg/	TM174	1270	46	14500	8890	85500	517
Aromatics >EC16-EC21 (aq)	<10 µg/	TM174	1410	91	14900	9140	131000	2530
Aromatics >EC21-EC35 (aq)	<10 µg/	TM174	574	131	3910	2730	32000	1330
Total Aromatics >EC12-EC35 (aq)	<10 µg/	TM174	3250	268	33300	20800	248000	4370
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/	TM174	23500	4680	51900	38500	334000	9770



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number: 240124 Job:

WSP Remediation **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

TPH CWG (W)	TPH CWG (W)									
Results Legend # ISO17025 accredited.		Customer Sample R	BH7	BH8	BH9	BH10	BH11	BH12		
M mCERTS accredited. aq Aqueous / settled sample. diss.filst   Dissolved / filtered sample. tot.unfilt   Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate standa	and to	Depth (m) Sample Type Date Sampled Sampled Time	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013		
check the efficiency of the method. results of individual compounds wi samples aren't corrected for the ret (F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)	The ithin	Date Received SDG Ref Lab Sample No.(s) AGS Reference	16/08/2013 130816-80 7945552 EW	16/08/2013 130816-80 7945553 EW	16/08/2013 130816-80 7945554 EW	16/08/2013 130816-80 7945559 EW		16/08/2013 130816-80 7945561 EW		
Component GRO Surrogate %	%	TM245	116	101	109	93	96	93		
recovery**										
GRO >C5-C12	<50 μg/		<50 #	584 #	<50 #	124 #	<50 #	545 #		
Methyl tertiary butyl ether (MTBE)	<3 µg/l		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #		
Aliphatics >C5-C6	<10 µg/	TM245	<10	<10	<10	30	18	37		
Aliphatics >C6-C8	<10 µg/	TM245	<10	10	<10	<10	<10	12		
Aliphatics >C8-C10	<10 µg/	TM245	<10	59	<10	16	<10	45		
Aliphatics >C10-C12	<10 µg/	TM245	<10	279	11	35	<10	244		
Aliphatics >C12-C16 (aq)	<10 µg/	TM174	<10	221	<10	42	<10	45		
Aliphatics >C16-C21 (aq)	<10 µg/	TM174	<10	244	<10	52	<10	56		
Aliphatics >C21-C35 (aq)	<10 µg/	TM174	<10	53	<10	28	<10	35		
Total Aliphatics >C12-C35 (aq)	<10 µg/	TM174	<10	518	<10	122	<10	136		
Aromatics >EC5-EC7	<10 µg/	TM245	<10	<10	<10	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg/	TM245	<10	<10	<10	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg/	TM245	<10	44	<10	12	<10	45		
Aromatics >EC10-EC12	<10 µg/	TM245	<10	186	<10	23	<10	162		
Aromatics >EC12-EC16 (aq)	<10 µg/	TM174	<10	23	<10	<10	<10	146		
Aromatics >EC16-EC21 (aq)	<10 µg/	TM174	<10	100	<10	<10	<10	137		
Aromatics >EC21-EC35 (aq)	<10 µg/	TM174	<10	39	<10	<10	<10	41		
Total Aromatics >EC12-EC35 (aq)	<10 µg/	TM174	<10	162	<10	<10	<10	324		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/	TM174	30	1270	32	246	29	1010		



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: **Barry Waterfront** Order Number: Job:

TPH CWG (W)							
Results Legend		Customer Sample R	BH13	BH14	BH15		
# ISO17025 accredited.  M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)					
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW) 15/08/2013		
** % recovery of the surrogate standa	ırd to	Date Sampled Sampled Time	15/08/2013	15/08/2013	15/08/2013		
check the efficiency of the method. results of individual compounds wi		Date Received	16/08/2013	16/08/2013	16/08/2013		
samples aren't corrected for the red		SDG Ref	130816-80 7945564	130816-80 7945566	130816-80 7945567		
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW		
Component	LOD/Unit						
GRO Surrogate %	%	TM245	93	91	98		
recovery**							
GRO >C5-C12	<50 µg	/I TM245	527	326	<50		
			#	#	#		
Methyl tertiary butyl ether	<3 µg/	TM245	<3	<3	<3		
(MTBE)			#	#	#		
Aliphatics >C5-C6	<10 µg	/I TM245	39	34	20		
Aliphatics >C6-C8	<10 µg	/I TM245	27	22	<10		
Aliphatics >C8-C10	<10 µg	/I TM245	70	36	<10		
Aliphatics >C10-C12	<10 µg	/I TM245	162	99	<10		
Aliphatics >C12-C16 (aq)	<10 µg	/I TM174	54	216	<10		
Aliphatics >C16-C21 (aq)	<10 µg	/I TM174	61	289	<10		
Allebertee COA COT ( )		n =		110	.40		
Aliphatics >C21-C35 (aq)	<10 µg	/I TM174	47	119	<10		
T + 1 4 11 11 11 11 11 11 11 11 11 11 11 11	-10	" T.4474	100	22.4	.40		
Total Aliphatics >C12-C35	<10 µg	/I TM174	162	624	<10		
(aq)	410	// TMO45	47	40	-10		
Aromatics >EC5-EC7	<10 µg	/I TM245	17	10	<10		
Aromatics >EC7-EC8	<10 µg	/I TM245	15	<10	<10		
Aloillatics >EC1-EC8	- 10 μg	1101245	15	<b>~10</b>	<b>~10</b>		
Aromatics >EC8-EC10	<10 µg	/I TM245	89	51	<10		
Aiomatics > ECO-ECTO	, 10 μg.	1101240	09	31	110		
Aromatics >EC10-EC12	<10 µg	/I TM245	108	66	<10		
7 tromatice + 20 to 20 t2	l To pg	1111210	100		110		
Aromatics >EC12-EC16	<10 µg	/I TM174	33	64	<10		
(aq)				-	-		
Aromatics >EC16-EC21	<10 µg	/I TM174	40	127	<10		
(aq)							
Aromatics >EC21-EC35	<10 µg	/I TM174	27	59	<10		
(aq)							
Total Aromatics	<10 µg	/I TM174	100	250	<10		
>EC12-EC35 (aq)							
Total Aliphatics &	<10 µg	/I TM174	788	1200	35		
Aromatics >C5-35 (aq)							
		_					
		+					
		+					
		+					



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 240124 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

VOC MS (W)								
Results Legend		Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013
** % recovery of the surrogate standa		Sampled Time				,		
check the efficiency of the method results of individual compounds w	rithin	Date Received	16/08/2013	16/08/2013	16/08/2013	16/08/2013	16/08/2013	16/08/2013
samples aren't corrected for the re (F) Trigger breach confirmed	covery	SDG Ref Lab Sample No.(s)	130816-80 7945544	130816-80 7945545	130816-80 7945547	130816-80 7945548	130816-80 7945550	130816-80 7945551
1-4&+§@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Unit							
Toluene-d8**	%	TM208	95.6	97.4	97.8	96.7	94.1	99.2
Methyl tertiary butyl ether (MTBE)	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l		1770 #	375 #	336 #	869 #	2070 #	58 #
Toluene	<1 µg/l		2340 #	376 #	787 #	1210 #	2510 #	77.6 #
Ethylbenzene	<1 µg/l		528 #	62.3 #	258 #	456 #	384 #	36.2 #
m,p-Xylene	<1 µg/l		1420 #	385 #	628 #	926 #	791 #	99.8 #
o-Xylene	<1 µg/l		548 #	153 #	340 #	512 #	405 #	49.5 #
tert-Amyl methyl ether (TAME)	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Sum of detected Xylenes	<2 µg/l	TM208	1970	538	968	1440	1200	149



Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 240124 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

VOC MS (W)								
Results Legend	C	Customer Sample R	BH7	BH8	BH9	BH10	BH11	BH12
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013	Water(GW/SW) 15/08/2013
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time						
results of individual compounds w	ithin	Date Received SDG Ref	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80	16/08/2013 130816-80
samples aren't corrected for the re-	covery	Lab Sample No.(s)	7945552	7945553	7945554	7945559	7945560	7945561
1-4&+§@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Units							
Toluene-d8**	%	TM208	98.2	98	98.3	98.6	99.7	97.6
Methyl tertiary butyl ether (MTBE)	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208	<1 #	2.93 #	<1 #	<1 #	<1 #	2.2
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	4.92 #
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	2.67
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2	<2	<2	7.59



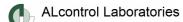
Validated

130816-80 H\_WSP\_CDF-63 39784.001 23336/39784/001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 240124 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

VOC MS (W)

VOC MS (W)		0	2002	51111		51115			
Results Legend # ISO17025 accredited.		Customer Sample R	BH13	BH14		BH15			
M mCERTS accredited.  aq Aqueous / settled sample.									
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	Water(GW/SW)	Water(GW/SW	Λ	Water(GW/SW)			
* Subcontracted test.		Date Sampled	15/08/2013	15/08/2013	'	15/08/2013			
** % recovery of the surrogate stand check the efficiency of the method	d. The	Sampled Time Date Received	. 16/08/2013	16/08/2013		16/08/2013			
results of individual compounds v samples aren't corrected for the re		SDG Ref	130816-80	130816-80		130816-80			
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)	,	Lab Sample No.(s)	7945564 EW	7945566 EW		7945567 EW			
Component	LOD/Unit	AGS Reference ts Method							
Toluene-d8**	%	TM208	96.1	93.6		99.6			
10.00.10 00	"	200	00	00.0		00.0			
Methyl tertiary butyl ether	<1 µg/	/I TM208	<1	<1		<1			
(MTBE)			#		#		#		
Benzene	<1 µg/	/I TM208	18.7	10.4		<1			
			#		#		#		
Toluene	<1 µg/	/I TM208	15.8	7.62		<1			
Etherdheannean	44	/I TN4000	#	4.45	#		#		
Ethylbenzene	<1 µg/	/I TM208	5.81	1.45	щ	<1	щ		
m,p-Xylene	<1 µg/	/I TM208	# 15.5	3.79	#	<1	#		
m,p Aylene	γι μθ/	1111200	#	0.70	#	*1	#		
o-Xylene	<1 µg/	/I TM208	6.58	6.19	-"	<1			
			#		#		#		
tert-Amyl methyl ether	<1 µg/	/I TM208	<1	<1		<1			
(TAME)			#		#		#		
Sum of detected Xylenes	<2 µg/	/I TM208	22.1	9.98		<2			
					-				
		+							
	-	+			-				
	<u>_</u> _							 	
		-							
		+			-				
					_				



Validated

130816-80 H\_WSP\_CDF-63 39784.001 Barry Waterfront 23336/39784/001/SG SDG: Location: Order Number: WSP Remediation 240124 Job:

**Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

# **Table of Results - Appendix**

Method No	Reference	Description	Wet/Dry Sample <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>&</sup>lt;sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



Validated

Barry Waterfront 23336/39784/001/SG SDG: Location: Order Number: 240124

130816-80 H\_WSP\_CDF-63 39784.001 WSP Remediation Job: **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

**Test Completion Dates** 

rest completion bates											
Lab Sample No(s)	7945544	7945545	7945547	7945548	7945550	7945551	7945552	7945553	7945554	7945559	
Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	BH9	BH10	
AGS Ref.	EW										
Depth											
Туре	LIQUID										
EPH CWG (Aliphatic) Aqueous GC (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	
EPH CWG (Aromatic) Aqueous GC (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	
GRO by GC-FID (W)	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	28-Aug-2013	28-Aug-2013	27-Aug-2013	
PAH Spec MS - Aqueous (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	29-Aug-2013	30-Aug-2013	29-Aug-2013	29-Aug-2013	
Phenois by HPLC (W)	27-Aug-2013	28-Aug-2013	28-Aug-2013	27-Aug-2013	28-Aug-2013	28-Aug-2013	28-Aug-2013	29-Aug-2013	27-Aug-2013	27-Aug-2013	
TPH CWG (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	
VOC MS (W)	27-Aug-2013	24-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	24-Aug-2013	24-Aug-2013	25-Aug-2013	25-Aug-2013	24-Aug-2013	

Lab Sample No(s)	7945560	7945561	7945564	7945566	7945567
Customer Sample Ref.	BH11	BH12	BH13	BH14	BH15
AGS Ref.	EW	EW	EW	EW	EW
Depth					
Туре	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH CWG (Aliphatic) Aqueous GC (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013
EPH CWG (Aromatic) Aqueous GC (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013
GRO by GC-FID (W)	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013
PAH Spec MS - Aqueous (W)	29-Aug-2013	29-Aug-2013	29-Aug-2013	29-Aug-2013	29-Aug-2013
Phenols by HPLC (W)	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013	27-Aug-2013
TPH CWG (W)	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013	30-Aug-2013
VOC MS (W)	24-Aug-2013	24-Aug-2013	24-Aug-2013	24-Aug-2013	24-Aug-2013



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG

Report Number: 240124 Superseded Report:

# Chromatogram

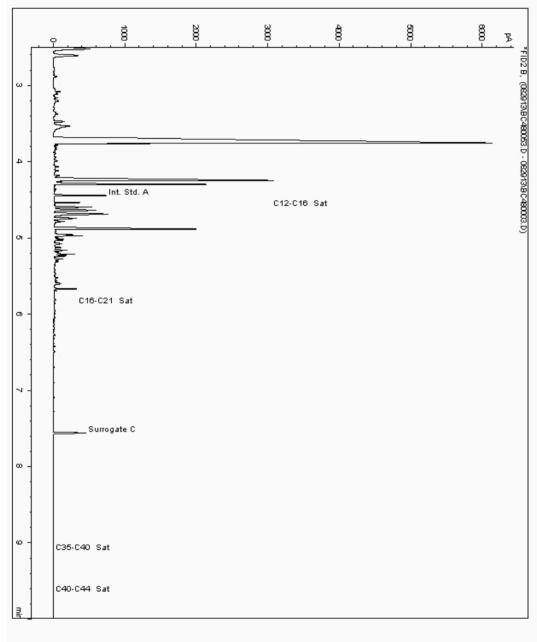
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7953521 Depth:

Sample ID : BH5

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608539-7953521
Date Acquired : 30/08/2013 11:33:01 PM
Units : ppb

Date Acquired : 30/08/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.042



Validated

SDG: 130816-80 H\_WSP\_CDF-63 Job:

39784.001

Client Reference:

Location: **Customer:** Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

240124

# Chromatogram

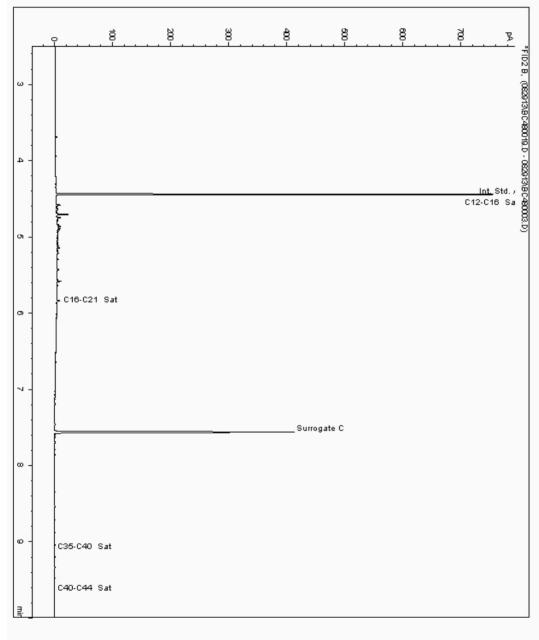
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) 7953545 Sample No : Depth: Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity:

7608566-7953545 29/08/2013 21:49:52 PM ppb Date Acquired : Units :

Dilution CF 1 0.008 Multiplier



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Customer: Attention: Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

240124

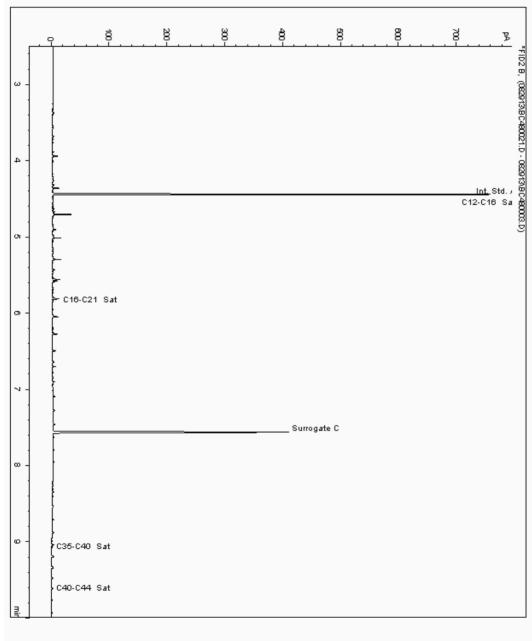
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7953553 Depth: Sample ID: 8H6

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608548-7953553
Date Acquired : 29/08/2013 22:28:23 PM
Units : ppb

Date Acquired : 29/08/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

**SDG:** 130816-80 **Job:** H\_WSP\_CDF-63

39784.001

Client Reference:

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

: 240124

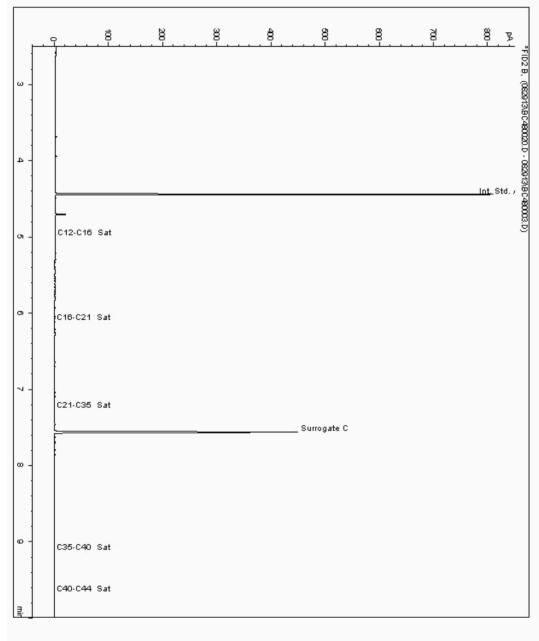
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7953572 Depth: Sample ID: 8H7

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608557-7953572
Date Acquired : 29/08/2013 22:09:00 PM
Units : ppb

Date Acquired : 29/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

mber: 240124

# Chromatogram

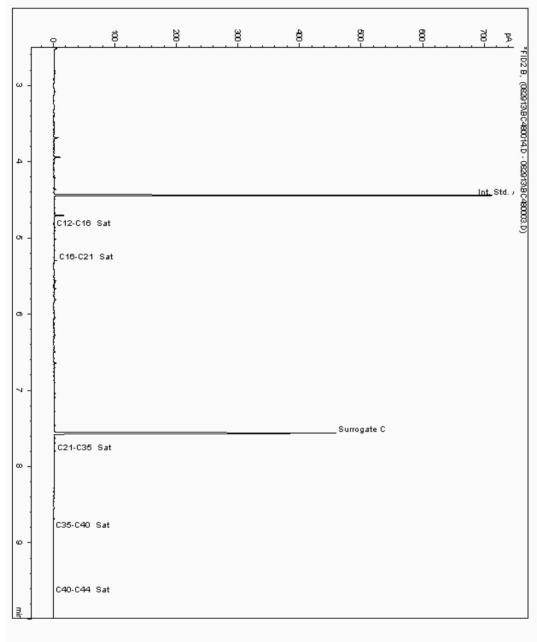
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7953577 Depth: Sample ID: 8H1

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608478-7953577

Date Acquired : 29/08/2013 20:43:09 PM
Units : ppb

Date Acquired : 29/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

SDG: 130816-80 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Customer:** Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: 23336/39784/001/SG

240124 Superseded Report:

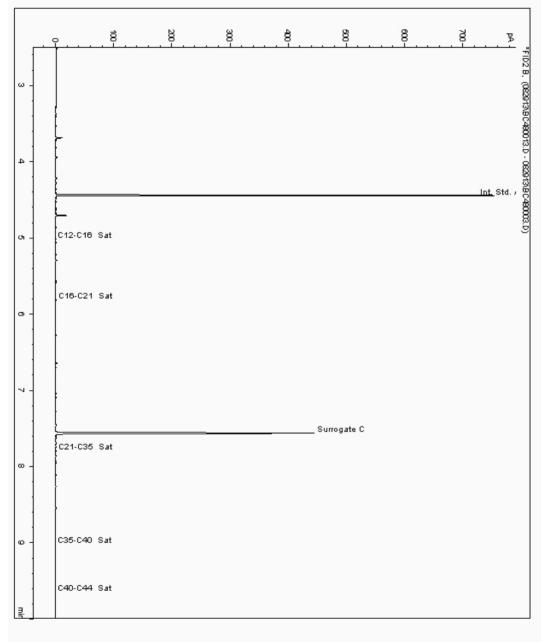
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : Depth: 7953585 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

7608490-7953585 29/08/2013 20:24:05 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

H\_WSP\_CDF-63 Customer: 39784.001 Attention:

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

240124

# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7953602 Depth:
Sample ID: 8H3

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608509-7953602 Date Acquired : 29/08/2013 21:11:48 PM Units : ppb

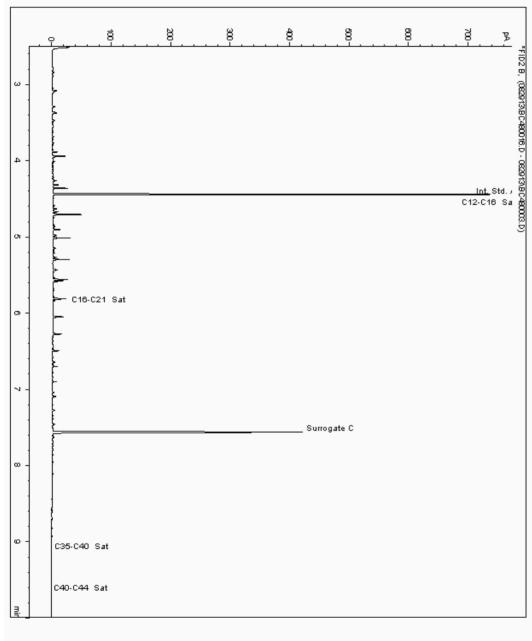
 Date Acquired : 29/08,

 Units : ppb

 Dilution :

 CF : 1

 Multiplier : 0.008



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

240124

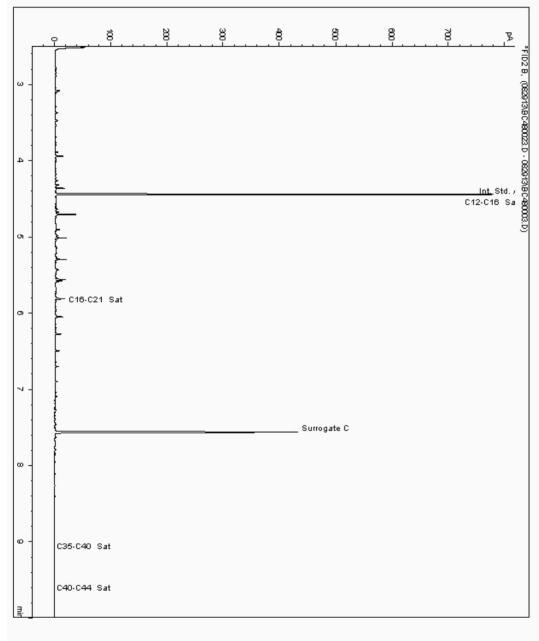
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7953611 Depth: Sample ID: 8H4

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608530-7953611 Date Acquired : 29/08/2013 22:57:12 PM Units : ppb

Date Acquired : 29/08/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

 130816-80
 Location:

 H\_WSP\_CDF-63
 Customer:

 39784.001
 Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

240124

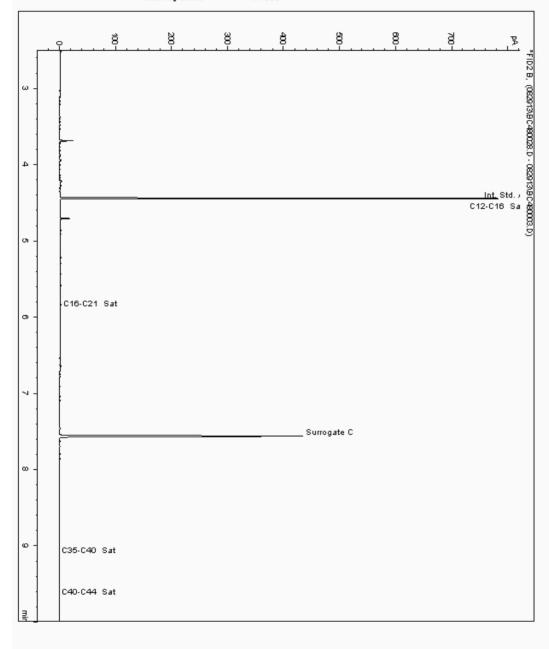
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7956343 Sample ID: BH13

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608629-7956343
Date Acquired : 30/08/2013 00:14:37 PM
Units : ppb

Date Acquired : 30/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

**SDG:** 130816-80 **Job:** H\_WSP\_CDF-63

39784.001

Client Reference:

Location: Customer: Attention: Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

: 240124

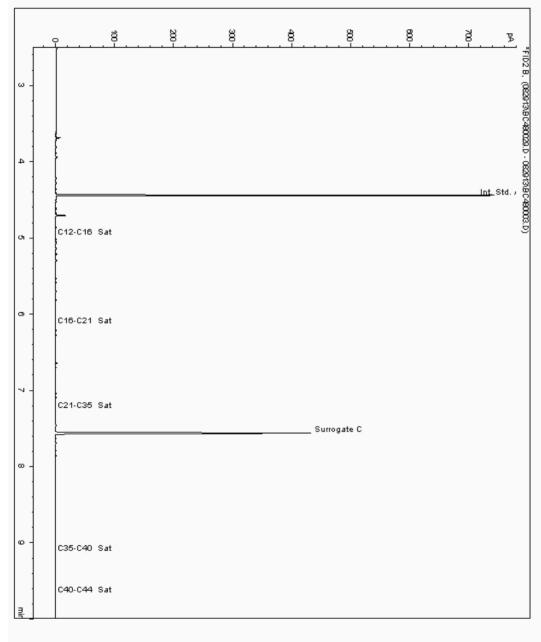
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7956382 Sample ID: 8H15

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608664-7956382 Date Acquired : 30/08/2013 00:33:58 PM

Date Acquired : 30/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

Barry Waterfront 23336/39784/001/SG SDG: 130816-80 Location: Order Number: Job: 240124

H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

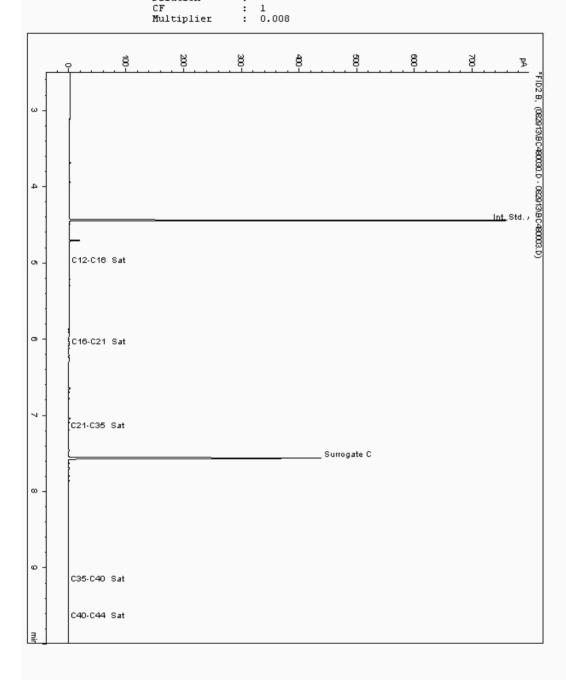
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : Depth: 7956398 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

7608576-7956398 30/08/2013 00:53:20 PM ppb Sample Identity:

Date Acquired : Units : Dilution



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: F-63 Customer: Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Report Number: 240124 Superseded Report:

# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7956413 Depth: Sample ID: 8H10

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608585-7956413
Date Acquired : 30/08/2013 01:12:42 PM
Units : ppb

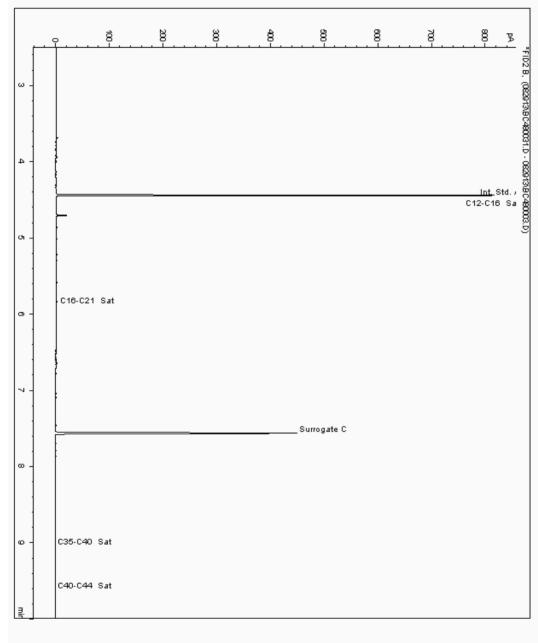
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 Units : ppb

 Dilution :

 CF : 1

 Multiplier : 0.008



Validated

SDG: 130816-80 Job:

Client Reference:

H\_WSP\_CDF-63 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

# Chromatogram

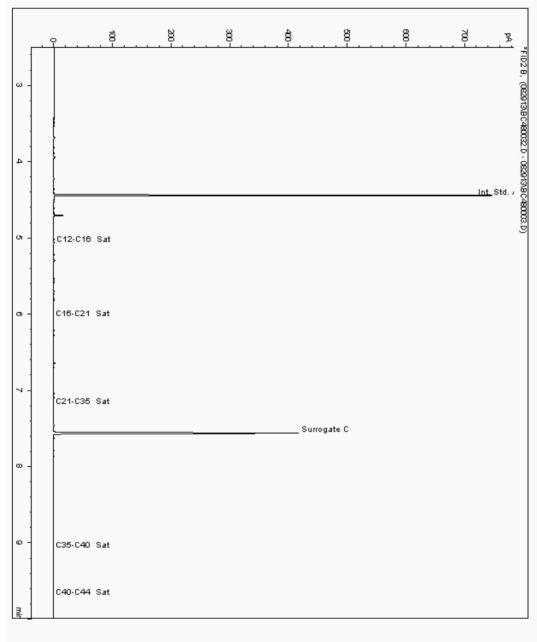
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : Depth: 7956756 Sample ID : BH11

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity:

7608594-7956756 30/08/2013 01:32:05 PM ppb Date Acquired : Units :

Dilution 1 0.008 Multiplier



39784.001

Client Reference:

#### **CERTIFICATE OF ANALYSIS**

Validated

Barry Waterfront SDG: 130816-80 Location: Job:

23336/39784/001/SG Order Number: H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: 240124

BH12

Steve Gronow Superseded Report:

Chromatogram

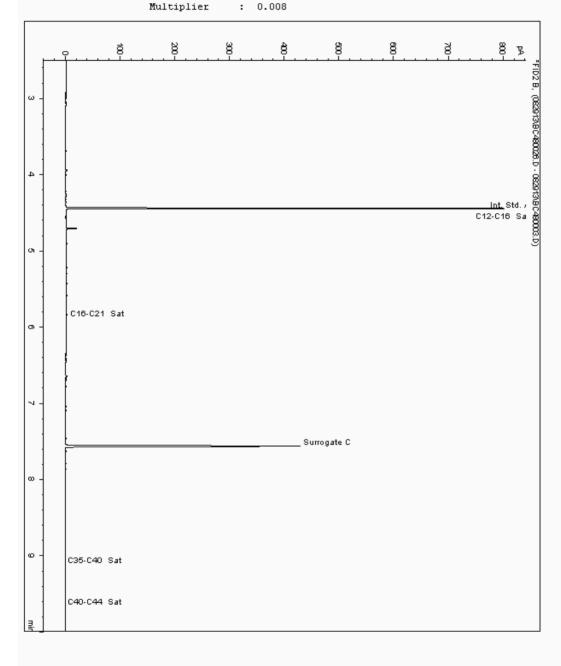
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : Depth: 7956794 Sample ID :

Attention:

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

7608603-7956794 29/08/2013 23:35:42 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

Chromatogram

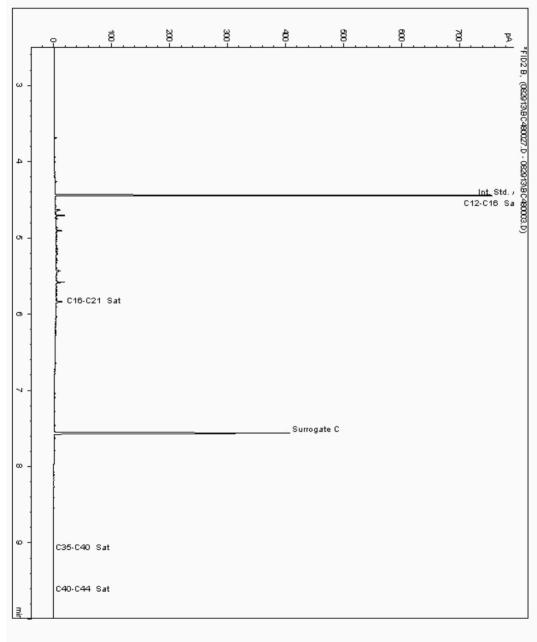
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 7956819 Depth:

Sample ID : BH14

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 7608638-7956819
Date Acquired : 29/08/2013 23:55:12 PM
Units : ppb

Date Acquired : 29/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

Barry Waterfront 23336/39784/001/SG 130816-80 Location: SDG: Order Number: Job: 240124

H\_WSP\_CDF-63 WSP Remediation **Customer:** Report Number: Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

Chromatogram

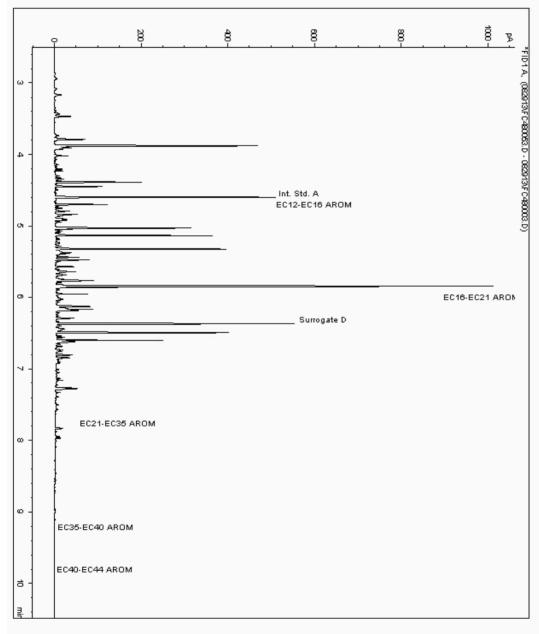
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7953521 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

7608540-7953521 30/08/2013 11:33:02 PM Date Acquired : Units : ppb

Dilution 1 0.417 Multiplier



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Ba
Customer: WS
Attention: Ste

Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23336/39784/001/SG

: 240124

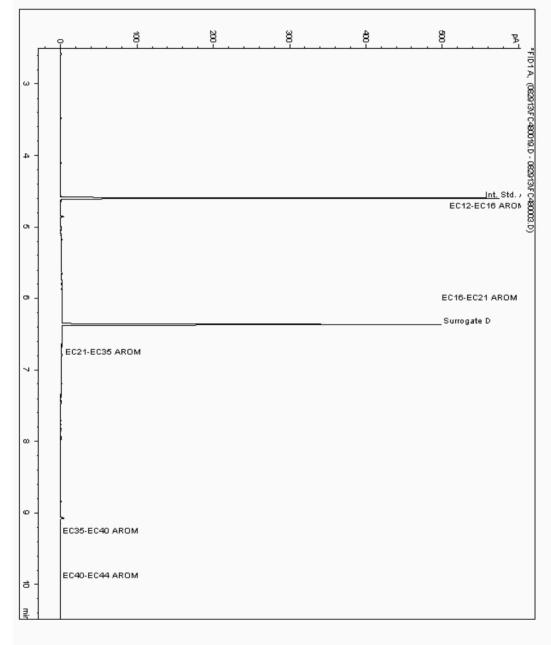
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 7953545 Depth: Sample ID: 8H8

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 7608567-7953545
Date Acquired : 29/08/2013 21:49:53 PM
Units : ppb

Date Acquired : 29/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

 SDG:
 130816-80
 Location:
 Barry Waterfront
 Order Number:
 23336/39784/001/SG

Job:H\_WSP\_CDF-63Customer:WSP RemediationReport Number:240124Client Reference:39784.001Attention:Steve GronowSuperseded Report:

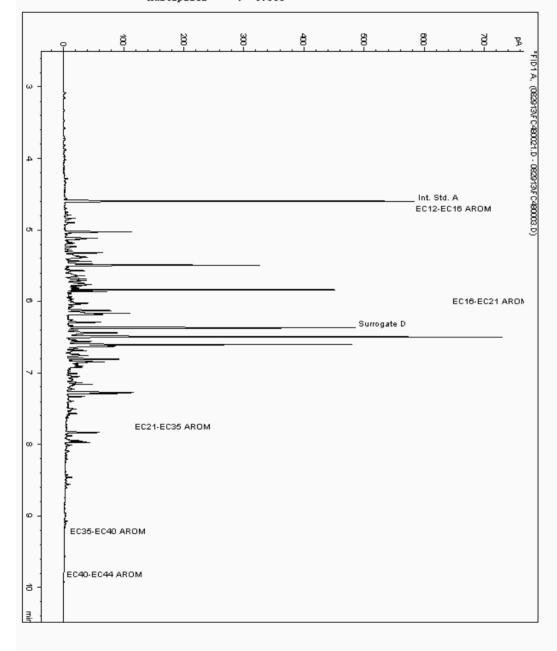
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 7953553 Depth: Sample ID: 8H6

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 7608549-7953553
Date Acquired : 29/08/2013 22:28:22 PM
Units : ppb

Date Acquired : 29/08, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

Barry Waterfront 23336/39784/001/SG 130816-80 Location: SDG: Order Number: Job: 240124

H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

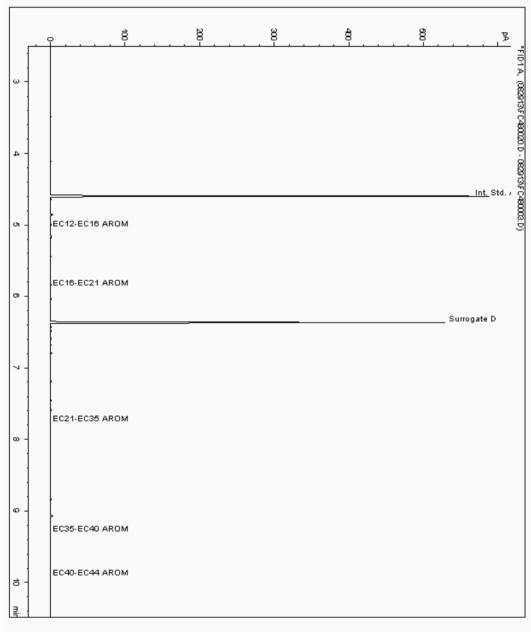
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7953572 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

7608558-7953572 29/08/2013 22:09:00 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Client Reference:

# **CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 130816-80 **Job:** H\_WSP\_CDF-63

H\_WSP\_CDF-63 Customer: 39784.001 Attention:

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG

mber: 240124

# Chromatogram

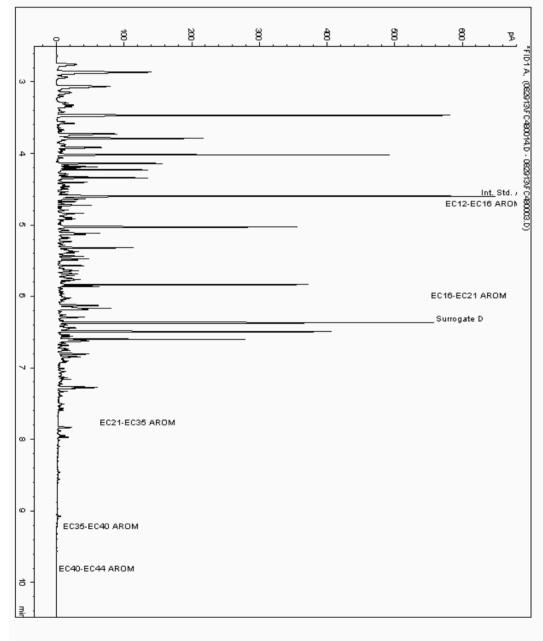
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 7953577 Depth: Sample ID: 8H1

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 7608479-7953577

Date Acquired : 29/08/2013 20:43:08 PM
Units : ppb

Date Acquired : 29/08/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

23336/39784/001/SG 130816-80 Location: **Barry Waterfront** SDG: Order Number: Job:

H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: 240124 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

Chromatogram

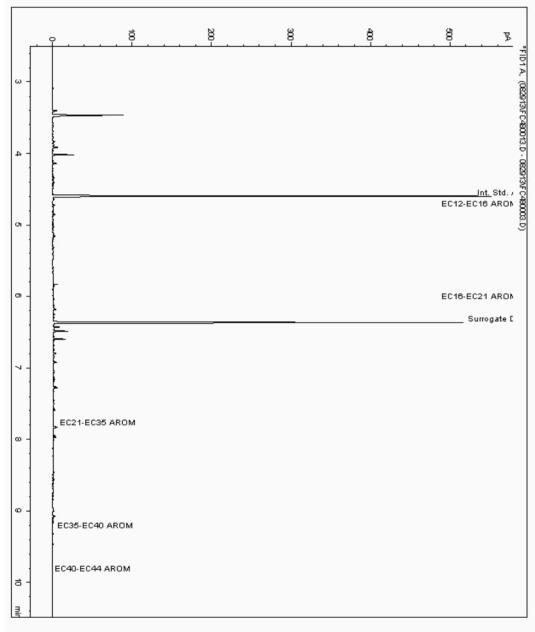
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7953585 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

7608491-7953585 29/08/2013 20:24:06 PM ppb Date Acquired : Units :

Dilution 1 0.008 Multiplier



Validated

130816-80 Location: **Barry Waterfront** SDG:

23336/39784/001/SG Order Number: H\_WSP\_CDF-63 Job: **Customer:** WSP Remediation Report Number: 240124 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

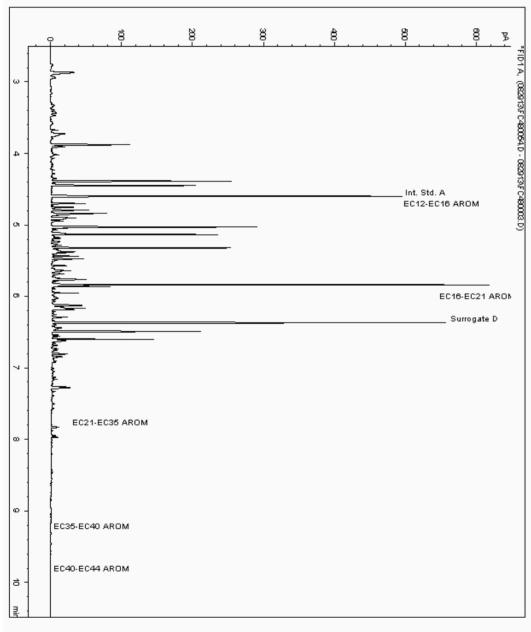
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7953602 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

7608510-7953602 30/08/2013 11:52:06 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.083 CF Multiplier



Validated

Barry Waterfront 23336/39784/001/SG 130816-80 Location: SDG: Order Number: Job:

H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: 240124 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

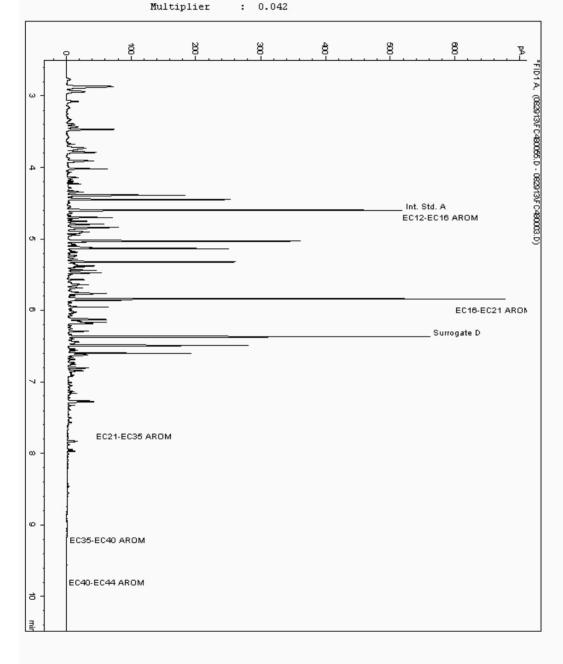
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7953611 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

7608531-7953611 30/08/2013 12:11:10 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.042



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barr Customer: WSF Attention: Stev

Barry Waterfront On WSP Remediation Restricted Steve Gronow Su

 Order Number:
 23336/39784/001/SG

 Report Number:
 240124

Superseded Report: 24012

Chromatogram

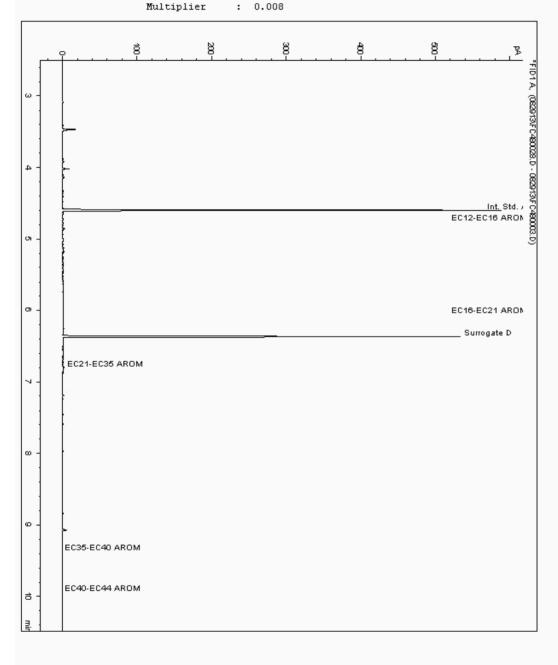
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 7956343 Depth:
Sample ID: 8H13

Sample ID: BH13

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 7608630-7956343 Date Acquired : 30/08/2013 00:14:37 PM

Date Acquired : 30/08/2013
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

23336/39784/001/SG

130816-80 Location: **Barry Waterfront** SDG: Order Number: H\_WSP\_CDF-63 Job: **Customer:** WSP Remediation

Report Number: 240124 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

BH15

Chromatogram

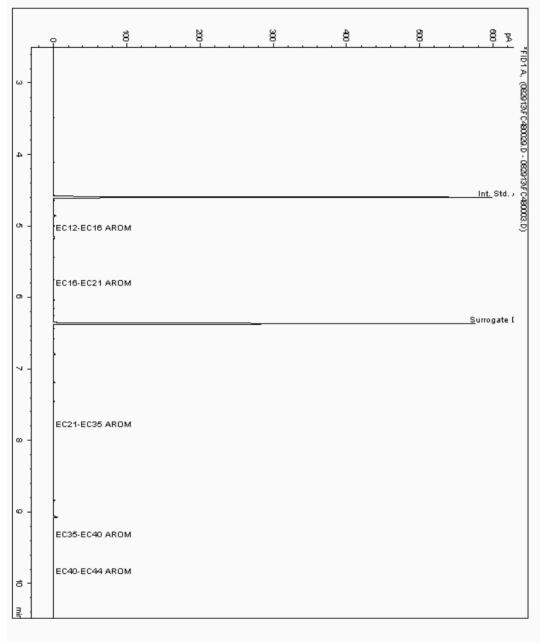
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7956382 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

7608665-7956382 30/08/2013 00:33:58 PM ppb Date Acquired : Units :

Dilution 1 0.008 Multiplier



Validated

23336/39784/001/SG 130816-80 Location: **Barry Waterfront** SDG: Order Number: Job: 240124

H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

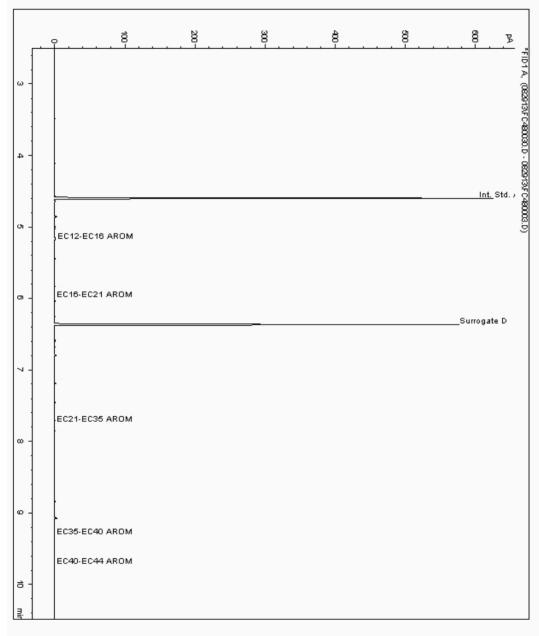
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7956398 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

7608577-7956398 30/08/2013 00:53:20 PM Sample Identity:

Date Acquired : Units : ppb Dilution 1 0.008 Multiplier



Validated

**SDG**: 130816-80 **Job**: H\_WSP\_CDF-0

Client Reference:

H\_WSP\_CDF-63 39784.001 Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report: 24012

# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 7956413 Sample ID: 8H10

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 7608586-7956413
Date Acquired : 30/08/2013 01:12:42 PM
Units : ppb

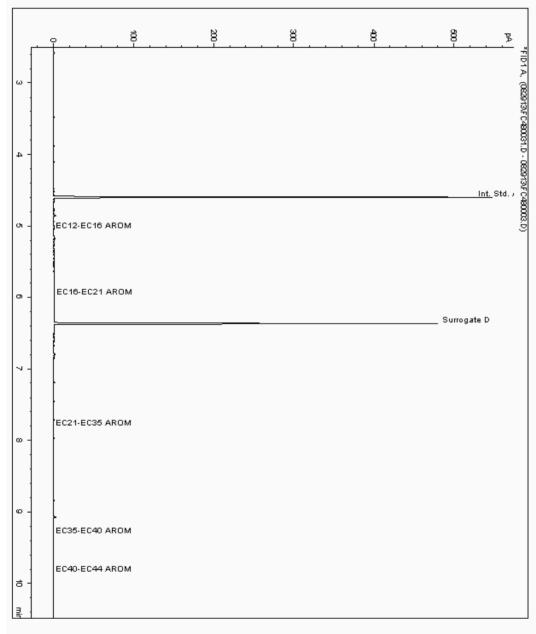
 Date Acquired : 30/08,

 Units : ppb

 Dilution :

 CF : 1

 Multiplier : 0.008



39784.001

Client Reference:

### **CERTIFICATE OF ANALYSIS**

Validated

23336/39784/001/SG 130816-80 Location: **Barry Waterfront** SDG: Order Number: H\_WSP\_CDF-63 Job: 240124

**Customer:** WSP Remediation Report Number: Attention: Steve Gronow Superseded Report:

Chromatogram

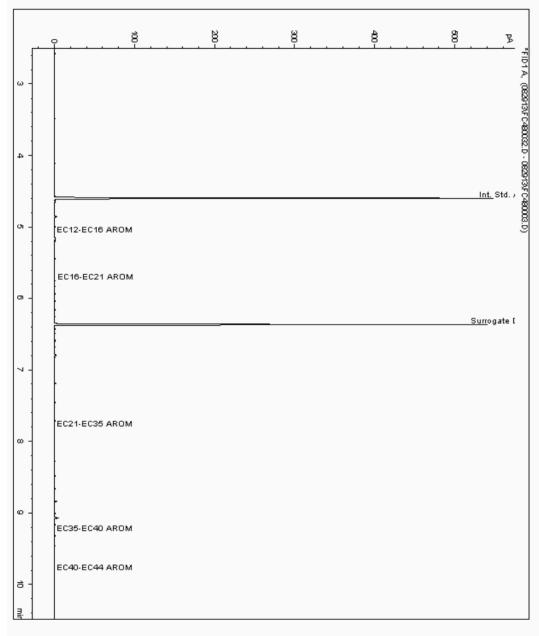
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7956756 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

BH11

7608595-7956756 30/08/2013 01:32:06 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Client Reference:

# **CERTIFICATE OF ANALYSIS**

Validated

130816-80 SDG: Job:

Location: **Barry Waterfront** H\_WSP\_CDF-63 **Customer:** WSP Remediation 39784.001 Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG

240124 Superseded Report:

Chromatogram

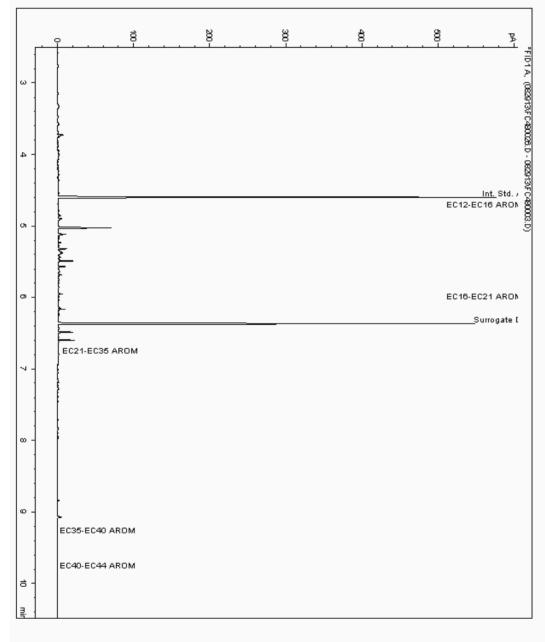
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7956794 Sample ID :

BH12

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

7608604-7956794 29/08/2013 23:35:42 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Client Reference:

# **CERTIFICATE OF ANALYSIS**

Validated

23336/39784/001/SG 130816-80 Location: **Barry Waterfront** SDG: Order Number: H\_WSP\_CDF-63 Job: 240124

**Customer:** WSP Remediation Report Number: 39784.001 Attention: Steve Gronow Superseded Report:

Chromatogram

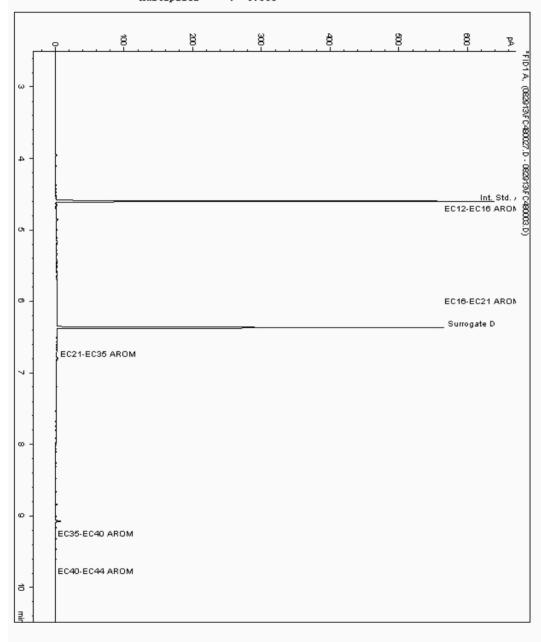
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : Depth: 7956819 Sample ID :

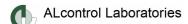
Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

BH14

7608639-7956819 29/08/2013 23:55:12 PM Sample Identity:

Date Acquired : Units : ppb Dilution 1 0.008 Multiplier





Analysis: GRO by GC-FID (W)

### **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

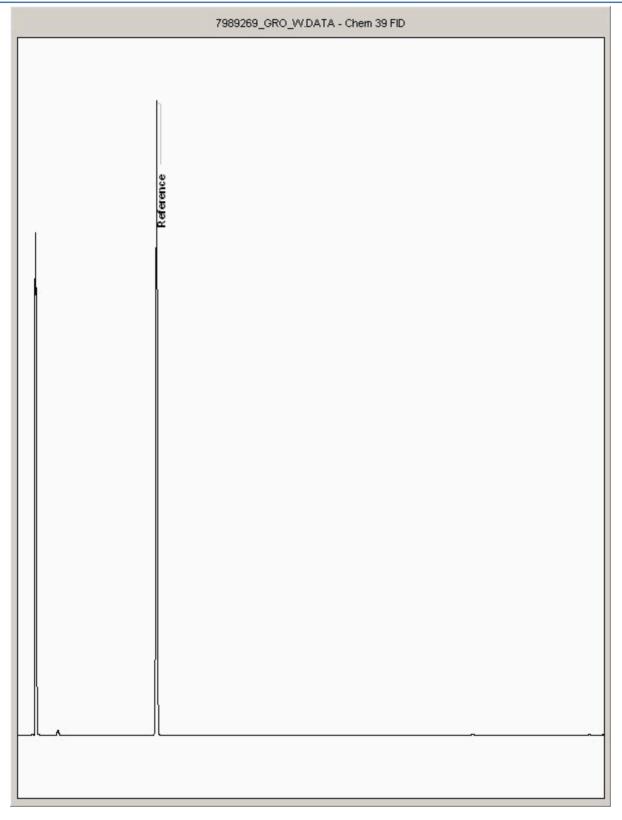
Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

# Chromatogram

Sample No: 7989269 Depth:





Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

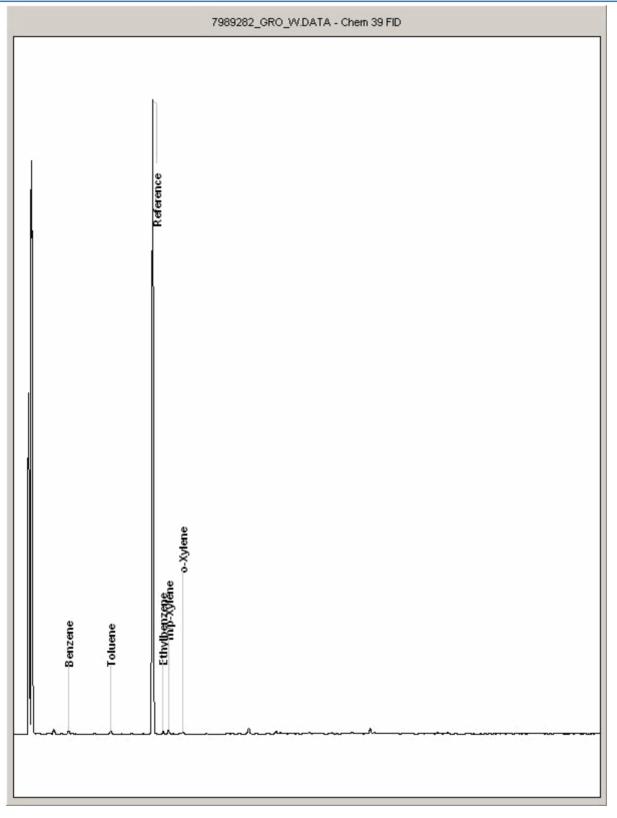
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 7989282
 Depth:





Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

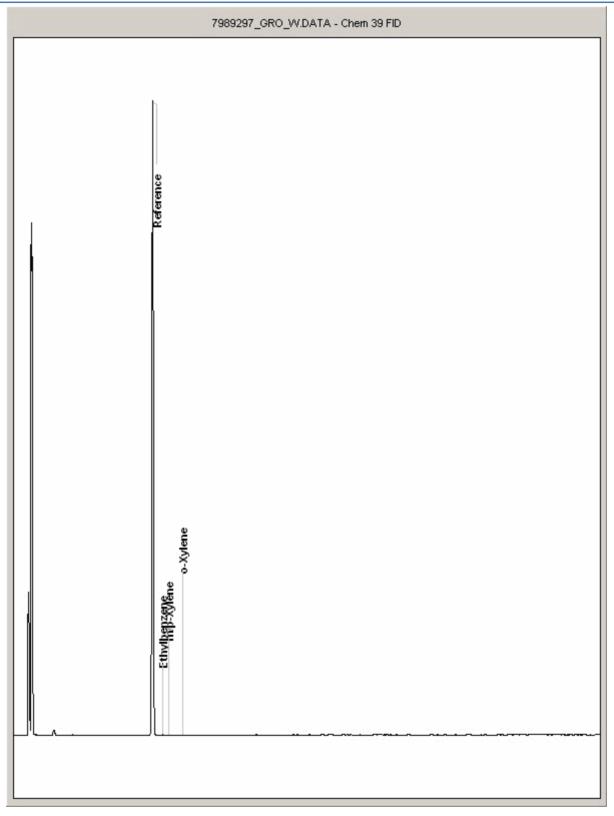
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 7989297
 Depth :



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report:

23336/39784/001/SG 240124

Chromatogram

Analysis: GRO by GC-FID (W) Sample No :  $_{989304}$  Sample ID :  $_{BH14}$ 

7989304\_GRO\_W.DATA - Chem 39 FID

Validated

130816-80 H\_WSP\_CDF-63 39784.001 SDG: Job: Client Reference:

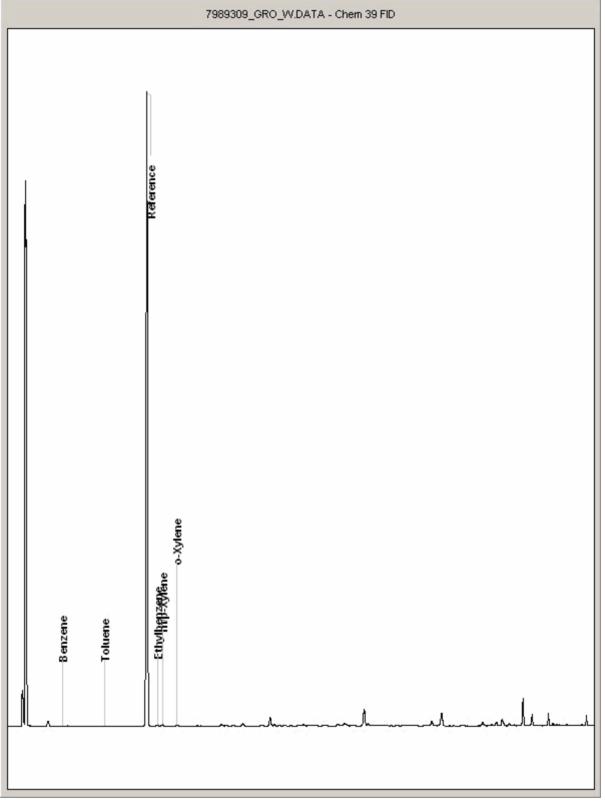
Location: Barry Waterfront WSP Remediation **Customer:** Attention: Steve Gronow

Order Number: Superseded Report:

23336/39784/001/SG 240124

Chromatogram

Analysis: GRO by GC-FID (W) Sample No : 7989309 Depth:





Validated

SDG: 130816-80 H\_WSP\_CDF-63 39784.001 Job: Client Reference:

Location: **Customer:** Attention:

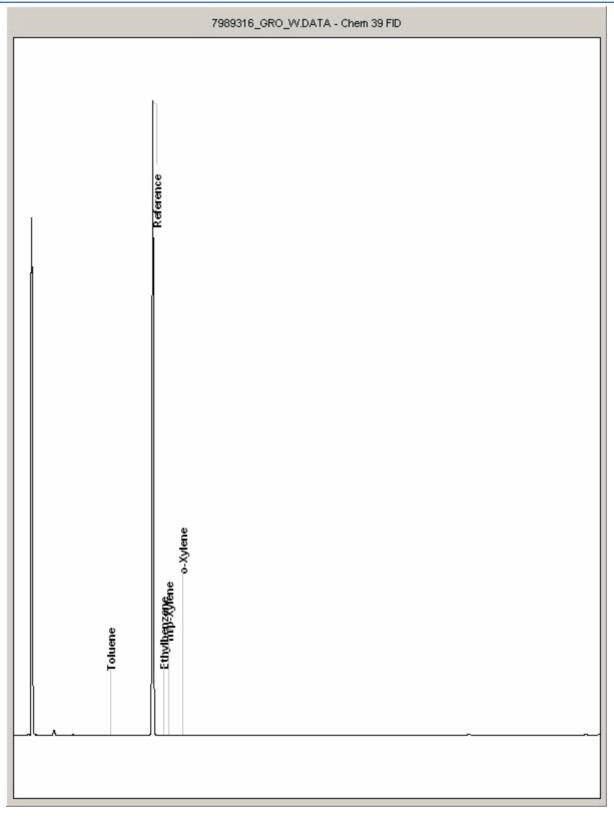
**Barry Waterfront** Order Number: WSP Remediation Steve Gronow

23336/39784/001/SG 240124 Report Number:

Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W) 7989316 Sample No : Depth:



Validated

130816-80 H\_WSP\_CDF-63 39784.001 SDG: Job: Client Reference:

Analysis: GRO by GC-FID (W)

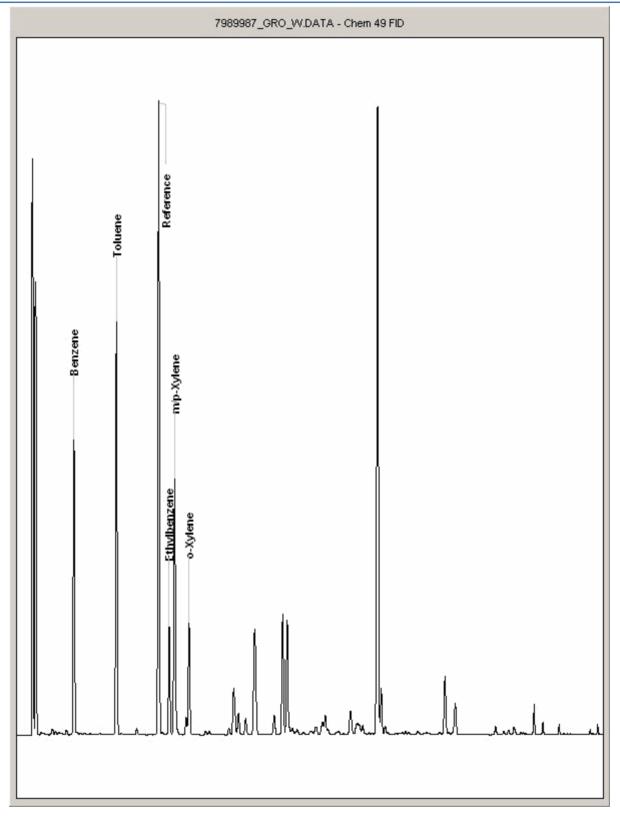
**Customer:** Attention:

Location: Barry Waterfront WSP Remediation Steve Gronow

Order Number: Superseded Report: 23336/39784/001/SG 240124

# Chromatogram

7989987 Sample No : Depth:



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

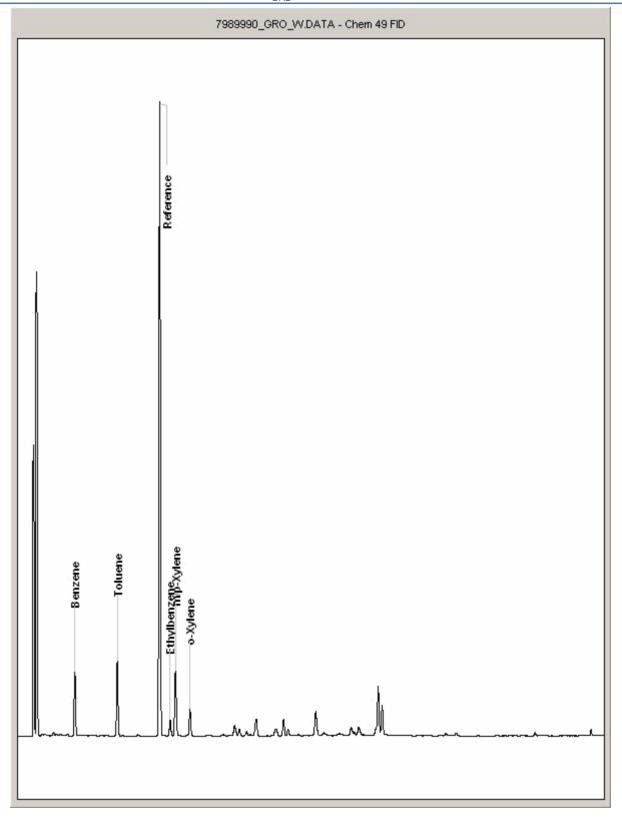
Order Number:

23336/39784/001/SG 240124

Superseded Report: 240124

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 7989990
 Depth :



Validated

130816-80 H\_WSP\_CDF-63 39784.001 SDG: Job:

Client Reference:

Barry Waterfront WSP Remediation Location: **Customer:** Attention: Steve Gronow

Order Number:

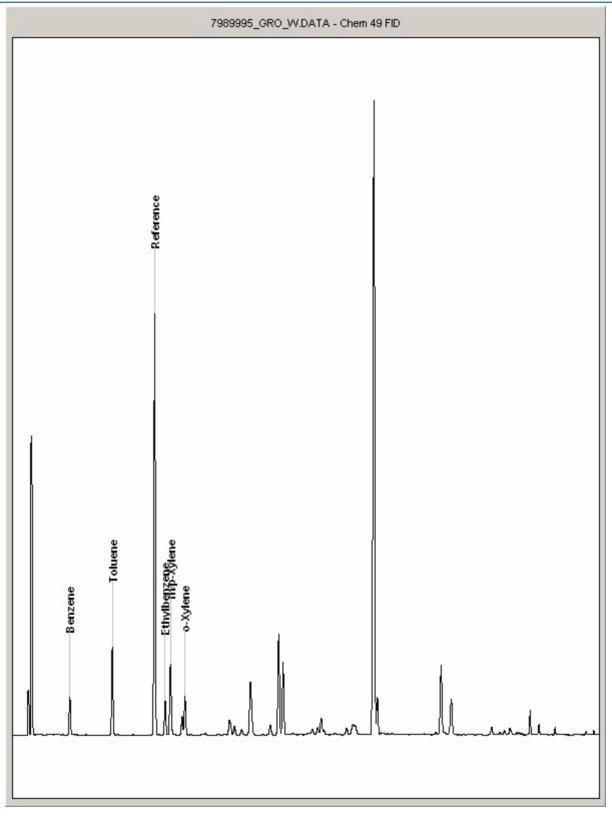
23336/39784/001/SG 240124

Superseded Report:

Chromatogram

7989995 Analysis: GRO by GC-FID (W) Sample No : Depth:

Sample ID : вн3



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

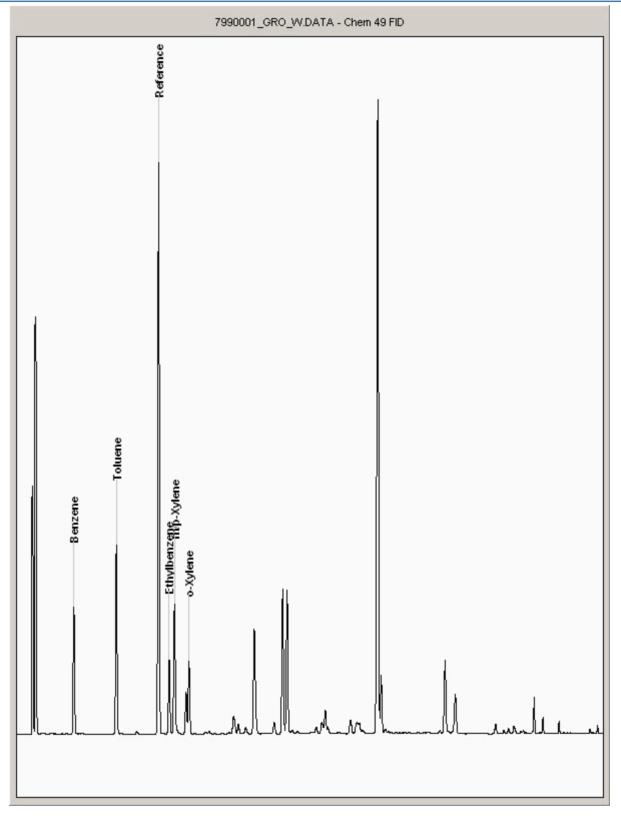
Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report: 2401

# Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No : 7990001
 Depth :



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

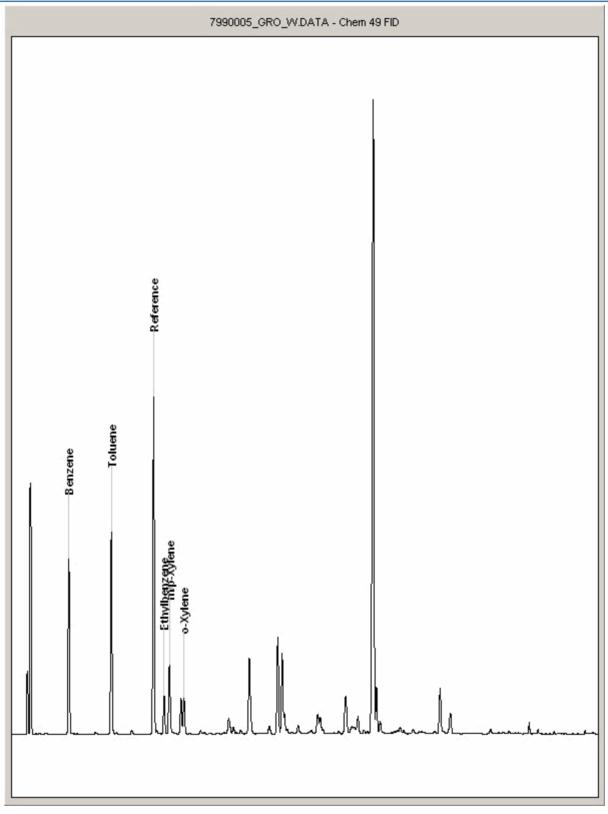
SP\_CDF-63 Customer: 44.001 Attention:

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

# Chromatogram



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

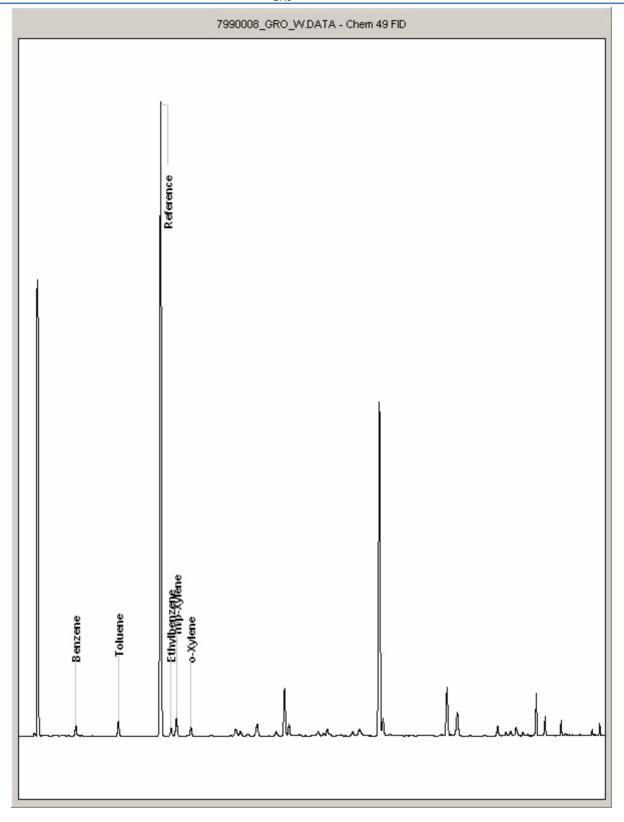
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number:

23336/39784/001/SG 240124

Superseded Report:

# Chromatogram





Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

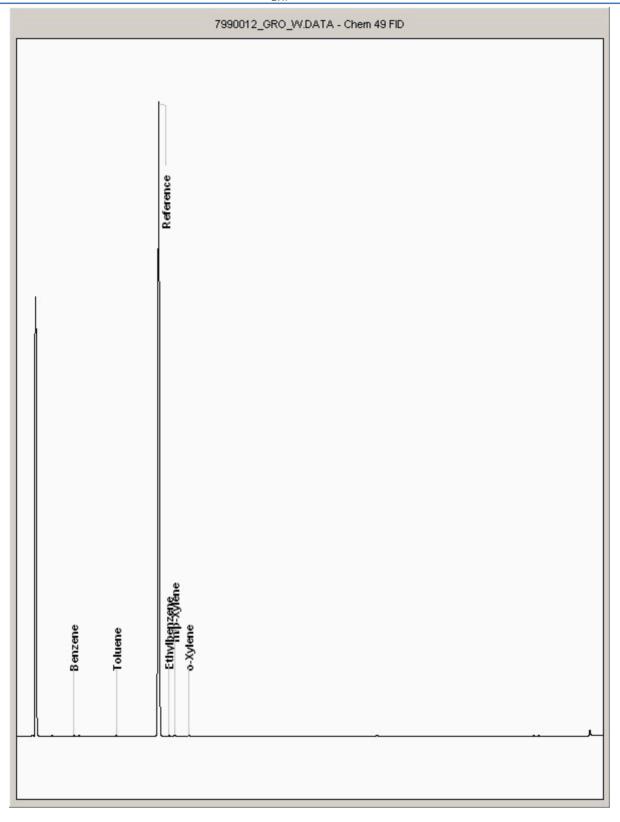
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23336/39784/001/SG 240124

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 7990012
 7990012



Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

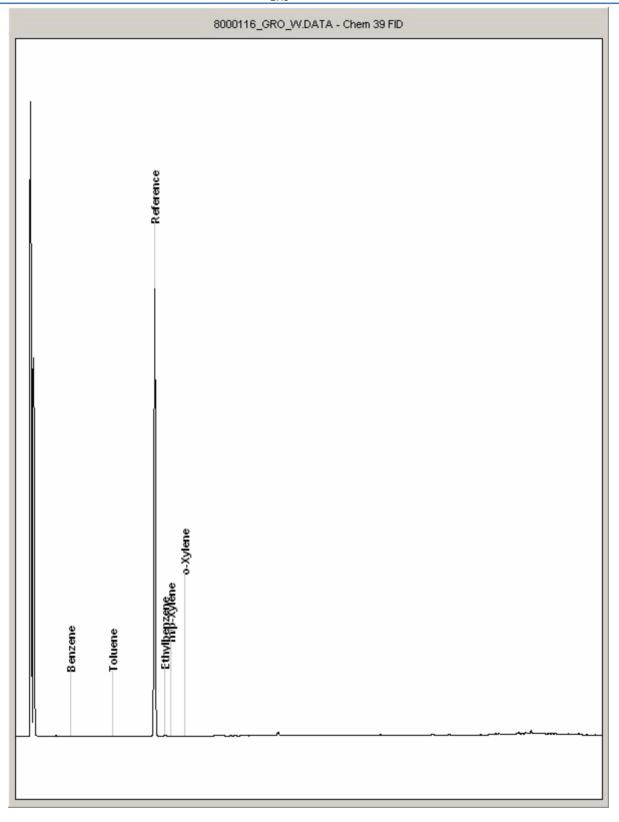
 Order Number:
 23336/39784/001/SG

 Report Number:
 240124

Superseded Report: 240

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8000116
 Depth:





Validated

 SDG:
 130816-80

 Job:
 H\_WSP\_CDF-63

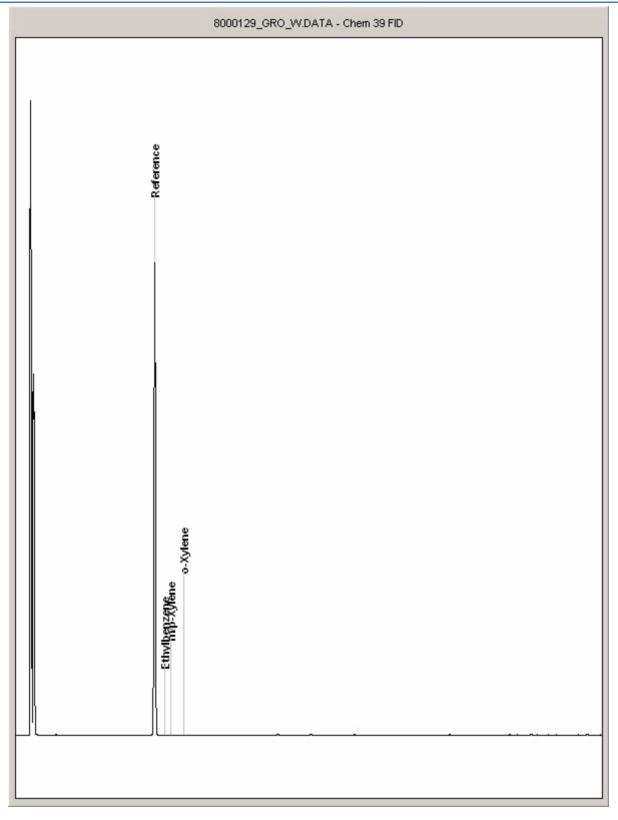
 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report: 23336/39784/001/SG 240124

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8000129
 Depth:



# **ALcontrol Laboratories**

#### **CERTIFICATE OF ANALYSIS**

23336/39784/001/SG SDG 130816-80 Location: Barry Waterfront Order Number:

H WSP CDF-63 WSP Remediation 240124 Job: **Customer:** Report Number: Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

# Appendix General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed
- 4. With respect to turnaround, we will always endeayour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No The quantity of asbestos present is not determined unless Determination Possible. specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
- 9. NDP -No determination possible due to insufficient/unsuitable sample
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately
- 11. Results relate only to the items tested.
- 12. LODs for wet tests reported on a dry weight basis are not corrected for moisture
- 13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %
- 14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, and Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol)
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

- 20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

# Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

#### Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method transmitted/polarised microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysofile	White Asbestos
Amoste	BrownAsbestos
Orodoblte	Blue Asbestos
Fibrous Adindite	=
Fibrous Anthophylite	=
Fibrous Trendile	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than:

Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside scope of UKAS accreditation.

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden

Deeside CH5 3US Tel: (01244) 528700

Fax: (01244) 528701 email: mkt@alcontrol.com Website: www.alcontrol.com

WSP Remediation Fairway House Paramount Business Park St Mellons Cardiff South Glamorgan CF3 0LW

Attention: Steve Gronow

# **CERTIFICATE OF ANALYSIS**

 Date:
 22 November 2013

 Customer:
 H\_WSP\_CDF

 Sample Delivery Group (SDG):
 131118-12

 Your Reference:
 39784.001

 Location:
 Barry Waterfront

 Report No:
 250928

We received 15 samples on Saturday November 16, 2013 and 15 of these samples were scheduled for analysis which was completed on Friday November 22, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

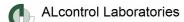
All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan
Operations Manager







Validated

 SDG:
 131118-12
 Location:
 Barry Waterfront
 Order Number:
 23820/39784-001/SG

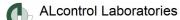
 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation
 Report Number:
 250928

 Client Reference:
 39784.001
 Attention:
 Steve Gronow
 Superseded Report:

**Received Sample Overview** 

∟ab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
8440249	BH1	EW	1.69	15/11/2013
8440258	BH2	EW	1.84	15/11/2013
8440259	ВН3	EW	2.28	15/11/2013
8440261	BH4	EW	2.16	15/11/2013
8440262	BH5	EW	2.12	15/11/2013
8440263	BH6	EW	2.20	15/11/2013
8440264	BH7	EW	2.93	15/11/2013
8440265	BH8	EW	3.10	15/11/2013
8440266	ВН9	EW	3.15	15/11/2013
8440250	BH10	EW	2.98	15/11/2013
8440252	BH11	EW	2.65	15/11/2013
8440254	BH12	EW	2.70	15/11/2013
8440255	BH13	EW	2.65	15/11/2013
8440256	BH14	EW	2.72	15/11/2013
8440257	BH15	EW	2.70	15/11/2013

Only received samples which have had analysis scheduled will be shown on the following pages.



Validated

 SDG:
 131118-12
 Location:
 Barry Waterfront
 Order Number:
 23820/39784-001/SG

 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation
 Report Number:
 250928

 Client Reference:
 39784.001
 Attention:
 Steve Gronow
 Superseded Report:

Client Reference: 39784.00	)1	Attention:					Steve Gronow						Sı	upers	ede	d Re	port:
LIQUID Results Legend X Test	Lab Samp	Lab Sample No(s)		8440258	8440259	8440261	8440262	8440263	8440264	8440265	8440266	8440250	8440252	8440254	8440255	8440256	8440257
No Determination Possible	Custo Sample R		BH1	BH2	BH3	BH4	BH5	вн6	BH7	BH8	вн9	BH10	BH11	BH12	BH13	BH14	BH15
	AGS Ref	ference	EW	п <b>Х</b>	E W	ЕW	EW	EW	ЕW	ЕW	ЕW	EΨ	EW	EW	ЕW	ΕW	. E
	Depth (m)			1.84	2.28	2.16	2.12	2.20	2.93	3.10	3.15	2.98	2.65	2.70	2.65	2.72	2.70
	Container		Vial (ALE297) 1l Glass bottle (ALE	11 Glass bottle (ALE	Vial (ALE297) 1l Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1l Glass bottle (ALE	Vial (ALE297) 1l Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1l Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE	Vial (ALE297) 1I Glass bottle (ALE
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15	X	X	X	X	X	X	X	X	x	x	X	x	x	x	X
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15	x	X	X	x	x	x	x	x	x	x	X	X	x	X	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 15	x	×	x	x	x	x	x	×	x	x	X	X	x	x	x
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 15	X	X	X	x	×	x	x	x	x	x	X	X	X	X	X
TPH CWG (W)	All	NDPs: 0 Tests: 15	X	X	X	x	×	×	x	x	x	x	X	X	x	x	X
VOC MS (W)	All	NDPs: 0 Tests: 15	X	X	x	X	X	X	X	X	X	X	X	X	x	X	x



Validated

 SDG:
 131118-12
 Location:
 Barry Waterfront
 Order Number:
 23820/39784-001/SG

 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation
 Report Number:
 250928

 Client Reference:
 39784.001
 Attention:
 Steve Gronow
 Superseded Report:

Results Legend
ISO17025 accredited.
mCERTS accredited.
Aqueous / settled sample.
Dissolved / filtered sample. Customer Sample R BH1 BH2 внз BH5 ВН6 aq diss.filt 2.20 Water(GW/SW) 1.84 Water(GW/SW) 2.28 Water(GW/SW) 2.16 Water(GW/SW) Depth (m) 1.69 2.12 diss.filt Dissolved / filtered sample.

\* Subcontracted test.

\* % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery [F] Trigger breach confirmed

1-48+\$@ Sample deviation (see appendix) Water(GW/SW) Water(GW/SW) Sample Type Date Sampled Sampled Time 15/11/2013 15/11/2013 15/11/2013 15/11/2013 15/11/2013 15/11/2013 16/11/2013 131118-12 16/11/2013 131118-12 16/11/2013 131118-12 16/11/2013 131118-12 16/11/2013 131118-12 16/11/2013 131118-12 Date Received SDG Ref 8440249 EW 8440258 EW 8440259 EW 8440261 EW 8440262 EW 8440263 EW Lab Sample No.(s) AGS Reference LOD/Units Component Method Phenols, Total Detected <16 µg/l TM259 6220 90 <16 8120 17700 80 monohydric 2# 2# 2# 2# 2# 2#



Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: 250928

Job: WSP Remediation **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

Results Legend		Customer Sample R	BH7	BH8	BH9	BH10	BH11	BH12
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	2.93	3.10	3.15	2.98	2.65	2.70
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013
** % recovery of the surrogate standa check the efficiency of the method.	rd to The	Sampled Time						
results of individual compounds wi	thin	Date Received SDG Ref	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12
samples aren't corrected for the rec (F) Trigger breach confirmed	covery	Lab Sample No.(s)	8440264	8440265	8440266	8440250	8440252	8440254
1-4&+§@ Sample deviation (see appendix)	LOD/Units	AGS Reference	EW	EW	EW	EW	EW	EW
Component Phenols, Total Detected		_	<16	<16	<16	<16	<16	<16
monohydric	<16 µg/	1 1101239	2#	2#	2#	2#	2#	2#
					2 "	2 11		
		_						
		_						

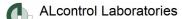


Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: **Barry Waterfront** Order Number:

Job: WSP Remediation 250928 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

Results Legend	(	Customer Sample R	BH13	BH14	BH15			
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	2.65	2.72	2.70			
tot.unfilt Total / unfiltered sample.		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
* Subcontracted test.  ** % recovery of the surrogate standa	ard to	Date Sampled Sampled Time	15/11/2013	15/11/2013	15/11/2013			
check the efficiency of the method results of individual compounds w	. The	Date Received	16/11/2013	16/11/2013	16/11/2013			
samples aren't corrected for the re-	coverv	SDG Ref	131118-12 8440255	131118-12 8440256	131118-12 8440257			
(F) Trigger breach confirmed 1-4&•§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW			
Component	LOD/Units							
Phenols, Total Detected	<16 µg/		<16	<16	<16			
monohydric			2#	2#	2#			
,								
		+						
				I.		<u> </u>	I.	

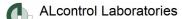


Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

PAH Spec MS - Aqueous	s (W)							
Results Legend # ISO17025 accredited.		Customer Sample R	BH1	BH2	ВН3	BH4	BH5	BH6
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	1.69 Water(GW/SW) 15/11/2013	1.84 Water(GW/SW) 15/11/2013	2.28 Water(GW/SW) 15/11/2013	2.16 Water(GW/SW) 15/11/2013	2.12 Water(GW/SW) 15/11/2013	2.20 Water(GW/SW) 15/11/2013
* % recovery of the surrogate stands check the efficiency of the method. results of individual compounds we samples aren't corrected for the reinforce of the r	. The ithin	Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference Method	16/11/2013 131118-12 8440249 EW	16/11/2013 131118-12 8440258 EW	16/11/2013 131118-12 8440259 EW	16/11/2013 131118-12 8440261 EW	16/11/2013 131118-12 8440262 EW	16/11/2013 131118-12 8440263 EW
Naphthalene (aq)	<0.1 µg/		7350	0.192	4.31	10200	3430	<5
Acenaphthene (aq)	<0.015	TM178	1080	6.88	39.6	# 428	557	85.4
Acenaphthylene (aq)	μg/l <0.011 μg/l	TM178	90.6	0.447 #	1.54 #	30.9 #	53.1 #	1.7
Fluoranthene (aq)	<0.017 μg/l	TM178	774 #	11.5 #	29.5	41.9 #	76.8 #	72.9
Anthracene (aq)	<0.015 μg/l	TM178	193 #	1.94 #	3.08	23.3	51.2 #	6.98
Phenanthrene (aq)	<0.022 μg/l	TM178	2150 #	11.3	1.03	198 #	422 #	34.2
Fluorene (aq)	<0.014 μg/l	TM178	696	2.36 #	16.7	171 #	278 #	7.02
Chrysene (aq)	<0.013 μg/l	TM178	115 #	1.53 #	3.94	<6.5 #	8.4	10.2
Pyrene (aq)	<0.015 μg/l	TM178	526 #	7.9	16.8	27.3	50 #	48 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	103 #	1.39 #	2.53 #	<8.5 #	6.11 #	8.96 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	29.4 #	0.499 #	0.799 #	<11.5 #	<2.88 #	1.84 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	39.4 #	0.869 #	1.2 #	<13.5 #	<3.38 #	3.25 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	34.5 #	0.83 #	0.947 #	<4.5 #	2.28	2.38
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	<8 #	0.0817 #	<0.4	<8 #	<2 #	<0.8 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	9.9 #	0.285 #	<0.4 #	<8 #	<2 #	<0.8 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	9.42 #	0.278 #	<0.35 #	<7 #	<1.75 #	<0.7 #
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	13200	48.3	122	11200	4940	283

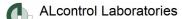


Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

PAH Spec MS - Aqueous	s (W)							
Results Legend # ISO17025 accredited.		Customer Sample R	ВН7	BH8	ВН9	BH10	BH11	BH12
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	2.93 Water(GW/SW) 15/11/2013	3.10 Water(GW/SW) 15/11/2013	3.15 Water(GW/SW) 15/11/2013	2.98 Water(GW/SW) 15/11/2013	2.65 Water(GW/SW) 15/11/2013	2.70 Water(GW/SW) 15/11/2013
** % recovery of the surrogate standa check the efficiency of the method. results of individual compounds wi samples aren't corrected for the red (F) Trigger breach confirmed 1-43+§@ Sample deviation (see appendix)	The thin	Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	16/11/2013 131118-12 8440264 EW	16/11/2013 131118-12 8440265 EW	16/11/2013 131118-12 8440266 EW	16/11/2013 131118-12 8440250 EW	16/11/2013 131118-12 8440252 EW	16/11/2013 131118-12 8440254 EW
Component	LOD/Units							
Naphthalene (aq)	<0.1 µg/	TM178	0.154	<0.1	<1	<0.1	0.108	0.128
Acenaphthene (aq)	<0.015 µg/l	TM178	1.62 #	* <0.015 *	39.5 #	<0.015 #	0.0257 #	0.0616 #
Acenaphthylene (aq)	<0.011 µg/l	TM178	0.13 #	<0.011 #	1.34 #	0.0421 #	0.0279 #	0.0205 #
Fluoranthene (aq)	<0.017 µg/l	TM178	4.01 #	0.0249 #	23.9 #	0.0472 #	0.165 #	0.0937 #
Anthracene (aq)	<0.015 µg/l	TM178	0.184 #	0.0309 #	4.6 #	0.039 #	0.0563 #	0.0192 #
Phenanthrene (aq)	<0.022 µg/l	TM178	0.27 #	0.0302 #	33.6 #	0.0319 #	0.221 #	0.0368
Fluorene (aq)	<0.014 µg/l	TM178	0.151 #	<0.014 #	23.6 #	0.044 #	0.0559 #	0.0144
Chrysene (aq)	<0.013 µg/l	TM178	0.66 #	<0.013 #	2.78 #	0.021 #	0.107 #	0.0608
Pyrene (aq)	<0.015 µg/l	TM178	2.64 #	0.0459 #	17.5 #	0.195 #	0.252 #	0.0697
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.474 #	<0.017 #	2.46 #	<0.017 #	0.0543 #	<0.017
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	0.291 #	<0.023 #	0.489 #	<0.023 #	0.0651 #	0.0236
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	0.426 #	<0.027 #	0.757 #	<0.027 #	0.087 #	0.0306
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	0.368	<0.009	0.594	0.0132	0.0821 #	0.0434 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.0355 #	<0.016 #	<0.16 #	<0.016 #	0.0164 #	<0.016
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	0.132 #	<0.016 #	<0.16 #	<0.016 #	0.0592 #	0.0214
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.121 #	<0.014 #	<0.14 #	<0.014 #	0.0485 #	0.017 #
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	11.7	<0.247	151	0.433	1.43	0.641

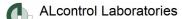


Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number:

WSP Remediation 250928 Job: **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

PAH Spec MS - Aqueous	s (W)						
Results Legend # ISO17025 accredited.	(	Customer Sample R	BH13	BH14	BH15		
M mCERTS accredited.  aq Aqueous / settled sample.		Donath (m)	0.05	0.70	0.70		
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	2.65 Water(GW/SW)	2.72 Water(GW/SW)	2.70 Water(GW/SW)		
* Subcontracted test.     ** % recovery of the surrogate standa	rd to	Date Sampled	15/11/2013	15/11/2013	15/11/2013		
check the efficiency of the method.	The	Sampled Time Date Received	16/11/2013	16/11/2013	16/11/2013		
results of individual compounds wi samples aren't corrected for the red		SDG Ref	131118-12 8440255	131118-12 8440256	131118-12 8440257		
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW		
Component	LOD/Units	Method					
Naphthalene (aq)	<0.1 µg/	/I TM178	<0.1	0.573	<0.1		
A companie the companie (com)	-0.045	TN4470	#	4 77	0.0545		
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.015 #	1.77 #	0.0515 #		
Acenaphthylene (aq)	<0.011	TM178	<0.011	0.137	<0.011		
(-4,	μg/l		#	#	#		
Fluoranthene (aq)	<0.017	TM178	<0.017	0.254	0.0955		
	μg/l		#	#	#		
Anthracene (aq)	<0.015	TM178	<0.015	0.173	0.0368		
Dhananthrana (ag)	μg/l <0.022	TM178	<0.022	0.556	0.0605		
Phenanthrene (aq)	<0.022 μg/l	1101170	<0.022 #	U.556 #	0.0605 #		
Fluorene (aq)	<0.014	TM178	<0.014	1.61	0.0257		
, "	μg/l		#	#	#		
Chrysene (aq)	<0.013	TM178	0.0131	<0.065	0.0419		
	μg/l		#	#	#		
Pyrene (aq)	<0.015	TM178	0.0847	0.28	0.131		
Benzo(a)anthracene (aq)	μg/l <0.017	TM178	<0.017	<0.085	<0.017		
Delizo(a)antinacene (aq)	νο.στ <i>η</i> μg/l	TIVITO	<0.017 #	~0.065 #	<0.017 #		
Benzo(b)fluoranthene (aq)	<0.023	TM178	<0.023	<0.115	<0.023		
(-4)	μg/l		#	#	#		
Benzo(k)fluoranthene (aq)	<0.027	TM178	<0.027	<0.135	<0.027		
	μg/l		#	#	#		
Benzo(a)pyrene (aq)	<0.009	TM178	0.0108	<0.045	0.0152		
Dihanza(a h)anthragana	μg/l	TM178	<0.016	<0.08	<0.016		
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	1101170	<0.016 #	<0.06 #	<0.016 #		
Benzo(g,h,i)perylene (aq)	<0.016	TM178	<0.016	<0.08	<0.016		
3 (3) (7) (3 (4)	μg/l		#	#	#		
Indeno(1,2,3-cd)pyrene	<0.014	TM178	<0.014	<0.07	<0.014		
(aq)	μg/l		#	#	#		
PAH, Total Detected	<0.247	TM178	<0.247	5.35	0.458		
USEPA 16 (aq)	μg/l						
						<u> </u>	
		+					



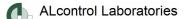
Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference: TPH CWG (W)

TPH CWG (W)								
Results Legend # ISO17025 accredited.	•	Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
m mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	1.69 Water(GW/SW) 15/11/2013	1.84 Water(GW/SW) 15/11/2013	2.28 Water(GW/SW) 15/11/2013	2.16 Water(GW/SW) 15/11/2013	2.12 Water(GW/SW) 15/11/2013	2.20 Water(GW/SW) 15/11/2013
** % recovery of the surrogate standa check the efficiency of the method. results of individual compounds wi samples aren't corrected for the re-	. The ithin	Sampled Time Date Received SDG Ref Lab Sample No.(s)	16/11/2013 131118-12 8440249 EW	16/11/2013 131118-12 8440258 EW	16/11/2013 131118-12 8440259 EW	16/11/2013 131118-12 8440261 EW	16/11/2013 131118-12 8440262 EW	16/11/2013 131118-12 8440263 EW
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	AGS Reference Method						
GRO Surrogate % recovery**	%	TM245	117	124	118	80	128	114
GRO >C5-C12	<50 µg/	/I TM245	13100 #	328 #	191 #	13900 #	14800 #	866 #
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Aliphatics >C5-C6	<10 µg/	/I TM245	50	12	<10	10	11	<10
Aliphatics >C6-C8	<10 µg/	/I TM245	103	20	<10	41	42	<10
Aliphatics >C8-C10	<10 µg/	/I TM245	907	32	21	1080	857	51
Aliphatics >C10-C12	<10 µg/	/I TM245	5090	74	71	5260	6340	421
Aliphatics >C12-C16 (aq)	<10 µg/	/I TM174	116	<10	<10	<10	44	<10
Aliphatics >C16-C21 (aq)	<10 µg/	/I TM174	103	<10	<10	<10	26	<10
Aliphatics >C21-C35 (aq)	<10 µg/	/I TM174	41	<10	<10	<10	19	15
Total Aliphatics >C12-C35 (aq)	<10 µg/		260	<10	<10	<10	89	15
Aromatics >EC5-EC7	<10 µg/	/I TM245	612	14	<10	600	822	12
Aromatics >EC7-EC8	<10 µg/	/I TM245	911	30	<10	926	1060	19
Aromatics >EC8-EC10	<10 µg/	/I TM245	2040	96	36	2500	1420	73
Aromatics >EC10-EC12	<10 µg/	/I TM245	3390	49	48	3510	4230	281
Aromatics >EC12-EC16 (aq)	<10 µg/	/I TM174	6310	38	160	2880	5140	245
Aromatics >EC16-EC21 (aq)	<10 µg/	/I TM174	5450	54	227	696	2200	355
Aromatics >EC21-EC35 (aq)	<10 µg/	/I TM174	1960	58	150	69	608	199
Total Aromatics >EC12-EC35 (aq)	<10 µg/	/I TM174	13700	150	537	3650	7950	799
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/	/I TM174	27100	478	728	17600	22800	1680



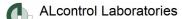
Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: 250928 Job:

WSP Remediation **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

TPH CWG (W)								
Results Legend # ISO17025 accredited.	0	Customer Sample R	BH7	BH8	BH9	BH10	BH11	BH12
M mCERTS accredited. aq Aqueous / settled sample. diss.filit blisolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. ** % recovery of the surrogate standa	rd to	Depth (m) Sample Type Date Sampled Sampled Time	2.93 Water(GW/SW) 15/11/2013	3.10 Water(GW/SW) 15/11/2013	3.15 Water(GW/SW) 15/11/2013	2.98 Water(GW/SW) 15/11/2013	2.65 Water(GW/SW) 15/11/2013	2.70 Water(GW/SW) 15/11/2013
check the efficiency of the method. results of individual compounds wi samples aren't corrected for the rec (F) Trigger breach confirmed 1-48+§© Sample deviation (see appendix)  Component	The thin	Date Received SDG Ref Lab Sample No.(s) AGS Reference	16/11/2013 131118-12 8440264 EW	16/11/2013 131118-12 8440265 EW	16/11/2013 131118-12 8440266 EW	16/11/2013 131118-12 8440250 EW	16/11/2013 131118-12 8440252 EW	16/11/2013 131118-12 8440254 EW
GRO Surrogate %	%	TM245	112	115	117	117	114	114
recovery**								
GRO >C5-C12	<50 μg/	TM245	<50 #	<50 #	787 #	63 #	<50 #	<50 #
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Aliphatics >C5-C6	<10 µg/	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C8-C10	<10 µg/	TM245	<10	<10	31	<10	<10	<10
Aliphatics >C10-C12	<10 µg/	TM245	<10	<10	390	24	<10	<10
Aliphatics >C12-C16 (aq)	<10 µg/	TM174	<10	20	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)	<10 µg/	TM174	<10	41	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)	<10 µg/	TM174	<10	13	<10	<10	<10	<10
Total Aliphatics >C12-C35 (aq)	<10 µg/	TM174	<10	74	<10	<10	<10	<10
Aromatics >EC5-EC7	<10 µg/	TM245	<10	<10	<10	<10	12	<10
Aromatics >EC7-EC8	<10 µg/	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/	TM245	<10	<10	89	<10	16	<10
Aromatics >EC10-EC12	<10 µg/	TM245	<10	<10	260	16	<10	<10
Aromatics >EC12-EC16 (aq)	<10 µg/	TM174	10	13	154	36	<10	<10
Aromatics >EC16-EC21 (aq)	<10 µg/	TM174	25	39	166	24	<10	<10
Aromatics >EC21-EC35 (aq)	<10 µg/	TM174	20	18	79	20	<10	<10
Total Aromatics >EC12-EC35 (aq)	<10 µg/	TM174	55	70	399	80	<10	<10
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/	TM174	69	144	1190	142	32	<10



Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

TPH CWG (W)							
Results Legend # ISO17025 accredited.		Customer Sample R	BH13	BH14	BH15		
M mCERTS accredited.  Aqueous / settled sample.							
diss.filt Dissolved / filtered sample.		Depth (m)	2.65	2.72	2.70		
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013	Water(GW/SW) 15/11/2013		
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time	16/11/2013				
results of individual compounds wi	ithin	Date Received SDG Ref	131118-12	16/11/2013 131118-12	16/11/2013 131118-12		
(F) Trigger breach confirmed	Lovery	Lab Sample No.(s)	8440255 EW	8440256 EW	8440257 EW		
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	AGS Reference s Method	EVV	EVV	Evv		
GRO Surrogate %	%	TM245	114	108	123		
recovery**	/0	1101243	114	100	123		
GRO >C5-C12	<50 μg/	/I TM245	<50	325	<50		
	""		#	#	#		
Methyl tertiary butyl ether	<3 µg/l	I TM245	<3	<3	<3		
(MTBE)			#	#	#		
Aliphatics >C5-C6	<10 µg/	/I TM245	<10	<10	<10		
Aliphatics >C6-C8	<10 µg/	/I TM245	<10	<10	<10		
Aliabetica > CO C40	410	/I TMO45	-10	45	-10		
Aliphatics >C8-C10	<10 µg/	/I TM245	<10	15	<10		
Aliphatics >C10-C12	<10 µg/	/I TM245	<10	66	<10		
priduo0 - 010 012	Ι 10 μg/	1101240	-10	00	-10		
Aliphatics >C12-C16 (aq)	<10 µg/	/I TM174	<10	<10	<10		
	L					 	
Aliphatics >C16-C21 (aq)	<10 µg/	/I TM174	<10	<10	<10		
Aliphatics >C21-C35 (aq)	<10 µg/	/I TM174	<10	<10	<10		
Total Aliphatics >C12-C35	<10 µg/	/I TM174	<10	<10	<10		
(aq)	410	/I TMO45	-10	-40	-10		
Aromatics >EC5-EC7	<10 µg/	/I TM245	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg/	/I TM245	<10	<10	<10		
7 Homatoo - 207 200	то ду	1111210	10	10			
Aromatics >EC8-EC10	<10 µg/	/I TM245	<10	187	<10		
Aromatics >EC10-EC12	<10 µg/	/I TM245	<10	44	<10		
Aromatics >EC12-EC16	<10 µg/	/I TM174	<10	149	<10		
(aq) Aromatics >EC16-EC21	<10 um	/I TM174	<10	F.C.	<10		
(aq)	<10 µg/	/1   1101174	<b>~10</b>	56	<b>~10</b>		
Aromatics >EC21-EC35	<10 µg/	/I TM174	<10	22	<10		
(aq)	""						
Total Aromatics	<10 µg/	/I TM174	<10	227	<10		
>EC12-EC35 (aq)							
Total Aliphatics &	<10 µg/	/I TM174	<10	551	<10		
Aromatics >C5-35 (aq)							
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Validated

23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

**Customer:** 

Client Reference:

131118-12 H\_WSP\_CDF-63 39784.001

WSP Remediation Attention: Steve Gronow

Report Number: Superseded Report: 250928

Client Reference: 3978	4.001		Attention: S	teve Gronow		Superseded Repo	ort:	
VOC MS (W)								
# ISO17025 accredited.		Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
M mCERTS accredited. aq Aqueous / settled sample. diss.fill: Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. Subcontracted test. * % recovery of the surrogate stands. check the efficiency of the method results of individual compounds w samples aren't corrected for the re	. The ithin	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref	1.69 Water(GW/SW) 15/11/2013 	1.84 Water(GW/SW) 15/11/2013 16/11/2013 131118-12	2.28 Water(GW/SW) 15/11/2013 . 16/11/2013 131118-12	2.16 Water(GW/SW) 15/11/2013 . 16/11/2013 131118-12	2.12 Water(GW/SW) 15/11/2013  16/11/2013 131118-12	2.20 Water(GW/SW) 15/11/2013  16/11/2013 131118-12
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	8440249 EW	8440258 EW	8440259 EW	8440261 EW	8440262 EW	8440263 EW
Component	LOD/Uni							
Dibromofluoromethane**	%	TM208	103	101	98.8	100	104	103
Toluene-d8**	%	TM208	97	97.9	99.4	96	97.2	98.4
4-Bromofluorobenzene**	%	TM208	96.1	99.8	98.2	88.9	92.9	99.1
Dichlorodifluoromethane	<1 µg	/I TM208	<1	<1	<1	<1	<1	<1
Chloromethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg	/I TM208	<1 #	<1	<1	<1 #	<1 #	<1 #
Bromomethane	<1 µg	/I TM208	<1 #	<1	<1	<1 #	<1 ====================================	<1 #
Chloroethane	<1 µg	/I TM208	<1 #	<1	<1	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg	/I TM208	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg	/I TM208	<1 #	<1	<1	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg	/I TM208	<1 #	<1	<1	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg	/I TM208	<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg	/I TM208	<1 #		<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg	/I TM208	<1	<1	<1	<1	<1	<1
Benzene	<1 µg	/I TM208	586 #	7.14	3 #	990 #	817 #	11.9 #
Trichloroethene	<1 µg		<1 #			<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg	/I TM208	<1 #	<1	<1	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg		<1 #	<1	<1	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg		<1 #			<1 #	<1 #	<1 #
Toluene	<1 µg	/I TM208	847 #	16.6	10.3 #	1560 #	1010 #	19 #
trans-1,3-Dichloropropene	<1 µg		<1 #	<1 ! #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

Validated

SDG: Job:

131118-12 H\_WSP\_CDF-63 39784.001 Client Reference:

Location: Barry Waterfront WSP Remediation **Customer:** Attention: Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

#### VOC MS (W)

VOC MS (W)								
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	1.69 Water(GW/SW) 15/11/2013	1.84 Water(GW/SW) 15/11/2013	2.28 Water(GW/SW) 15/11/2013	2.16 Water(GW/SW) 15/11/2013	2.12 Water(GW/SW) 15/11/2013	2.20 Water(GW/SW) 15/11/2013
** % recovery of the surrogate stands check the efficiency of the method results of individual compounds w samples aren't corrected for the re	. The ithin	Sampled Time Date Received SDG Ref	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	Lab Sample No.(s)  AGS Reference ts Method	8440249 EW	8440258 EW	8440259 EW	8440261 EW	8440262 EW	8440263 EW
1,3-Dichloropropane	<1 µg/	_	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Tetrachloroethene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/	/I TM208	<1 #	<1 <1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/	/I TM208	<1 #	<1	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/	/I TM208	267 #	3.63	4.74 #	854 #	148 #	1.89 #
m,p-Xylene	<1 µg/	/I TM208	745 #	43.2 #	8.79 #	1220 #	319 #	13.5 #
o-Xylene	<1 µg/	/I TM208	328 #	19.9 #	5.16 #	615 #	159 #	10.5 #
Styrene	<1 µg/	/I TM208	122 #	<1 #	<1 #	498 #	177 #	<1 #
Bromoform	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/	/I TM208	10.2 #	<1 #	<1 #	17 #	5.29 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/	/I TM208	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/	/I TM208	9.41 #	<1 #	<1 #	7.65 #	2.1 #	<1 #
2-Chlorotoluene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/	/I TM208	73.8 #	4.04 #	4 #	63.4 #	30.5 #	5.19 #
4-Chlorotoluene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/		220 #		6.38 #	184 #	85.9 #	6.53 #
sec-Butylbenzene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/		29.1 #		<1 #	62.4 #	29.5 #	<1 #
1,3-Dichlorobenzene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/		<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloroprop ane	<1 µg/		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/		<1 #		<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/	/I TM208	11800 #	1.43 #	<1 #	19700 #	11200 #	224 #



Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

VOC MS (W)

Client Reference:

VOC MS (W)	_							
# ISO17025 accredited.  M mCERTS accredited.		Customer Sample R	BH1	BH2	BH3	BH4	BH5	BH6
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate standa		Depth (m) Sample Type Date Sampled Sampled Time	1.69 Water(GW/SW) 15/11/2013	1.84 Water(GW/SW) 15/11/2013	2.28 Water(GW/SW) 15/11/2013	2.16 Water(GW/SW) 15/11/2013	2.12 Water(GW/SW) 15/11/2013	2.20 Water(GW/SW) 15/11/2013
check the efficiency of the method results of individual compounds w	ithin	Date Received SDG Ref	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12
samples aren't corrected for the re (F) Trigger breach confirmed	covery	Lab Sample No.(s)	8440249 EW	8440258 EW	8440259 EW	8440261 EW	8440262 EW	8440263 EW
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	AGS Reference s Method	_,,				2**	
1,2,3-Trichlorobenzene	<1 µg/		<1	<1	<1	<1	<1	<1
1,3,5-Trichlorobenzene	<1 µg/	I TM208	<1	<1	<1	*1	<1	<1
Sum of detected Xylenes	<2 μg/	I TM208	1070	63.1	14	1840	478	24

Validated

131118-12 **Barry Waterfront** 23820/39784-001/SG SDG: Location: Order Number:

Report Number:

Job: H WSP CDF-63 **Customer:** WSP Remediation 250928 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report: VOC MS (W) Customer Sample R ВН9 BH11 BH12 BH7 вн8 BH10 ISO17025 accredited. mCERTS accredited. Aqueous / settled sample Depth (m) 2 93 3.10 3.15 2.98 2 65 2.70 diss.filt Dissolved / filtered sample Total / unfiltered sample Water(GW/SW) Water(GW/SW) Water(GW/SW) Water(GW/SW) Water(GW/SW) Water(GW/SW) Sample Type Date Sampled 15/11/2013 15/11/2013 15/11/2013 15/11/2013 15/11/2013 15/11/2013 % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within Sampled Time 16/11/2013 16/11/2013 16/11/2013 16/11/2013 16/11/2013 16/11/2013 Date Received 131118-12 131118-12 131118-12 131118-12 SDG Ref 131118-12 131118-12 samples aren't corrected for the recovery Trigger breach confirmed 8440264 8440265 8440266 8440250 8440252 8440254 Lab Sample No.(s) EW EW EW EW 1-4&+§@ Sample deviation (see appendix) EW EW AGS Reference LOD/Units Component Method Dibromofluoromethane\*\* TM208 108 105 105 106 104 103 % 99.7 Toluene-d8\*\* TM208 99.3 98.8 97.9 100 99 4-Bromofluorobenzene\*\* % TM208 99 96.1 98.4 97.7 99 96.9 Dichlorodifluoromethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 Chloromethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # Vinyl chloride TM208 <1 µg/l <1 <1 <1 <1 <1 <1 # # # # # # Bromomethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # # # Chloroethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # # # Trichlorofluoromethane TM208 <1 <1 <1 <1 <1 <1 <1 µg/l # # # # # # TM208 <1 1,1-Dichloroethene <1 µg/l <1 <1 <1 <1 <1 # # # # # # Carbon disulphide <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # # # Dichloromethane <3 µg/l TM208 <3 <3 <3 <3 <3 <3 # # # # # # Methyl tertiary butyl ether TM208 <1 µg/l <1 <1 <1 <1 <1 <1 (MTBE) # # # trans-1,2-Dichloroethene <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # 1.1-Dichloroethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # cis-1,2-Dichloroethene <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # # # 2,2-Dichloropropane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 Bromochloromethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # # Chloroform <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # # # # # 1,1,1-Trichloroethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 # # 1,1-Dichloropropene TM208 <1 µg/l <1 <1 <1 <1 <1 <1 # # Carbontetrachloride TM208 <1 µg/l <1 <1 <1 <1 <1 <1 # # # # # # 1.2-Dichloroethane <1 µg/l TM208 <1 <1 <1 <1 <1 <1 Benzene <1 µg/l TM208 3.36 <1 3.5 <1 11.6 <1 # # # #

1.1.2-Trichloroethane

Trichloroethene

1,2-Dichloropropane

Bromodichloromethane

cis-1,3-Dichloropropene

trans-1,3-Dichloropropene

Dibromomethane

Toluene

TM208

TM208

TM208

TM208

TM208

TM208

TM208

TM208

<1 µg/l

<1 µg/l

<1 µg/l

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<1 µg/l

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Validated

131118-12 H\_WSP\_CDF-63 39784.001 SDG: Job:

Location: **Customer:** Attention:

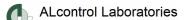
Barry Waterfront Order Number: WSP Remediation Steve Gronow Superseded Report:

23820/39784-001/SG 250928 Report Number:

VOC MS (W)

Client Reference:

Date Samples   Successment et al.   Successment e	2.70 Vater(GW/SW) 15/11/2013
District   District	Vater(GW/SW)
Date Received of the inflosory of the mithods have received and decidated components with received and decidated components with the state of the decidated and process with the state of	
Section   Sect	16/11/2013
Method   1,3-Dichloropropane   <1 µg/l   TM208   <1   <1   <1   <1   <1   <1   <1   <	131118-12 8440254
1,3-Dichloropropane	EW
Tetrachloroethene	<1
Dibromochioromethane	#
1,2-Dibromoethane	<1 #
Chlorobenzene	<1 #
Table   Tabl	<1 #
Ethylbenzene	<1 #
Mind	<1 #
O-Xylene	<1 #
Styrene	<1 #
# # # # # # # # # # # # # # # # # # #	<1 #
Bromobenzene   <1 \( \mu g/l \)   TM208   <1	<1 #
# # # # # # # # # # # # # # # # # # #	<1 #
1,2,3-Trichloropropane	<1 #
Bromobenzene         <1 μg/l         TM208         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 </td <td>&lt;1</td>	<1
Propylbenzene	<1 #
# # # # # # # # # # # # # # # # # # #	<1 #
1,3,5-Trimethylbenzene	<1 #
# # # # # # # # 4 # # 4 # # # # # # # #	<1 #
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	<1 #
tert-Butylbenzene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 # # # # # #	<1 #
1,2,4-Trimethylbenzene <1 μg/l TM208 <1 <1 6.41 <1 <1 <1 <1 # # # # # # # # # # # # #	<1 #
sec-Butylbenzene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	<1 #
4-iso-Propyltoluene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	<1 #
1,3-Dichlorobenzene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	<1 #
1,4-Dichlorobenzene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 # # # # # # # # #	<1 #
n-Butylbenzene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 <1 # # # # # # # #	<1 #
1,2-Dichlorobenzene <1 μg/l TM208 <1 <1 <1 <1 <1 <1	<1
1,2-Dibromo-3-chloroprop <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1	<1
1,2,4-Trichlorobenzene <1 µg/l TM208 <1 <1 <1 <1 <1 <1 <1 <1 ## ## ## ## ##	<1 #
Hexachlorobutadiene <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 # # # # #	<1 #
tert-Amyl methyl ether <1 μg/l TM208 <1 <1 <1 <1 <1 <1 <1 (TAME) # # # # # #	<1 #
Naphthalene <1 μg/l TM208 <1 <1 335 1.43 <1 # # # # # # # # # # # # # # # # # #	<1 #



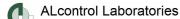
Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

VOC MS (W)

voc	MS (W)								
# M aq diss.filt tot.unfilt	Results Legend ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted test.		Customer Sample R  Depth (m)  Sample Type  Date Sampled	2.93 Water(GW/SW) 15/11/2013	BH8 3.10 Water(GW/SW) 15/11/2013	BH9 3.15 Water(GW/SW) 15/11/2013	BH10 2.98 Water(GW/SW) 15/11/2013	BH11 2.65 Water(GW/SW) 15/11/2013	BH12 2.70 Water(GW/SW) 15/11/2013
**	% recovery of the surrogate standa check the efficiency of the method. results of individual compounds wi saults of endividual compounds wi regular and the endit of the recovery trigger breach confirmed Sample deviation (see appendix)	The ithin	Sampled Time Date Received SDG Ref Lab Sample No.(s)	16/11/2013 13/11/8-12 8440264 EW	16/11/2013 131118-12 8440265 EW	16/11/2013 131118-12 8440266 EW	16/11/2013 131118-12 8440250 EW	16/11/2013 16/11/2013 131118-12 8440252 EW	16/11/2013 16/11/2013 131118-12 8440254 EW
Compo		LOD/Uni	AGS Reference ts Method	LW	LVV	LVV	LVV	LVV	LVV
	Trichlorobenzene	<1 µg/		<1	<1	<1	<1	<1	<1
1,3,5-	Trichlorobenzene	<1 µg/	/I TM208	<1	<b>*</b> <1	* <1	<b>*</b>	*1	<b>#</b> <1
Sum o	of detected Xylenes	<2 µg/	/I TM208	3.82	<2	20.1	<2	7.4	<2



Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job: 250928

WSP Remediation **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

VOC MS (W)							
Results Legend		Customer Sample R	BH13	BH14	BH15		
# ISO17025 accredited.  M mCERTS accredited.							
aq Aqueous / settled sample.		Double (m)	0.05	0.70	0.70		
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	2.65 Water(GW/SW)	2.72 Water(GW/SW)	2.70 Water(GW/SW)		
* Subcontracted test.		Date Sampled	15/11/2013	15/11/2013	15/11/2013		
** % recovery of the surrogate standa		Sampled Time					
check the efficiency of the method. results of individual compounds wi		Date Received	16/11/2013	16/11/2013	16/11/2013		
samples aren't corrected for the red	covery	SDG Ref	131118-12 8440255	131118-12 8440256	131118-12 8440257		
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW		
Component	LOD/Units						
		_	405	101	400		
Dibromofluoromethane**	%	TM208	105	104	106		
Toluene-d8**	%	TM208	99.1	100	99.4		
4-Bromofluorobenzene**	%	TM208	97	98	98.6		
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1		
Dictilorodilidoroffietriarie	~ ι μg/ι	1101200	~1	`'			
Chloromethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#	:	
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1		
			#	#	#	:	
Bromomethane	<1 µg/l	TM208	<1	<1	<1		
	. 49/1	1200	#	, , ,	#		
Chloroethane	c1 ua/	TM208	<1	<1	<1		
Chioroethane	<1 µg/l	I IVIZUO				J	
<u></u>			#	#	#	-	
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#	: [	
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	·	
Dictiorometriarie	<3 μg/i	1 101200				.	
			#	#	#	1	
Methyl tertiary butyl ether	<1 µg/l	TM208	<1	<1	<1		
(MTBE)			#	#	#	:	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#	:	
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1		
1,1 Biomorocarano	1 P9/1	1111200	#	#	#		
sis 4.0 Dishlamathana	-4/	TM200					
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#	:	
Chloroform	<1 µg/l	TM208	<1	<1	<1		
Cilioroloiiii	1 P9/1	1111200	#	#	#		
4.4.4 Triablementh and	-4/	TM200				•	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1		
			#	#			
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
			#	#			
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1		
		1	#	#	#	: [	
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1		
, = ===================================	. 49/1	1200	•	·			
Benzene	<1 µg/l	TM208	<1	1.53	<1	+	
Delizerie	~ ι μg/l	1101200				.T	
Triable as a C		T1 1000	#	#		·	
Trichloroethene	<1 µg/l	TM208	<1	<1	<1		
		1	#	#	#		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
		1	#	#	#	: [	
Dibromomethane	<1 µg/l	TM208	<1	<1	<1		
	. ۳3/1	255	#	#			
Bromodichloromethane	~1 ··~"	TM200	<1	<1	<1		
Diomodicilioromethane	<1 µg/l	TM208				J	
			#	#	#	-	
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#	:	
Toluene	<1 µg/l	TM208	<1	<1	<1		
		1	#	#	#	: [	
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			. #	. #	- #	<u>.</u>	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1		
1, 1,2-111011101061110116	- ι μ <u>y</u> /ι	1 101200				.]	
			#	#	#		

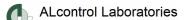


Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number:

WSP Remediation 250928 Job: **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample R	BH13	BH14	BH15		
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	2.65 Water(GW/SW) 15/11/2013	2.72 Water(GW/SW) 15/11/2013	2.70 Water(GW/SW) 15/11/2013		
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time					
results of individual compounds w	ithin	Date Received SDG Ref	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12		
samples aren't corrected for the re-	covery	Lab Sample No.(s)	8440255 EW	8440256 EW	8440257 EW		
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	AGS Reference s Method	⊏vv	EVV	Evv		
1,3-Dichloropropane	<1 µg/		<1	<1	<1		
1,3-Dicilioroproparie	, γρ	1101200	#	"			
Tetrachloroethene	<1 µg/	TM208	<1 #	<1 #	<1		
Dibromochloromethane	<1 µg/		<1 #	<1 #	<1 #		
1,2-Dibromoethane	<1 µg/		<1 #	<1 #	<1 #		
Chlorobenzene	<1 µg/		<1 #	<1 #			
1,1,1,2-Tetrachloroethane	<1 µg/		<1 #	<1 #			
Ethylbenzene	<1 µg/		<1 #	168 #			
m,p-Xylene	<1 µg/		<1 #	<1 #			
o-Xylene	<1 µg/		<1 #	<1 #			
Styrene	<1 µg/		<1 #	<1 #			
Bromoform	<1 µg/		<1 #	<1 #			
Isopropylbenzene	<1 µg/		<1 #	1.31			
1,1,2,2-Tetrachloroethane	<1 µg/		<1	<1	<1		
1,2,3-Trichloropropane	<1 µg/		<1 #	<1 #			
Bromobenzene	<1 μg/		<1 #	<1 #			
Propylbenzene	<1 μg/		<1 #	<1 #			
2-Chlorotoluene	<1 μg/		<1 #	<1 #			
1,3,5-Trimethylbenzene	<1 µg/		<1 #	<1 #			
4-Chlorotoluene	<1 µg/		<1 #	<1 #			
tert-Butylbenzene  1,2,4-Trimethylbenzene	<1 µg/		<1 #	<1 #			
<u> </u>	<1 µg/		<1 #	<1 #			
sec-Butylbenzene	<1 µg/		<1 # <1	<1 # <1	<1 # <1		
4-iso-Propyltoluene  1,3-Dichlorobenzene	<1 μg/ <1 μg/		<1 # <1	<1 # <1			
			<1 # <1	<1 = <1			
1,4-Dichlorobenzene	<1 µg/		<1 # <1	<1 #			
n-Butylbenzene  1,2-Dichlorobenzene	<1 μg/ <1 μg/		<1 # <1	<1 #			
1,2-Dibromo-3-chloroprop ane	<1 µg/		<1 <1	<1 <1	<1		
1,2,4-Trichlorobenzene  Hexachlorobutadiene	<1 μg/ <1 μg/		<1 # <1	<1 # <1			
			<1 # <1	<1 #			
tert-Amyl methyl ether (TAME)	<1 µg/		<1 # <1	<1 # 15.8			
Naphthalene	<1 µg/	TM208	<1 #	15.8 #			



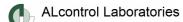
Validated

131118-12 H\_WSP\_CDF-63 39784.001 23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: Job:

WSP Remediation 250928 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

VOC MS (W)							
# ISO17025 accredited.		Customer Sample R	BH13	BH14	BH15		
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	2.65 Water(GW/SW) 15/11/2013	2.72 Water(GW/SW) 15/11/2013	2.70 Water(GW/SW) 15/11/2013		
** % recovery of the surrogate standa check the efficiency of the method	ard to	Sampled Time					
results of individual compounds w samples aren't corrected for the re	ithin	Date Received SDG Ref	16/11/2013 131118-12	16/11/2013 131118-12	16/11/2013 131118-12		
(F) Trigger breach confirmed	covery	Lab Sample No.(s)	8440255 EW	8440256 EW	8440257 EW		
1-4&•§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference Method					
1,2,3-Trichlorobenzene	<1 µg/l		<1	<1	<1		
			#	#	#		
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1		
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2		
Sum of detected Aylenes	~2 μg/i	1101200	~2	~2	\_		



Validated

 SDG:
 131118-12
 Location:
 Barry Waterfront
 Order Number:
 23820/39784-001/SG

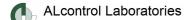
 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation
 Report Number:
 250928

Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

**Table of Results - Appendix** 

Method No	Reference	Description	Wet/Dry Sample <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>&</sup>lt;sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



Validated

23820/39784-001/SG SDG: Location: Barry Waterfront Order Number: 250928

131118-12 H\_WSP\_CDF-63 39784.001 WSP Remediation Job: **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

**Test Completion Dates** 

rest completion bates													
Lab Sample No(s)	8440249	8440258	8440259	8440261	8440262	8440263	8440264	8440265	8440266	8440250			
Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	ВН9	BH10			
AGS Ref.	EW												
Depth	1.69	1.84	2.28	2.16	2.12	2.20	2.93	3.10	3.15	2.98			
Туре	LIQUID												
EPH CWG (Aliphatic) Aqueous GC (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013			
EPH CWG (Aromatic) Aqueous GC (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013			
GRO by GC-FID (W)	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013			
PAH Spec MS - Aqueous (W)	22-Nov-2013	21-Nov-2013	21-Nov-2013	22-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013			
Phenols by HPLC (W)	20-Nov-2013	20-Nov-2013	20-Nov-2013	20-Nov-2013	20-Nov-2013	21-Nov-2013	21-Nov-2013	20-Nov-2013	20-Nov-2013	20-Nov-2013			
TPH CWG (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013			
VOC MS (W)	20-Nov-2013	20-Nov-2013	19-Nov-2013	20-Nov-2013	20-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013			

Lab Sample No(s)	8440252	8440254	8440255	8440256	8440257	
Customer Sample Ref.	BH11	BH12	BH13	BH14	BH15	
AGS Ref.	EW	EW	EW	EW	EW	
Depth	2.65	2.70	2.65	2.72	2.70	
Туре	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	
EPH CWG (Aliphatic) Aqueous GC (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	
EPH CWG (Aromatic) Aqueous GC (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	
GRO by GC-FID (W)	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	
PAH Spec MS - Aqueous (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	
Phenols by HPLC (W)	21-Nov-2013	21-Nov-2013	20-Nov-2013	20-Nov-2013	21-Nov-2013	
TPH CWG (W)	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	21-Nov-2013	
VOC MS (W)	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	19-Nov-2013	

Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

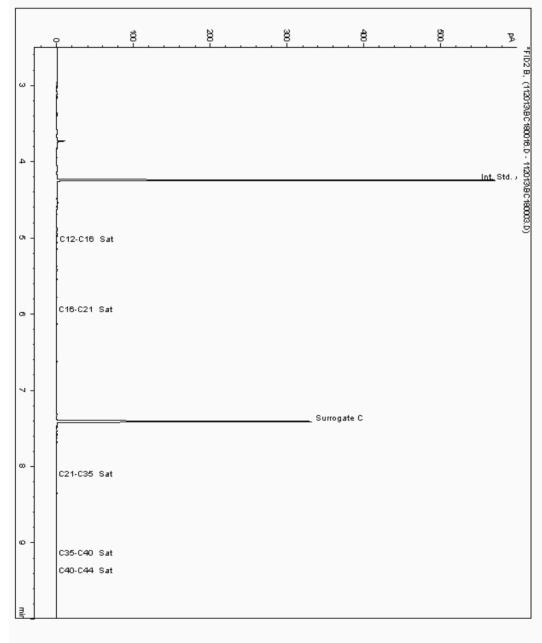
# Chromatogram

Analysis:EPH CWG (Aliphatic) Aqueous GC (W)Sample No :<br/>Sample ID :8443058<br/>BH15Depth :<br/>BH15

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056305-8443058
Date Acquired : 20/11/2013 20:33:33 PM
Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference:

**Customer:** 39784.001 Attention:

Barry Waterfront Location: WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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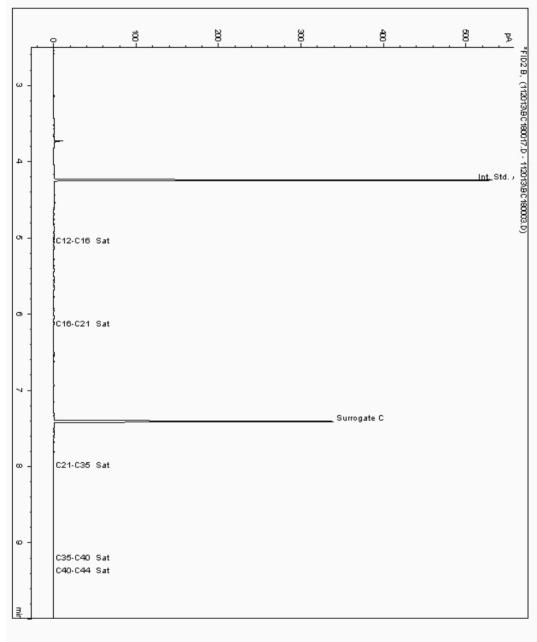
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 2.70 8443067 Sample ID : BH12

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity:

8056273-8443067 20/11/2013 20:52:15 PM ppb Date Acquired : Units :



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

er: 250928

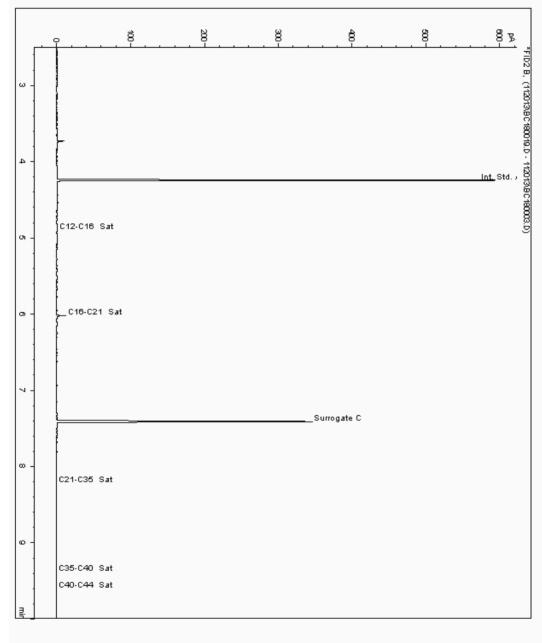
# Chromatogram

Analysis:EPH CWG (Aliphatic) Aqueous GC (W)Sample No :8443075Depth :2.65Sample ID :BH11

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056263-8443075
Date Acquired : 20/11/2013 21:29:51 PM
Units : ppb

Date Acquired : 20/11/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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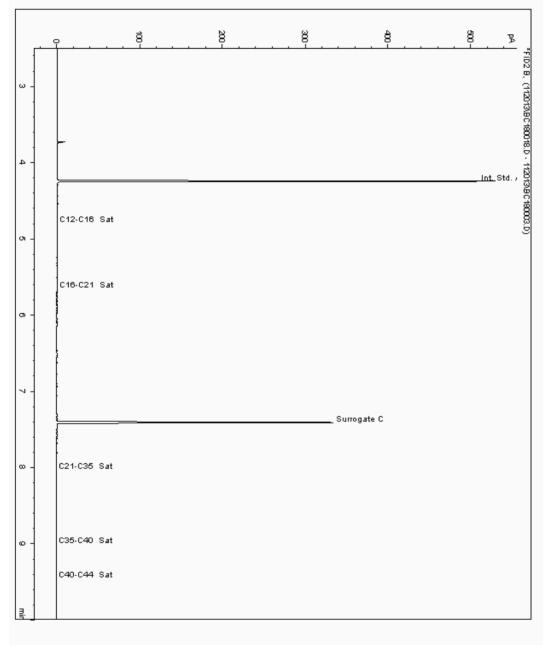
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 2.72 8443099 Sample ID : BH14

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity:

8056293-8443099 20/11/2013 21:11:11 PM ppb Date Acquired : Units :



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barr Customer: WSF Attention: Stev

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

umber: 250928

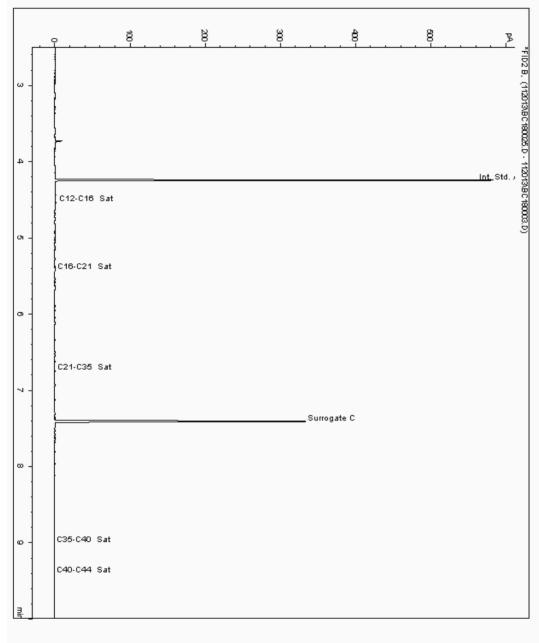
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8443119 Depth: 2.20 Sample ID: 8H6

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056356-8443119
Date Acquired : 20/11/2013 23:13:21 PM
Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Customer:** Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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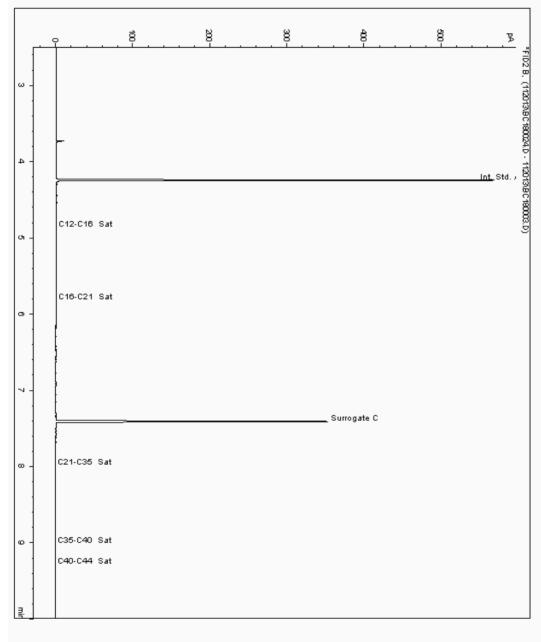
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 2.65 8443129 Sample ID : BH13

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity:

8056283-8443129 20/11/2013 22:54:34 PM ppb Date Acquired : Units :





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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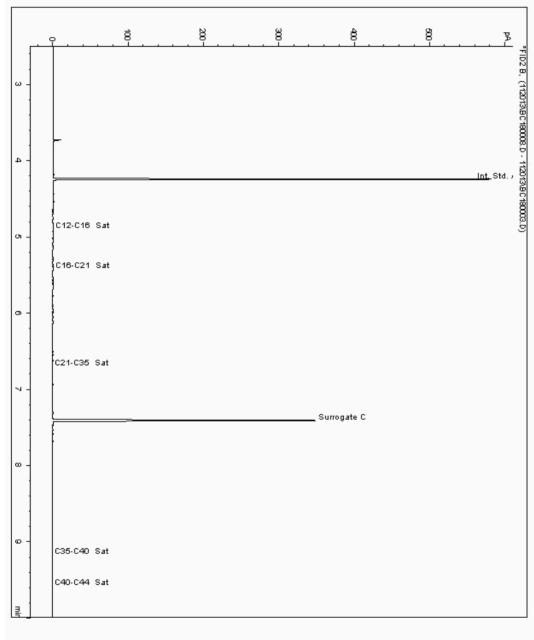
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8443137 Depth: 3.15
Sample ID: 8HQ

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056397-8443137
Date Acquired : 20/11/2013 18:22:08 PM
Units : ppb

Date Acquired : 20/11/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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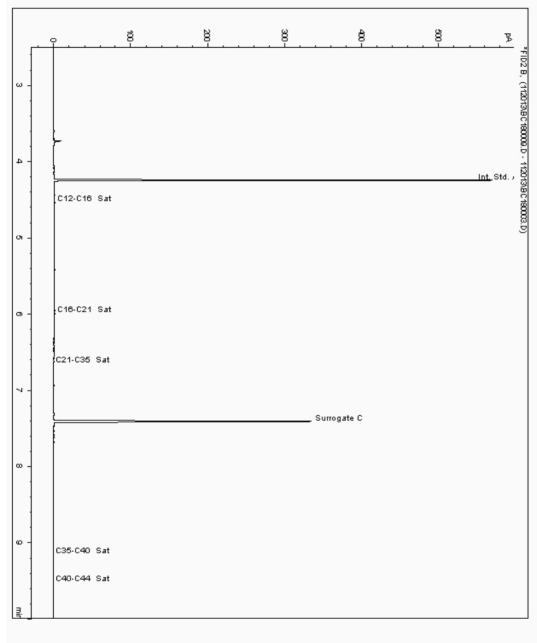
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Depth**: 3.10 Sample No : 8443149 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity:

8056387-8443149 20/11/2013 18:41:02 PM ppb Date Acquired : Units :



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Customer:** Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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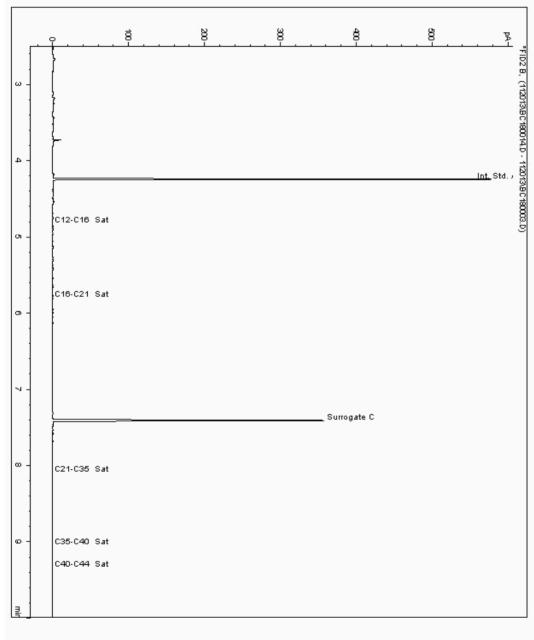
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 2.16 8443453 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity:

8056336-8443453 20/11/2013 19:56:06 PM ppb Date Acquired : Units :



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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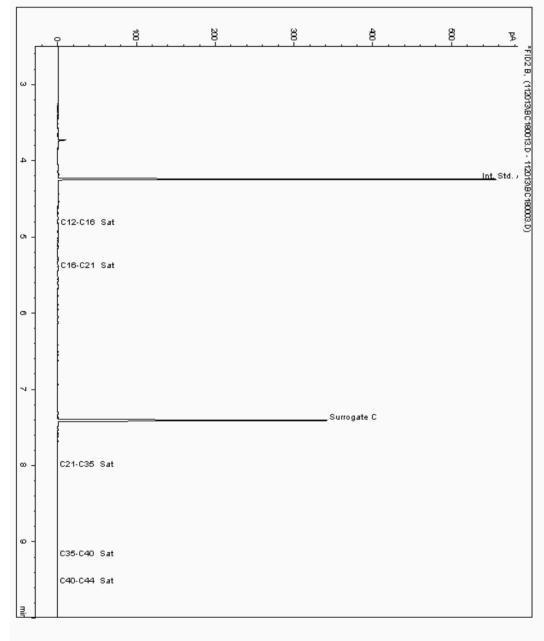
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8443575 Depth: 2.28
Sample ID: 8H3

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056326-8443575
Date Acquired : 20/11/2013 19:37:02 PM
Units : ppb

Date Acquired : 20/11/
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Bar Customer: WS Attention: Ste

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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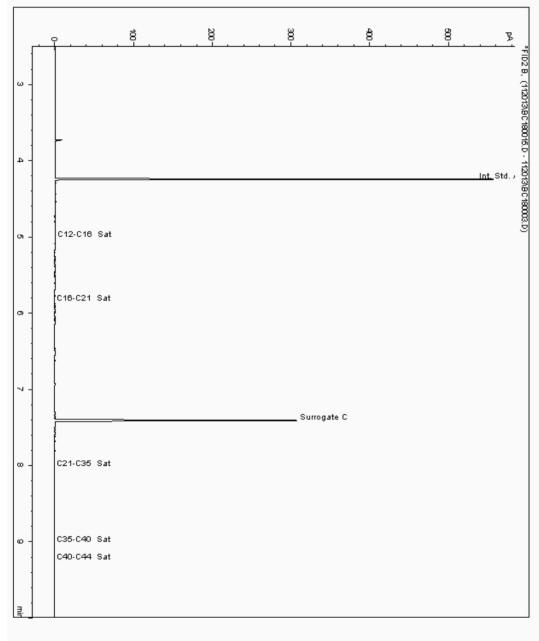
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8443673 Depth: 2.93
Sample ID: 8H7

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056372-8443673
Date Acquired : 20/11/2013 20:14:50 PM
Units : ppb

Date Acquired : 20/11 Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Customer:** Attention:

Barry Waterfront WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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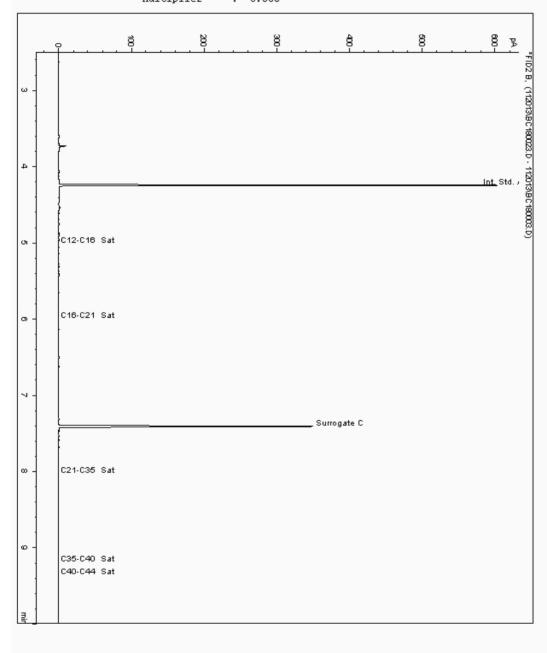
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 2.98 8443742 Sample ID : BH10

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

8056253-8443742 20/11/2013 22:35:44 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

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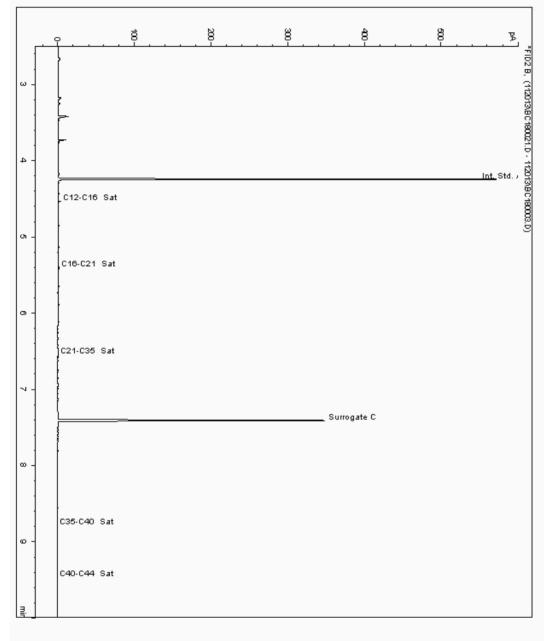
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8443975 Depth: 2.12
Sample ID: 8H5

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8056346-8443975
Date Acquired : 20/11/2013 22:07:13 PM
Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: WSP Remediation **Customer:** Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

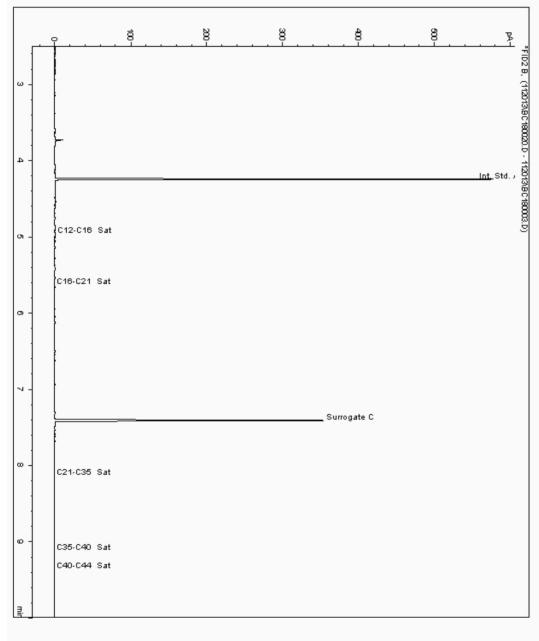
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : Depth: 1.84 8443980 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity:

8056315-8443980 20/11/2013 21:48:35 PM ppb Date Acquired : Units :



Validated

SDG: 131118-12 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: 23820/39784-001/SG

250928 Superseded Report:

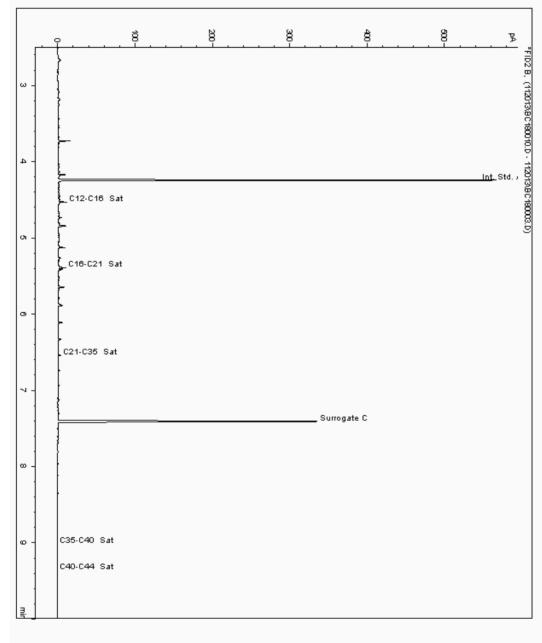
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 1.69 8443986 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

8056240-8443986 20/11/2013 18:59:45 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

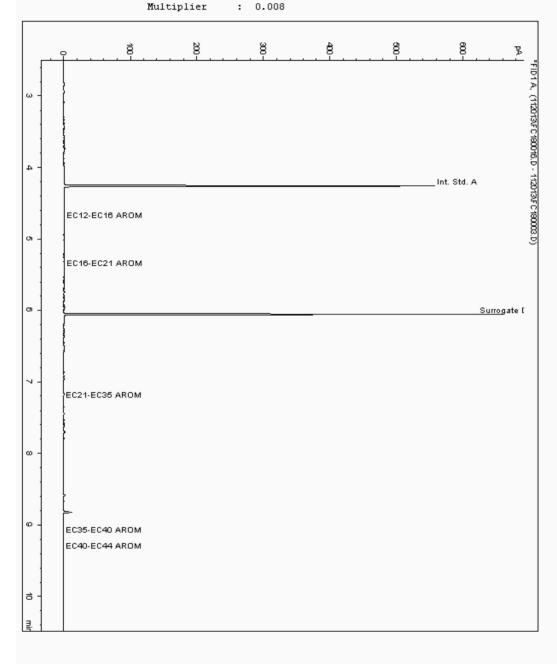
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 2.70 8443058 Sample ID : BH15

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8056306-8443058 20/11/2013 20:33:33 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

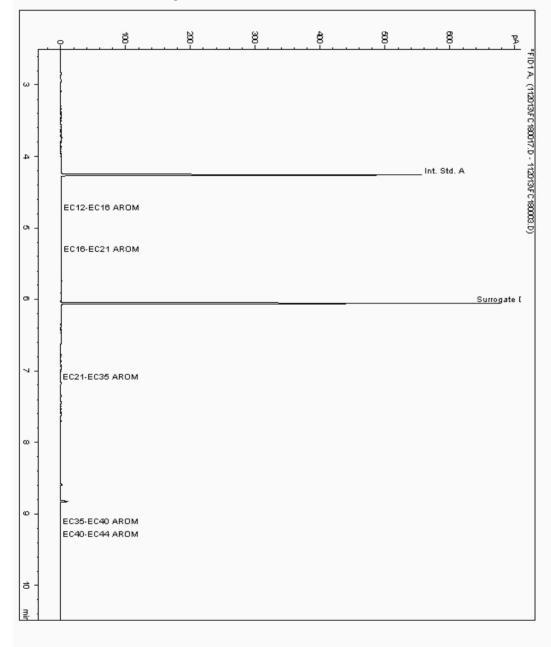
# Chromatogram

Analysis:EPH CWG (Aromatic) Aqueous GC (W)Sample No :<br/>Sample ID :8443067<br/>BH12Depth :<br/>BH12

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8056274-8443067 Date Acquired : 20/11/2013 20:52:15 PM Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

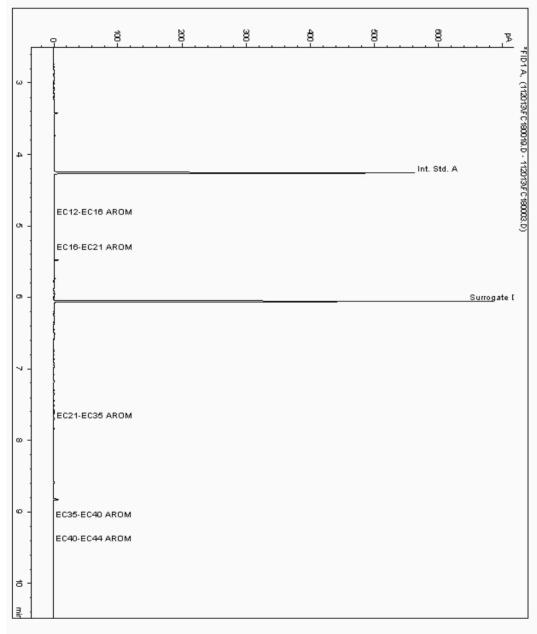
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 2.65 8443075 Sample ID : BH11

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8056264-8443075 20/11/2013 21:29:51 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

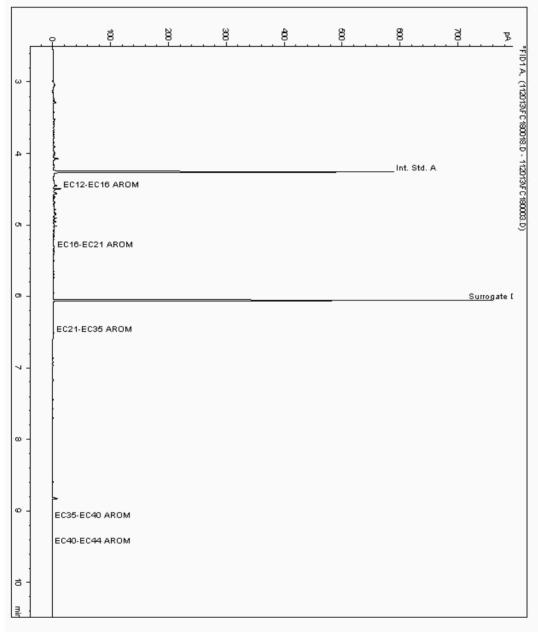
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : 8443099 **Depth**: 2.72 Sample ID : BH14

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

8056294-8443099 20/11/2013 21:11:11 PM ppb Date Acquired : Units :



Validated

**SDG:** 131118-12 **Job:** H\_WSP\_CDF-63

39784.001

Client Reference:

Location: Ba Customer: W Attention: St

Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

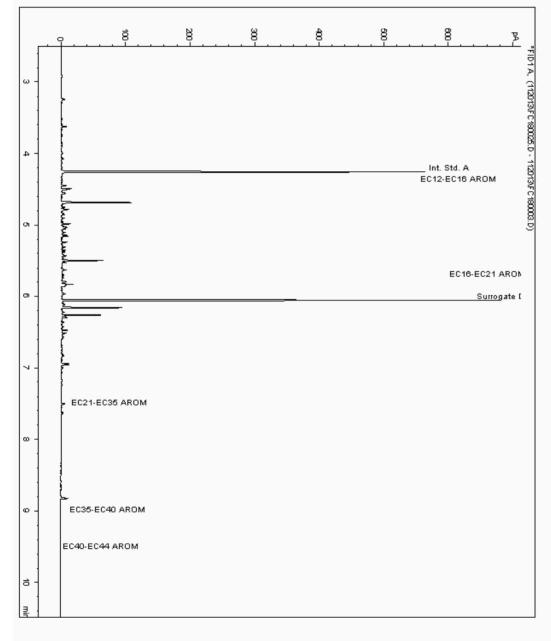
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8443119 Depth: 2.20 Sample ID: 8H6

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 8056357-8443119
Date Acquired : 20/11/2013 23:13:21 PM
Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

2 Location: CDF-63 Customer: Attention: Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

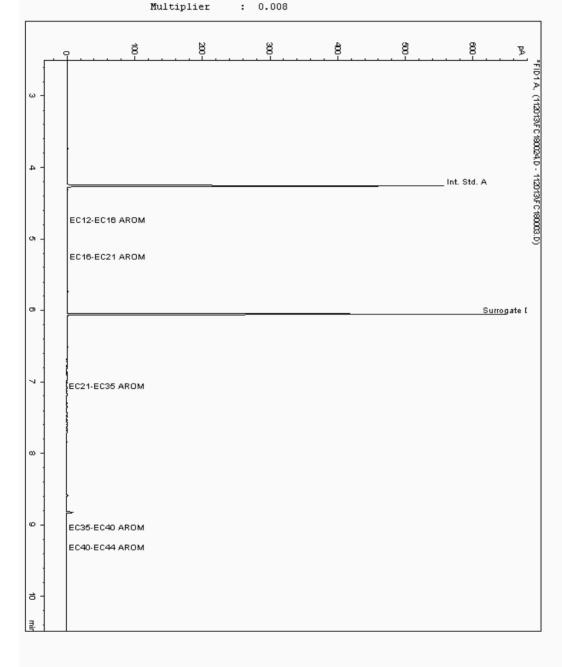
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8443129 Sample ID: 8H13

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 8056284-8443129
Date Acquired : 20/11/2013 22:54:34 PM
Units : ppb

Date Acquired : 20/11/201
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Client Reference:

### **CERTIFICATE OF ANALYSIS**

Validated

Superseded Report:

131118-12 Location: **Barry Waterfront** 23820/39784-001/SG SDG: Order Number: Job: Report Number: 250928

H\_WSP\_CDF-63 **Customer:** WSP Remediation 39784.001 Attention: Steve Gronow

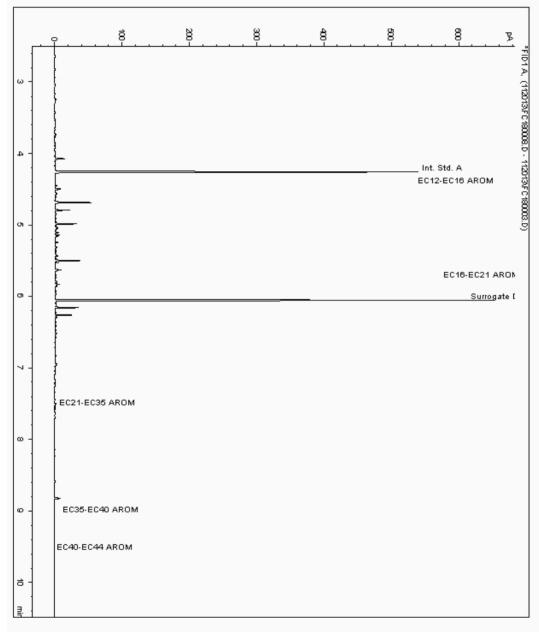
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Depth**: 3.15 Sample No : 8443137 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

8056398-8443137 20/11/2013 18:22:08 PM ppb Date Acquired : Units :



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Customer: Attention:

Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

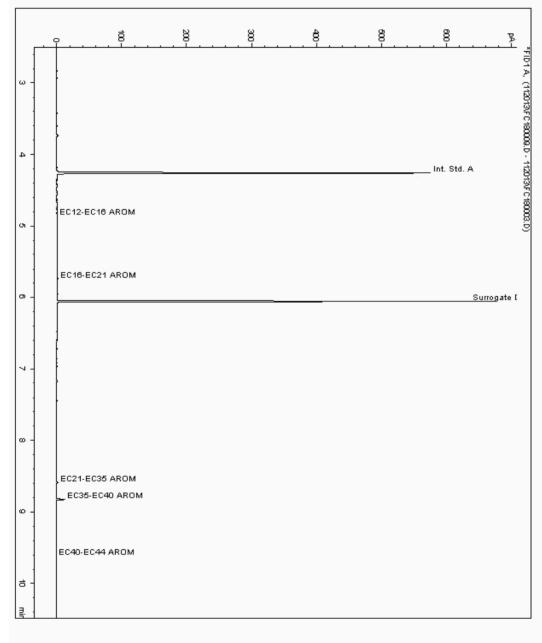
Chromatogram

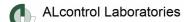
Analysis: EPH CWG (Aromatic) Aqueous GC (W)
Sample No: 8443149
Sample ID: 8H8

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8056388-8443149
Date Acquired : 20/11/2013 18:41:02 PM
Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008





Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

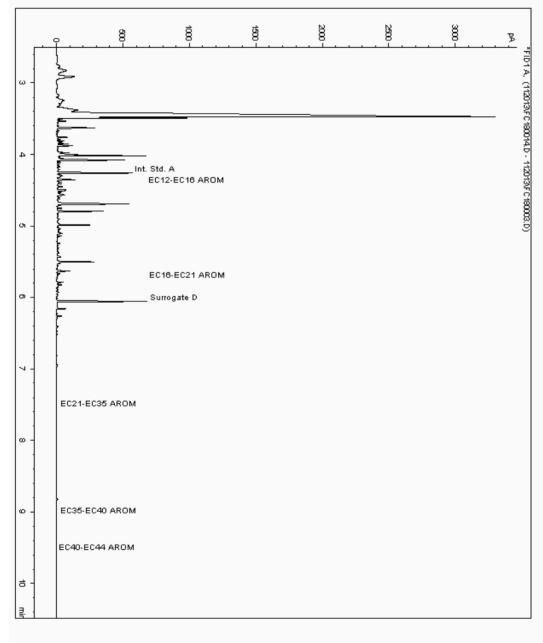
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 2.16 8443453 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8056337-8443453 20/11/2013 19:56:06 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Client Reference:

#### **CERTIFICATE OF ANALYSIS**

Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: 39784.001

Location: **Customer:** Attention:

**Barry Waterfront** Order Number: WSP Remediation Report Number: Steve Gronow

23820/39784-001/SG 250928

Superseded Report:

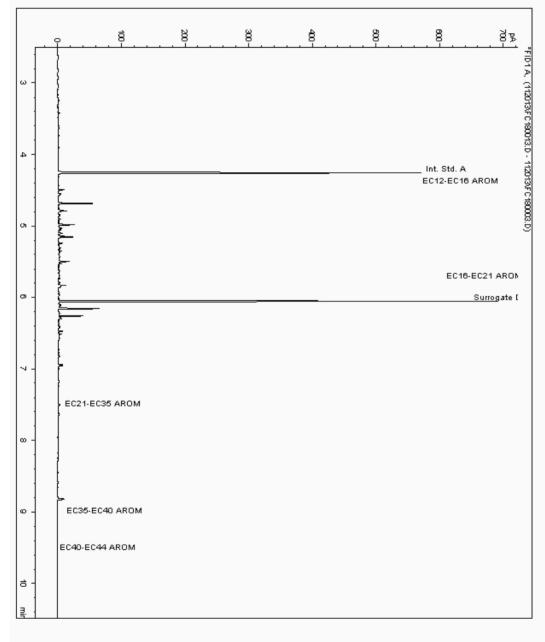
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 2.28 8443575 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8056327-8443575 20/11/2013 19:37:02 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

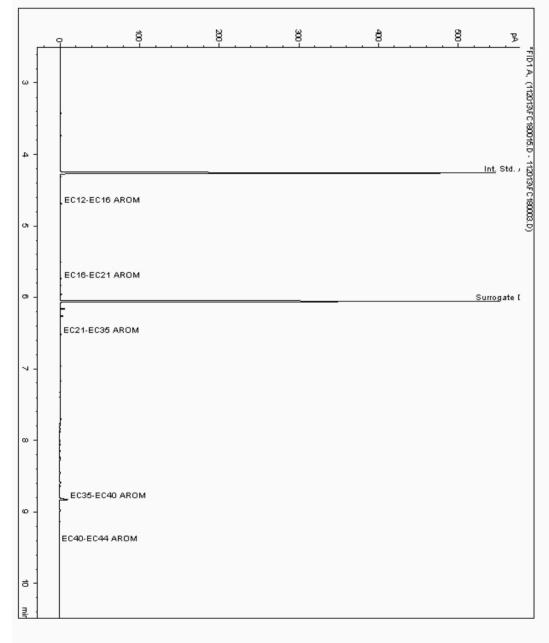
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8443673 Depth: 2.93
Sample ID: 8H7

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8056373-8443673
Date Acquired : 20/11/2013 20:14:50 PM
Units : ppb

Date Acquired : 20/11, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

131118-12 Location: **Barry Waterfront** 23820/39784-001/SG SDG: Order Number:

H\_WSP\_CDF-63 Job: **Customer:** WSP Remediation Report Number: 250928 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

Chromatogram

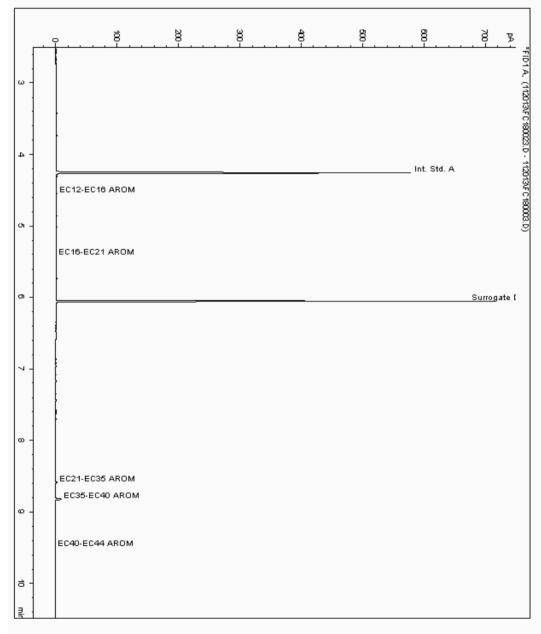
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 2.98 8443742 Sample ID : BH10

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

8056254-8443742 20/11/2013 22:35:44 PM ppb Date Acquired : Units :

Dilution 1 0.008 Multiplier





Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23820/39784-001/SG

250928

# Chromatogram

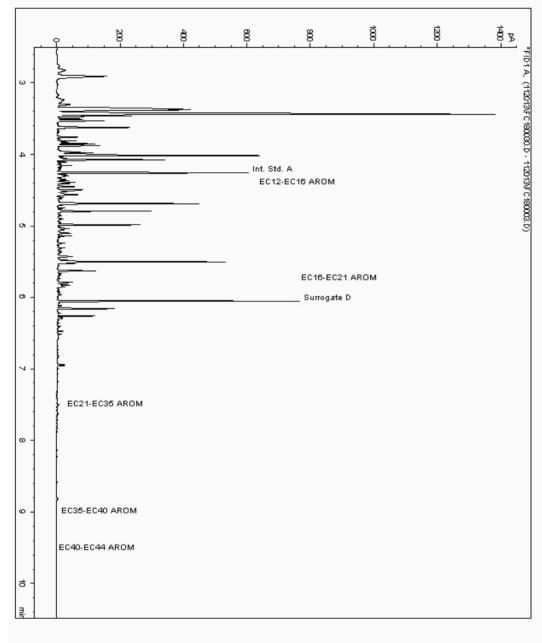
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth:** 2.12 8443975 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

8056347-8443975 21/11/2013 14:41:37 PM ppb Date Acquired : Units :

Dilution 1 0.017 Multiplier



Validated

131118-12 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: 23820/39784-001/SG

250928 Superseded Report:

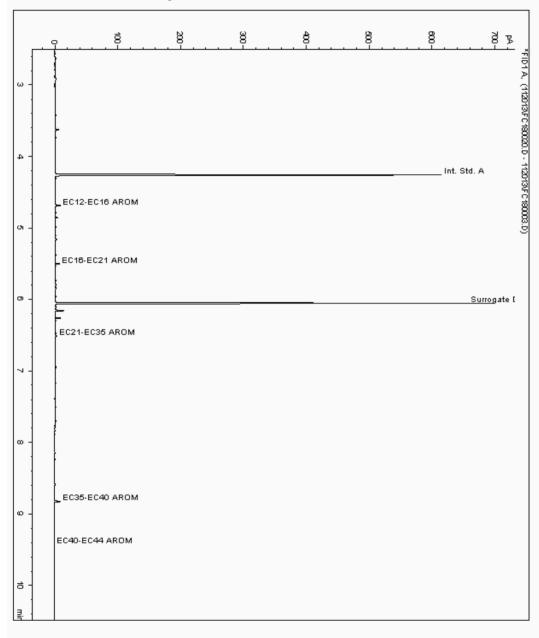
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 1.84 8443980 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8056316-8443980 20/11/2013 21:48:35 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.008 Multiplier



39784.001

Client Reference:

#### **CERTIFICATE OF ANALYSIS**

Validated

131118-12 Location: **Barry Waterfront** 23820/39784-001/SG SDG: Order Number: H\_WSP\_CDF-63 Job:

**Customer:** WSP Remediation Report Number: 250928 Attention: Steve Gronow Superseded Report:

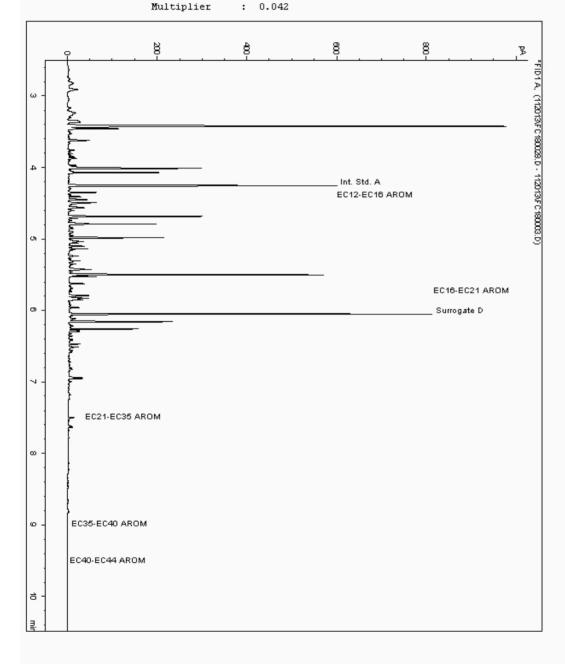
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 1.69 8443986 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8056241-8443986 21/11/2013 14:13:19 PM ppb Sample Identity:

Date Acquired : Units : Dilution 1 0.042



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

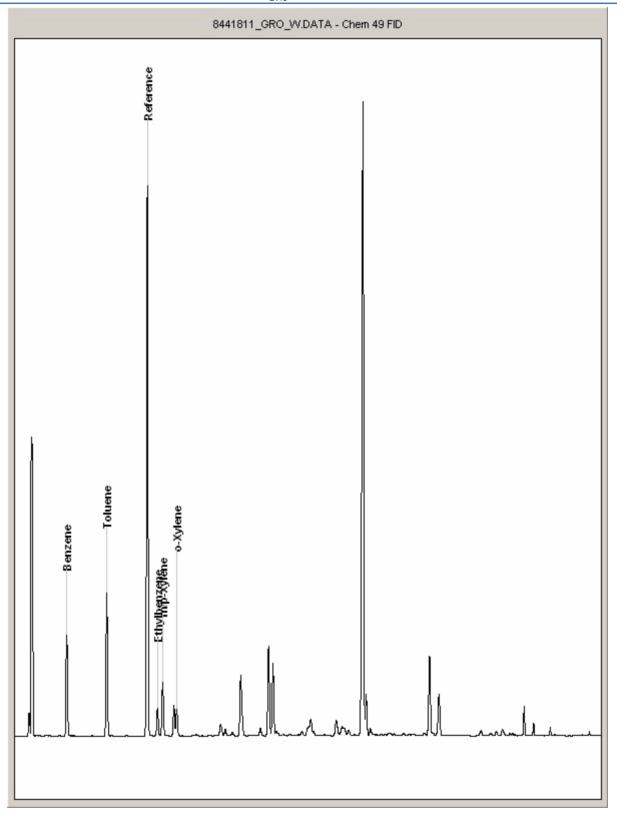
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441811
 Depth:
 2.12



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

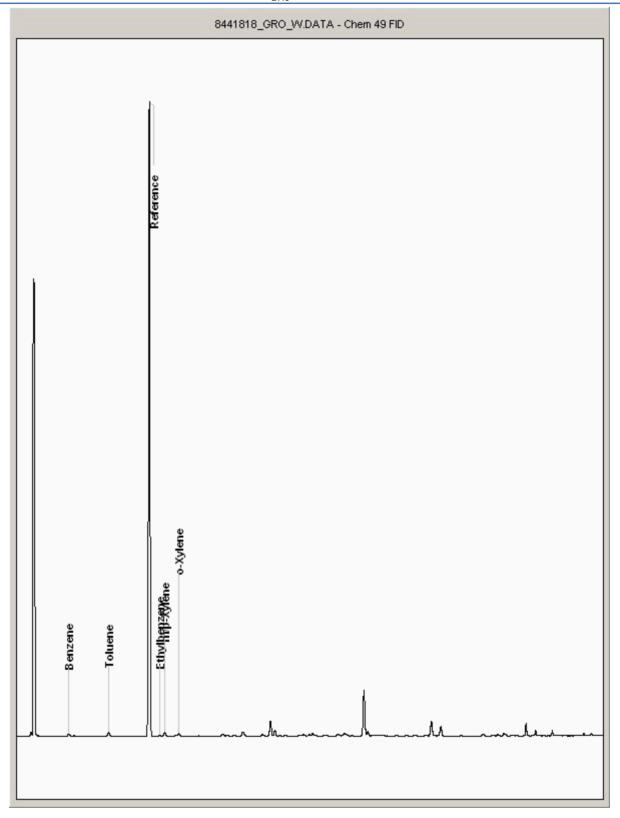
Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8441818
 8441818
 Depth: 2.20





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

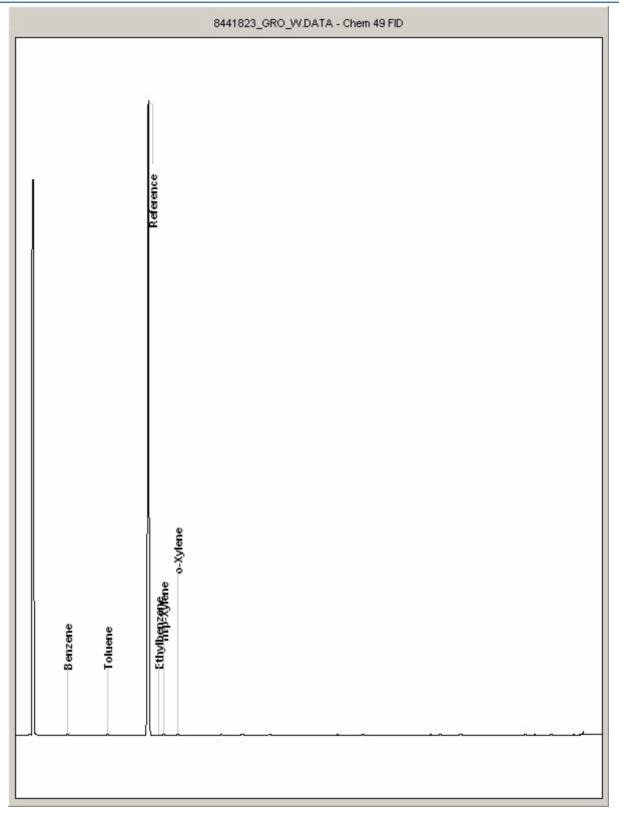
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 $\textbf{Analysis:} \quad \mathsf{GRO} \; \mathsf{by} \; \mathsf{GC-FID} \; (\mathsf{W}) \qquad \qquad \textbf{Sample No}: \qquad 8441823 \qquad \qquad \textbf{Depth}: \qquad 2.93$ 





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

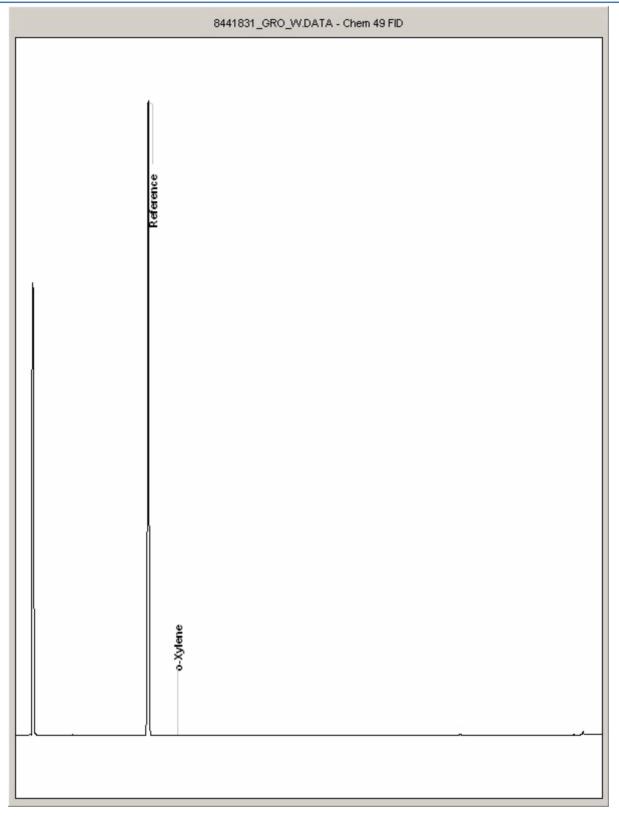
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8441831
 8441831
 Depth: 3.10



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

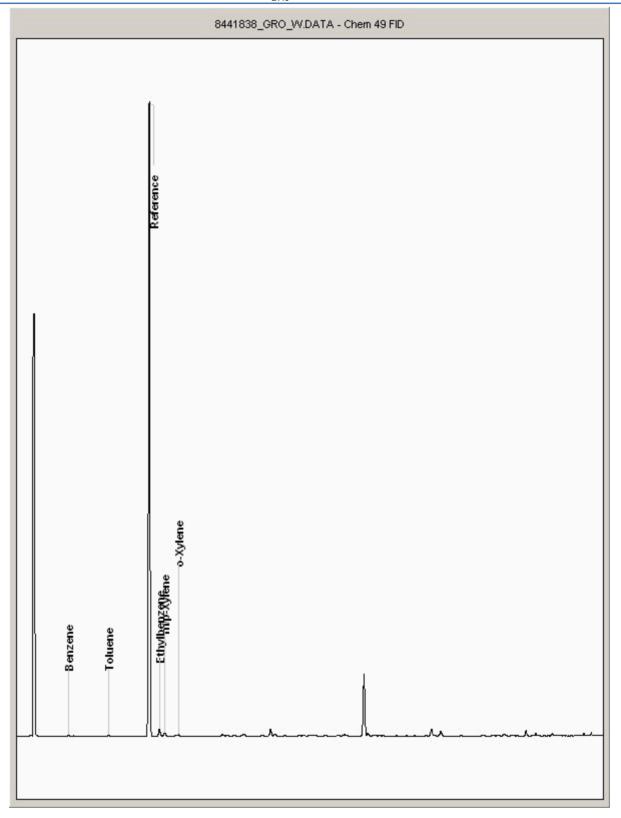
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8441838
 8441838
 Depth: 3.15





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

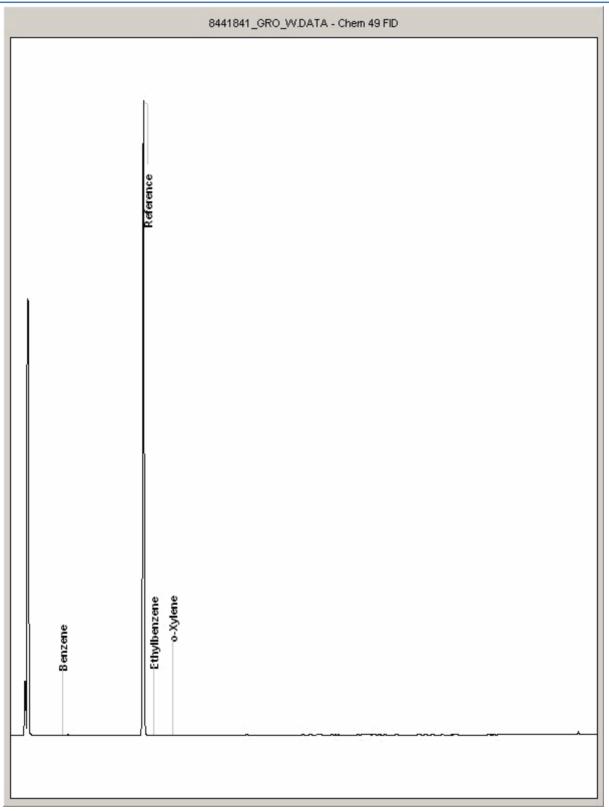
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441841
 Depth:
 2.98





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

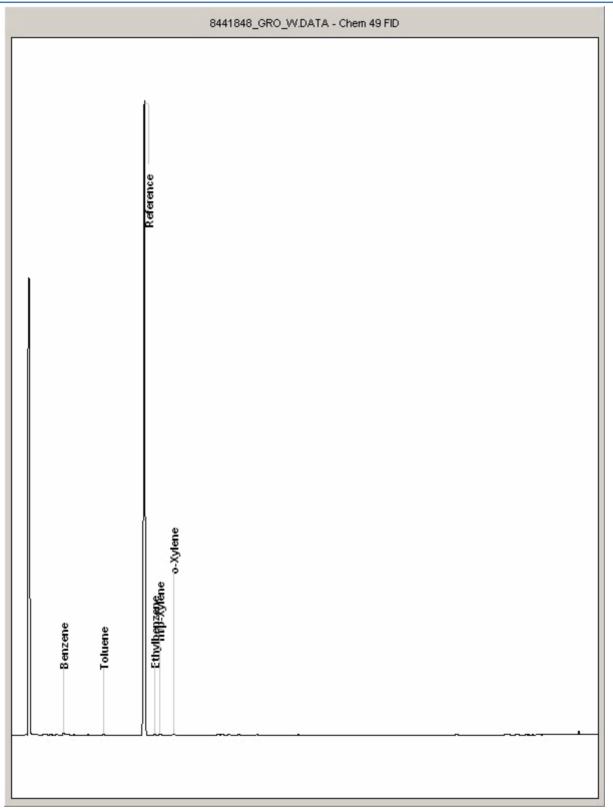
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report: 25092

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441848
 Depth:
 2.65





Analysis: GRO by GC-FID (W)

#### **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

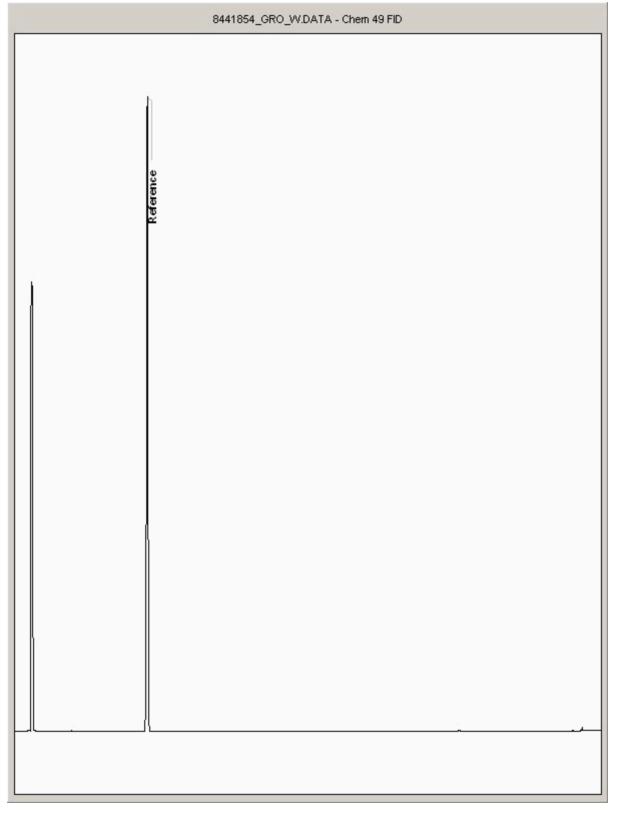
Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report: 2509.

Chromatogram

**Sample No**: 8441854 **Depth**: 2.70





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

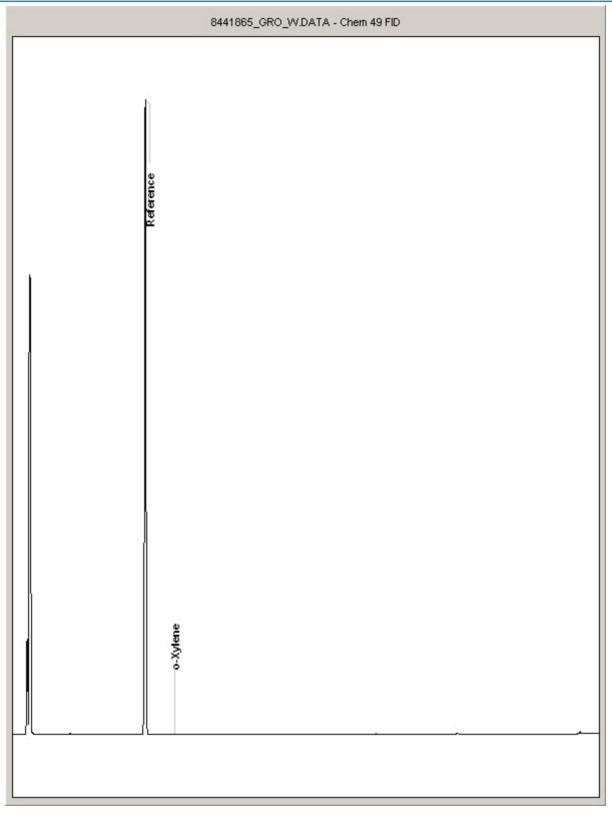
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441865
 Depth:
 2.65





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

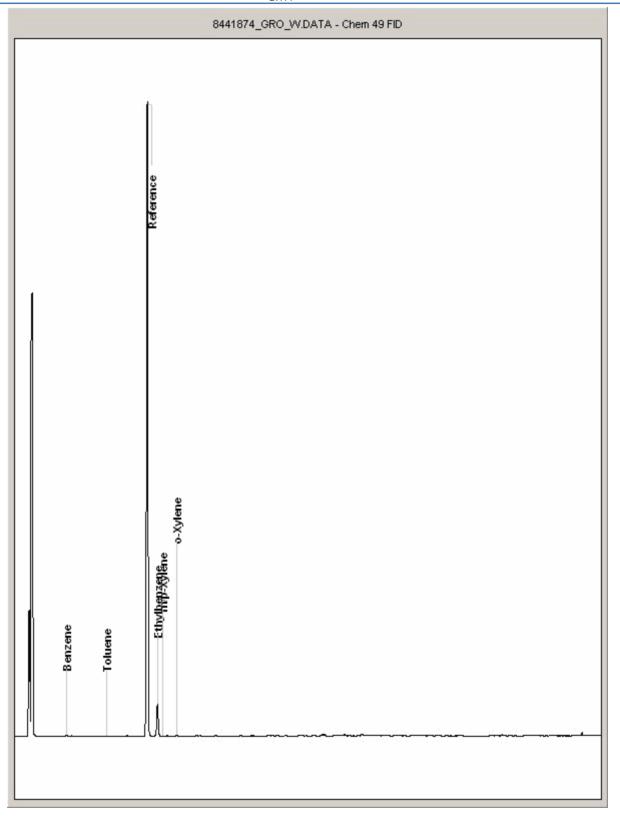
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441874
 Depth:
 2.72





Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

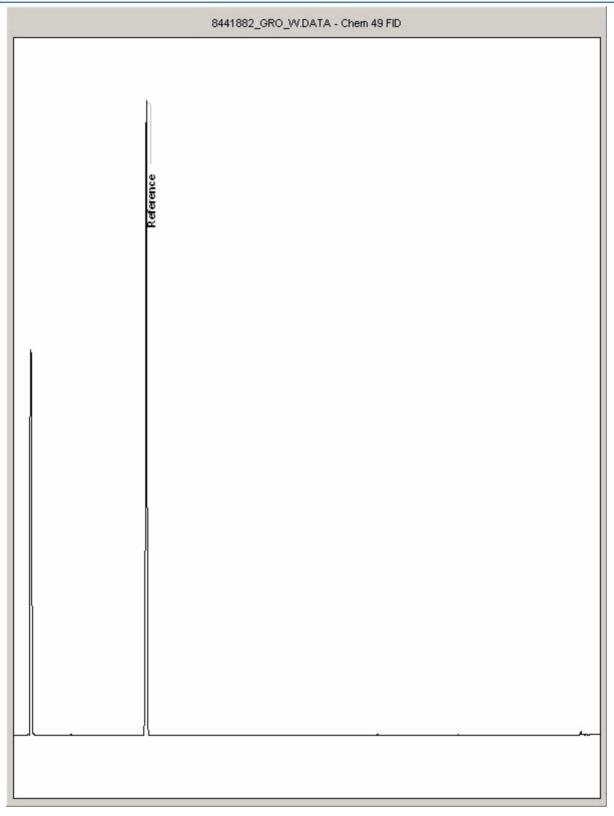
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No :
 8441882
 Depth :
 2.70



Client Reference:

#### **CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 131118-12 **Job:** H\_WSP\_CDF-63

39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

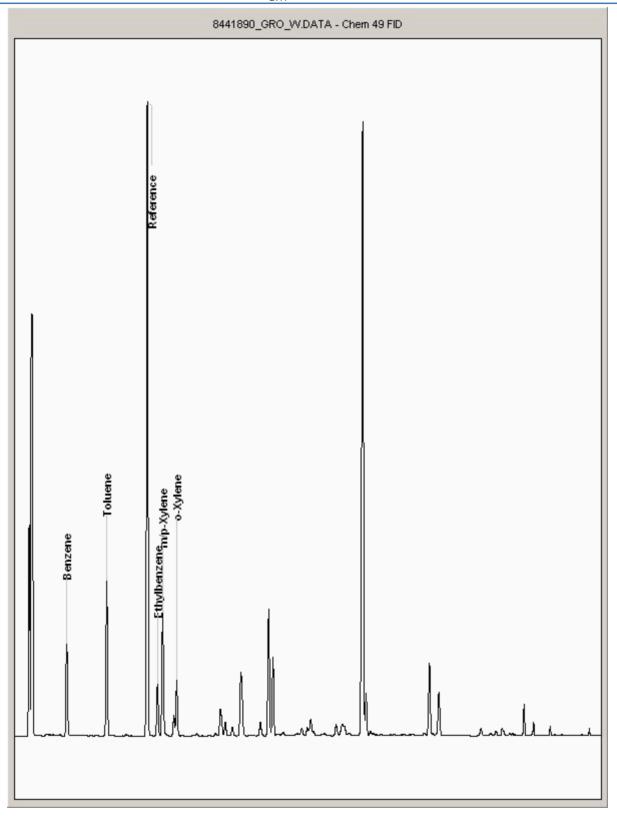
Order Number: Report Number:

23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441890
 Depth:
 1.69





Analysis: GRO by GC-FID (W)

#### **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

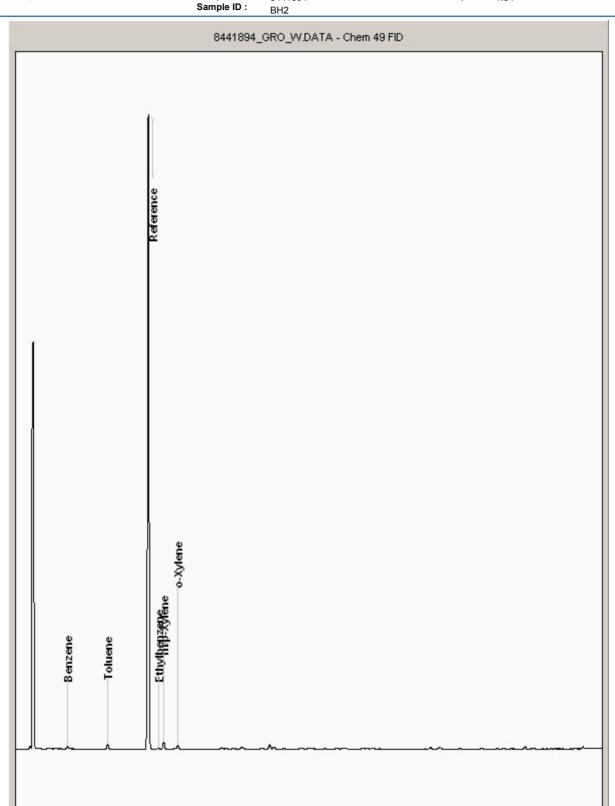
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

# Chromatogram

**Sample No**: 8441894 **Depth**: 1.84



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Ba Customer: W Attention: St

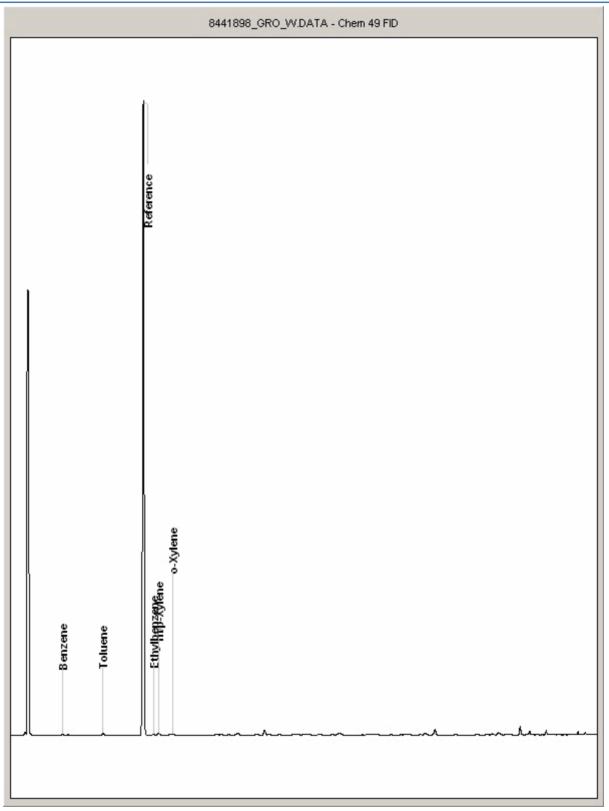
Barry Waterfront Order Number:
WSP Remediation Report Number:
Steve Gronow Superseded Report:

23820/39784-001/SG 250928

250928

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441898
 Depth:
 2.28



Validated

 SDG:
 131118-12

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

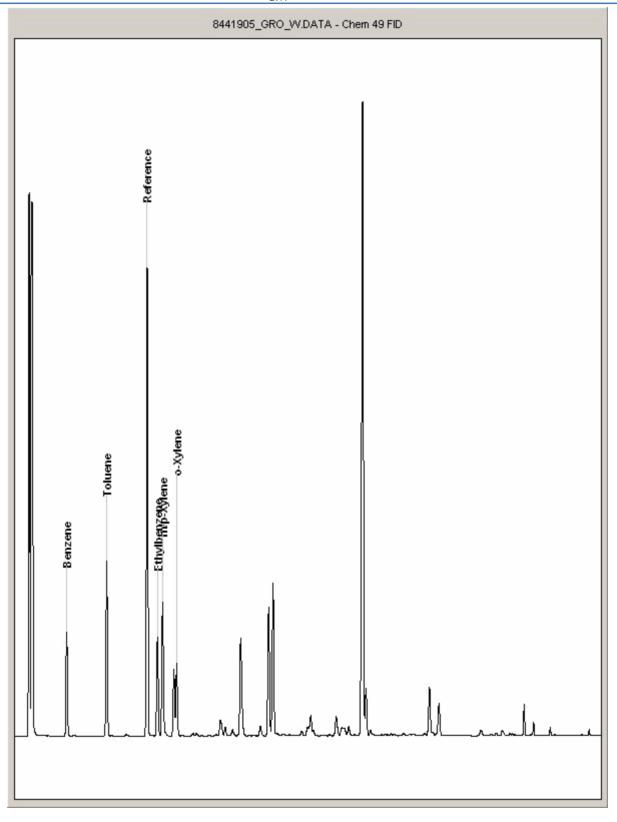
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23820/39784-001/SG 250928

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8441905
 Depth:
 2.16



# ALcontrol Laboratories

#### **CERTIFICATE OF ANALYSIS**

 SDG:
 131118-12
 Location:
 Barry Waterfront
 Order Number:
 23820/39784-001/SG

 Job:
 H WSP CDF-63
 Customer:
 WSP Remediation
 Report Number:
 250928

Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

# Appendix General

- 1. Results are expressed on a dry weight basis (dried at  $35^{\circ}$ C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.
- 9. NDP -No determination possible due to insufficient/unsuitable sample.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.
- 11. Results relate only to the items tested.
- 12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.
- 13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.
- 14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

- 20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

### Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

#### **Asbestos**

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysofile	White Asbestos
Amoste	Brown Asbestos
Orodobite	Blue Asbestos
Fibrous Adinoite	=
Florous Anthophylite	=
Fibrous Trendile	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than:

Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden

> Deeside CH5 3US Tel: (01244) 528700

Fax: (01244) 528701 email: mkt@alcontrol.com Website: www.alcontrol.com

WSP Remediation Fairway House Paramount Business Park St Mellons Cardiff South Glamorgan CF3 0LW

Attention: Steve Gronow

### **CERTIFICATE OF ANALYSIS**

 Date:
 03 January 2014

 Customer:
 H\_WSP\_CDF

 Sample Delivery Group (SDG):
 131220-67

 Your Reference:
 39784.001

 Location:
 Barry Waterfront

 Report No:
 255906

We received 15 samples on Wednesday December 18, 2013 and 15 of these samples were scheduled for analysis which was completed on Friday January 03, 2014. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan
Operations Manager





Validated

23945/39784/tm SDG: 131220-67 Location: **Barry Waterfront** Order Number: H\_WSP\_CDF-63 WSP Remediation 255906 Job: **Customer:** Report Number:

Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
8632057	RW01	EW	0.00	16/12/2013
8632068	RW02	EW	0.00	16/12/2013
8632069	RW03	EW	0.00	16/12/2013
8632070	RW04	EW	0.00	16/12/2013
8632072	RW05	EW	0.00	16/12/2013
8632076	RW06	EW	0.00	16/12/2013
8632077	RW07	EW	0.00	16/12/2013
8632078	RW08	EW	0.00	16/12/2013
8632079	RW09	EW	0.00	16/12/2013
8632059	RW10	EW	0.00	16/12/2013
8632061	RW11	EW	0.00	16/12/2013
8632063	RW12	EW	0.00	16/12/2013
8632064	RW13	EW	0.00	16/12/2013
8632065	RW14	EW	0.00	16/12/2013
8632066	RW15	EW	0.00	16/12/2013

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG

131220-67

#### **CERTIFICATE OF ANALYSIS**

**Barry Waterfront** 

Location:

Validated

23945/39784/tm

Order Number:

Job: H\_WSP\_CDF-63 **Customer:** WSP Remediation Report Number: 255906 39784.001 Attention: Steve Gronow Superseded Report: Client Reference: **LIQUID** 8632065 8632064 8632061 8632057 8632068 8632070 8632076 8632077 8632079 8632059 8632063 **Results Legend** Lab Sample No(s) X Test No Determination Possible Customer RW01 RW02 RW04 RW07 RW11 RW14 RW03 RW06 RW08 RW09 **RW10** Sample Reference ΕV ΕV ΕW ΕV ΕV ΕŃ ΕV ΕW ΕV ΕV ΕV E K **AGS Reference** ΕW 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Depth (m) H2SO4 (ALE244)
11 Glass bottle (ALE
Vial (ALE297)
H2SO4 (ALE294)
11 Glass bottle (ALE
Vial (ALE297)
Vial (ALE297) H2SO4 (ALE244)
11 Glass bottle (ALE
Vial (ALE297)
H2SO4 (ALE244)
11 Glass bottle (ALE
Vial (ALE297)
H2SO4 (ALE297)
H2SO4 (ALE297)
H2SO4 (ALE297)
H2SO4 (ALE297)
Vial (ALE297) H2SO4 (ALE244)
11 Glass bottle (ALE
Vial (ALE297) H2SO4 (ALE244)
11 Glass bottle (ALE
Vial (ALE297) H2SO4 (ALE244)
11 Glass bottle (ALE
Vial (ALE297) H2SO4 (ALE244) 1I Glass bottle (ALE Vial (ALE297) H2SO4 (ALE244) 1I Glass bottle (ALE Vial (ALE297) H2SO4 (ALE244)
1I Glass bottle (ALE
Vial (ALE297) Container EPH CWG (Aliphatic) Aqueous GC All NDPs: 0 Tests: 15 EPH CWG (Aromatic) Aqueous GC All NDPs: 0 Tests: 15 GRO by GC-FID (W) All NDPs: 0 Tests: 15 PAH Spec MS - Aqueous (W) All NDPs: 0 Tests: 15 Phenols by HPLC (W) All NDPs: 0 Tests: 15 TPH CWG (W) All NDPs: 0 Tests: 15

VOC MS (W)

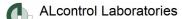
All

NDPs: 0 Tests: 15

Validated

SDG: 131220-67 Location: Barry Waterfront Order Number: 23945/39784/tm Job: H\_WSP\_CDF-63 Customer: WSP Remediation Report Number: 255906 Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

Job: H_WSP_C   Client Reference: 39784.001		Attention		WSP Re Steve G	emediati Fronow	
LIQUID Results Legend X Test	Lab Sample N	Lab Sample No(s)				
No Determination Possible	Custome Sample Refer		RW14	RW15		
	AGS Refere	nce	EW	EW		
	Depth (m	)	0.00	0.00		
	Containe	r	Vial (ALE297) H2SO4 (ALE244)	Vial (ALE297) H2SO4 (ALE244) 11 Glass bottle (ALE		
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15		x		
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15		x		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 15	X	x		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15		x		
Phenois by HPLC (W)	All	NDPs: 0 Tests: 15	X	×		
TPH CWG (W)	All	NDPs: 0 Tests: 15		x		
VOC MS (W)	All	NDPs: 0 Tests: 15	v			



Steve Gronow

Validated

131220-67 H\_WSP\_CDF-63 39784.001 SDG: Job:

Client Reference:

Location: **Customer:** 

Attention:

Barry Waterfront Order Number: WSP Remediation Report Number:

Superseded Report:

23945/39784/tm

255906

Results Legend # ISO17025 accredited.		Customer Sample R	RW01	RW02	RW03	RW04	RW05	RW06
# ISO/Tros accredited.  aq Aqueous / settled sample. diss.fill: Dissolved / filtered sample. tot.unfilt: Total / unfiltered sample.  * Subcontracted test.  * % recovery of the surrogate stands check the efficiency of the method results of individual compounds w samples aren't corrected for the re (F) Trigger breach confirmed	. The ithin	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s)	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632057	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632068	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632069	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632070	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632072	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632076
1-4&+\$@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Unit							
Resorcinol	<10 µg	/I TM259	<10	<10	<10	<10	<10	<10
Catechol	<10 µg	/I TM259	<10	<10	<10	<10	<10	<10
Phenol	<2 μg/	TM259	860 #	10 #	<2 #	680 #	270 #	<2 #
Cresols	<6 µg/	TM259	2580 #	20 #	<6 #	2900 #	2220 #	<6 #
Xylenols	<8 µg/	TM259	7390 #	310 #	<8 #	9690 #	4510 #	<8 #
1-Naphthol	<10 µg	/I TM259	280	10	<10	270	30	<10
2,3,5-Trimethylphenol	<3 µg/	TM259	<3 #	<3 #	<3 #	<3 #	260 #	<3 #
2-Isopropylphenol	<6 µg/	TM259	1780 #	40 #	<6 #	2250 #	1310 #	<6 #
Phenols, Total Detected monohydric	<16 µg	/I TM259	10800 #	340 #	<16 #	13300 #	7000 #	<16 #
Phenols, Total Detected 8 Speciated	<45 µg	/I TM259	12900	390	<45	15800	8600	<45

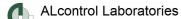


Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number:

Job: WSP Remediation 255906 **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

Results Legend		Customer Sample R	RW07	RW08	RW09	RW10	RW11	RW12
# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Depth (m) Sample Type Date Sampled	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013
** % recovery of the surrogate standa check the efficiency of the method. results of individual compounds wi samples aren't corrected for the re	. The ithin	Sampled Time Date Received SDG Ref Lab Sample No.(s)	3 18/12/2013 131220-67 8632077	3 18/12/2013 131220-67 8632078	3 18/12/2013 131220-67 8632079	3 18/12/2013 131220-67 8632059	3 18/12/2013 131220-67 8632061	3 18/12/2013 131220-67 8632063
(F) Trigger breach confirmed  1-4&+§@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Unit	_	.10	.10	.10	-10		-10
Resorcinol	<10 µg	/I TM259	<10	<10	<10	<10	<10	<10
Catechol	<10 µg		<10	<10	<10	<10	<10	<10
Phenol	<2 µg/	I TM259	<2 #	<2 #	<2 #	<2 #	<2 #	<2 #
Cresols	<6 µg/		<6 #	<6 #	<6 #	<6 #	<6 #	<6 #
Xylenols	<8 µg/	I TM259	40 #	<8 #	<8 #	<8 #	<8 #	<8 #
1-Naphthol	<10 µg		<10	<10	<10	<10	<10	<10
2,3,5-Trimethylphenol	<3 µg/	I TM259	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
2-Isopropylphenol	<6 µg/	TM259	10 #	<6 #	<6 #	<6 #	<6 #	<6 #
Phenols, Total Detected monohydric	<16 µg	/I TM259	40 #	<16 #	<16 #	<16 #	<16 #	<16 #
Phenols, Total Detected 8 Speciated	<45 µg	/I TM259	50	<45	<45	<45	<45	<45
Opecialed								



Client Reference:

#### **CERTIFICATE OF ANALYSIS**

Validated

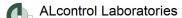
Superseded Report:

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number:

Job: WSP Remediation 255906 **Customer:** Report Number: Steve Gronow

Attention:

Results Legend # ISO17025 accredited.		Customer Sample R	RW13	RW14	RW15			
M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00	0.00	0.00			
tot.unfilt Total / unfiltered sample.		Sample Type	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013			
** % recovery of the surrogate standa		Date Sampled Sampled Time	3	3	3			
check the efficiency of the method. results of individual compounds wi		Date Received	18/12/2013	18/12/2013	18/12/2013			
samples aren't corrected for the re-		SDG Ref	131220-67 8632064	131220-67 8632065	131220-67 8632066			
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	6632064 EW	6632065 EW	EW			
Component	LOD/Unit							
Resorcinol	<10 µg	_	<10	<10	<10			
1.000.00.			.0					
Catechol	<10 µg	/I TM259	<10	<10	<10			
Phenol	<2 µg/	TM259	<2	<2	<2			
			- #	- #	- #			
Cresols	<6 µg/	TM259	<6	<6	<6			
0.000.0	o mg/	.  200	#	#	#			
Xylenols	<8 µg/	TM259	<8	<8	<8			
7.7.66.6	o mg/	.  200	#	#	#			
1-Naphthol	<10 µg	/I TM259	<10	<10	<10			
	μ9	200	. 5					
2,3,5-Trimethylphenol	<3 µg/	TM259	<3	<3	<3			
_,0,0	. · · · · μg/	200	-5	#	#			
2-Isopropylphenol	<6 µg/	TM259	<6	<6	<6			
	- ο μg/	. 1111200	<b>~</b> 0	#	#			
Phenols, Total Detected	<16 µg	/I TM259	<16	<16	<16			
monohydric	, το μg	,. I IVIZJ <del>a</del>	<b>~10</b> #	#	_ \ \ \ #			
Phenois, Total Detected 8	<45 µg	/I TM259	<45	<45	<45			
Speciated Speciated	i πο μg	71 111200	140	140	140			
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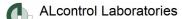


Validated

131220-67 **Barry Waterfront** 23945/39784/tm SDG: Location: Order Number: Job: H WSP CDF-63 **Customer:** WSP Remediation Report Number: 255906

Client Reference: 39784.001

Attention: Steve Gronow Superseded Report: PAH Spec MS - Aqueous (W) Customer Sample R RW01 RW03 RW05 RW06 RW02 RW04 ISO17025 accredited Aqueous / settled sample Depth (m) 0.00 0.00 0.00 0.00 0.00 0.00 diss.filt Dissolved / filtered sample Total / unfiltered sample Water(GW/SW) Water(GW/SW) Water(GW/SW) Water(GW/SW) Water(GW/SW) Water(GW/SW) Sample Type Date Sampled 16/12/2013 16/12/2013 16/12/2013 16/12/2013 16/12/2013 16/12/2013 % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within Sampled Time 18/12/2013 18/12/2013 18/12/2013 18/12/2013 18/12/2013 18/12/2013 131220-67 131220-67 131220-67 SDG Ref 131220-67 131220-67 131220-67 samples aren't corrected for the recovery Trigger breach confirmed 8632072 EW 8632076 EW 8632057 8632068 8632069 8632070 Lab Sample No.(s) EW EW EW EW 1-4&+§@ Sample deviation (see appendix) AGS Reference LOD/Units Component Method Naphthalene (aq) <0.1 µg/l TM178 <1 0.118 <0.1 <2.5 <5 <0.1 &# &# &# &# &# <0.015 TM178 205 0.0791 0.0407 430 249 0.0245 Acenaphthene (aq) μg/l &# &# &# &# &# &# Acenaphthylene (ag) <0.011 TM178 3.13 0.0502 0.133 27.2 7.71 0.027 μg/l &# &# &# &# &# Fluoranthene (aq) TM178 0.676 1.69 26.3 64.3 0.348 < 0.017 36.7 μg/l &# &# &# &# &# &# TM178 0 729 0 259 24.5 0.0951 Anthracene (ag) <0.015 8 96 14 μg/l &# &# &# &# &# &# Phenanthrene (aq) TM178 0.427 0.403 0 494 185 2.8 0 217 < 0.022 μg/l &# &# &# &# &# &# 0.0349 0.098 0.0738 Fluorene (aq) < 0.014 TM178 39.5 168 99.2 μg/l &# &# &# &# &# &# 0.274 Chrysene (aq) < 0.013 TM178 1.58 0.518 1.06 1.02 4.89 μg/l &# &# &# &# &# &# <0.015 TM178 22.3 0.619 1.32 16.2 41 0.284 Pyrene (aq) μg/l &# &# &# &# &# &# <0.017 TM178 1.56 0.286 0.66 0.719 3.51 0.127 Benzo(a)anthracene (aq) μg/l &# &# &# &# &# &# 0.376 0.371 0.885 <0.575 <1.15 0.203 Benzo(b)fluoranthene (aq) <0.023 TM178 μg/l &# &# &# &# &# &# 0.748 <0.675 Benzo(k)fluoranthene (aq) <0.027 TM178 0.414 0.326 <1.35 0.165 μg/l &# &# &# &# &# &# TM178 0.334 0.363 0.893 <0.225 0.162 Benzo(a)pyrene (aq) < 0.009 1.12 μg/l &# &# &# &# &# &# 0.0472 <0.16 0 114 0.0264 Dibenzo(a,h)anthracene < 0.016 TM178 < 0.4 <0.8 μg/l (aq) &# &# &# &# &# &# 0 148 0.322 < 0.4 <0.8 0.0906 Benzo(g,h,i)perylene (aq) < 0.016 TM178 < 0.16 μg/l &# & # &# &# &# &# 0.315 < 0.35 0.0778 Indeno(1,2,3-cd)pyrene < 0.014 TM178 < 0.14 0.138 < 0.7 μg/l &# &# (ag) &# &# &# &# PAH, Total Detected <0.344 TM178 320 4.97 9.01 870 502 2.16 USEPA 16 (aq) μg/l & & & & & &



Validated

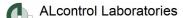
Superseded Report:

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number: WSP Remediation 255906 Job: **Customer:** Report Number: Steve Gronow

Attention:

Client Reference:

PAH Spec MS - Aqueous	s (W)							
Results Legend # ISO17025 accredited.	C	Customer Sample R	RW07	RW08	RW09	RW10	RW11	RW12
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00	0.00	0.00	0.00	0.00	0.00
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013
** % recovery of the surrogate standa check the efficiency of the method.	The	Sampled Time Date Received	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013
results of individual compounds wi samples aren't corrected for the rec		SDG Ref	131220-67 8632077	131220-67 8632078	131220-67 8632079	131220-67 8632059	131220-67 8632061	131220-67 8632063
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Units							
Naphthalene (aq)	<0.1 µg/	TM178	<0.1	<0.1 &#</td><td><0.1</td><td><0.1</td><td>1.25</td><td>0.189</td></tr><tr><td>Acenaphthene (aq)</td><td><0.015 µg/l</td><td>TM178</td><td><0.015 &#</td><td><0.015 &#</td><td>0.0185 & #</td><td><0.015 &#</td><td>0.417 &#</td><td>0.0456</td></tr><tr><td>Acenaphthylene (aq)</td><td><0.011 µg/l</td><td>TM178</td><td><0.011 & #</td><td><0.011 & #</td><td>0.0447</td><td>0.0221</td><td>0.426 & #</td><td>0.0862</td></tr><tr><td>Fluoranthene (aq)</td><td><0.017 μg/l</td><td>TM178</td><td>0.154 &#</td><td>0.0404 &#</td><td>0.126 &#</td><td>0.109 &#</td><td>3.61 &#</td><td>0.742 &#</td></tr><tr><td>Anthracene (aq)</td><td><0.015 µg/l</td><td>TM178</td><td>0.065 &#</td><td>0.0189 &#</td><td>0.0518 &#</td><td>0.0323 &#</td><td>0.937 &#</td><td>0.246 &#</td></tr><tr><td>Phenanthrene (aq)</td><td><0.022 µg/l</td><td>TM178</td><td>0.0671 &#</td><td>0.0448 &#</td><td>0.114 &#</td><td>0.0914 &#</td><td>3.27 &#</td><td>0.391 &#</td></tr><tr><td>Fluorene (aq)</td><td><0.014 µg/l</td><td>TM178</td><td>0.0277 &#</td><td><0.014 &#</td><td>0.0327 &#</td><td>0.02 &#</td><td>0.848 &#</td><td>0.0797 &#</td></tr><tr><td>Chrysene (aq)</td><td><0.013 μg/l</td><td>TM178</td><td>0.0472 &#</td><td>0.0301 &#</td><td>0.115 &#</td><td>0.0789 &#</td><td>2.75 &#</td><td>0.517 &#</td></tr><tr><td>Pyrene (aq)</td><td><0.015 μg/l</td><td>TM178</td><td>0.0549 &#</td><td>0.0438 &#</td><td>0.113 &#</td><td>0.0916 &#</td><td>2.89 &#</td><td>0.576 &#</td></tr><tr><td>Benzo(a)anthracene (aq)</td><td><0.017 μg/l</td><td>TM178</td><td><0.017 &#</td><td><0.017 &#</td><td>0.0666 &#</td><td>0.0477 &#</td><td>1.88 &#</td><td>0.334 &#</td></tr><tr><td>Benzo(b)fluoranthene (aq)</td><td><0.023 μg/l</td><td>TM178</td><td>0.025 &#</td><td>0.0258 & #</td><td>0.0878</td><td>0.0854 &#</td><td>3.45 & #</td><td>0.503</td></tr><tr><td>Benzo(k)fluoranthene (aq)</td><td><0.027 μg/l</td><td>TM178</td><td><0.027 &#</td><td><0.027 &#</td><td>0.0853 & #</td><td>0.0635</td><td>2.77</td><td>0.408</td></tr><tr><td>Benzo(a)pyrene (aq)</td><td><0.009 µg/l</td><td>TM178</td><td>0.0271 &#</td><td>0.0243 & #</td><td>0.105 &#</td><td>0.0756 & #</td><td>2.87</td><td>0.476</td></tr><tr><td>Dibenzo(a,h)anthracene (aq)</td><td><0.016 µg/l</td><td>TM178</td><td><0.016 &#</td><td><0.016 &#</td><td>0.0195 &#</td><td>0.0178 &#</td><td>0.667 &#</td><td>0.0916 &#</td></tr><tr><td>Benzo(g,h,i)perylene (aq)</td><td><0.016 µg/l</td><td>TM178</td><td>0.0186 &#</td><td>0.0227 &#</td><td>0.0786 &#</td><td>0.0695 &#</td><td>2.45 &#</td><td>0.36 &#</td></tr><tr><td>Indeno(1,2,3-cd)pyrene (aq)</td><td><0.014 µg/l</td><td>TM178</td><td>0.014 &#</td><td>0.0179 &#</td><td>0.0637 &#</td><td>0.0551 &#</td><td>2.13 &#</td><td>0.316 &#</td></tr><tr><td>PAH, Total Detected USEPA 16 (aq)</td><td><0.344 µg/l</td><td>TM178</td><td>0.501 &</td><td><0.344 &</td><td>1.12 &</td><td>0.86 &</td><td>32.6 &</td><td>5.36 &</td></tr><tr><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>				



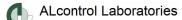
Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number: Job: Customer: 255906

Client Reference: Attention: Steve Gronow

WSP Remediation Report Number: Superseded Report:

Client Reference:	39784.001		Attention: Ste	eve Gronow		Superseded Repo	ort:	
PAH Spec MS - Aqu	eous (W)							
Results Legend	(**)	Customer Sample R	RW13	RW14	RW15			
# ISO17025 accredited.  M mCERTS accredited.		·						
aq Aqueous / settled sample.		Depth (m)	0.00	0.00	0.00			
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
* Subcontracted test.  ** % recovery of the surrogat	a standard to	Date Sampled	16/12/2013	16/12/2013	16/12/2013			
check the efficiency of the	method. The	Sampled Time Date Received	3 18/12/2013	3 18/12/2013	3 18/12/2013			
results of individual compo samples aren't corrected for		SDG Ref	131220-67	131220-67	131220-67			
(F) Trigger breach confirmed		Lab Sample No.(s)	8632064 EW	8632065 EW	8632066 EW			
1-4&+§@ Sample deviation (see app		AGS Reference	EVV	EVV	⊏vv			
Component	LOD/U		2 / 2 /					
Naphthalene (aq)	ر 0.1>	ug/l TM178	0.121	<0.1	<0.1			
			&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Acenaphthene (aq)</td><td><0.0</td><td></td><td>0.0181</td><td><0.015</td><td><0.015</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>& #</td><td></td><td></td><td></td></tr><tr><td>Acenaphthylene (aq)</td><td><0.0</td><td></td><td>0.0134</td><td>0.0206</td><td><0.011</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td>_</td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Fluoranthene (aq)</td><td><0.0</td><td></td><td>0.287</td><td>0.0855</td><td>0.0696</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>& #</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Anthracene (aq)</td><td><0.0</td><td></td><td>0.0208</td><td>0.0287</td><td>0.0269</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Phenanthrene (aq)</td><td><0.02</td><td></td><td>0.213</td><td>0.0771</td><td>0.0471</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Fluorene (aq)</td><td><0.0</td><td>14 TM178</td><td>0.0191</td><td>0.0263</td><td>0.0171</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Chrysene (aq)</td><td><0.0</td><td></td><td>0.248</td><td>0.0746</td><td>0.047</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Pyrene (aq)</td><td><0.0</td><td>_</td><td>0.228</td><td>0.0951</td><td>0.0808</td><td></td><td></td><td></td></tr><tr><td>  ' ' '</td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Benzo(a)anthracene (aq</td><td></td><td></td><td>0.0944</td><td>0.0423</td><td>0.0176</td><td></td><td></td><td></td></tr><tr><td>  ( - ) ( )</td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Benzo(b)fluoranthene (a</td><td></td><td></td><td>0.25</td><td>0.0681</td><td>0.0357</td><td></td><td></td><td></td></tr><tr><td>Bonzo(b)ndoruminono (di</td><td>μg/l</td><td></td><td>8.#</td><td>8.#</td><td>8.#</td><td></td><td></td><td></td></tr><tr><td>Benzo(k)fluoranthene (ad</td><td></td><td></td><td>0.234</td><td>0.0633</td><td>0.0283</td><td></td><td></td><td></td></tr><tr><td>Delizo(k)lidoralitilelle (at</td><td>μg/l</td><td></td><td>8.#</td><td>8.#</td><td>8.0203</td><td></td><td></td><td></td></tr><tr><td>Benzo(a)pyrene (aq)</td><td><0.00</td><td>_</td><td>0.197</td><td>0.0764</td><td>0.0327</td><td></td><td></td><td></td></tr><tr><td>berizo(a)pyrene (aq)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Dibarra (a.b.) anthur ann</td><td>μg/l</td><td>_</td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Dibenzo(a,h)anthracene</td><td><0.0</td><td></td><td>0.047</td><td><0.016</td><td><0.016</td><td></td><td></td><td></td></tr><tr><td>(aq)</td><td>μg/l</td><td>_</td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Benzo(g,h,i)perylene (aq</td><td></td><td></td><td>0.154</td><td>0.0655</td><td>0.0291</td><td></td><td></td><td></td></tr><tr><td></td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>Indeno(1,2,3-cd)pyrene</td><td><0.0</td><td></td><td>0.135</td><td>0.0493</td><td>0.0219</td><td></td><td></td><td></td></tr><tr><td>(aq)</td><td>μg/l</td><td></td><td>&#</td><td>&#</td><td>&#</td><td></td><td></td><td></td></tr><tr><td>PAH, Total Detected</td><td><0.34</td><td></td><td>2.28</td><td>0.773</td><td>0.454</td><td></td><td></td><td></td></tr><tr><td>USEPA 16 (aq)</td><td>μg/l</td><td></td><td>&</td><td>&</td><td>&</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>					

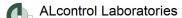


Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number: Job: WSP Remediation 255906 **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

TPH CWG (W)						<u> </u>		
Results Legend # ISO17025 accredited.		Customer Sample R	RW01	RW02	RW03	RW04	RW05	RW06
M MCERTS accredited.  aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Depth (m) Sample Type Date Sampled	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013
** % recovery of the surrogate stands check the efficiency of the method results of individual compounds we samples aren't corrected for the re Trigger breach confirmed 1-4&+§© Sample deviation (see appendix)  Component	. The ithin	Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	3 18/12/2013 131220-67 8632057 EW	3 18/12/2013 131220-67 8632068 EW	3 18/12/2013 131220-67 8632069 EW	3 18/12/2013 131220-67 8632070 EW	3 18/12/2013 131220-67 8632072 EW	3 18/12/2013 131220-67 8632076 EW
GRO Surrogate % recovery**	%	TM245	94	83	90	87	93	120
GRO >C5-C12	<50 µg/	/I TM245	11300 #	334 #	<50 #	21000 #	7910 #	<50 #
Methyl tertiary butyl ether (MTBE)	<3 μg/l	TM245	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Aliphatics >C5-C6	<10 µg/	/I TM245	14	<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/	/I TM245	55	11	<10	49	17	<10
Aliphatics >C8-C10	<10 µg/		752	31	<10	1470	454	<10
Aliphatics >C10-C12	<10 µg/		4580	141	<10	8830	3730	<10
Aliphatics >C12-C16 (aq)	<10 µg/		<10	<10	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)	<10 µg/		<10	<10	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)	<10 µg/		<10	<10	<10	<10	<10	<10
Total Aliphatics >C12-C35 (aq)	<10 µg/		<10	<10	<10	<10	<10	<10
Aromatics >EC5-EC7	<10 µg/		566	<10	<10	730	193	<10
Aromatics >EC7-EC8	<10 µg/		711	<10	<10	1120	350	<10
Aromatics >EC8-EC10	<10 µg/	/I TM245	1600	49	<10	2940	683	<10
Aromatics >EC10-EC12	<10 µg/	/I TM245	3050	94	<10	5890	2480	<10
Aromatics >EC12-EC16 (aq)	<10 µg/		1110	<10	<10	2230	2340	<10
Aromatics >EC16-EC21 (aq)	<10 µg/		241	17	17	437	627	<10
Aromatics >EC21-EC35 (aq)	<10 µg/		50	16	15	46	149	<10
Total Aromatics >EC12-EC35 (aq)	<10 µg/		1400	33	32	2720	3110	<10
Total Aliphatics & Aromatics >C5-35 (aq)	<10 μg/	/I TM174	12700	365	33	23700	11000	<10



Validated

131220-67 H\_WSP\_CDF-63 39784.001 SDG: Location: Barry Waterfront Order Number: Job: WSP Remediation **Customer:** 

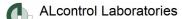
Client Reference:

Attention: Steve Gronow Report Number:

23945/39784/tm 255906

Superseded Report:

TDU CIAO	1.001		Attention. Ott	sve Gronow		Ouperscaed Repe		
TPH CWG (W)								
# ISO17025 accredited.		Customer Sample R	RW07	RW08	RW09	RW10	RW11	RW12
M mCERTS accredited.								
aq Aqueous / settled sample.		Depth (m)	0.00	0.00	0.00	0.00	0.00	0.00
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
* Subcontracted test.		Date Sampled	16/12/2013	16/12/2013	16/12/2013	16/12/2013	16/12/2013	16/12/2013
** % recovery of the surrogate standa		Sampled Time	3	3	3	3	3	3
check the efficiency of the method. results of individual compounds wi		Date Received	18/12/2013	18/12/2013	18/12/2013	18/12/2013	18/12/2013	18/12/2013
samples aren't corrected for the re-		SDG Ref	131220-67 8632077	131220-67 8632078	131220-67 8632079	131220-67 8632059	131220-67 8632061	131220-67 8632063
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Unit							
		_						
GRO Surrogate %	%	TM245	110	91	94	90	95	91
recovery**								
GRO >C5-C12	<50 µg/	/I TM245	<50	<50	<50	<50	<50	<50
			#	#	#	#	#	#
Methyl tertiary butyl ether	<3 µg/l	TM245	<3	<3	<3	<3	<3	<3
	-5 μg/i	1101243						
(MTBE)			#	#	#	#	#	#
Aliphatics >C5-C6	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
'	'''							-
Aliabetics > C0 C10	<10 um	/I TM245	<b>~10</b>	-10	-10	-10	-10	<b>~10</b>
Aliphatics >C8-C10	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C10-C12	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C12-C16 (aq)	<10 µg/	/I TM174	<10	<10	<10	<10	<10	<10
pa.aa	μ9/		- 10		• 10	• 10	10	110
APakara 2010 0011	.16	() T	-10	40	-40	-40	0.5	-46
Aliphatics >C16-C21 (aq)	<10 µg/	/I TM174	<10	<10	<10	<10	25	<10
Aliphatics >C21-C35 (aq)	<10 µg/	/I TM174	<10	<10	<10	<10	107	<10
	'							
Total Aliphatics >C12-C35	<10 µg/	/I TM174	<10	<10	<10	<10	132	<10
1	< 10 μg/	1 1101174	<10	<b>\10</b>	<10	<10	132	<10
(aq)								
Aromatics >EC5-EC7	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
7.11011101100 201 200		.	. •				, •	. •
1 500 5040	.40	" TN 40.45	.10	.10	.10	.10	.40	.10
Aromatics >EC8-EC10	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	<10 µg/	/I TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC12-EC16	<10 µg/	/I TM174	<10	10	<10	<10	19	<10
	10 μg/	1 110117-	10	10	110	110	13	10
(aq)				- 12	- 10	- 10		
Aromatics >EC16-EC21	<10 µg/	/I TM174	<10	19	<10	<10	41	12
(aq)								
Aromatics >EC21-EC35	<10 µg/	/I TM174	<10	13	<10	<10	134	10
(aq)								
Total Aromatics	<10 µg/	/I TM174	<10	42	<10	<10	194	22
>EC12-EC35 (aq)	10 μg/	1 110117-	10	74	110	110	134	22
					- 12	- 12		
Total Aliphatics &	<10 µg/	/I TM174	<10	42	<10	<10	326	22
Aromatics >C5-35 (aq)								
		+						
		+						
		+						



Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number: WSP Remediation 255906 Job: **Customer:** Report Number:

Attention: Steve Gronow Superseded Report:

Client Reference:

TPH CWG (W)							
# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample.  diss.filt Dissolved / filtered sample.		Customer Sample R  Depth (m)	RW13	RW14 0.00	RW15 0.00		
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013		
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time	3	3	3		
results of individual compounds wi samples aren't corrected for the rec	thin	Date Received SDG Ref	18/12/2013 131220-67	18/12/2013 131220-67	18/12/2013 131220-67		
(F) Trigger breach confirmed  1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	8632064 EW	8632065 EW	8632066 EW		
Component	LOD/Unit						
GRO Surrogate %	%	TM245	89	90	93		
recovery** GRO >C5-C12	<50 µg	/I TM245	<50 #	136 #	85 #		
Methyl tertiary butyl ether (MTBE)	<3 µg/	TM245	<3 #	<3 #	<3 #		
Aliphatics >C5-C6	<10 µg	/I TM245	<10	<10	<10		
Aliphatics >C6-C8	<10 µg	/I TM245	<10	12	<10		
Aliphatics >C8-C10	<10 µg	/I TM245	<10	14	13		
Aliphatics >C10-C12	<10 µg	/I TM245	<10	58	30		
Aliphatics >C12-C16 (aq)	<10 µg	/I TM174	<10	<10	<10		
Aliphatics >C16-C21 (aq)	<10 µg	/I TM174	<10	<10	<10		
Aliphatics >C21-C35 (aq)	<10 µg	/I TM174	<10	<10	<10		
Total Aliphatics >C12-C35 (aq)	<10 µg	/I TM174	<10	<10	<10		
Aromatics >EC5-EC7	<10 µg	/I TM245	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg	/I TM245	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg	/I TM245	<10	<10	<10		
Aromatics >EC10-EC12	<10 µg	/I TM245	<10	39	20		
Aromatics >EC12-EC16 (aq)	<10 µg	/I TM174	<10	30	<10		
Aromatics >EC16-EC21 (aq)	<10 µg		<10	29	<10		
Aromatics >EC21-EC35 (aq)	<10 µg		<10	85	<10		
Total Aromatics >EC12-EC35 (aq)	<10 µg		<10	144	<10		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg	/I TM174	<10	279	83		

# **ALcontrol Laboratories**

## **CERTIFICATE OF ANALYSIS**

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: **Barry Waterfront** Order Number: Job: WSP Remediation 255906 **Customer:** Report Number: Client Reference:

Attention: Steve Gronow Superseded Report:

VOC MS (W)								
Results Legend		Customer Sample R	RW01	RW02	RW03	RW04	RW05	RW06
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample.		Depth (m)	0.00	0.00	0.00	0.00	0.00	0.00
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
* Subcontracted test.		Date Sampled	16/12/2013	16/12/2013	16/12/2013	16/12/2013	16/12/2013	16/12/2013
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time Date Received	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013
results of individual compounds w	thin	SDG Ref	131220-67	131220-67	131220-67	131220-67	131220-67	131220-67
samples aren't corrected for the re-	covery	Lab Sample No.(s)	8632057	8632068	8632069	8632070	8632072	8632076
1-4&+§@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW	EW	EW	EW
Component	LOD/Unit	s Method						
Dibromofluoromethane**	%	TM208	105	107	104	103	108	104
Toluene-d8**	%	TM208	96.7	97.8	98	95.8	98.5	97.6
10.00.10 00	,,,	200	· · · · · · · · · · · · · · · · · · ·	01.0		00.0	00.0	07.0
4-Bromofluorobenzene**	%	TM208	93.6	98.5	98.6	89.8	97.1	97.8
4-Bioinolidolobelizelle	/0	1101200	93.0	90.5	90.0	09.0	97.1	97.0
Dishlass differences the same	.4	T14000	.4	-4	-4	-4	.4	.4
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
The merenaere meanane	. 49/	200	. #	. #	. #	. #	. #	. #
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
1, 1-Dichioloethene	~ 1 μg/1	1101200						
Contrar disculphide	44	TM000	#	#	#	#	#	#
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3	<3	<3
			#	#	#	#	#	#
Methyl tertiary butyl ether	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
(MTBE)			#	#	#	#	#	#
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
.,			#	#	#	#	#	#
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
2,2 Biomoropropane	n pg/	1111200	•	-,	-,	.,	٠,	
Bromochloromethane	<1 ua/	TM208	<b>~1</b>	<i>c</i> 1	<i>c</i> 1	<i>z</i> 1	<i>c</i> 1	
Bromochloromethane	<1 µg/l	1101200	<1 	<1 	<1 	<1 	<1 	<1 
011 (		T14000	#	#	#	#	#	#
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Benzene	<1 µg/l	TM208	634	<1	<1	874	209	<1
			#	#	#	#	#	#
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Thomorouncine	- i µg/i	1101200	*	#	#	#	#	*
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
1,2-Dichioroproparie	~ ι μg/ι	1101200						
D'hannan Hanna	.4	T14000	#	#	#	#	#	#
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Toluene	<1 µg/l	TM208	802	<1	<1	1330	383	<1
			#	#	#	#	#	#
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
	"		#	#	#	#	#	#
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
, , , = 111211101000110110	. Ma/	00	#	#	#	#	#	#
<u> </u>			#	#	#	#	#	#

#### Validated

**ALcontrol Laboratories** 

131220-67 H\_WSP\_CDF-63 39784.001 SDG: Location: Barry Waterfront Order Number: Job: WSP Remediation **Customer:** Report Number: Steve Gronow

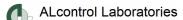
Client Reference: Attention:

23945/39784/tm 255906

Superseded Report:

VO.	~ N	10	^\^/
VU	U 11	10 (	(W)

VOC MS (W)								
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample R	RW01	RW02	RW03	RW04	RW05	RW06
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. ** recovery of the surrogate stands check the efficiency of the method		Depth (m) Sample Type Date Sampled Sampled Time	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3
results of individual compounds w samples aren't corrected for the re (F) Trigger breach confirmed	ithin	Date Received SDG Ref Lab Sample No.(s)	18/12/2013 131220-67 8632057 EW	18/12/2013 131220-67 8632068 EW	18/12/2013 131220-67 8632069 EW	18/12/2013 131220-67 8632070 EW	18/12/2013 131220-67 8632072 EW	18/12/2013 131220-67 8632076 EW
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Uni	AGS Reference ts Method	2**		2**			
1,3-Dichloropropane	<1 µg	_	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Tetrachloroethene	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg.	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg		365 #	1.18 #	<1 #	612 #	81.3 #	<1 #
m,p-Xylene	<1 µg		582 #	14.1 #	<1 #	1070 #	191 #	<1 #
o-Xylene	<1 µg.		295 #	14.3 #	<1 #	521 #	93.8	<1 #
Styrene	<1 µg		75.5 #	<1 #	<1 #	388 #	91.3	<1 #
Bromoform	<1 µg.		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg.		11.2	<1 #	<1 #	15.9	1.6	<1 #
1,1,2,2-Tetrachloroethane	<1 µg		<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	<1 µg.		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg		5.43	<1 #	<1 #	7.02	<1 #	<1 #
2-Chlorotoluene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg		63.8	3.26	<1 #	64.5	23.6	<1 #
4-Chlorotoluene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg.		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg		167 #	3.62	<1 #	185	67.5	<1 #
sec-Butylbenzene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg		<1 #	<1 #	<1 #	<1 #	18 #	<1 #
1,3-Dichlorobenzene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg		<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloroprop ane	<1 µg		<1	<1	<1 <1	<1 <1	<1 <1	<1
1,2,4-Trichlorobenzene	<1 µg		<1 #	<1 #	#	#	#	<1 #
Hexachlorobutadiene	<1 µg		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg.		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg	/I TM208	5310 #	51.4 #	<1 #	15100 #	4540 #	<1 #



Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number: WSP Remediation 255906 Job:

**Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

VOC MS (W)								
Results Legend # ISO17025 accredited.		Customer Sample R	RW01	RW02	RW03	RW04	RW05	RW06
M mCERTS accredited. aq Aqueous / settled sample. diss.fill: Dissolved / filtered sample. tot.unfilt  Total / unfiltered sample.  "Subcontracted test. " /* recovery of the surrogate stands. check the efficiency of the method results of individual compounds w samples aren't corrected for the re  (F) Trigger breach confirmed 148+§@ Sample deviation (see appendix)  Component	. The ithin	Depth (m) Sample Type Date Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference S Method	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632057 EW	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632068 EW	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632069 EW	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632070 EW	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632072 EW	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632076 EW
1,2,3-Trichlorobenzene	<1 µg/l		<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
1,3,5-Trichlorobenzene	<1 µg/l		<1	<1	<1	<1	<1	<1
Sum of detected Xylenes	<2 μg/l	TM208	877	28.4	<2	1590	285	<2

Validated

# **ALcontrol Laboratories**

## **CERTIFICATE OF ANALYSIS**

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: **Barry Waterfront** Order Number:

WSP Remediation 255906 Job: **Customer:** Report Number: Client Reference: Attention: Steve Gronow Superseded Report:

VOC MS (W)

VOC MS (W)								
Results Legend  # ISO17025 accredited.  M mCERTS accredited.	•	Customer Sample R	RW07	RW08	RW09	RW10	RW11	RW12
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test.		Depth (m) Sample Type Date Sampled	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013
results of individual compounds wi samples aren't corrected for the rec	thin	Date Received SDG Ref	131220-67	131220-67	131220-67	131220-67	131220-67	131220-67
(F) Trigger breach confirmed	,	Lab Sample No.(s)	8632077 EW	8632078 EW	8632079 EW	8632059 EW	8632061 EW	8632063 EW
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference Method						
Dibromofluoromethane**	%	TM208	109	104	105	104	104	101
Toluene-d8**	%	TM208	98.4	98.4	98.7	99	100	98.9
4-Bromofluorobenzene**	%	TM208	97.2	101	102	102	102	102
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Chloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Benzene	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

# **ALcontrol Laboratories**

131220-67 H\_WSP\_CDF-63 39784.001

**CERTIFICATE OF ANALYSIS** 

Location: Barry Waterfront

WSP Remediation **Customer:** Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Validated

#### VOC MS (W)

Client Reference:

SDG:

Job:

VOC MS (W)								
Results Legend  # ISO17025 accredited.  M mCERTS accredited.		Customer Sample R	RW07	RW08	RW09	RW10	RW11	RW12
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.  * recovery of the surrogate standa		Depth (m) Sample Type Date Sampled Sampled Time	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3	0.00 Water(GW/SW) 16/12/2013 3
check the efficiency of the method results of individual compounds w samples aren't corrected for the re  (F) Trigger breach confirmed	ithin	Date Received SDG Ref Lab Sample No.(s)	18/12/2013 131220-67 8632077	18/12/2013 131220-67 8632078	18/12/2013 131220-67 8632079	18/12/2013 131220-67 8632059	18/12/2013 131220-67 8632061	18/12/2013 131220-67 8632063
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Unit	AGS Reference	EW	EW	EW	EW	EW	EW
1,3-Dichloropropane	<1 μg/	_	<1	<1	<1	<1	<1	<1
Tetrachloroethene	<1 µg/	/I TM208	**************************************	*1 *1 *#	<1 #	<1 #	*1 *1 *#	**************************************
Dibromochloromethane	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/	/I TM208	<1 #	~1 #	<1 #	<1 #	~1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/	/I TM208	1.05 #	<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/	/I TM208	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/		<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloroprop ane	<1 µg/		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/	/I TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #



Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: Barry Waterfront Order Number: WSP Remediation 255906 Job: **Customer:** Report Number:

Client Reference: Attention: Steve Gronow Superseded Report:

VOC MS (W)

VOC MS (W)								
# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample.		Customer Sample R  Depth (m)	RW07	RW08 0.00	RW09 0.00	RW10 0.00	RW11 0.00	RW12 0.00
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type Date Sampled	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013
** % recovery of the surrogate standa check the efficiency of the method.		Sampled Time Date Received	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013	3 18/12/2013
results of individual compounds wi samples aren't corrected for the re-		SDG Ref	131220-67 8632077	131220-67 8632078	131220-67	131220-67 8632059	131220-67 8632061	131220-67 8632063
(F) Trigger breach confirmed 1-4&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	EW	EW	8632079 EW	EW	EW	6032003 EW
Component	LOD/Unit	_						
1,2,3-Trichlorobenzene	<1 µg/		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/		<1	<1	<1	<1	<1	<1
Sum of detected Xylenes	<2 µg/	I TM208	<2	<2	<2	<2	<2	<2



Validated

**ALcontrol Laboratories** 

131220-67 H\_WSP\_CDF-63 39784.001 SDG: Job: Client Reference:

Location: Barry Waterfront WSP Remediation **Customer:** Attention: Steve Gronow

Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

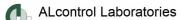
Ollent Reference. 3370-			Attention. Ott	eve Gronow		ouperscaed repo	
VOC MS (W)							
Results Legend	C	ustomer Sample R	RW13	RW14	RW15		
# ISO17025 accredited.							
M mCERTS accredited.  aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample.		Depth (m)	0.00	0.00	0.00		
tot.unfilt Total / unfiltered sample.  * Subcontracted test.		Sample Type	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013	Water(GW/SW) 16/12/2013		
** % recovery of the surrogate standa	rd to	Date Sampled Sampled Time	3	3	3		
check the efficiency of the method.	The	Date Received	18/12/2013	18/12/2013	18/12/2013		
results of individual compounds wi samples aren't corrected for the re-		SDG Ref	131220-67	131220-67	131220-67		
(F) Trigger breach confirmed	,	Lab Sample No.(s)	8632064	8632065	8632066		
1-4&+§@ Sample deviation (see appendix)		AGS Reference	EW	EW	EW		
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM208	105	106	99.6		
	, ,						
T-1 d0**	0/	TM000	00.7	00.0	00.0		
Toluene-d8**	%	TM208	98.7	98.9	99.2		
4-Bromofluorobenzene**	%	TM208	102	102	102		
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1		
Dichiorodinaorometriane	11 µg/1	1101200	٠,	`'	71		
Chloromethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Bromomethane	<1 µg/l	TM208	<1	<1	<1		
Biomomediane	~ ι μg/ι	1101200					
			#	#	#		
Chloroethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1		
Themorematicaliane	11 µg/1	1101200					
=			#	#	#		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1		
i i			#	#	#		
Dichloromethane	<3 µg/l	TM208	<3	<3	<3		
Dichioroffiethane	<3 μg/i	1101200					
			#	#	#		
Methyl tertiary butyl ether	<1 µg/l	TM208	<1	<1	<1		
(MTBE)			#	#	#		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
adile 1,2 Biomerecarene	n pg/i	1111200	#	#	#		
4.4.5:11	4 #	T14000					
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
Z,Z Biomoropropario	n pg/i	1111200	.,	· ·	.,		
B	4 0	T14000	.4	.4	.4		
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Chloroform	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1		
1,1,1-111011010etilalie	- 1 μg/1	1101200					
			#	#	#		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
1.2 Diobloroothono	<1 ug/l	TM208	<1	<1	<1		
1,2-Dichloroethane	<1 µg/l	1101200	<u> </u>	<u> </u>	<u> </u>		
Benzene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Trichloroethene	<1 µg/l	TM208	<1	<1	<1		
Thomorocarche	11 µg/1	1101200					
		=	#	#	#		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
Dibromomethane	<1 µg/l	TM208	<1	<1	<1		
	F-5/.		. #	. #	. #		
Promodiableromethere	۰4 ۰۰- ۳	TM200					
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
		1	#	#	#		
Toluene	<1 µg/l	TM208	<1	<1	<1		
. 3.46.16	. ду/	200					
trans 4.0 Districts	.4 "	T14000	#	#	#		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1		
			#	#	#		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1		
		1	#	#	#		



Validated

SDG:131220-67Location:Barry WaterfrontOrder Number:23945/39784/tmJob:H\_WSP\_CDF-63Customer:WSP RemediationReport Number:255906Client Reference:39784.001Attention:Steve GronowSuperseded Report:

VOC MS (W)					_	
# ISO17025 accredited.  M mCERTS accredited.		Customer Sample R	RW13	RW14	RW15	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  * Subcontracted test.  ** % recovery of the surrogate stands	ard to	Depth (m) Sample Type Date Sampled	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	0.00 Water(GW/SW) 16/12/2013	
check the efficiency of the method	. The	Sampled Time Date Received	3 18/12/2013	3 18/12/2013	3 18/12/2013	
samples aren't corrected for the re (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	131220-67 8632064	131220-67 8632065	131220-67 8632066	
1-4&+§@ Sample deviation (see appendix)  Component	LOD/Uni	AGS Reference	EW	EW	EW	
1,3-Dichloropropane	<1 μg		<1	<1	<1	
	13		#	#	#	
Tetrachloroethene	<1 µg	/I TM208	<1 #	<1 #	<1 #	
Dibromochloromethane	<1 µg	/I TM208	<1	<1	<1	
1,2-Dibromoethane	<1 µg	/I TM208	<b>*</b>	# <1	<1	
			#	#		
Chlorobenzene	<1 µg	/I TM208	<1 #	<1 #	<1 #	
1,1,1,2-Tetrachloroethane	<1 µg	/I TM208	<1	<1	<1	
Ethylbenzene	<1 µg.	/I TM208	<1	* <1	* <1	
m,p-Xylene	<1 ua	/I TM208	# <1	# <1	# <1	
пі,р-хуіепе	<1 µg	71 1101200	<b>~</b> 1	<u> </u>		
o-Xylene	<1 µg	/I TM208	<1 #	<1 #	<1 #	
Styrene	<1 µg	/I TM208	<1	<1	<1	
Bromoform	<1 µg.	/I TM208	<b>*</b>	# <1	# <1	
			#	#	#	
Isopropylbenzene	<1 µg	/I TM208	<1 #	<1 #	<1 #	
1,1,2,2-Tetrachloroethane	<1 µg	/I TM208	<1	<1	<1	
1,2,3-Trichloropropane	<1 µg	/I TM208	<1 #	<1 #	<1 **	
Bromobenzene	<1 µg	/I TM208	<1 #	<1 #	<1	
Propylbenzene	<1 µg	/I TM208	<1	<1	<1	
2-Chlorotoluene	<1 µg.	/I TM208	# <1 #	** <1 **	<1	
1,3,5-Trimethylbenzene	<1 µg	/I TM208	<1 #	<1 #	<1	
4-Chlorotoluene	<1 µg	/I TM208	<1	<1	<1	
tert-Butylbenzene	<1 µg	/I TM208	** <1 **	** <1 **	<1	
1,2,4-Trimethylbenzene	<1 µg	/I TM208	<1	<1	<1	
sec-Butylbenzene	<1 µg.	/I TM208	<b>*</b>	# <1	* <1	
4-iso-Propyltoluene	<1 μg	/I TM208	<b>*</b>	# <1	# <1	
			#	#	#	
1,3-Dichlorobenzene	<1 µg	/I TM208	<1 #	<1 #	<1 #	
1,4-Dichlorobenzene	<1 µg	/I TM208	<1 #	<1 #	<1	
n-Butylbenzene	<1 µg	/I TM208	<1	<1	<1	
1,2-Dichlorobenzene	<1 µg	/I TM208	<1	*1	<1	
1,2-Dibromo-3-chloroprop ane	<1 µg	/I TM208	<1	<1	<1	
1,2,4-Trichlorobenzene	<1 µg.	/I TM208	<1 #	<1 #	<1 #	
Hexachlorobutadiene	<1 µg	/I TM208	<1 #	<1 #	<1	
tert-Amyl methyl ether (TAME)	<1 µg	/I TM208	<1 #	<1 #	<1	
Naphthalene	<1 µg.	/I TM208	<1	<1	<1	
			#	#	#	



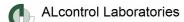
Validated

131220-67 H\_WSP\_CDF-63 39784.001 23945/39784/tm SDG: Location: **Barry Waterfront** Order Number: 255906 Job:

WSP Remediation **Customer:** Report Number: Attention: Steve Gronow Superseded Report:

Client Reference:

VOC	VIS (W)							
#	Results Legend ISO17025 accredited.		Customer Sample R	RW13	RW14	RW15		
M aq diss.filt tot.unfilt **	mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted test. % recovery of the surrogate standa check the efficiency of the method. results of individual compounds wi samples aren't corrected for the recovery of the surrogate standa check the efficiency of the method. Trigger breach confirmed Sample deviation (see appendix)	The thin covery	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632064 EW	0.00 Water(CW/SW) 16/12/2013 3 18/12/2013 131220-67 8632065 EW	0.00 Water(GW/SW) 16/12/2013 3 18/12/2013 131220-67 8632066 EW		
Compo		LOD/Unit						
1,2,3-	Trichlorobenzene	<1 µg/	'I TM208	<1	<1	<1		
1,3,5-	Trichlorobenzene	<1 µg/	/I TM208	<1	* <1	<1		
Sum o	f detected Xylenes	<2 µg/	/I TM208	<2	<2	<2		



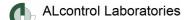
Validated

SDG:131220-67Location:Barry WaterfrontOrder Number:23945/39784/tmJob:H\_WSP\_CDF-63Customer:WSP RemediationReport Number:255906Client Reference:39784.001Attention:Steve GronowSuperseded Report:

**Table of Results - Appendix** 

Method No	Reference	Description	Wet/Dry Sample <sup>1</sup>	Surrogate Corrected
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

<sup>&</sup>lt;sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



Validated

SDG:131220-67Location:Barry WaterfrontOrder Number:23945/39784/tmJob:H\_WSP\_CDF-63Customer:WSP RemediationReport Number:255906Client Reference:39784.001Attention:Steve GronowSuperseded Report:

**Test Completion Dates** 

i oot oomprotten battoo												
Lab Sample No(s)	8632057	8632068	8632069	8632070	8632072	8632076	8632077	8632078	8632079	8632059		
Customer Sample Ref.	RW01	RW02	RW03	RW04	RW05	RW06	RW07	RW08	RW09	RW10		
AGS Ref.	EW											
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Туре	LIQUID											
EPH CWG (Aliphatic) Aqueous GC (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014		
EPH CWG (Aromatic) Aqueous GC (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014		
GRO by GC-FID (W)	24-Dec-2013	24-Dec-2013	24-Dec-2013	24-Dec-2013	24-Dec-2013	28-Dec-2013	28-Dec-2013	24-Dec-2013	24-Dec-2013	24-Dec-2013		
PAH Spec MS - Aqueous (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014		
Phenols by HPLC (W)	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013		
TPH CWG (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014		
VOC MS (W)	30-Dec-2013	24-Dec-2013	24-Dec-2013	30-Dec-2013	31-Dec-2013	30-Dec-2013	30-Dec-2013	30-Dec-2013	30-Dec-2013	30-Dec-2013		
•												

Lab Sample No(s)	8632061	8632063	8632064	8632065	8632066
Customer Sample Ref.	RW11	RW12	RW13	RW14	RW15
AGS Ref.	EW	EW	EW	EW	EW
Depth	0.00	0.00	0.00	0.00	0.00
Туре	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH CWG (Aliphatic) Aqueous GC (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014
EPH CWG (Aromatic) Aqueous GC (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014
GRO by GC-FID (W)	24-Dec-2013	24-Dec-2013	24-Dec-2013	24-Dec-2013	24-Dec-2013
PAH Spec MS - Aqueous (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014
Phenols by HPLC (W)	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013	31-Dec-2013
TPH CWG (W)	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014	03-Jan-2014
VOC MS (W)	30-Dec-2013	30-Dec-2013	30-Dec-2013	30-Dec-2013	30-Dec-2013

Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

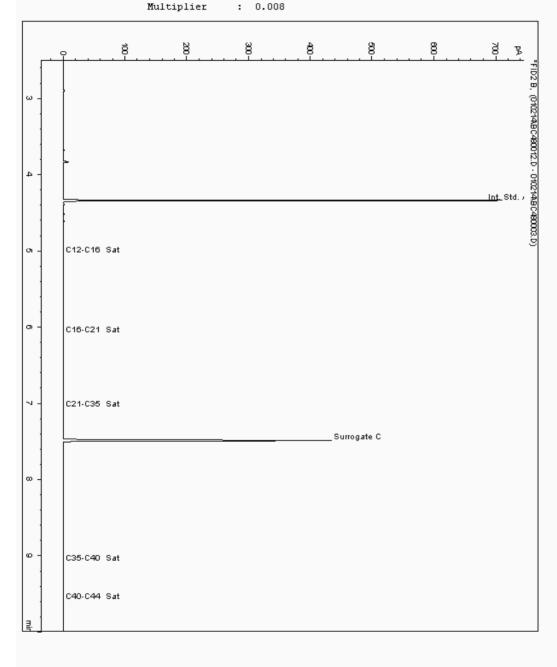
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8635952 Depth: 0.00 Sample ID: PW04

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226788-8635952 Date Acquired : 02/01/2014 17:07:14 PM

Date Acquired : 02/01/2014 17
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

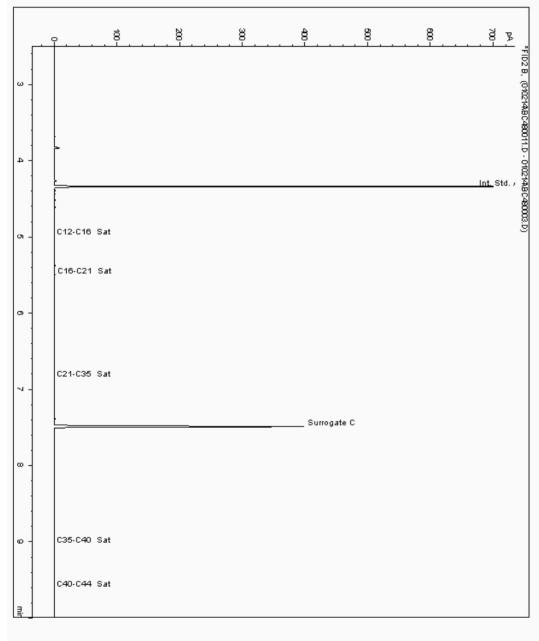
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8635956 Depth: 0.00

Sample ID: RW03

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226765-8635956 Date Acquired : 02/01/2014 16:48:37 PM

Date Acquired : 02/01 Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

 SDG:
 131220-67
 Location:
 Barry Waterfront

 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation

 Client Reference:
 39784.001
 Attention:
 Steve Gronow

Order Number: 2
Report Number: 2
Superseded Report:

23945/39784/tm 255906

Chromatogram

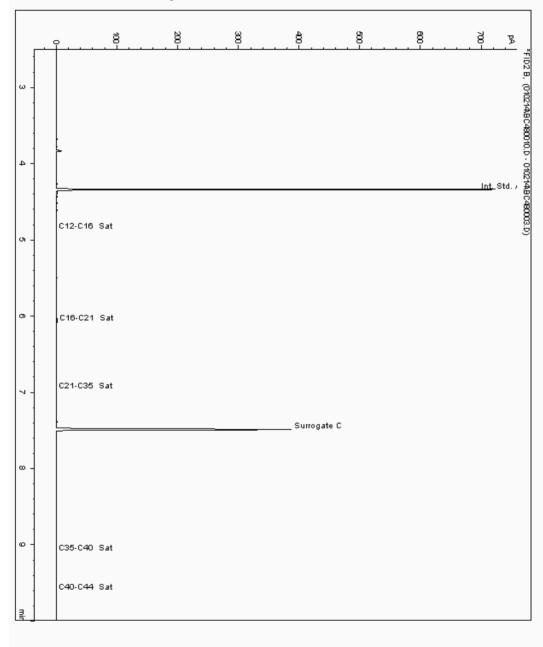
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8635960 Depth: 0.00

Sample ID : RW02

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226740-8635960 Date Acquired : 02/01/2014 16:29:59 PM

Date Acquired : 02/01
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: 23
Report Number: 25
Superseded Report:

23945/39784/tm 255906

Chromatogram

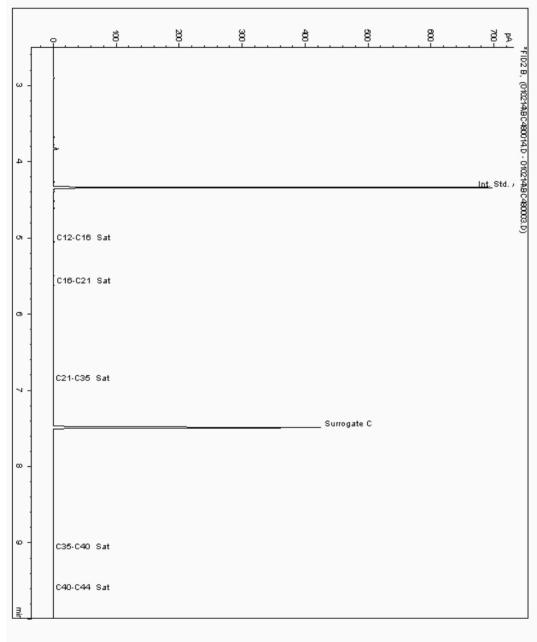
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8635971 Depth: 0.00 Sample ID: PW01

Sample ID : RW01

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 8226582-8635971
Date Acquired : 02/01/2014 17:44:40 PM
Units : ppb

Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report:

23945/39784/tm 255906

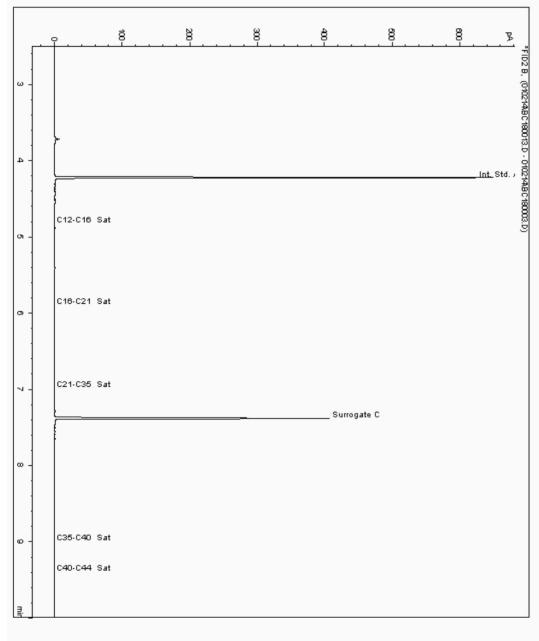
Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8635975 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

8226859-8635975 02/01/2014 17:20:06 PM Sample Identity: Date Acquired : Units :

ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

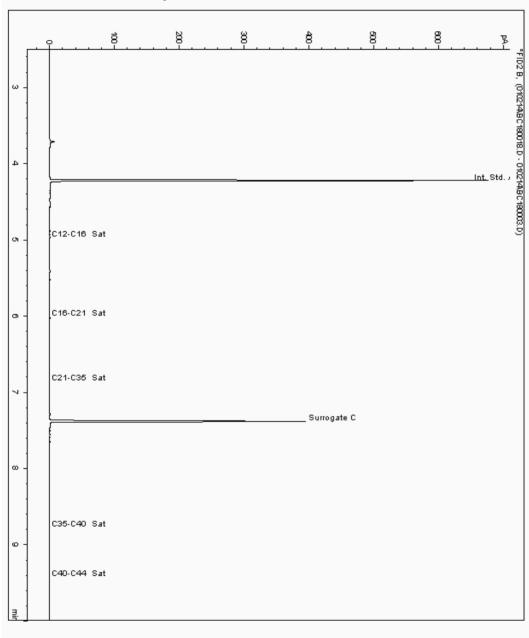
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No: 8635993 Sample ID: PW05 **Depth**: 0.00

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226804-8635993 Date Acquired : 02/01/2014 18:53:26 PM

Date Acquired : 02/01
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

131220-67 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

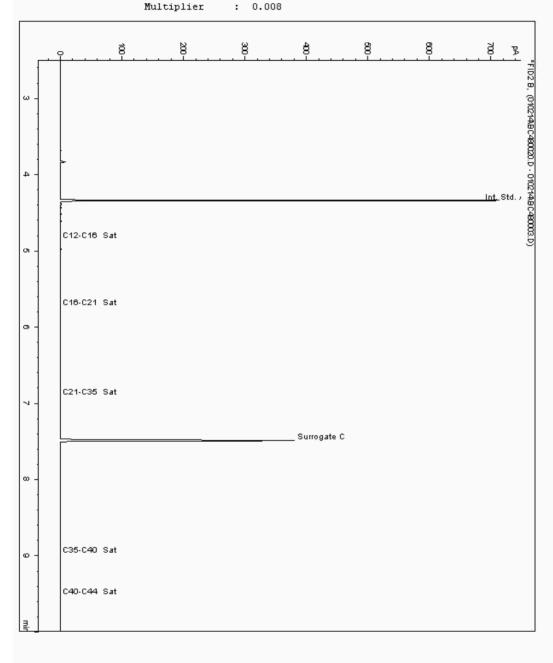
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8635997 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

8226842-8635997 02/01/2014 19:36:20 PM Sample Identity:

Date Acquired : Units : ppb Dilution 1 0.008



Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number:

23945/39784/tm 255906

Superseded Report:

# Chromatogram

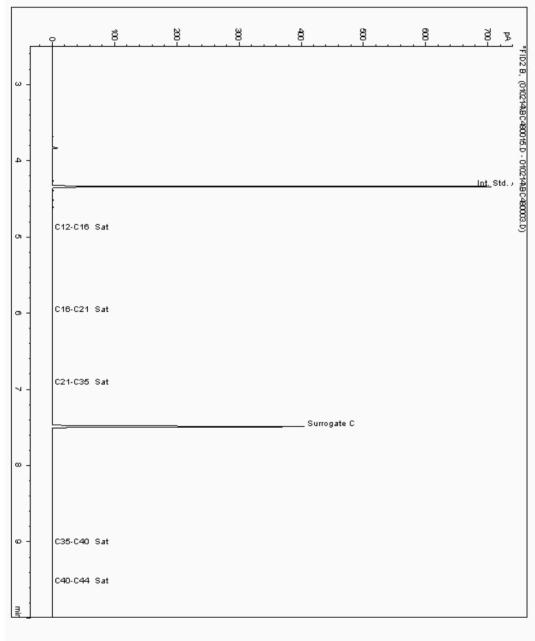
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8636001 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity:

8226820-8636001 02/01/2014 18:03:15 PM

Date Acquired : Units : ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report:

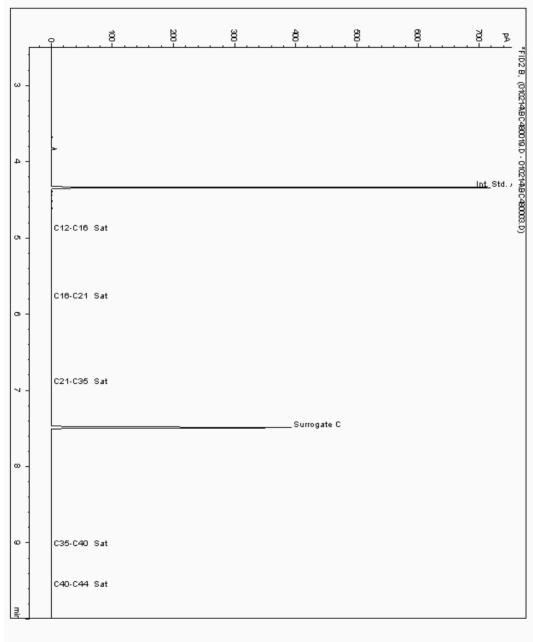
23945/39784/tm 255906

Chromatogram

> Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226617-8636227 Date Acquired : 02/01/2014 19:17:47 PM

Date Acquired : 02/01/Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

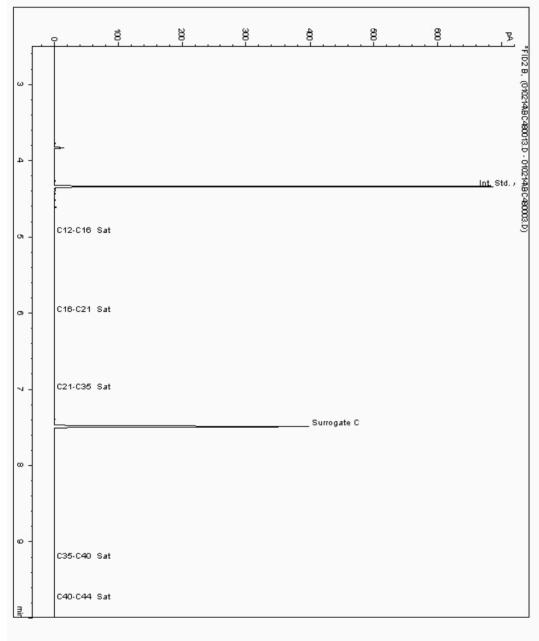
Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

> Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 8226679-8636237 Date Acquired : 02/01/2014 17:26:05 PM

| Date Acquired : 02/01/Units : ppb | Dilution : CF : 1 | Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

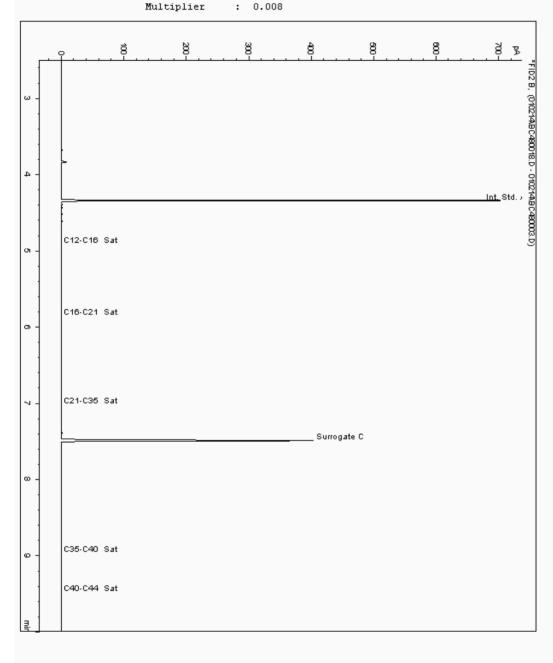
# Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No: 8636245 Depth: 0.00 Sample ID: PW09

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226875-8636245 Date Acquired : 02/01/2014 18:59:09 PM

Date Acquired : 02/01
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

131220-67 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report:

23945/39784/tm 255906

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 8636280 Sample ID : RW15

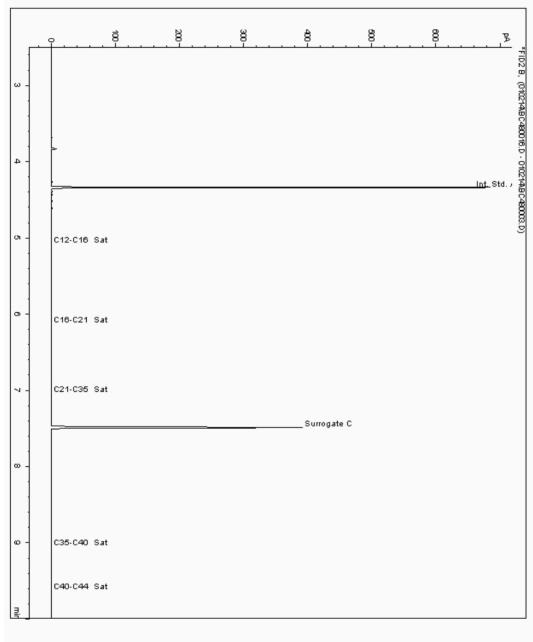
**Depth**: 0.00

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

8226717-8636280 02/01/2014 18:21:47 PM Sample Identity:

Date Acquired : Units : ppb

Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Customer: Attention: Barry Waterfront WSP Remediation Steve Gronow

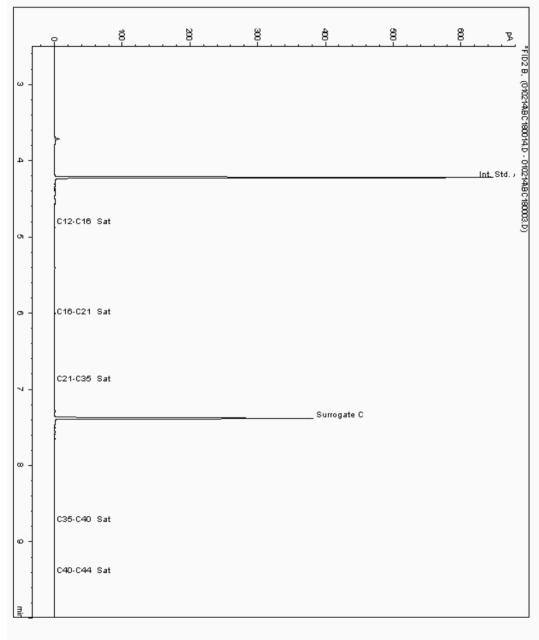
Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

> Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity: 8226695-8636286 Date Acquired : 02/01/2014 17:38:49 PM

Date Acquired : 02/01, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

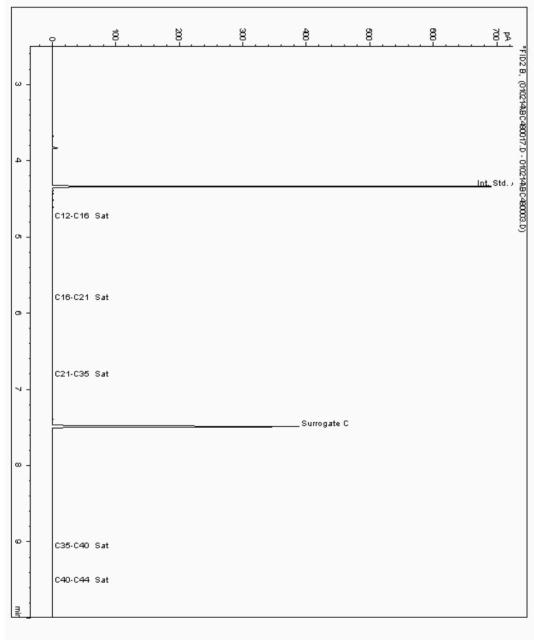
Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : 8636293 **Depth**: 0.00 Sample ID : RW12

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( Cl2 - C40 )

Sample Identity:

8226660-8636293 02/01/2014 18:40:35 PM Date Acquired : Units :

ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

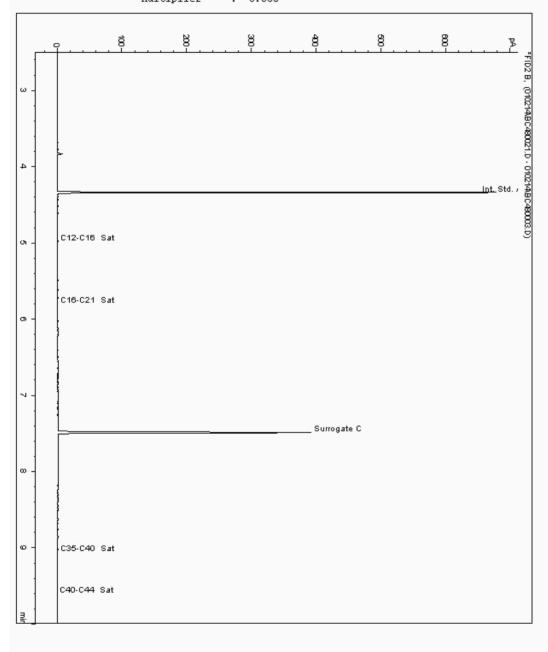
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No: 8636296 Sample ID: RW11 **Depth**: 0.00

Alcontrol/Geochem Analytical Services Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 8226643-8636296 Date Acquired : 02/01/2014 19:55:07 PM

Date Acquired : 02/01
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

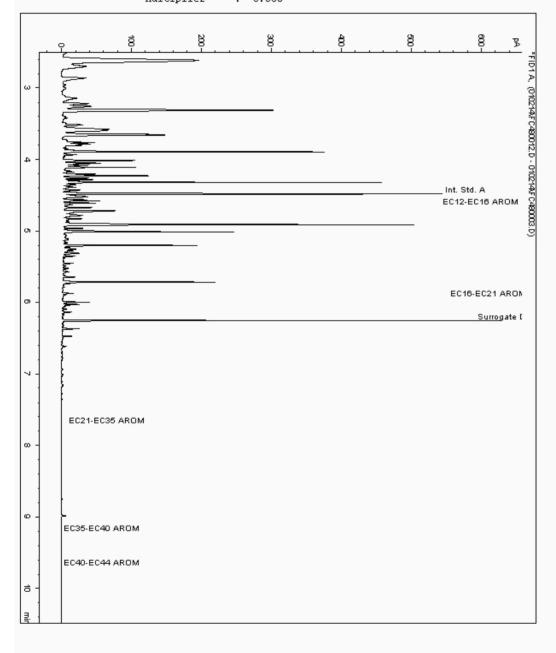
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : 8635952 **Depth**: 0.00 Sample ID : RW04

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8226789-8635952 02/01/2014 17:07:13 PM Sample Identity:

Date Acquired : Units : ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report:

23945/39784/tm 255906

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W)

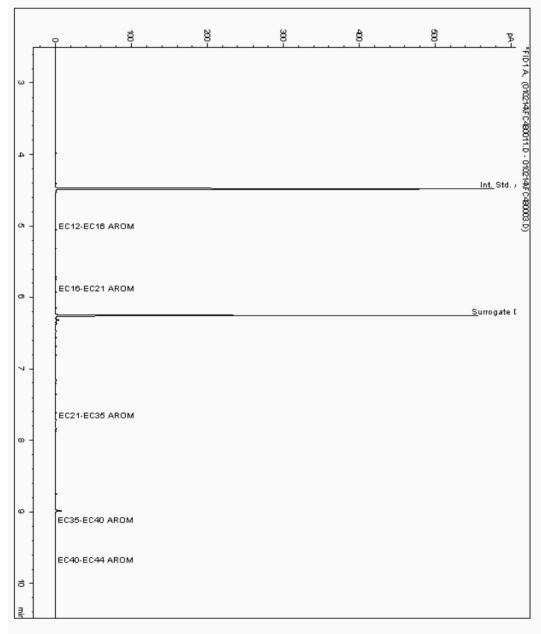
Sample No: 8635956 Sample ID: PW03 **Depth:** 0.00

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8226766-8635956 Date Acquired : 02/01/2014 16:48:36 PM

Date Acquired : 02/01/2014 16: Units : ppb Dilution :

Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Customer: Attention:

Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

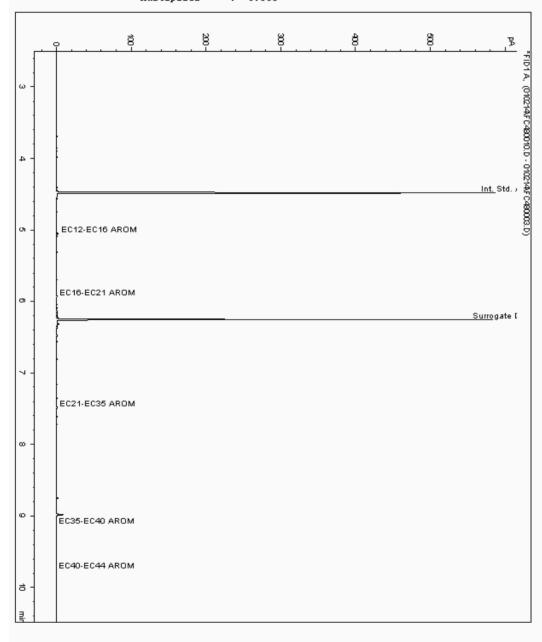
**Analysis:** EPH CWG (Aromatic) Aqueous GC (W)

Sample No: 8635960 Sample ID: PW02 **Depth:** 0.00

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8226741-8635960 Date Acquired : 02/01/2014 16:29:59 PM

Date Acquired : 02/01
Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Ba Customer: W Attention: St

Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

# Chromatogram

> Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8226583-8635971 Date Acquired : 02/01/2014 17:44:41 PM

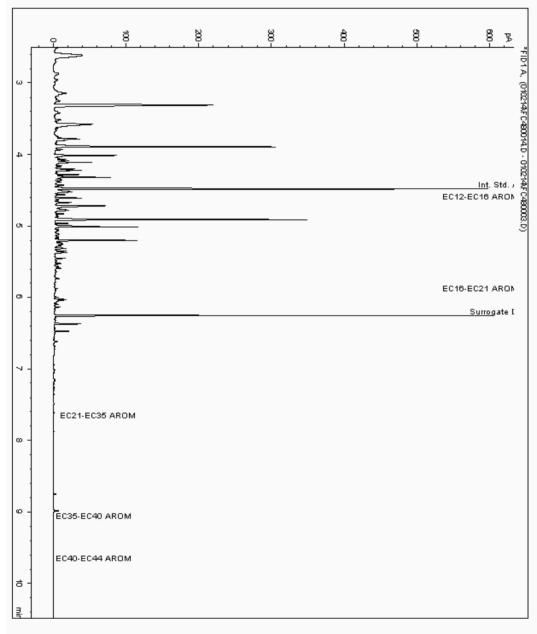
 Date Acquired : 02/01,

 Units : ppb

 Dilution :

 CF : 1

 Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: 239
Report Number: 255
Superseded Report:

23945/39784/tm 255906

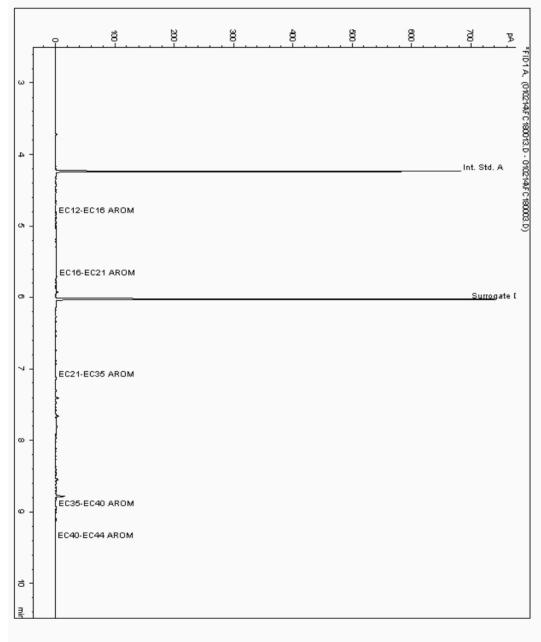
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8635975 Depth: 0.00 Sample ID: PW08

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8226860-8635975 Date Acquired : 02/01/2014 17:20:06 PM

| Date Acquired : 02/01/Units : ppb | Dilution : CF : 1 | Multiplier : 0.008



Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

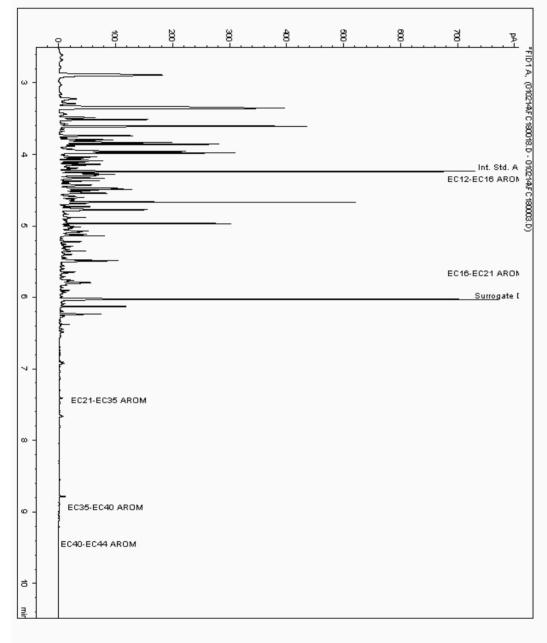
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8635993 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8226805-8635993 02/01/2014 18:53:25 PM Sample Identity:

Date Acquired : Units : ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Customer: Attention: Barry Waterfront WSP Remediation Steve Gronow Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Superseded Nepo

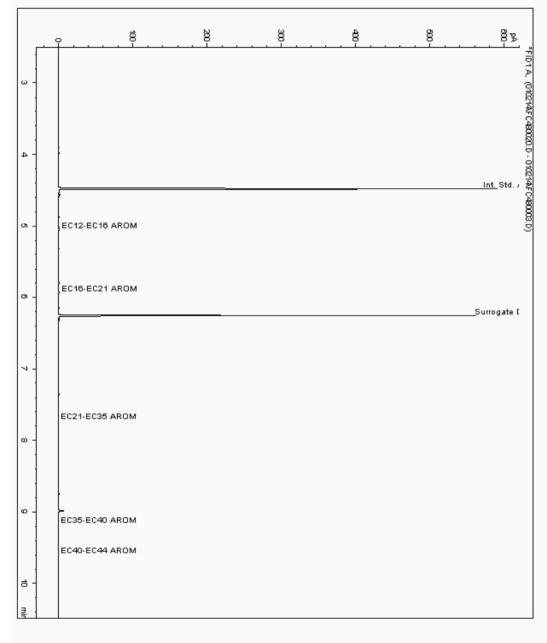
# Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8635997 Depth: 0.00 Sample ID: PW07

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 8226843-8635997 Date Acquired : 02/01/2014 19:36:21 PM

Date Acquired : 02/01, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

131220-67 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report:

23945/39784/tm 255906

# Chromatogram

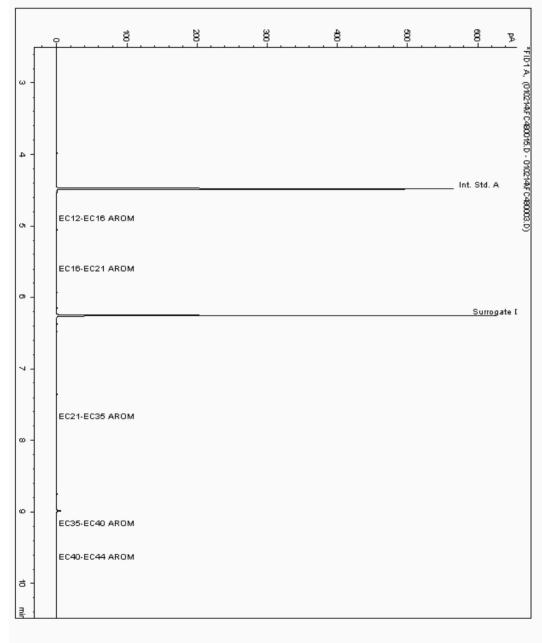
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8636001 Sample ID :

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

8226821-8636001 02/01/2014 18:03:14 PM Date Acquired : Units :

ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: 2 Report Number: 2 Superseded Report:

23945/39784/tm 255906

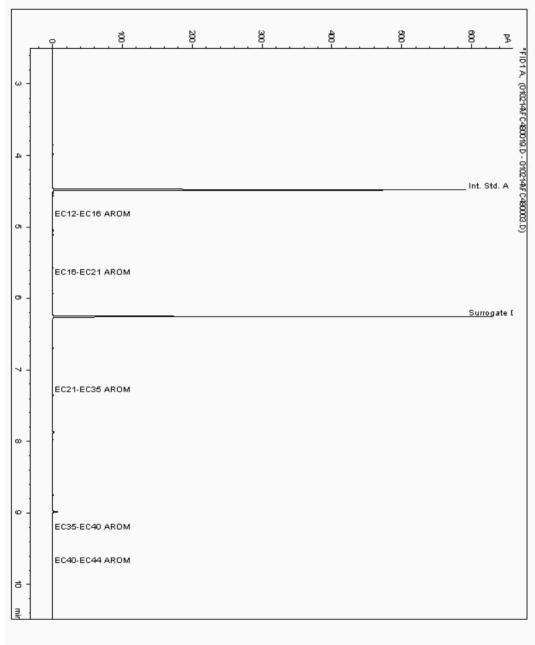
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8636227 Depth: 0.00 Sample ID: PW10

Sample ID: RW10

Alcontrol/Geochem Analytical Services
Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8226618-8636227 Date Acquired : 02/01/2014 19:17:46 PM



Validated

 SDG:
 131220-67
 Location:
 Barry Waterfront
 Order Nu

 Job:
 H\_WSP\_CDF-63
 Customer:
 WSP Remediation
 Report Nu

 Client Reference:
 39784.001
 Attention:
 Steve Gronow
 Supersed

 Order Number:
 23945/39784/tm

 Report Number:
 255906

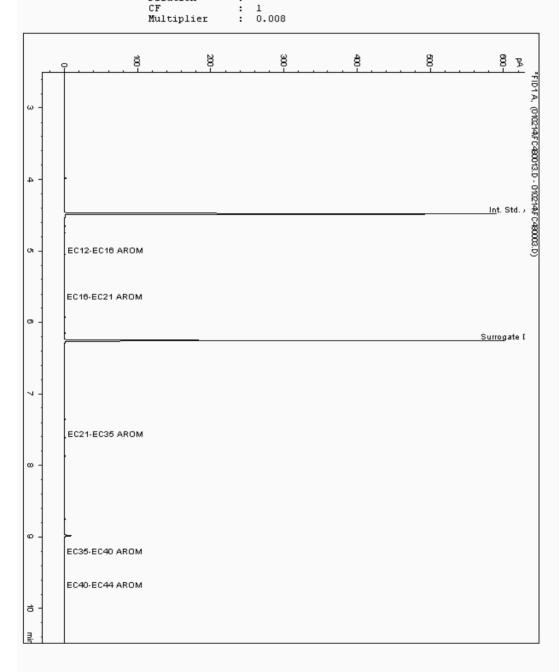
Superseded Report:

Chromatogram

> Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 8226680-8636237 Date Acquired : 02/01/2014 17:26:04 PM

Date Acquired : 02/01/2014 Units : ppb Dilution : CF : 1



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

Chromatogram

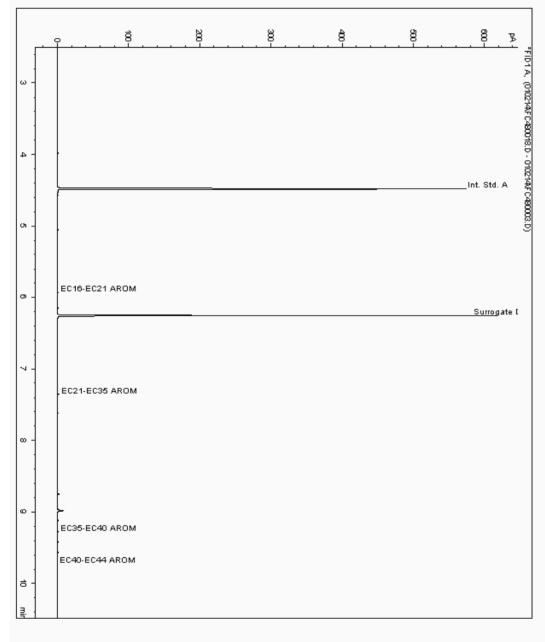
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8636245 Depth: 0.00

Sample ID: RW09

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 8226876-8636245 Date Acquired : 02/01/2014 18:59:10 PM Units : ppb

Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location: Barry Waterfront
Customer: WSP Remediation
Attention: Steve Gronow

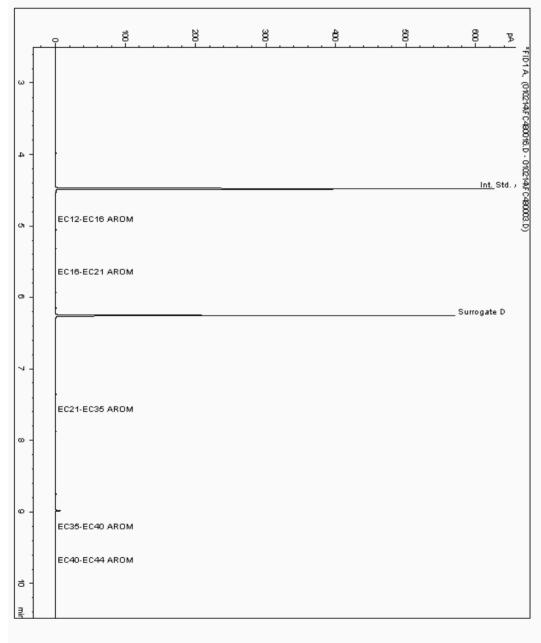
Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

Chromatogram

> Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( Cl2 - C40 )

Sample Identity: 8226718-8636280 Date Acquired : 02/01/2014 18:21:48 PM

Date Acquired : 02/01, Units : ppb Dilution : CF : 1 Multiplier : 0.008



Validated

131220-67 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Customer:** Attention:

**Barry Waterfront** WSP Remediation Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

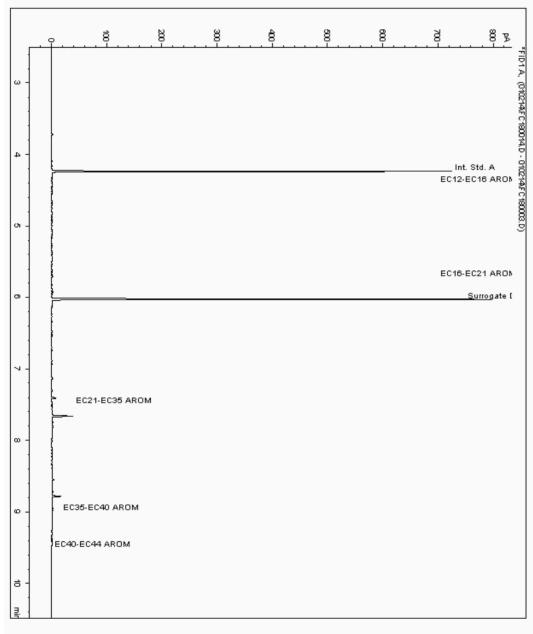
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8636286 Sample ID : RW14

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

8226696-8636286 02/01/2014 17:38:49 PM Sample Identity:

Date Acquired : Units : ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

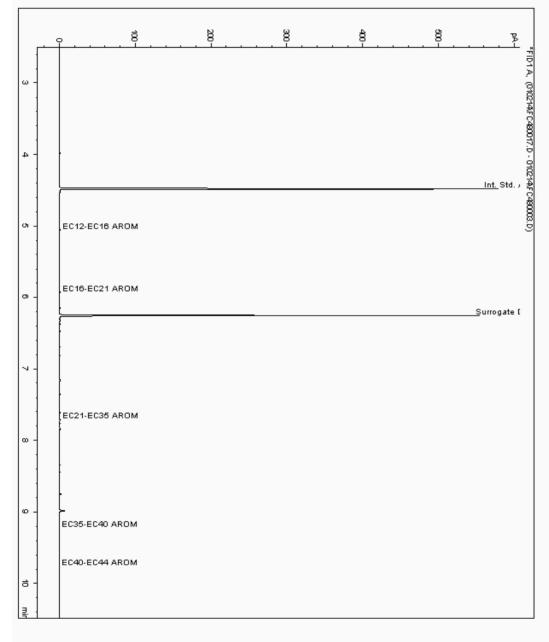
Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No: 8636293 Depth: 0.00 Sample ID: 0.00

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 8226661-8636293 Date Acquired : 02/01/2014 18:40:36 PM

Date Acquired : 02/01/Units : ppb
Dilution :
CF : 1
Multiplier : 0.008



Validated

131220-67 SDG: H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Barry Waterfront Location: **Customer:** WSP Remediation Attention: Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm

255906

## Chromatogram

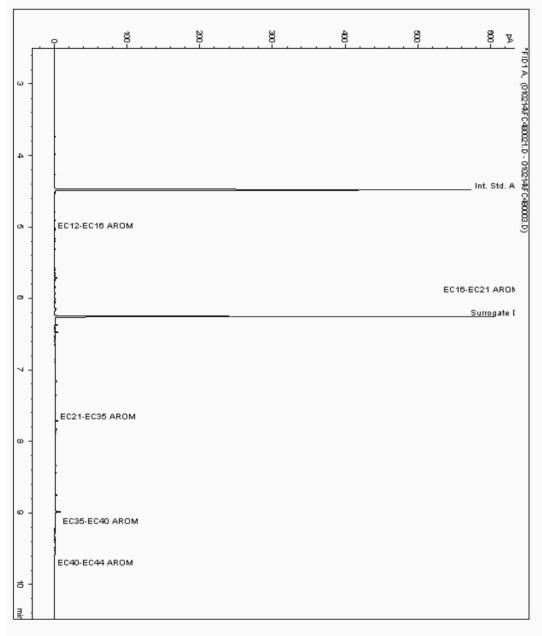
Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : **Depth**: 0.00 8636296 Sample ID : RW11

Alcontrol/Geochem Analytical Services Speciated TPH - AROM ( C12 - C40 )

Sample Identity:

8226644-8636296 02/01/2014 19:55:08 PM Date Acquired : Units :

ppb Dilution 1 0.008 Multiplier



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

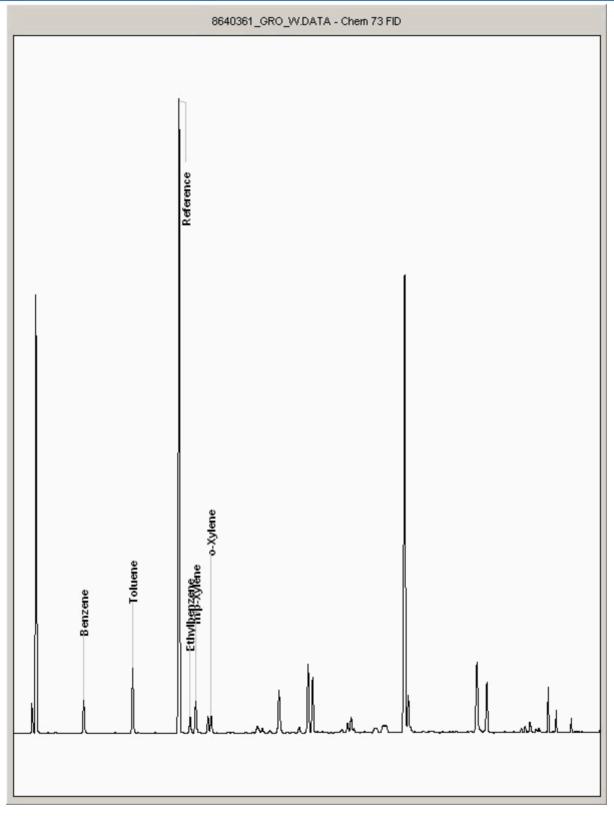
Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

## Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8640361
 Depth: 0.00

Sample ID: RW05





Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number:

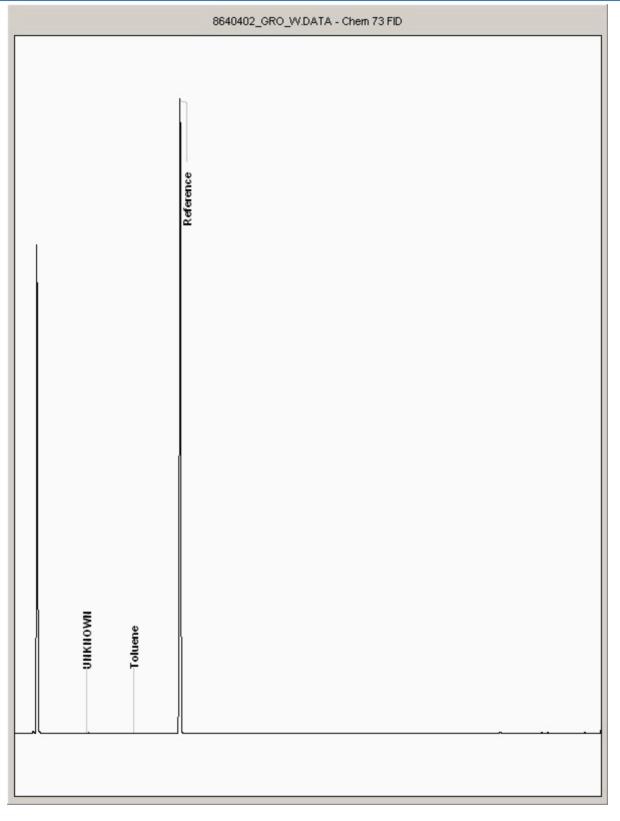
23945/39784/tm 255906

Superseded Report:

## Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8640402
 Bepth: 0.00

Sample ID : RW08





Analysis: GRO by GC-FID (W)

## **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: 239
Report Number: 255
Superseded Report:

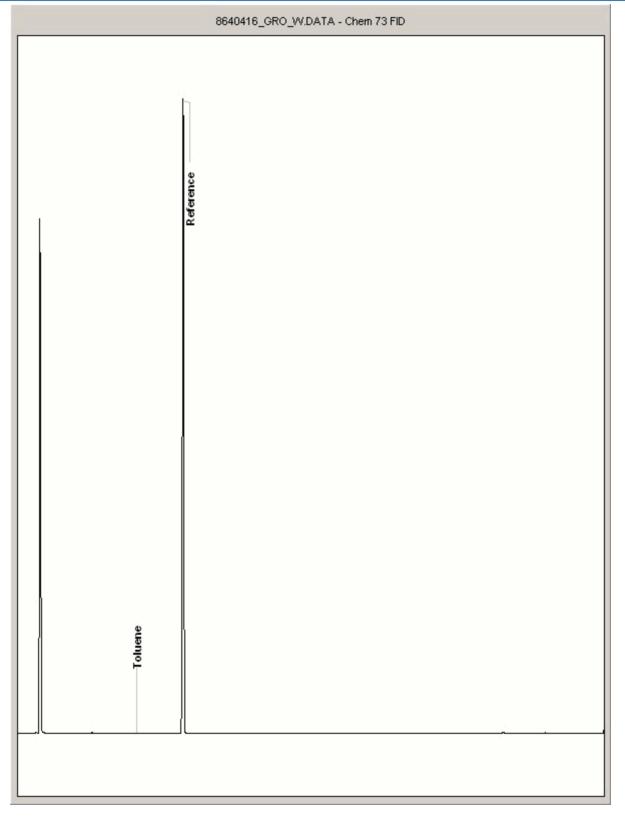
23945/39784/tm 255906

Superseded Repe

## Chromatogram

**Sample No**: 8640416 **Depth**: 0.00

Sample ID : RW09





Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

Chromatogram

8640426\_GRO\_W.DATA - Chem 73 FID



Analysis: GRO by GC-FID (W)

## **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

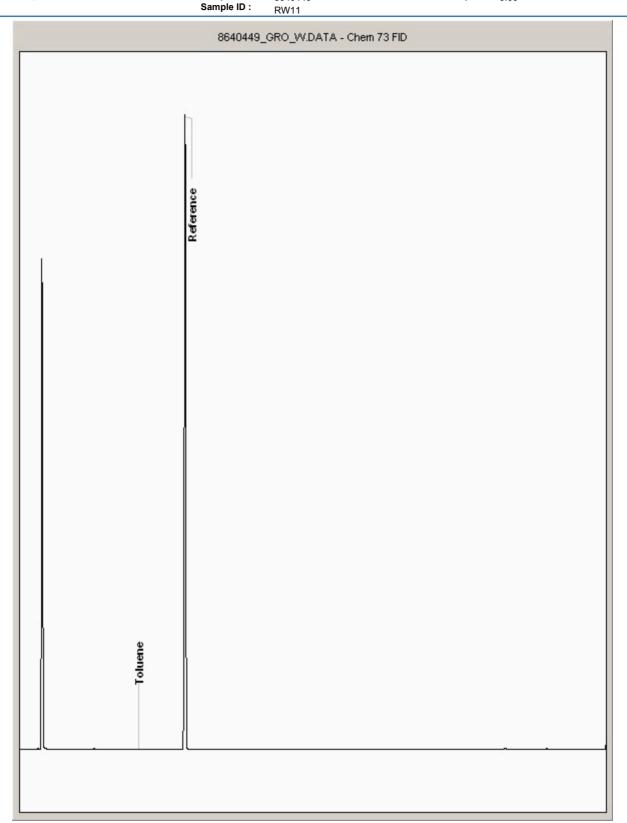
 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report: 23945/39784/tm 255906

.

## Chromatogram





Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront** WSP Remediation **Customer:** Attention: Steve Gronow

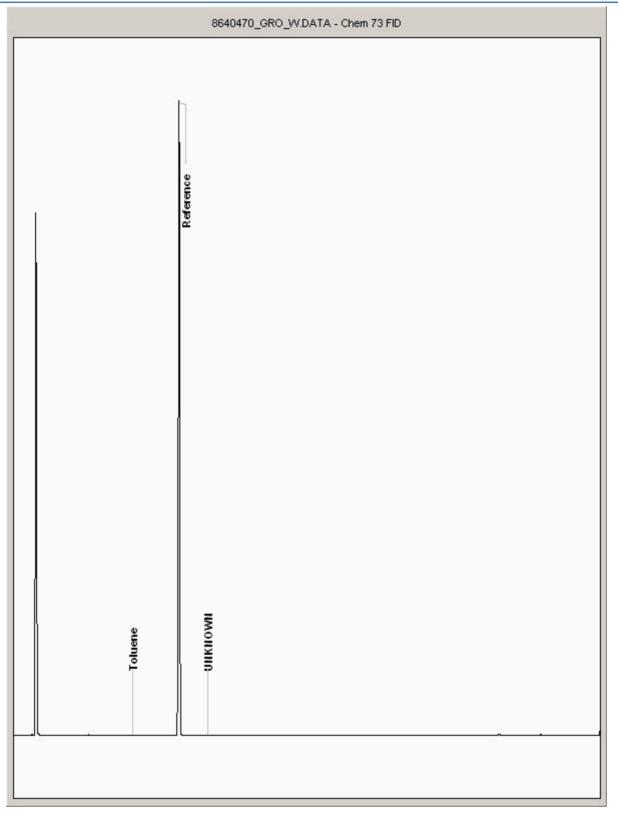
23945/39784/tm Order Number: Superseded Report:

255906

Chromatogram

Analysis: GRO by GC-FID (W) **Depth**: 0.00 Sample No : 8640470

Sample ID : RW12





Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number: Superseded Report:

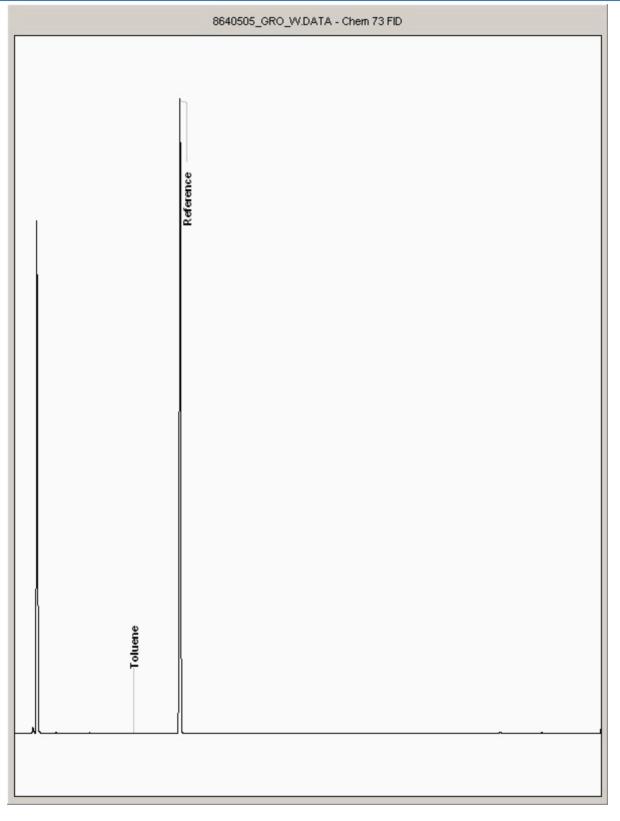
23945/39784/tm 255906

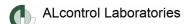
ouperseded Kept

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8640505
 Bepth: 0.00

Sample ID : RW13





Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

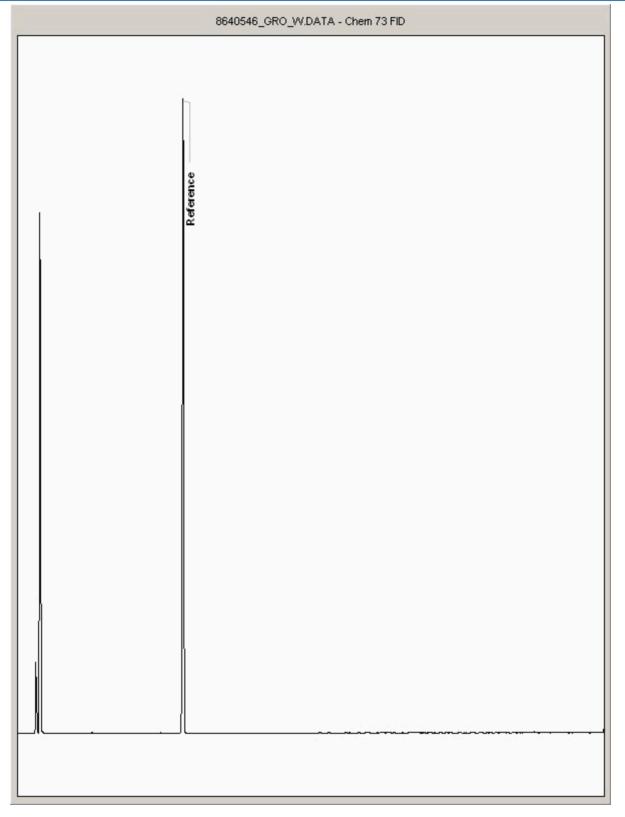
Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8640546
 Depth: 0.00

Sample ID : RW14





Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

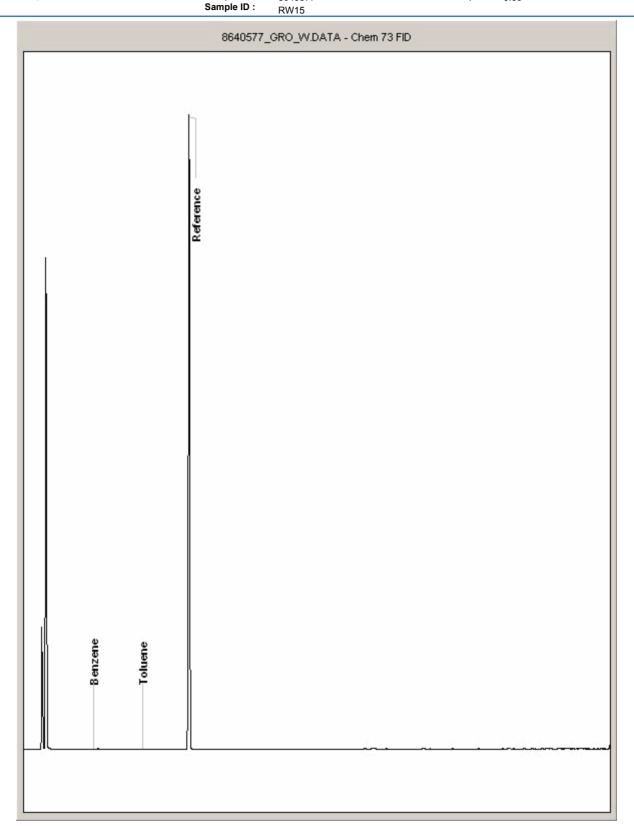
 Order Number:
 23945/39784/tm

 Report Number:
 255906

Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No: 8640577
 Bepth: 0.00



Validated

131220-67 H\_WSP\_CDF-63 39784.001 SDG: Job: Client Reference:

Location: Barry Waterfront WSP Remediation **Customer:** Attention: Steve Gronow

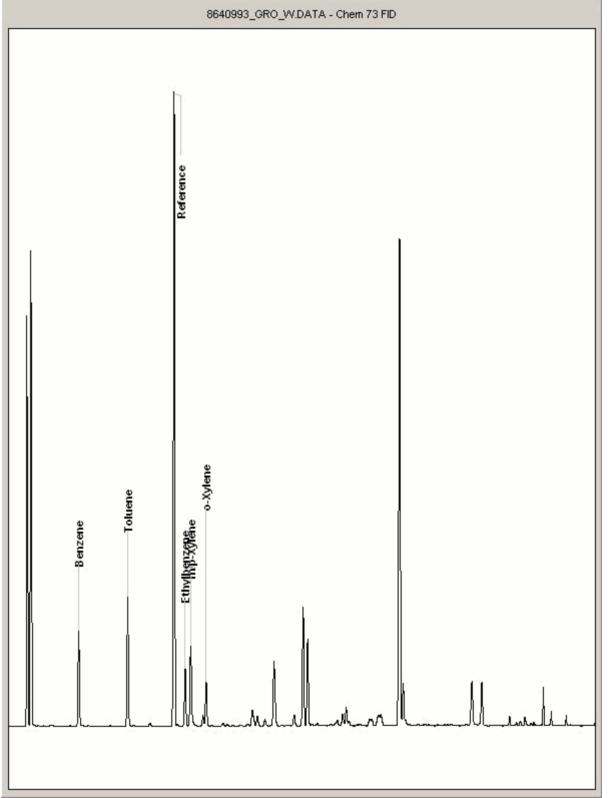
23945/39784/tm Order Number: 255906

Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W)  $\textbf{Depth}: \quad 0.00$ Sample No : 8640993 Sample ID : RW01





Analysis: GRO by GC-FID (W)

## **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

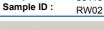
Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

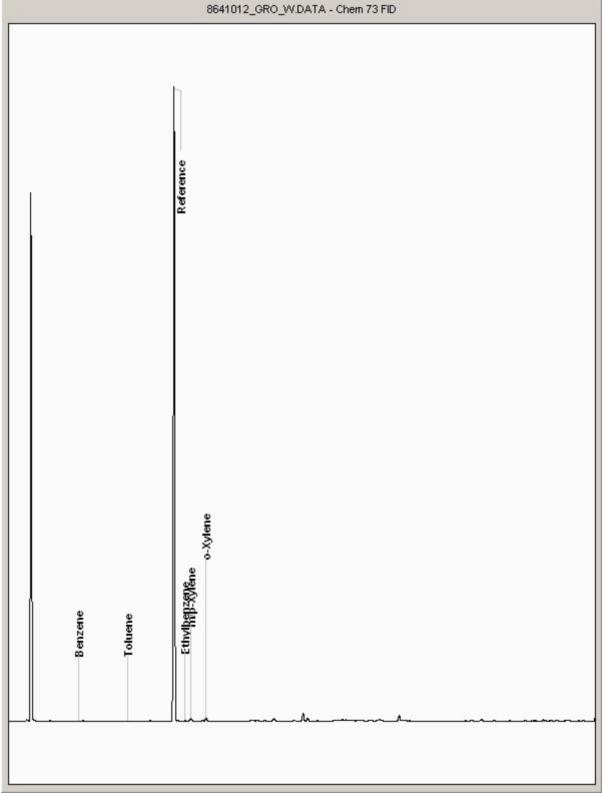
Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

## Chromatogram

**Sample No**: 8641012 **Depth**: 0.00







Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

Location: **Barry Waterfront** WSP Remediation **Customer:** Attention: Steve Gronow

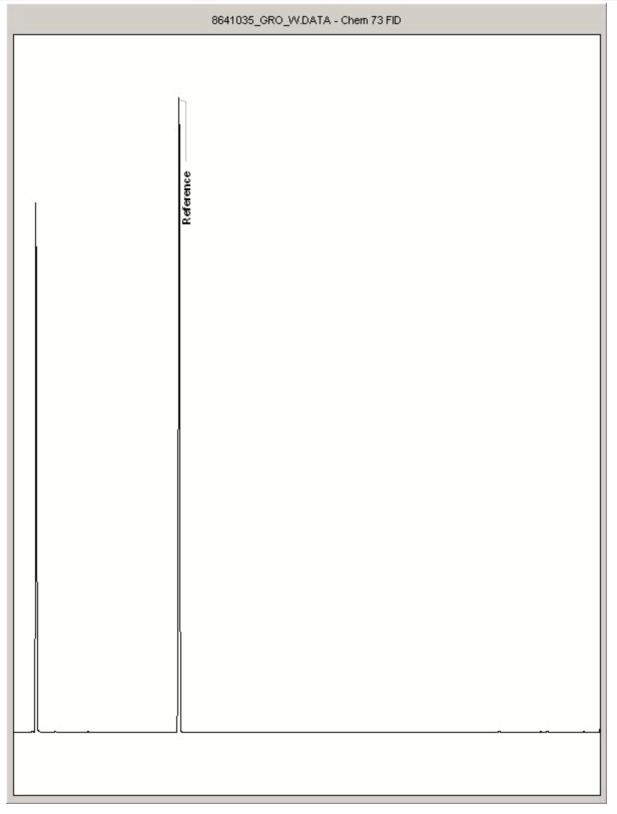
Order Number: 23945/39784/tm 255906

Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (W)  $\textbf{Depth}: \quad 0.00$ Sample No : 8641035

Sample ID : RW03



Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

Order Number: Report Number:

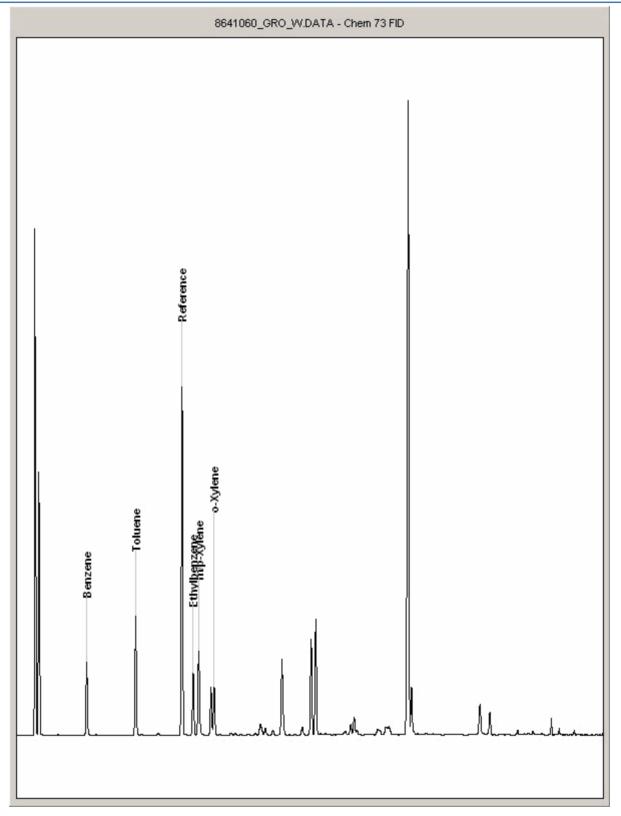
23945/39784/tm 255906

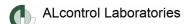
Superseded Report:

Chromatogram

 Analysis:
 GRO by GC-FID (W)
 Sample No:
 8641060
 Depth:
 0.00

Sample ID : RW04





Validated

SDG: 131220-67 H\_WSP\_CDF-63 Job: Client Reference: 39784.001

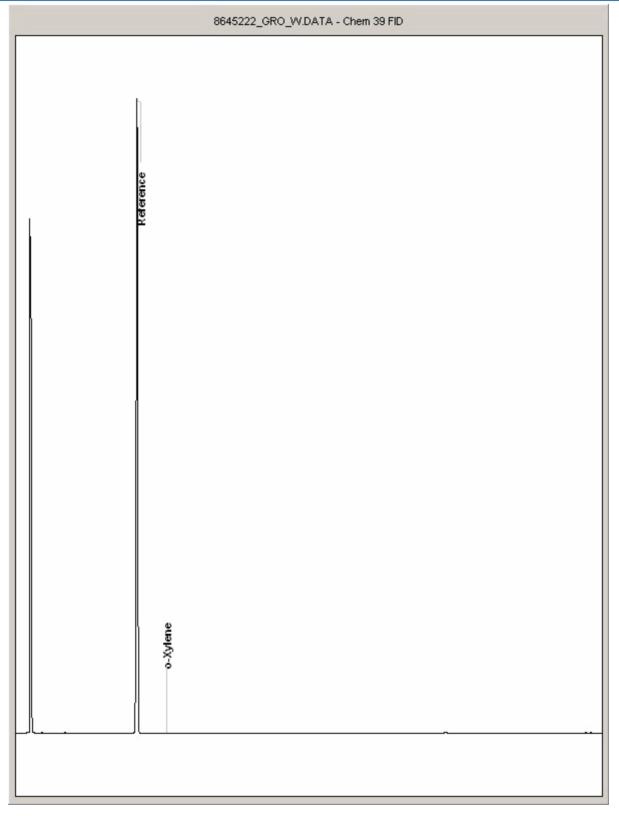
Location: **Barry Waterfront** WSP Remediation **Customer:** Attention: Steve Gronow

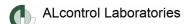
23945/39784/tm Order Number: 255906 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (W) 8645222 **Depth**: 0.00 Sample No :

Sample ID : RW06





Analysis: GRO by GC-FID (W)

#### **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 131220-67

 Job:
 H\_WSP\_CDF-63

 Client Reference:
 39784.001

Location:Barry WaterfrontCustomer:WSP RemediationAttention:Steve Gronow

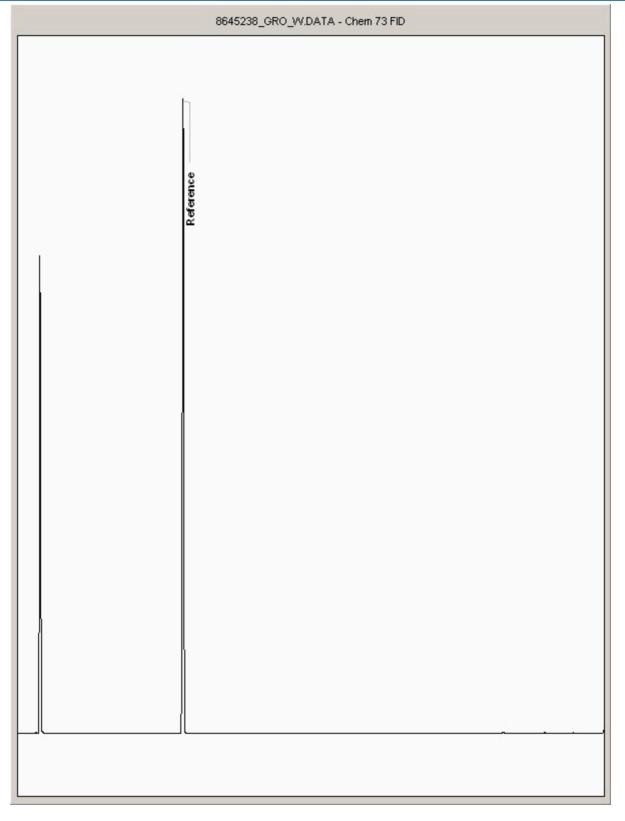
Order Number: Report Number: 23945/39784/tm 255906

Superseded Report:

Chromatogram

**Sample No**: 8645238 **Depth**: 0.00

Sample ID : RW07



## **ALcontrol Laboratories**

#### **CERTIFICATE OF ANALYSIS**

SDG 131220-67 Location: Barry Waterfront Order Number: 23945/39784/tm H WSP CDF-63 WSP Remediation 255906 Job: **Customer:** Report Number: Superseded Report:

Client Reference: 39784.001 Attention: Steve Gronow

## Appendix

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
- 7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
- 9. NDP -No determination possible due to insufficient/unsuitable sample
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately
- 11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request
- 12. Results relate only to the items tested
- 13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.
- 14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, ethylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 3-Methylphenol 2.5 Dimethylphenol. Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
- 17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited
- 19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample
- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do
- 23. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 24. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be

#### SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYS
SOLVENT EXTRACTABLE MATTER	D&C	DOM	SOXTHERM	GRAMMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DOM	SOXTHERM	IATROSCAN
ELEMENTAL SULPHUR	D&C	DOM	SOXTHERM	HPLC
PHENOLSBYGOVIS	WET	DOM	SOXTHERM	GCMS
HERBICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS
PESTICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS
EPH (DRO)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH (MINOL)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH (CLEANED UP)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH CWG BYGC	D&C	HEXANEACETONE	END OVEREND	GCFID
POB TOT / POB CON	D&C	HEXANEACETONE	END OVEREND	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANEACETONE	MCROWAVE TM218.	GCMS
C8-C40(C6C40) EZ FLASH	WET	HEXANEACETONE	SHAKER	GGEZ
POLYAROMATIC HYDROCARBONS RAFID GC	WET	HEXANEACETONE	SHAKER	GC-EZ
SEM VOLATILEORGANIC COMPOUNDS	WET	DOMACETONE	SONICATE	GCMS

#### LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	extraction Method	ANALYSS
PAHMS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
EPH	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRREDEXTRACTION(STIR-BAR)	9CFID
MINERAL OIL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GC FID
POB 7 CONGENERS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
POB TOTAL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
svoc	DOM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DOM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DOM	LIQUID/LIQUID SHAKE	GCMS
TRAZINE HERES	DOM	LIQUID/LIQUID SHAKE	GCMS
PHENOLSMS	DOM	SOLID PHASE EXTRACTION	GCMS
TPH byINFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL byIR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

## Identification of Asbestos

Materials

The results for asbestos identification for samples are obtained from possible Asbestos Containing Material, during the 'Screening of so Asbestos Containing Materials', soils have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name				
Chrysotile	White Asbestos				
Amoste	Brown Asbestos				
Crododate	Blue Asbestos				
Fibrous Adinoite	-				
Fibrous Anthophylite	-				
Fibrous Tremolite	-				

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all information contained in the report are outside the scope of UKAS accreditation.

## ALcontrol Laboratories

#### **CERTIFICATE OF ANALYSIS**

SDG 131220-67 Location: Barry Waterfront Order Number: 23945/39784/tm H WSP CDF-63 WSP Remediation 255906 **Customer:** Report Number: Client Reference: 39784.001 Attention: Steve Gronow Superseded Report:

## Appendix

General

- 1. Results are expressed on a dry weight basis (dried at  $35^{\circ}$ C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.
- ${\it 9.\ NDP\ -No\ determination\ possible\ due\ to\ insufficient/unsuitable\ sample.}$
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.
- 11. Results relate only to the items tested.
- 12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.
- 13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.
- 14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- 17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

- 20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

## Sample Deviations

1	Container with Headspace provided for volatiles analysis							
2	Incorrect container received							
3	Deviation from method							
4	Holding time exceeded before sample received							
§	Sampled on date not provided							
•	Sample holding time exceeded in laboratory							
@	Sample holding time exceeded due to sampled on date							
&	Sample Holding Time exceeded - Late arrival of instructions.							

#### **Asbestos**

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name				
Chrysofile	WhiteAsbestos				
Amoste	Brown Asbestos				
Orodobite	Blue Asbestos				
Fibrous Adinoite	=				
Florous Anthophylite	=				
Fibrous Trendile	-				

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than:

Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

# Appendix C – Dŵr Cymru Consent to Discharge



Steve Gronow
Principal Engineer
WSP Remediation Limited
Regus Cardiff Bay
Falcon Drive
Cardiff Bay
CARDIFF
CF10 4RU

Date 15<sup>th</sup> October 2013

2 3 OCT 2013

Dear Mr Gronow,

Ref:- Authorisation for the Temporary Disposal of Wastewater derived from a Groundwater Remediation Project at Barry Waterfront to the Public Foul Sewer

Thank you for your recent enquiry regarding an authorisation to discharge trade effluent to the public foul sewer from the above address.

Based on the information provided, I can confirm that authorisation is given to discharge the trade effluent into the public foul sewer, subject to the following conditions and not otherwise:

- 1. The premises from which the trade effluent may be discharged is: West Pond, Barry Waterfront Development, Powell Duffryn Way, Barry, Vale of Glamorgan CF62 5QR.
- 2. The maximum volume of trade effluent that may be discharged shall not exceed 50 cubic metres per day at a flow rate of no more than 0.6 litres/second.
- 3. The trade effluent to be discharged is derived from groundwater from boreholes within a contaminated brown field site, which has been fully pretreated to remove contaminants.
- 4. The trade effluent is expected to contain traces of hydrocarbons, phenols and polyaromatic hydrocarbons. The pretreatment plant must remove these contaminants to trace levels in the treated effluent prior to discharge to the public foul sewer.
- 5. The pretreatment plant is to comprise a containment lagoon to remove coarse solids, particulate filtration, oil/water separation, and finally a granular activated carbon filter. Samples are to be taken and analysed to prove the performance of the pretreatment plant prior to sewer discharge. Samples taken must also be analysed for Settled Chemical Oxygen Demand and Total Suspended Solids in order to provide information for charging purposes according to Dwr Cymru's Scheme of Charges.
- 6. Please ensure that the discharge is made to foul sewer only and that there is no risk of the contamination of any surface water drainage.



- 7. Flows must be introduced into the public sewer in such a way that will not affect the free flow of its contents, for example, settlement of suspended solids or surcharging upstream. Please suspend the discharge of the trade effluent during periods of heavy rainfall, in order to help minimise hydraulic overloading of the sewerage system. Should this cause difficulties in managing the volumes of treated effluent on site, please contact us for advice.
- 8. A 3 metre gravity section must be incorporated into the design before connection to the public sewer should the discharge be pumped.
- 9. A flow meter must be installed after the pretreatment plant, and daily flow meter readings taken and recorded to provide cumulative volumes for charging purposes according to Dwr Cymru's current Scheme of Charges. These records must be submitted to the local Trade Effluent Officer on completion of the project.
- 10. This permission is given on the understanding that:
  - a) it may be reviewed from time to time in accordance with the frequency applying in respect of a trade effluent consent issued under the Water Industry Act 1991, section 124.
  - b) Dwr Cymru-Welsh Water may review its Trade Effluent Policy and require a review of this permission subject to the restrictions in a) above.
  - c) If the nature of the discharge is changed then Dwr Cymru-Welsh Water must be informed of this and shall be entitled to review the permission.
- 11. This permission is valid for 1 month from the date of this letter. When an extension is required, please contact the local Trade Effluent Officer on the number/e-mail address given below.

The standard trade effluent consent application fee has already been paid in respect of this application.

In the meantime, if you have any queries or should the operation change in any way so as to affect the nature and volume of wastewater for disposal, please contact Heather Pepper, Trade Effluent Officer on (029) 20 478822 or on e-mail at <a href="heather.pepper@dwrcymru.com">heather.pepper@dwrcymru.com</a>.

Yours sincerely

Clare L Walters

Head of Waste Science & Business Improvement

# Appendix D – Waste Disposal Tickets



# **Cleansing Service Group Ltd Waste Disposal Return**

This is a return to prove you have disposed of your waste correctly at the Disposal site indicated on the right. You should keep this for your records as you may need to produce this document to indicate safe disposal.

Cleansing Service Group Ltd

Bristol Treatment Plant

Pennywell Road

Easton Bristol

Avon BS5 0TQ Licence Number: Telephone Number: AP3336SD

0117 9411583

**Producer Premises Number** oiw607

SIC Code:

45.25

**Company Address** 

WSA Remediation Ltd

Barry Waterfront

The Quays, Clive Rd

Barry

Wales

CF62 5UA

For Waste Disposed Between: 01/01/2014 and 31/03/2014

Date	Consignment Note Number	EWC Code	Quantity Disposed (Litres)	Mode Of Transport	Frequency of Collection	Hazards	Physical Form	Method Of Disposal	Accepted or Rejected
13/1/2014	oiw607/02721	191307	4500	Tanker		H7	Liquid	R03	Accepted

Total Number of Waste Consignments this period 1

**Total Quantity Disposed (Litres) 4500** 

## **Hazardous Waste Registration Report**

**Batch Number:** 1664880 **Report Date:** 27-11-2013

## Details of the company (or individual) providing hazardous waste registration details

WSP REMEDIATION Contact Name: Mr Steve Gronow REGUS CARDIFF BAY Telephone: 07971060389

FALCON DRIVE Fax:

CARDIFF BAY Email: steve.gronow@wspgroup.com

CARDIFF CF10 4RU

Expected Payment: £18.00

Payment Type: CCARD Payment Made: £18.00

Total Payments: £18.00

Difference in Expected Payment and Required Payment: £0.00

Number of sites successfully registered: 1

Number of sites failed registration due to processing errors: 0

**Sites successfully registered** (Previous Registration Numbers which could not be validated are shown in brackets - you must use the new registration numbers given from the start dates shown)

Registration Number	Producer Name	Customer Reference	Address from Application	Start Date	Expiry Date
OIW607	WSP REMEDIATION		BARRY WATERFRONT DEVELOPMENT OFF POWELL DUFFRYN WAY BARRY VALE OF GLAMORGAN CF62 5QR	27-11-2013	26-11-2014





Atlantic Eco Park
Newton Road
Rumney
Cardiff

Tel: (029) 2079 7835 Fax: (029) 2036 0043

www.neal-soils.co.uk EA Site Permit: EPR/VP3095FS

/ehicle Reg.

Ref.

Description of Goods

Customer Signature



Atlantic Eco Park, Newton Road, Rumney, Cardiff CF3 2EJ Longships Road, Cardiff Docks, Cardiff CF10 4LU Tel: 029 2079 7835 Fax: 029 2036 0043

EA Site Permit: EPR/VP3095FS EA Site Permit: EPR/UP3396EK

## **Duty of Care - Waste Transfer / Delivery Note**

Date

**Customer/Waste Producer** 

Cuddy (23882/39784-001/SG). Cuddy Site Offices, Powell Dyffryn Way, Barry Waterfront, Barry, CF

SIC Code **Order Details** 



23882/39784-001/SG

ade & EWC riazardous Soils & Stones - 17 05 03 Job Number:

51966

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

**Customer Signature** 

HAZARDOUS WASTE

**Print Name** 

Time on Site

Time Off Site

**Waste Carrier** 

**EA Registration Number** 

Signed CN63 ZRC Vehicle Req

Waste/Product Receiver

Atlantic Eco Park, Newton Road, Rumney, Cardiff, CF3 2EJ

**EA Registration Number** 

Signed

**Notes** 

LEGAL LEVEL LOAD ONLY Your Waste Partner

PRODUCERS CERTIFICATE (See conditions overle

Description of Waste: Where waste is discovered to be



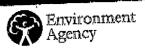
## The Hazardous Waste Regulations 2005: Consignment Note



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## Form HWCN01v111

# The Hazardous Waste Regulations 2005: Consignment Note



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Project number: 39784 Dated: 20/06/2014 Revised:

# creu lle gwell creating a better place



Mr. Jim Hayward Q D S Environmental Ltd. Langton Priory Portsmouth Road Guildford Surrey GU2 4YG

Ein cyf/Our ref: SE/2012/115884/03-L01 Eich cyf/Your ref: 5040/5/3758/JH

Dyddiad/Date:

25 February 2013

Annwyl / Dear Mr. Hayward,

QDS ENVIRONMENTAL LTD. REMEDIAL ACTION PLAN, WEST POND BARRY, BARRY WATERFRONT, BARRY FOR CUDDY GROUP. REF. 504/5/3758/JH. NOVEMBER 2012. LAND AT BARRY WATERFRONT, ADJACENT TO DOCK NO 1, BARRY

Thank you for sending us the Remedial Action Plan (Ref. 5040/5/3758/JH rev1, dated November 2012) for the above development site, which we received on 6<sup>th</sup> February 2013.

We assume this is for the discharge of condition 40 of planning permission 2009/00946/OUT and in particular Part 4. We can confirm that the information is now sufficient to recommend discharge of this condition.

Yn ddiffuant / Yours sincerely,

Mr. Gwion Thorpe Planning Liaison Officer / Swyddog Cynllunio

Deialu uniongyrchol/Direct dial 029 20 245046
Ffacs uniongyrchol/Direct fax 02920 362920
E-bost uniongyrchol/Direct e-mail gwion.thorpe@environment-agency.wales.gov.uk





Mr Steve Gronow WPS Remediation Regus Cardiff Bay Falcon Drive Cardiff Bay Cardiff CF10 4RU Our ref: EPR/FP3495FA/Z001

**Date: 19 August 2013** 

Sent via email to <a href="mailto:steve.gronow@wpsgroup.com">steve.gronow@wpsgroup.com</a>

Dear Mr Gronow

#### Confirming you may begin your deployment

Deployment ref: EPR/FP3495FA/Z001 Permit reference: EPR/FP3495FA Permit holder: WSP Remediation Ltd

Location of the deployment: Barry Waterfront Development, Powell Duffryn

Way, CF62 5QR

We've assessed your deployment notification and agree that you may start to operate.

Your deployment lasts for one year and expires on **15 August 2014**. If you wish to continue after this date you must complete another deployment notification.

You must comply with your permit and carry out the activities in accordance with the requirements of the agreed deployment application. The term 'deployment application' refers to the deployment form and all of the accompanying information. The accompanying information is that sent in with the deployment form and any additional information received during the assessment.

If you want to change any of the details provided in the deployment form you must seek written permission from us before you change what you're doing.

This approval letter is only to allow the mobile plant deployment in accordance with your environmental permit. As the operator, it's your responsibility to agree other authorisations, for example, planning permission, remedial strategy, abstraction or discharge consents with the relevant regulatory authority.

Ffôn/Tel 0300 065 3000 Ffacs/Fax 0844 892 0845

Ebost/Email <u>ymholidau@cyfoethnaturiolcymru.gov.uk</u> enquiries@naturalresourceswales.gov.uk

Canolfan Gwasanaethu Cwsmeriaid, Derbyn Trwyddedau, Cyfoeth Naturiol Cymru, Ty Cambria, 29 Heol Casnewydd, Caerdydd. CF24 0TP

Customer Service Centre, Natural Resources Wales, Cambria House, 29 Newport Road, Cardiff. CF24

Gwefan/Website www.cyfoethnaturiolcymru.gov.uk Croesewir gohebiaeth yn y Gymraeg a'r Saesneg

www.naturalresourceswales.gov.uk Correspondence welcomed in Welsh and English

Please note that operating under your mobile plant permit does not imply that the remediation processes used will be suitable for meeting any remediation objectives specified. These issues must be considered separately by the developer/consultant and our local area Groundwater and Contaminated Land team. These must be defined in the site remedial strategy which sets out the remediation options to reduce or control the risks from pollution linkages associated with the site as a whole. You may need to carry out further remediation if an unacceptable risk to the environment remains at the site.

Please notify me at least seven days prior to starting the remediation activities, at <a href="mailto:permittingreceiptcentre@naturalresourceswales.gov.uk">permittingreceiptcentre@naturalresourceswales.gov.uk</a>. I will send your notification to the local area office closest to the deployment site.

If you have any queries about this matter please contact us by telephone on 0300 0653000 or email us at <a href="mailto:enquiries@naturalresourceswales.gov.uk">enquiries@naturalresourceswales.gov.uk</a> quoting your deployment application reference.

Yours sincerely

Eirian Macdonald

Wales Permitting Centre (Cardiff)/ Canolfan Trwyddedu Cymru (Caerdydd)

Ffôn/Tel 0300 065 3000 Ffacs/Fax 0844 892 0845

 ${\tt Ebost/Email} \qquad \underline{{\tt ymholidau@cyfoethnaturiolcymru.gov.uk}}$ 

enquiries@naturalresourceswales.gov.uk

Canolfan Gwasanaethu Cwsmeriaid, Derbyn Trwyddedau, Cyfoeth Naturiol Cymru, Ty Cambria, 29 Heol Casnewydd, Caerdydd. CF24 0TP

Customer Service Centre, Natural Resources Wales, Cambria House, 29 Newport Road, Cardiff. CF24

Gwefan/Website www.cyfoethnaturiolcymru.gov.uk Croesewir gohebiaeth yn y Gymraeg a'r Saesneg

www.naturalresourceswales.gov.uk Correspondence welcomed in Welsh and English

## Barry Waterfront Development

WSP-39784-EMP (Emissions Monitoring Plan for B9.1)

Medium	Monitoring Programme	Trigger Level	Location	Frequency	Trigger Level Exceedence Action Plan
Treated groundwater	Measurement of volumes discharged to foul sewer	N/A	Discharge flow meter	Weekly	Site works will manage flow to within discharge consent parameters
Treated groundwater	Analysis of discharge samples	To be confirmed (on basis of consent to discharge)	Discharge point	Monthly	Analysis undertaken to confirm compliance with agreed discharge consent compliance criteria. In the event of an exceedence the plant will be shut down and filters maintained or replaced
Vapours / odours	Photoionisation detector (PID) to monitor VOC's at source areas (downwind of water treatment plant)	1ppm total VOC's	Source areas (downwind of water treatment plant)	Weekly	Site works to cease and method of work reviewed
Dust	No activites likely to give rise to dust emissions	N/A	N/A	N/A	N/A
Noise	No activites likely to give rise to noise emissions	N/A	N/A	N/A	N/A

<sup>\*</sup>All monitoring will be undertaken by experienced WSP site engineers

Technically competent person (WAMITAB accredited) will attend site during start-up of each treatment technology and then on a minimum of one day per month basis.



Mr Steve Gronow
Principal Engineer
WSP Remediation
Regus House Falcon Drive
Cardiff
CF10 4RU

4th September 2014

Annwyl Mr Gronow / Dear Mr Gronow

Ein cyf/Our ref: SE/2014/117154/03-L01 Eich cyf/Your ref: 39784.060214.JW

Development Planning Team Rivers House St. Mellons Business Park Fortran Road St. Mellons Cardiff CF3 0EY

Ebost/Email:

jackie.walters@cyfoethnaturiolcymru.gov.uk jackie.walters@naturalresourceswales.gov.uk

Ffôn/Phone: 029 20245183

## REMEDIATION VERIFCATION REPORT FOR THE WORKS UNDERTAKEN AT WEST POND

Thank you for your email of 15<sup>th</sup> July 2014, enclosing a copy of the Verification Report, Remedial Works at West Pond, Barry Waterfront Development, prepared by WSP (ref. 39784. Rev 01; dated June 2014).

Our response is as follows;

The report demonstrates that risk to controlled waters has been reduced and shows a declining trend from the post works monitoring from October 2013 to April 2014. We are satisfied that the verification report includes the details given within section 3.6 of the RAP issued by QDS in February 2013.

Should this report be submitted to the local planning authority in order to formally discharge conditions (2009/00946/OUT and 2010/00696/FUL), we would confirm that we find the details acceptable in order to discharge relevant conditions.

We trust our advice is of use and should you have any further queries then please do not hesitate to contact us. Please be aware that any advice and comments which may have been made by Natural Resources Wales within the planning process should only be looked at in the context of that regime within which they fall and should not be construed as having any bearing or binding effect on other regulatory processes.



Yn ddiffuant / Yours sincerely

Mrs Jackie Walters

Juanters

Senior Development Planning Advisor / Uwch Ymgynghorydd Cynllunio Datblygu Cyfoeth Naturiol Cymru / Natural Resources Wales

Gwefan / Website: <a href="https://www.naturalresourceswales.gov.uk">www.naturalresourceswales.gov.uk</a>

Ein pwrpas yw sicrhau fod adnoddau naturiol Cymru yn cael eu cynnal, gwella a'u defnyddio yn gynaliadwy, yn awr ac i'r dyfodol / Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future.

## **WSP UK Limited**

Colston 33 Bristol BS1 4UA UK

Tel: +44 117 930 2000 Fax: +44 117 929 4624 www.wspgroup.co.uk

