



DEC

Environmental Solutions

Esso - Bowling – Rest of Bowling Remediation Project

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Site Specific Working Plan

Rev. E: B

Esso Petroleum Company Limited

REST OF BOWLING REMEDIATION WORKS

PLAN

Site Specific Working Plan

ANNEX 5

Development of discharge standards for River Clyde



DEC – DEME Environmental Contractors

Rest of Bowling Remediation Project

Development of discharge standards for River Clyde

355383-R01

MARCH 2021

RSK



RSK GENERAL NOTES

Project No.: 355383-R01 (00)

Title: Development of discharge standards for River Clyde: Rest of Bowling Remediation Project

Client: DEC – DEME Environmental Contractors: Haven 1025 – ScheldeDijk, Belgium

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Revision control sheet

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Rev 00	<u>24th March 2021</u>	First issue

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.



This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

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EXECUTIVE SUMMARY

Commissioning and purpose of assessment	RSK Environment Limited (RSK) was commissioned by DEC – DEME Environmental Contractors to develop discharge standards for the River Clyde Estuary for the Rest of Bowling remediation project.
Site description and proposed development	The Bowling site was formerly used as a fuel distribution terminal by Esso between 1920 and the early 1990s. Infrastructure was decommissioned and demolished during the 1990s and the site is now vacant. The site covers approximately 63 hectares (ha), of which the terrestrial area accounts for 41 ha. An additional 22 ha of estuarine mudflats lie within the boundary, of which parts are designated as SSSI, SPA and Ramsar sites. As part of the remedial works discharges of abstracted groundwater and wastewater from treatment processes is proposed to the River Clyde Estuary, a transitional water body, following treatment. As a result, dilution calculations are required to calculate acceptable discharge concentrations from the outfall.
Proposed discharge	The proposed discharge point is some 69 m from the shoreline and has been chosen to be far enough from the shoreline to keep the pipe under water at low tide, but also far enough away from the shipping channel which is approximately 100 m from the shoreline. Prior to discharge, abstracted water will be passed through a water treatment system which will remove free product, suspended solids and reduce dissolved phase concentrations of organic compounds in water.
Previous site investigation (SI) reports	Groundwater and surface water quality monitoring reports for the site dating back to 2009 have been made available for review.
Chemical composition of effluent	Potential contaminants associated with the past history of the site comprise petroleum hydrocarbons, PAH's and volatile organic compounds. Measurable thicknesses of petroleum hydrocarbon product have been detected at the site which will be removed from abstracted groundwater during the treatment process to remove any detectable sheens. The previous monitoring results indicate that concentrations of metals detected in groundwater are unlikely to exceed the relevant EQS and have therefore not been considered further in the assessment. Dissolved phase concentrations of petroleum hydrocarbons and PAH in groundwater exceed the relevant EQS for a number of compounds and hydrocarbon bands. In order to derive discharge criteria, benzene, xylene and naphthalene were chosen as indicator compounds due to their mobility and the fact there are EQS values available.
Discharge limit derivation	Calculations based on the WRc Design Guide have been utilised for the assessment and an initial dilution factor calculated in the Estuary. The results have been used to calculate discharge standards for a range of flow rates for the modelled outfall characteristics. The results indicate a 95th percentile initial dilution of approximately 100 assuming an effluent discharge rate of 200 m ³ /hr with a discharge pipe with 10 to 20 ports for the two depths modelled. The results indicate that the model is sensitive to water depth and the number of ports on the outfall.

Monitoring and mitigation measures	Following the installation of the treatment system and the commencement of the dewatering works, daily inspections should be conducted to inspect for visual sheens. Sampling of the effluent for petroleum hydrocarbons (TPHCWG including BTEX) and speciated PAHs will be in accordance with CAR licence conditions.
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The information given in this summary is necessarily incomplete and is provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.

1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by DEC – DEME Environmental Contractors (DEME) to develop discharge standards for the River Clyde for the Rest of Bowling remediation project. The project was carried out to an agreed brief as set out in RSK's proposal (Ref. 355383 T01 (00) dated 29th January 2021).

This report is subject to the RSK service constraints given in **Appendix A** and limitations that may be described through this document.

1.2 Proposed works

We understand that the Bowling site was formerly used as a fuel distribution terminal by Esso between 1920 and the early 1990s. Infrastructure was decommissioned and demolished during the 1990s and the site is now vacant. The site covers approximately 63 hectares (ha), of which the terrestrial area accounts for 41 ha. An additional 22 ha of estuarine mudflats lie within the boundary, of which parts are designated as SSSI, SPA and Ramsar.

DEME have been appointed to undertake remediation of Centrefield and other areas of the site, which is due to commence in the spring of this year. As part of the remedial works, discharge of abstracted groundwater and wastewater from treatment processes is proposed to the River Clyde Estuary, a transitional water body, following treatment. As a result, dilution calculations are required to calculate acceptable discharge concentrations from the outfall.

The location of the proposed discharge is presented in **Figure 2**.

1.3 Scope of works

Guidance on modelling discharges to transitional water bodies is provided in SEPA Supporting Guidance (WAT-SG-11): Modelling Coastal and Transitional Discharges v3.0 April 2013. In addition, Environmental Quality Standards (EQS) for transitional waters are set out in SEPA guidance document 'Supporting Guidance (WAT-SG- 53) Environmental Standards for Discharge to Surface Waters'.

With respect to initial dilution calculations, SEPA expect dischargers to use one of the approved models: ELSID, PLUMES or CORMIX. We understand that since publication of WAT-SG-11, ELSID has been superseded by the WRc Design Guide. For the purposes of our quotation we have assumed that SEPA will approve the use of calculations based on the WRc Design Guide as previously agreed by Parsons Brinckerhoff with SEPA for Bowling Eastfield.

The scope of works has comprised the following:

- review of available data including
 - plans indicating the location of discharge and design of the outfall;

- groundwater and surface water quality data;
- development of discharge standards for the River Clyde based on modelling of the initial dilution of certain dissolved phase determinands only.

It is understood that the maximum discharge flow rate is c. 200 m³/d).

1.4 Existing reports

Groundwater and surface water monitoring reports dating back to 2009 have been provided to RSK for review. The following reports detailing previous works at the site were used in the assessment

- Parsons Brinckerhoff: Bowling Groundwater Monitoring Q3, September 2013 Report for Esso Petroleum Company, Limited. Reference 97313AAAH-ZEV dated December 2013
- WSP, Quarterly monitoring and annual summary report: Q4 2017 – site wide former Bowling terminal, Bowling, Dumbarton for Esso Petroleum Company Limited, Reference 70032892/2018-Q4 Dated August 2018;
- WSP, 2019 Q1 Groundwater Monitoring Report. Former Bowling terminal, Bowling, for Esso Petroleum Company Limited, Reference 70032892 dated May 2019

Groundwater analyses contained in this report are considered representative of the groundwater quality entering the water treatment system. The surface water quality results contained in the report have been used to establish background concentrations upstream of the site in the River Clyde.

1.5 Limitations

The comments given in this report and the opinions expressed are primarily based on third party data and investigations, while RSK has undertaken a critical review of the information provided we cannot be held liable for the quality of the data provided. No intrusive investigations have been undertaken by RSK to confirm the actual ground conditions or groundwater and surface water quality and hence the environmental status of the site. There may be conditions pertaining to the site that have not been disclosed by the investigations and therefore could not be taken into account. In particular groundwater concentrations may vary from those reported due to seasonal, or other effects,

This report should be considered in the light of any changes in legislation, statutory requirement or industry practices that have occurred subsequent to the date of issue.

It should be noted that the report assumes the following

- we are not required to model suspended solids, which would require a different method of assessment;
- there are no discharge ‘neighbours’ which need to be considered in the assessment;
- the ambient current velocity survey conducted for the previous Eastfield remediation project adjacent can be applied to the site.

2 SITE DETAILS

2.1 Site location

Site location details are presented in **Table 1** and a site location plan is provided on **Figure 1**.

Table 1 **Site location details**

Site name	Rest of Bowling Remediation Project
Full site address and postcode	Former Esso fuel terminal site. Dumbarton Road, Milton, West Dunbartonshire, Scotland, G82 2TG
National Grid reference (Approximate Discharge location)	242978, 673645

2.2 Site description

The site occupies an area of approximately 63 hectares (ha) on the north bank of the River Clyde approximately 10 miles west of Glasgow city centre. The site is bounded to the south by the River Clyde and to the north by an active rail line and the A814 Dumbarton Road. A site location plan is shown in **Figure 1**.

The site was an active fuel terminal between the 1920's and 1990's before being decommissioned in 1997. No infrastructure or active storage capacity remains on site. During its operation the site was the largest fuel terminal operated by Esso in Scotland, receiving and transferring hydrocarbon products by rail, road and sea.

The site has been sub-divided into ten different areas based on the historic activities and infrastructure that were present comprising: the Area of Fill (AOF), Centrefield (CFD), Eastfield (EFD), Former Rail Sidings (FRS), Garden (GDN), Greenfield/Sheepfold (GFD), Highland Fuels (HFS), Northfield (NFD), Westfield A (WFA) and Westfield B (WFB).

It is understood that remediation of the Eastfield area was subject to a separate discharge. During remediation of the rest of the Bowling site, pumped groundwater will be stored and treated in the storage and treatment area shown in **Figure 2**, prior to discharge via a discharge pipe into the River Clyde.

These areas are depicted on the site area layout plan included as **Figure 2**.

2.3 Surrounding land uses

The Site is located in Bowling, West Dunbartonshire, within a predominantly commercial / industrial setting with the River Clyde to the South. Immediate surrounding land uses are described in **Table 2**.

Table 2 Surrounding land uses

North	Railway line
East	Eastfield
South	River Clyde Estuary, (SSSI, SPA, Ramsar site)
West	Mud flats and River Clyde Estuary (SSSI, SPA, Ramsar site)

2.4 Proposed discharge activity

The proposed remedial works will require excavation and associated dewatering and ex situ treatment of impacted soils to meet remediation targets.

Pumped water will be passed to a storage and treatment area located in Westfield C. The anticipated maximum discharge rate is 200 m³/h (4800 m³/day).

The location of the discharge into the River Clyde has been chosen to be far enough from the shoreline to keep the pipe under water at low tide, but also far enough away from the shipping channel which is approximately 100 m from the shoreline.

The location of discharge point to the River Clyde and locations of storage and treatment areas are shown on **Figure 2**.

Water collected during the remediation works on platforms and during the excavation works will be subject to treatment. Water will be pumped to the influent basin of the Water Treatment Plant (WTP) for further treatment. Water volumes collected, treated and discharged will be monitored and recorded by means of in line flow meters.

The water treatment plant will consist of the following process steps:

- de-sander and Oil-water separator
- influent buffer
- flocculation unit to remove suspended solids
- lamella separator
- sand filters
- activated carbon filters
- a discharge unit

Free phase product (Non-Aqueous Phase Liquid, NAPL) will be encountered on the water surface in the excavation pits. The removal and collection of NAPL is described in a specific protocol, developed by the contractor.

The location of the proposed discharge is shown in relation to the low and high tide levels on **Figure 2** which shows the proposed discharge is below the low tide line.

2.5 Hydrology

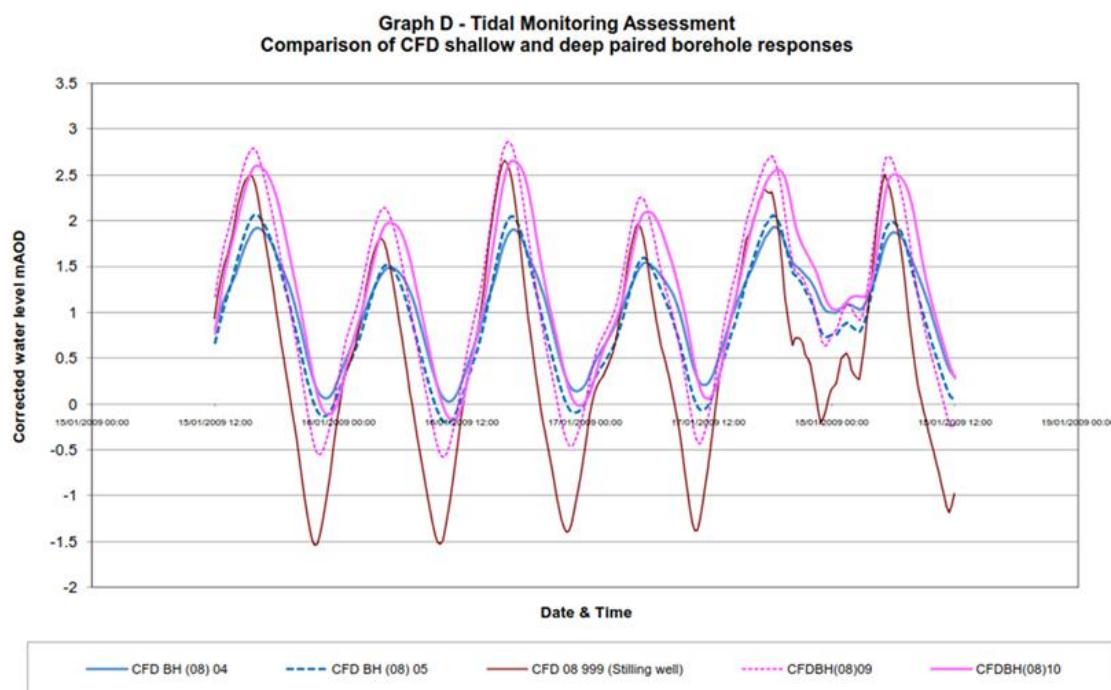
Pertinent information regarding the hydrology within the site area is summarised in **Table 3**.

Table 3 Summary of hydrology in site area

Condition	Description
Surface watercourse s/features	<p>The nearest identified surface watercourse to the site is the River Clyde located adjacent to the site.</p> <p>The stretch of the watercourse adjacent to the site and at the location where the discharge will take place is tidal.</p> <p>The River Clyde has been classified by SEPA as being part of the Clyde Estuary in the location of the site comprising a transitional water body. SEPA has classified the Clyde Estuary as being of a moderate condition.</p> <p>Aside from tidal effects, the River Clyde flows in a general west north westerly direction.</p> <p>Reference to the Forth and Clyde Admiralty map indicates that the proposed discharge is located at the point where it changes from shallow to deep water, with the water depth indicated to be some 5 m.</p> <p>A bathymetric survey conducted adjacent to the site previously by others confirms the water depth at the location of the proposed discharge to be approximately 5 m. A velocity survey conducted for the purposes of the Eastfield remediation extends to the area of the proposed discharge. Further information is contained in Section 2.5.1 and 2.5.2.</p>

2.5.1 Tidal levels

Monitoring of tidal levels has been conducted adjacent to the site from monitoring well BH 088 999 known as the 'Stilling well' on the CFD sheet pile outside wall. This well is purely a river level well. This well is indicated as the brown line on the tidal monitoring data shown below. The tidal monitoring from the Stirling well indicates that the tidal range is some 4.20 m adjacent to the site ranging between -1.50 m AOD and 2.70 m AOD. Chart datum



is at some -1.62 m AOD (based on the conversion factor at Millport Ref 1). Using this conversion, the highest water level measured is some 1.08 m above chart datum adjacent to the site.

This monitoring data, together with data on the Marine Scotland website and the National Tidal and Sea Level Facility has been used to determine the following design parameters for the assessment:

The National Tidal Facility indicates the following for the nearest measurement to the site (Millport) relative to chart datum: mean high water springs (MHWS): 3.39 m, mean low water springs (MLWS): 0.44 m, mean high water neaps (MHWN): 2.83 m and mean low water neaps (MLWN): 1.06 m

Mean Spring Tidal Range: Based on the information above, the mean spring tidal range is calculated as follows: MHWS (3.39) – MLWS (0.44) = 2.95. Reference to the Marine Scotland website indicates that the mean tidal range of the estuary is between 3.10 and 4.00 m. The calculated value of 2.95 is therefore considered a conservative assumption.

Mean Neap Tidal Range (m): MHWN (2.83) – MLWN (1.06) = 1.77 m

The bathymetry survey and admiralty chart indicate shallow water depth offshore to range between 0 and 5 m. The proposed discharge will be at some point between this. Reference to the Forth and Clyde admiralty map indicates that the proposed discharge is shown to be located at the point where it changes from shallow to deep water, with the depth indicated to be some 5 m. Reference to the bathymetry survey presented in **Figure 4** confirms the depth at the point of discharge to be some 5 m.

2.5.2 Bathymetry survey

The results of a bathymetry survey conducted along the shoreline to the Westfield area are presented in **Figure 4**. This indicates a shallow water depth along the shoreline increasing to some 5 m at the point of discharge to some 9 m in the shipping lane c. 100 m from the shoreline.

2.5.3 Ambient current velocity

RSK has been provided with a copy of the ambient velocity survey conducted in June 2010 along the foreshore of the site.

It is understood that Clydeside Surveys were commissioned to undertake a Moving Vessel ADCP current velocity survey within the Clyde along a transect running parallel to the site boundary. The transect line was positioned as close to the shoreline as possible whilst maintaining a water depth of approximately 5 m to achieve a velocity profile.

The survey was undertaken on 28 - 29 June 2010, at approximately 30-minute intervals over the duration of a 12-hour spring tidal cycle. The ADCP was set to acquire data at approximately 50 cm depth intervals, repeated at approximately 10 m intervals along the transect line.

The data provided to RSK has been divided into portions of the transect that run along the front of each specific area of the site. Calculations of the min, max, mean and 95th percentile velocity determined for the receiving water along the river frontage are provided. The data collected is presented as **Appendix C**.

2.6 Sensitive land uses

Table 4 provides a summary of any environmentally sensitive areas identified within 500 m of the site based on the Defra Magic Map.

Table 4 Environmentally sensitive areas

Feature	Present within 500m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	Yes	Ramsar & SPA Inner Clyde Estuary. Mostly tidal mudflat and some saltmarsh	Ramsar and SPA extend to the south, west and east of the site and relate to the River Clyde estuary and associated habitats
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	Yes	SSSI Inner Clyde Estuary. Mostly tidal mudflat and some saltmarsh	Ramsar and SPA extend to the south, west and east of the site and relate to the River Clyde estuary and associated habitats.

The SSSI is important for its extensive saltmarsh habitats and is one of the most northerly of the large west coast estuaries used by migrating birds (redshank). These birds depend on a corresponding variety of plants and invertebrates supported by the intertidal habitats. Further information on the site is presented in **Appendix D**.

The site is designated as an SPA and Ramsar for the redshank.

SEPA has a statutory obligation, under the Conservation (Natural Habitats etc) Regulations, not to issue a licence for any discharge which has been shown, by an appropriate assessment, to be likely to have an adverse effect on the designated conservation interests of a Special Area of Conservation (SAC, under the European Habitats Directive) or a Special Protection Area (SPA, under the European Wild Birds Directive).

Reference to WAT-SG-11, indicates that:

'Where a mixing zone may impinge on any SAC or SPA, SEPA has a duty to ensure, before issuing a licence, that the integrity of the site will not be adversely affected. The integrity of a site is defined in the Habitats Directive 92/43/EEC (CELEX: 31992L0043) as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or levels of populations of the species for which it was classified. SEPA will ensure that no mixing zone will jeopardise the integrity of any designated sites, and will apply the same approach to other sites with statutory conservation designation (e.g. SSSIs). Consideration will also be given to other areas which have a recognised, but non-statutory, conservation interest (e.g. Marine Consultation Areas).'

Reference to the Site Management Statement for the Inner Clyde SSSI indicates that there are a number of objectives for the management of the site.

The most relevant objective to the proposed discharge is as follows:

Objective 2: '*To maintain the extent and forage value of intertidal sand and mudflats by minimising or avoiding mechanical damage and harmful pollution. Removal of intertidal or subtidal sediments (as by dredging) may affect the availability of suitable foraging habitat for wildfowl, and should be avoided where possible. Organic pollution of intertidal areas has declined substantially in recent years with improved waste water treatment, although, ironically, the reduced nutrient inputs have in some cases lowered the availability of the mud and sand-dwelling invertebrates that some birds feed on. Inorganic pollution, too, is likely to have declined substantially with a reduction in heavy industry adjacent to the Clyde, fewer movements of large boats, and improved regulation.'*

The proposed discharge has therefore been placed beyond the extent of the SSSI and into a deeper part of the channel to ensure dilution occurs beyond the extent of the SSSI.

3 DISCHARGE LIMIT DERIVATION

Guidance on modelling discharges to transitional water bodies is provided in SEPA Supporting Guidance (WAT-SG-11): Modelling Coastal and Transitional Discharges v3.0 April 2013.

With respect to initial dilution calculations, SEPA expect dischargers to use one of the approved models: ELSID, PLUMES or CORMIX. We understand that since publication of WAT-SG-11, ELSID has been superseded by the WRc Design Guide.

3.1 Model

Discussions by the Client with SEPA indicate that the use of calculations based on the WRc Design Guide are acceptable for the assessment.

The calculation of initial dilution (ID) is based on the principle that effluent discharge to tidal waters is typically buoyant as a consequence of the difference in density between the fresh water and surrounding saline waters. Initial dilution is the process whereby the discharge from a submerged outfall is entrained by surrounding waters as a result of turbulent mixing and discharge buoyancy relative to ambient water density. The WRc Design Guide adopts calculations for two different buoyant discharge scenarios:

- the buoyancy dominated near field regime (BDNF). In this case, the discharge is influenced primarily by the density difference and occurs in conditions of weak currents; and
- the buoyancy dominated far field (BDFF). In this case, in conditions of strong ambient current, the dilution is influenced less by buoyancy and more so by ambient current.

The initial dilution calculation spreadsheet adopts the relevant calculation approach based on the outcome of the condition calculations (i.e. if buoyancy or ambient velocity is the more dominant factor).

The model also uses the Cederwall equation to calculate still water initial dilution achieved by a buoyant jet. This calculation assumes the minimum depth and zero ambient current.

The WRc spreadsheet indicates that the highest of the calculated initial dilutions should be used as the ID (given that the Cederwall calculations only consider still water dilution and conservative assumptions not allowing for a tidal cycle).

A copy of the calculations used in the spreadsheet are presented in **Appendix F**.

For the purposes of this report, the maximum flow rate has been used to calculate the minimum ID. Reference to WAT-SG-11 records that SEPA's requirements for ID, set as 95%iles, are x 50 for industrial effluents dependent on treatment etc (case specific).

3.2 Chemical composition of 'effluent'

Potential contaminants associated with the past history of the site comprise petroleum hydrocarbons, PAH's and volatile organic compounds.

Correspondence with SEPA confirms that they require as a minimum no visible pollution or sheens in the discharge. Further the expectation is that potential pollutants in the groundwater will be identified based on previous investigations. It is the expectation that concentrations of determinants will meet the relevant EQS in the River Clyde.

RSK have been provided with copies of the groundwater and surface water monitoring reports prepared for the site between 2009 and 2019. This groundwater data has been used to determine the likely chemical composition of the effluent.

Until September 2013, groundwater and surface water from the site was analysed for a suite comprising total petroleum hydrocarbons criteria working group (TPH CWG), benzene, toluene, ethyl benzene, xylene (BTEX) and methyl tert-butyl ether (MTBE), dissolved metals, polycyclic aromatic hydrocarbons (PAH), pH, volatile organic compounds (VOC), electrical conductivity, alkalinity and chloride analysis.

In more recent years, chemical analysis of groundwater and surface water has been for TPH CWG, BTEX, MTBE, and PAHs analysis, with selected samples also scheduled for VOCs and chloride. Until 2018 monitored natural attenuation (MNA) parameters were also analysed for.

The results contained in the most recent groundwater monitoring reports made available to RSK (WSP Quarterly and annual summary report Q4 2017, and the 2019 Q1 Groundwater Monitoring report), have been used to assess the likely chemical composition of the effluent with respect to TPH, BTEX, PAH and VOC's. Parsons Brinckerhoff: Bowring Groundwater Monitoring Q3, September 2013 Report dated December 2013, has been used to assess the potential concentrations of metals in the discharge. A summary of the maximum results for each area of the site is presented in Appendix B1. The results annotated CFD, NFD, WFA and WFB within Appendix B1 are used in the assessment (EFD results have been excluded since this was subject to a separate remedial scheme and discharge consent).

Reference to the reports supplied to RSK also indicates that measurable thicknesses of petroleum hydrocarbon product have been detected at the site. For the purposes of this report, it has been assumed that any free product will be removed from the wastewater prior to it being treated and discharged.

Environmental Quality Standards (EQS) for transitional waters are set out in SEPA guidance document 'Supporting Guidance (WAT-SG- 53) Environmental Standards for Discharge to Surface Waters'. Reference to WAT-SG-11 indicates that '*the concentration of dispersing effluent must be such that no established relevant UK or SEPA chemical Environmental Quality Standard is breached outwith the mixing zone. This must take account of the individual standards which may be expressed as annual mean values, or percentile exceedance values, or maximum allowable concentrations*'.

A summary of the potential range in concentrations of determinants in the effluent is presented in **Table 5**. It is noted that for total petroleum hydrocarbons and PAH, a requirement of the discharge will be that there is no visible evidence of contamination such as a sheen. Compounds with a low solubility and high partition coefficient are likely to be removed from groundwater during the treatment process prior to being discharged. In order to assess the potential risk of dissolved phase concentrations of petroleum hydrocarbons and PAH to the River Clyde estuary, indicator compounds have been

chosen for fractions / compounds which have a high solubility and which also have an EQS for transitional waters

Table 5 Groundwater analytical results (mg/l unless indicated)

Parameter	Assumed effluent concentration (2013 / 2018)*	Max background concentrations River Clyde (2013 / 2018)	Environmental Quality Standard Estuarine Waters Annual Average
Arsenic	0.00892 – 0.0115	0.00416	0.025
Cadmium	<0.0001 – 0.000329	<0.0001	0.0002
Chromium	0.00318 – 0.06	0.00679	Not available
Copper	<0.00085 – 0.003	0.00503	0.00376
Lead	<0.00002 – 0.000449	0.000337	0.0013
Mercury	<0.00001 – 0.000022	<0.00001	0.00007
Nickel	0.00182 - 0.00945	0.00851	0.0086
Zinc	0.00243 – 0.00484	0.00808	0.0079
Oil and grease: TPH	0.011 - 149	<0.01	None
Total PAH	0.000101 – 0.0938	<0.000082 to 0.000124	None
TPH & PAH Indicator compounds:			
Benzene	<0.007 to 1.13	<0.003	0.008
Toluene	<0.004 to 0.033	<0.004	0.074
Ethylbenzene	<0.005 to 0.014	<0.005	0.02
Xylene	<0.011 to 0.072	<0.011	0.03
Acenaphthylene	<0.000005 to 0.00232	<0.000005	0.0058
Naphthalene	<0.00001 to 0.0091	0.0000198 to 0.0000611	0.002

*Range in concentration measured at the site 2013 / 2018

The results indicate that concentrations of metals detected in groundwater (assumed effluent concentration) are unlikely to exceed the relevant EQS given that for the majority of metals, the maximum detected concentrations fall below the relevant EQS. Where exceedances have been detected (i.e. cadmium and nickel), the maximum concentration only marginally exceeds the EQS and given that there will be significant dilution prior to discharging, there are unlikely to be any exceedances of EQS. It is further noted that cadmium and nickel have not been detected at elevated concentrations in the River Clyde. Metals have therefore not been considered further in the assessment.

With respect to petroleum hydrocarbons and PAH, NAPL has been detected at the site. Prior to discharge, groundwater will be treated to remove any visible sheens. Dissolved phase concentrations of petroleum hydrocarbons and PAH in groundwater exceed the relevant EQS for indicator compounds benzene, xylene and naphthalene.

3.3 Surface water background concentrations

The assessment has also given consideration to background concentrations of the identified contaminants of concern within the River Clyde. Surface water sampling has been undertaken within the Clyde at 8 locations along the site boundary between September 2009 and March 2019. The laboratory test results for surface waters are missing from the 2019 report, therefore the surface water data collected for 2018 have been used. It is noted that recent monitoring rounds have not analysed for metals, therefore for metals, the Parsons Brinckerhoff data for December 2013, has been used. The laboratory data is presented in Appendix B2 with the maximum concentrations recorded in **Table 5** above.

Exceedances of the EQS are recorded for, copper and zinc, with concentrations recorded to be generally higher than that recorded in groundwater at the site.

Concentrations of petroleum hydrocarbons recorded in surface water fall below the relevant limit of detection. Detectable concentrations of PAH compounds have been recorded albeit sporadically.

Given that surface water samples collected adjacent to and up hydraulic gradient of the site show no detections of hydrocarbons and only sporadic detectable concentrations of PAH compounds, it has been assumed that for the purposes of modelling, background concentrations within the Clyde are zero.

3.4 Input parameters

3.4.1 Water depth

Reference to the admiralty maps and bathymetry survey indicate that the likely water depth at the point of discharge is some 5 m.

3.4.2 Ambient current velocity

The results of the ambient current velocity survey historically undertaken for the site is presented as **Appendix C**.

For the purposes of this report, the data collected along the transects of the shoreline to the Westfield area have been used, since the discharge is proposed off the shoreline to this area of the site.

3.4.3 Outfall discharge rate

The discharge rate to the river is based on anticipated dewatering requirements during the remediation works at the site.

WAT-SG-11 indicates that the mean flow of effluent should be used when deriving the estimates of initial dilution. The mean flow rate is unknown, however the maximum discharge rate is anticipated to be 200 m³/hr. A range of discharge rates have therefore been modelled comprising 50 m³/hr, 100 m³/hr and 200 m³/hr.

3.4.4 Model input parameters

The initial dilution model calculates a 95th percentile initial dilution over a tidal cycle based on the following factors:

- rate of discharge from the outfall;
- number of diffuser ports along the outfall;
- velocity of the current in the river adjacent to the diffuser port;
- depth of water above the diffuser port;
- density of the discharge; and
- density of the receiving water.

Parameters utilised within dilution calculation are outlined in **Table 6** below.

Table 6 Model input parameters

Parameter	Unit	Value	Comment
Mean spring tidal range MHWS	m	2.95	See section 2.5.1
Total water depth at MLWS	m	3.44	Bathymetry survey and admiralty chart indicate shallow water depth to range between 0 and 5 m. Proposed discharge will be at some point between this. Calculated based on a conservative assumption of bed depth of -3 m at point of discharge. MLWS = 0.44 m. Total water depth = 3.44 m
Mean neap tidal range	m	1.77	See Section 2.5.1
Total water depth at MLWN	m	4.06	Bathymetry survey and admiralty chart indicate shallow water depth to range between 0 and 5 m. Proposed discharge will be at some point between this. Calculated based on conservative assumption of bed depth of -3 m at point of discharge MLWN = 1.06 m. Total water depth = 4.06 m
Total flow discharge	m ³ /s	0.055 0.027 0.014	200 m ³ /h – maximum discharge rate 100 m ³ /hr – 50% maximum discharge rate 50 m ³ /hr – 25% maximum discharge rate
Diameter of outfall	m	0.25	Assumed
Number of diffuser ports	-	1	Proposed
Height of ports above bed	m	0.1	Assumed
Diameter diffuser ports	m	0.1	Assumed
Ambient water density	kg/m ³	1013	Saline water density = 1026. Brackish conditions in Clyde adjacent and downstream from proposed outfall. Mid-point saline to fresh water used
Effluent density	kg/m ³	1000	Fresh water density assumed
Number of time intervals	-	25	Time intervals across the tidal cycle based on site specific tide and ambient current velocity. A 95 th percentile dilution factor has then been determined

3.5 Modelling results

The modelling results for initial dilution (ID) are presented in **Appendix E** and are summarised in **Table 7** below.

Table 7 Initial dilution results

Parameter	Cederwall	WRc
Total flow discharge: 0.06 m³/s	27.85	6.93
Total flow discharge: 0.03 m³/s	19.40	11.01
Total flow discharge: 0.014 m³/s	16.10	20.08

As discussed in Section 3.1, the Cederwall calculation uses a still water initial dilution achieved by a buoyant jet assuming minimum depth and zero ambient current. The WRc ID is either the BDNF or the BDFF (the spreadsheet adopts the relevant approach based on whether buoyancy or ambient velocity is the more dominant factor but does not state which is adopted).

The results indicate an ID of 27.85 based on the Cederwall calculation and a 95th percentile ID of 6.93 using the WRc equations for the maximum discharge rate proposed at the site. The WRc calculation sheet indicates that the highest of the two calculations should be taken as the ID. This falls below SEPA's requirements for initial dilution, set as 95%iles, of 50 times dilution. Further, the ID results for a discharge rate of 0.03 m³/s and 0.014 m³/s also fall below the 50 times dilution.

Additional modelling was therefore undertaken, the results of which are presented in Section 3.6 below.

3.6 Sensitivity analysis

Sensitivity analysis has been conducted for the discharge rate of 200 m³/hr to determine which inputs are the most sensitive within the model. The depth of water, number of ports and ambient velocity have been amended and the results are presented in **Appendix E** and are summarised in **Table 8** below.

Table 8 Sensitivity analysis: Initial dilution results – Discharge rate 200 m³/hr

Parameter alteration	Cederwall	WRc
Original	27.85	6.93
2.1 m MLWN (shallow)	21.89	1.55
10 Ports	17.20	36.46
20 Ports	21.62	99.89
2.1 m MLWN / 20 Ports	6.39	14.35
0 ambient velocity	27.85	6.93
5.62 MLWN	32.78	12.92

Parameter alteration	Cederwall	WRc
5.62 MLWN / 20 ports	37.74	156.74
5.62 MLWN / 10 ports	28.19	98.74

The results indicate that both the depth of water and the number of ports affect the amount of dilution within the estuary. An initial dilution of approximately 100 times is achieved with a depth of 3 m and 20 ports and x150 with a depth of 5 m and 20 ports. The model has been re-run for the varying flow rates assuming a depth of 3 m and 20 ports are installed along the discharge pipe or a depth of 5 m and 10 ports. The results are presented in **Table 9** below.

Table 9 Initial dilution results (WRc)

Parameter	5 m depth 10 ports	3 m depth 20 ports
Total flow discharge: 0.06 m ³ /s	98.74	99.89
Total flow discharge: 0.03 m ³ /s	156.74	160.53
Total flow discharge: 0.014 m ³ /s	260.51	266.82

The results indicate that significantly higher dilution is achieved by installing 20 ports along the discharge pipe or by increasing the depth water at the point of discharge. Based on the results of the modelling, it is therefore recommended that the effluent is discharged into the estuary at a minimum of 3 m to 5 m depth and that 10 to 20 diffuser ports are installed along the pipe (dependant on depth).

3.7 Proposed discharge criteria

The results presented in **Table 9** have been used to calculate discharge standards for a range of flow rates for the two modelled outfall characteristics and are presented in **Table 10** below.

Table 10 Proposed discharge criteria (mg/l unless indicated)

Parameter	Assumed effluent concentration	EQS AA	Discharge Criteria EQS x DL		
			0.06 m ³ /s X 100	0.03 m ³ /s X 150	0.014 m ³ /s X 260
Oil and grease: TPH	0.011 - 149	None	No visible sheen	No visible sheen	No visible sheen
Total PAH	0.000101 – 0.0938	None	No visible sheen	No visible sheen	No visible sheen

Parameter	Assumed effluent concentration	EQS AA	Discharge Criteria EQS x DL		
			0.06 m³/s X 100	0.03 m³/s X 150	0.014 m³/s X 260
TPH & PAH Indicator compounds:					
Benzene	<0.007 to 1.13	0.008	0.8	1.20	2.08
Xylene	<0.011 to 0.072	0.03	3	4.5	7.80
Acenaphthylene	<0.000005 to 0.00232	0.0058	0.58	0.87	1.51
Naphthalene	<0.00001 to 0.0091	0.002	0.2	0.30	0.52

In addition to the above, the initial discharge model is conservative for the following reasons:

- the effluent will be treated prior to discharge, reducing concentrations in the raw effluent;
- a conservative assumption has been made regarding the tidal range;
- the maximum flow rate is unlikely to be maintained throughout the duration of the remediation;
- only initial dilution has been calculated and the output of the model used dictates that the EQS will not be exceeded beyond the 'surface boil';
- the calculated initial dilutions are based on 95th percentile values across the tidal cycle and 95th percentile results for velocity.

4 CONCLUSIONS

The modelling of discharges to the River Clyde has been undertaken using site specific information using calculations based on the WRc Design Guide as agreed with SEPA.

The findings and conclusions of this study are as follows:

- potential contaminants of concern in the discharge comprise petroleum hydrocarbons and PAH;
- indicator compounds have been used to derive discharge criteria, based on their occurrence in groundwater, solubility. Chosen indicator compounds also have an EQS;
- the initial dilution calculations indicate that the model is sensitive to the depth of surface water and the number of ports along the discharge;
- the results of the modelling indicate that the discharge should be located at a MLWS depth of 3.44 m with 20 ports or 5.00 m with 10 ports. This achieves an ID of approximately 100 for the maximum effluent flow rate.

The modelling is considered conservative for the following reasons:

- the effluent will be treated prior to discharge, reducing concentrations in the raw effluent;
- a conservative assumption has been made regarding the tidal range;
- the maximum flow rate is unlikely to be maintained throughout the duration of the remediation;
- only initial dilution has been calculated and the output of the model used dictates that the EQS will not be exceeded beyond the 'surface boil';
- the calculated initial dilutions are based on 95th percentile values across the tidal cycle and 95th percentile results for velocity.

It is therefore concluded that the proposed discharge of treated wastewater is unlikely to impact the River Clyde. In addition, it is proposed to locate the discharge beyond the extent of the SSSI along the shoreline of the site and into a deeper part of the channel to ensure dilution occurs beyond the extent of the SSSI.

Following the installation of the treatment system and the commencement of the dewatering works, daily inspections should be conducted to inspect for visual sheens. Sampling of the effluent for petroleum hydrocarbons (TPHCWG including BTEX) and speciated PAHs will be in accordance with CAR licence conditions.

5 REFERENCES

Previous SI reports and other site related information

Parsons Brinckerhoff: Bowling Groundwater Monitoring Q3, September 2013 Report for Esso Petroleum Company, Limited. Reference 97313AAAH-ZEV dated December 2013

WSP, Quarterly monitoring and annual summary report: Q4 2017 – site wide former Bowling terminal, Bowling, Dumbarton for Esso Petroleum Company Limited, Reference 70032892/2018-Q4 Dated August 2018;

WSP, 2019 Q1 Groundwater Monitoring Report. Former Bowling terminal, Bowling, for Esso Petroleum Company Limited, Reference 70032892 dated May 2019

Bowling, River Clyde bathymetry survey dated 2019

Bowling ADCP Survey dated June 2010

Standards and guidance

National Tidal and Sea Level facility <https://www.ntslf.org/tides/datum>

Marine Scotland Maps NMPI

<https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=423>

Scottish Natural Heritage. Inner Clyde. Site of special scientific interest. Site management statement. Site Code 1701.

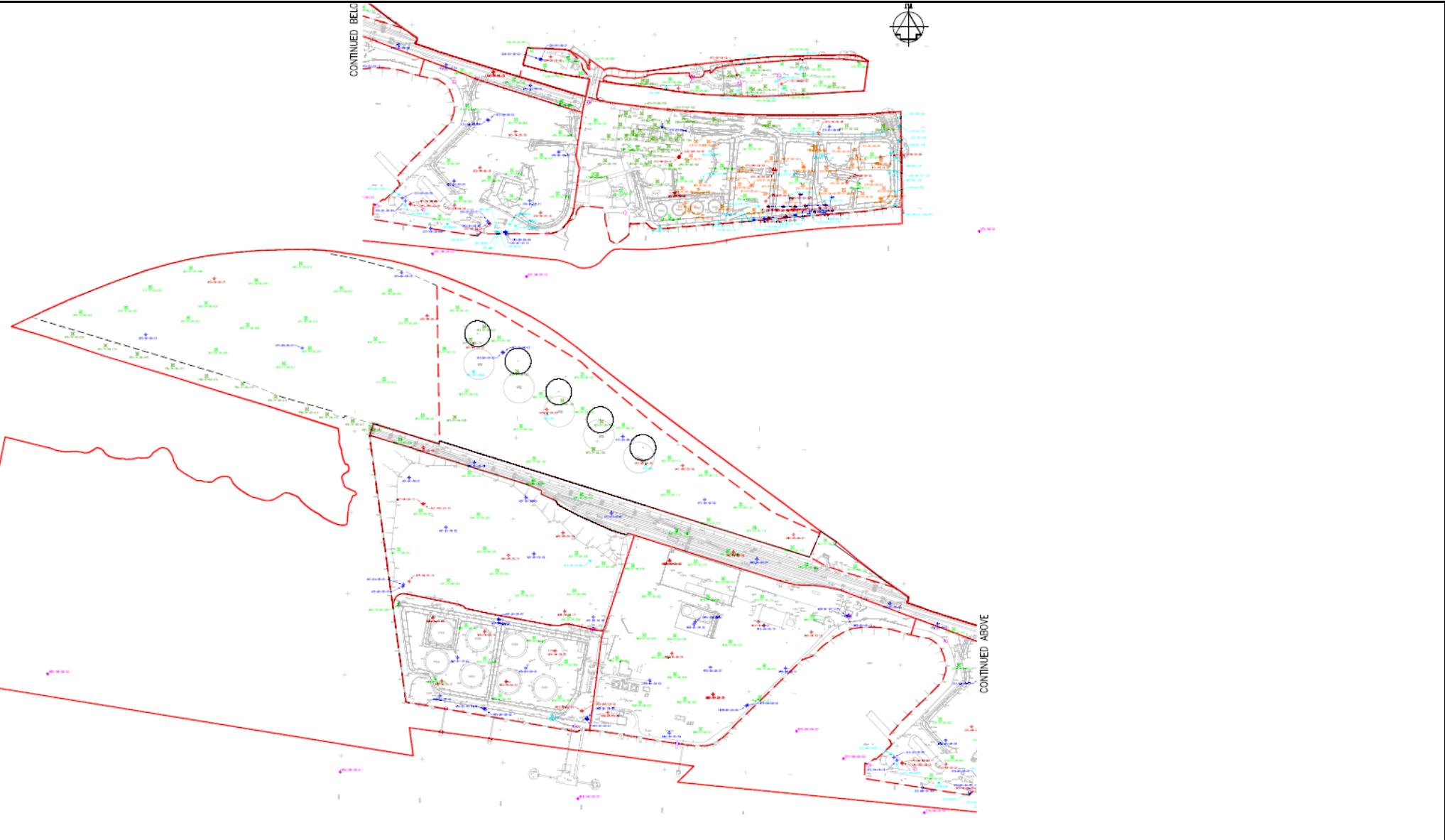
SEPA Supporting Guidance (WAT-SG-11): Modelling Coastal and Transitional Discharges v3.0 April 2013.

SEPA Supporting Guidance (WATSG- 53) Environmental Standards for Discharge to Surface Waters.

WRc Design Guide for Marine Treatment Systems. Vol II 1990



FIGURES



RSK

Site Location Plan

Client: DEC DEME Environmental Contractors

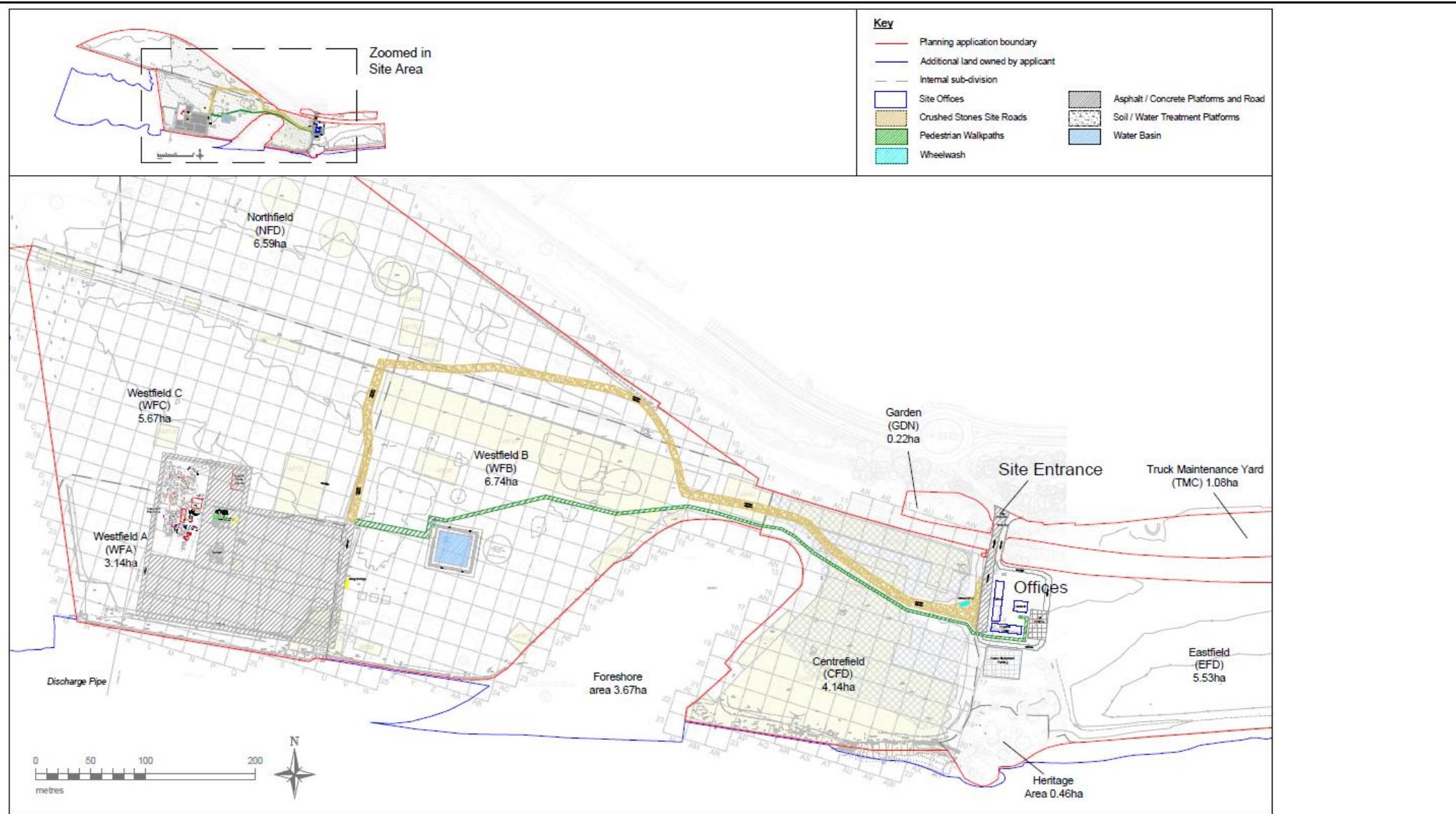
Figure No: 1

Site: Rest of Bowling Remediation Project

Job No: 355383

Scale: NTS

Source: Client



RSK

Site Layout Plan

Client: DEC DEME Environmental Contractors

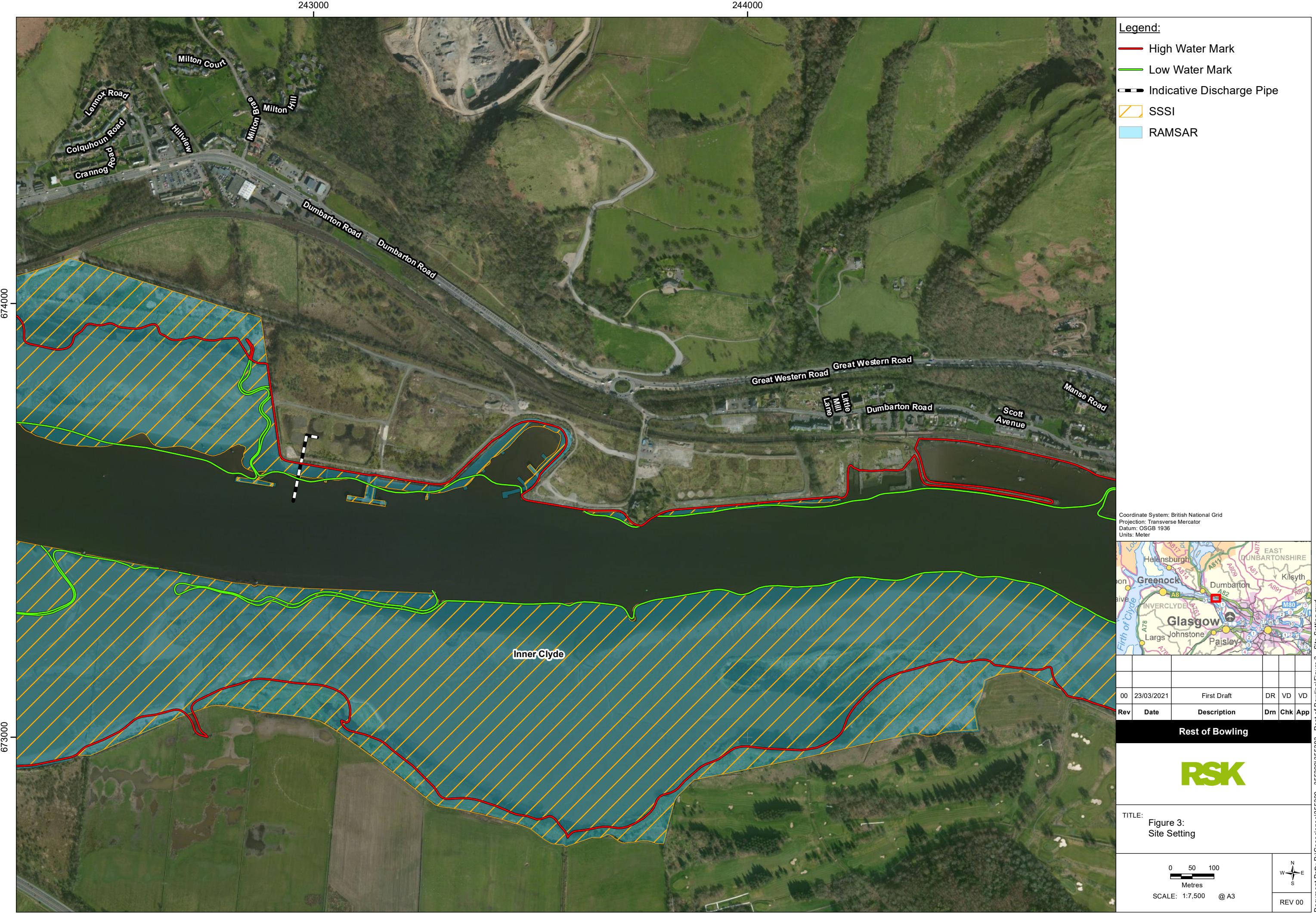
Figure No: 2

Site: Rest of Bowling Remediation Project

Job No: 355383

Scale: NTS

Source: Client





APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for DEC – DEME Environmental Contractors (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client, dated 10th February 2021. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):

- a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
- b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.
- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

- 8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.
- 9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
- 10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
- 11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
- 12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.



APPENDIX B

WATER QUALITY MONITORING RESULTS

BOWLING GROUNDWATER AND SURFACE WATER MONITORING, SEPTEMBER 2013 (Q3)

Table 2 - Summary of maximum concentrations (mg/l) of metals in groundwater and surface water, September/ October 2013

Analyte	LOD	Site wide	AOF	CFD	EFD	FRS	GFD	HFS	NFD	WFA	WFB	GDN	Surface Water
		Max	max	Max	Max	max	max	max	max	max	max	max	max
Arsenic	<0.00012	0.0115	0.00372	0.00892	0.00931	0.00241	0.000921	0.00201	0.00899	0.00373	0.0115	0.00663	0.00416
Beryllium	<0.00007	0.000107	<0.00007	0.000076	<0.00007	<0.00007	0.000107	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	0.000085
Cadmium	<0.0001	0.000329	<0.0001	0.000261	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.000329	<0.0001	<0.0001	<0.0001
Chromium	<0.00022	0.06	0.0124	0.0193	0.0169	0.00312	0.00848	0.00318	0.00333	0.0125	0.06	0.00202	0.00679
Copper	<0.00085	0.0107	<0.00085	0.00192	0.0107	0.00134	0.00125	<0.00085	0.00309	<0.00085	0.003	<0.00085	0.00503
Lead	<0.00002	0.00232	0.000104	0.000308	0.00232	0.000747	<0.00002	0.000118	<0.00002	0.000206	0.000449	0.000114	0.000337
Mercury	<0.00001	0.000022	<0.00001	0.000022	0.000017	<0.00001	<0.00001	<0.00001	0.000012	<0.00001	<0.00001	<0.00001	<0.00001
Nickel	<0.00015	0.00945	0.00576	0.00312	0.00319	0.00307	0.00156	0.00121	0.00376	0.00182	0.00945	0.00116	0.00851
Vanadium	<0.00024	0.00542	0.00342	0.00542	0.0049	0.00261	0.00235	0.000853	0.00154	0.00344	0.00468	0.000699	0.00237
Zinc	<0.00041	0.0644	0.0101	0.00315	0.0644	0.00169	0.00225	0.0011	0.00243	0.00184	0.00484	0.00144	0.00808

NB – values highlighted in red represent the maximum groundwater site concentration recorded in September/ October 2013

ALS

ALS

Location:	Esso Bowling	Customer Sample ID	AOFBH(08)01	AOFBH(08)02	AOFBH(08)03	AOFBH(08)04	AOFBH(08)05	AOFBH(08)06	AOFBH(08)08	AOFBH(08)09	AOFBH(08)AB	CFDBH(08)01	CFDBH(08)02	CFDBH(08)03	CFDBH(08)04		
		Depth	2.67-	0.57-	0.00-0.00	0.00-0.00	3.00-	1.99-	0.00-0.00	0.00-0.00	3.01-	1.62-	0.89-	1.64-	4.97-		
		AGS Id	EW														
		Sampled Date	11/03/2019	12/02/2019	29/01/2019	29/01/2019	31/01/2019	12/02/2019	29/01/2019	12/02/2019	12/03/2019	12/03/2019	01/02/2019	01/02/2019	11/02/2019		
		SDG	190313-20	190214-37	190131-28	190131-28	190202-51	190214-37	190131-28	190214-37	190313-20	190202-51	190202-51	190213-59			
Analysis	Test	Method	Units	LOD													
	Pyrene (aq)	TM178	µg/l	<0.005	0.194	0.0184	0.00852	<0.005	0.014	0.03	<0.005	0.0435	0.15	<0.005	0.012	0.0369	15.8
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	0.0482	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	2.15
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	0.0606	0.00742	<0.005	<0.005	0.00566	0.00727	<0.005	0.0107	<0.005	<0.005	<0.005	<0.005	3.27
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	0.0249	<0.005	<0.005	<0.005	0.00511	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.39
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	0.043	0.00486	<0.002	<0.002	0.00385	0.00511	<0.002	0.00696	<0.002	<0.002	<0.002	<0.002	2.22
	Dibenzo(a,h)anthracene (aq)	TM178	µg/l	<0.005	0.00686	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.347	
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	0.0352	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.82	
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	0.0233	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.788	
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	1.33	<0.082	<0.082	<0.082	0.125	0.197	<0.082	0.104	0.318	<0.082	0.173	0.255	73.8
VOCs																	
	Dibromofluoromethane**	TM208	%	-	-	-	-	-	-	-	-	-	111	108	109	108	
	Toluene-d8**	TM208	%	-	-	-	-	-	-	-	-	-	101	94.5	95.4	87.8	
	4-Bromofluorobenzene**	TM208	%	-	-	-	-	-	-	-	-	-	98.7	103	95.8	102	
	Dichlorodifluoromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Chloromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Vinyl chloride	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Bromomethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Chloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Trichlorofluoromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,1-Dichloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Carbon disulphide	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Dichloromethane	TM208	µg/l	<3	-	-	-	-	-	-	-	-	<3	<3	<3	<3	
	Methyl tertiary butyl ether (MTBE)	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	trans-1,2-Dichloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,1-Dichloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	cis-1,2-Dichloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	2,2-Dichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Bromochloromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Chloroform	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,1,1-Trichloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,1-Dichloropropene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Carbontetrachloride	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,2-Dichloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Benzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	162	
	Trichloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,2-Dichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Dibromomethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Bromodichloromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	cis-1,3-Dichloropropene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	Toluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	5.85	
	trans-1,3-Dichloropropene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	
	1,1,2-Trichloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	<1	<1	<1	<1	

ALS

Location:	Esso Bowling	Customer Sample ID	AOFBH(08)01	AOFBH(08)02	AOFBH(08)03	AOFBH(08)04	AOFBH(08)05	AOFBH(08)06	AOFBH(08)08	AOFBH(08)09	AOFBH(08)AB	CFDBH(08)01	CFDBH(08)02	CFDBH(08)03	CFDBH(08)04
		Depth	2.67-	0.57-	0.00-0.00	0.00-0.00	3.00-	1.99-	0.00-0.00	0.00-0.00	3.01-	1.62-	0.89-	1.64-	4.97-
		AGS Id	EW												
		Sampled Date	11/03/2019	12/02/2019	29/01/2019	29/01/2019	31/01/2019	12/02/2019	29/01/2019	12/02/2019	12/03/2019	01/02/2019	01/02/2019	01/02/2019	11/02/2019
		SDG	190313-20	190214-37	190131-28	190131-28	190202-51	190214-37	190131-28	190214-37	190313-20	190202-51	190202-51	190213-59	
Analysis	Test	Method	Units	LOD	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,3-Dichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Tetrachloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Dibromochloromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2-Dibromoethane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Chlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Ethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	1.9
	m,p-Xylene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	11.3
	o-Xylene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	2.21
	Styrene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Bromoform	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Isopropylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	6.85
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2,3-Trichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Bromobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Propylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	7.63
	2-Chlorotoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	4-Chlorotoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	tert-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	sec-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	2.73
	4-iso-Propyltoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,3-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,4-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	n-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Hexachlorobutadiene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	Naphthalene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	<1	<1	<1	<1

ALS

Location:	Esso Bowling	Customer Sample ID	CFDBH(08)05	CFDBH(08)07	CFDBH(08)08	CFDBH(08)12	CFDBH(08)13	CFDBH(11)02	CFDBH(11)03	CFDBH(11)04	CFDBH(11)06	CFDBH(11)07	CFDBH(11)09	CFDBH(11)10	CFDBH(11)12		
		Depth	5.05-	4.49-	3.50-	0.43-	0.68-	4.06-	3.36-	4.80-	4.26-	4.77-	2.55-	2.35-	2.71-		
		AGS Id	EW														
		Sampled Date	11/02/2019	31/01/2019	31/01/2019	01/02/2019	01/02/2019	26/02/2019	26/02/2019	25/02/2019	26/02/2019	26/02/2019	11/03/2019	12/02/2019	26/02/2019		
		SDG	190213-59	190202-51	190202-51	190202-51	190202-51	190227-16	190227-16	190227-11	190227-16	190227-16	190313-20	190214-37	190227-16		
Analysis	Test	Method	Units	LOD													
Inorganics																	
	Chloride	TM184	µg/l	<10000	-	32900	15600	-	-	-	-	-	-	-	-		
GRO																	
	Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	-	-		
	Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	-	-		
TPH CWG																	
	GRO Surrogate % recovery**	TM245	%		98	95	92	95	94	96	102	100	94	92	100	97	94
	GRO >C5-C12	TM245	µg/l	<50	<50	<50	<50	<50	<50	<50	288	90	87	394	291	<50	<50
	Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	9	<7	<7	<7	<7	<7	<7
	Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
	Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
	Aliphatics >C5-C6	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	52	<10	<10	81	23	<10	<10
	Aliphatics >C6-C8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	130	12	<10	121	72	<10	<10
	Aliphatics >C8-C10	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	19	<10	10	42	54	<10	<10
	Aliphatics >C10-C12	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	38	35	36	73	62	<10	<10
	Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	<10	55	10300	<10	<10	<10	33	41	11	61	<10	42	28
	Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	<10	84	10900	<10	15	<10	77	47	16	88	<10	91	68
	Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	<10	73	6490	<10	10	<10	96	<10	<10	36	<10	86	92
	Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	<10	212	27700	<10	25	<10	206	88	27	185	<10	219	188
	Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC8-EC10	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	14	<10	<10	28	37	<10	<10
	Aromatics >EC10-EC12	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	25	23	24	49	41	<10	<10
	Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	<10	12	3870	<10	<10	<10	<10	53	29	23	<10	<10	<10
	Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	<10	24	5300	<10	<10	<10	<10	45	12	28	<10	21	10
	Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	<10	10	5280	<10	<10	<10	<10	27	<10	23	<10	20	46
	Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	<10	46	14400	<10	<10	<10	<10	125	41	74	<10	41	56
	Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	<10	258	42100	<10	25	<10	494	302	155	654	291	260	244
PAHs																	
	Naphthalene (aq)	TM178	µg/l	<0.01	<0.01	<0.01	3.48	<0.01	<0.01	<0.01	0.0774	2.22	0.0397	0.172	<0.01	-	
	Acenaphthene (aq)	TM178	µg/l	<0.005	<0.005	0.0475	7.82	<0.005	<0.005	0.18	0.56	0.292	0.195	0.063	0.0225	<0.005	-
	Acenaphthylene (aq)	TM178	µg/l	<0.005	<0.005	0.0114	1.8	<0.005	<0.005	0.0059	<0.005	0.289	0.0527	<0.005	<0.005	<0.005	-
	Fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	0.0378	3.72	<0.005	0.0228	0.0108	0.0227	0.105	0.0375	0.0223	0.0128	<0.005	-
	Anthracene (aq)	TM178	µg/l	<0.005	<0.005	0.0124	4.02	<0.005	<0.005	<0.005	0.0157	0.0764	0.0539	0.0106	<0.005	<0.005	-
	Phenanthrene (aq)	TM178	µg/l	<0.005	<0.005	0.081	15.4	<0.005	0.0284	0.0127	0.0212	0.14	0.42	0.0835	0.0137	<0.005	-
	Fluorene (aq)	TM178	µg/l	<0.005	<0.005	0.0539	8.45	<0.005	<0.005	0.0271	0.0302	0.584	0.251	0.0855	<0.005	<0.005	-
	Chrysene (aq)	TM178	µg/l	<0.005	<0.005	0.0121	1.48	<0.005	<0.005	<0.005	0.0122	0.00585	<0.005	0.00732	<0.005	<0.005	-

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Location:	Esso Bowling	Customer Sample ID	CFDBH(08)05	CFDBH(08)07	CFDBH(08)08	CFDBH(08)12	CFDBH(08)13	CFDBH(11)02	CFDBH(11)03	CFDBH(11)04	CFDBH(11)06	CFDBH(11)07	CFDBH(11)09	CFDBH(11)10	CFDBH(11)12
		Depth	5.05-	4.49-	3.50-	0.43-	0.68-	4.06-	3.36-	4.80-	4.26-	4.77-	2.55-	2.35-	2.71-
		AGS Id	EW												
		Sampled Date	11/02/2019	31/01/2019	31/01/2019	01/02/2019	01/02/2019	26/02/2019	26/02/2019	25/02/2019	26/02/2019	26/02/2019	11/03/2019	12/02/2019	26/02/2019
		SDG	190213-59	190202-51	190202-51	190202-51	190202-51	190227-16	190227-16	190227-11	190227-16	190227-16	190313-20	190214-37	190227-16
Analysis	Test	Method	Units	LOD											
	1,3-Dichloropropane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Tetrachloroethene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Dibromochloromethane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,2-Dibromoethane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Chlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	m,p-Xylene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	o-Xylene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Styrene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Bromoform	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Isopropylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,2,3-Trichloropropane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Bromobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Propylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	2-Chlorotoluene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	4-Chlorotoluene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	tert-Butylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	1.17	<1	<1
	sec-Butylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	4-iso-Propyltoluene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,3-Dichlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,4-Dichlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	n-Butylbenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,2-Dichlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Hexachlorobutadiene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	2.9	<1	<1
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1

EPH CWG

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Location:	Esso Bowling	Customer Sample ID	CFDBH(11)17	CFDBH(11)19	CFDBH(11)21	CFDBH(11)22	CFDBH(11)23	CFDBH(14)01	CFDBH(14)04	CFDBH(14)05	CFDBH(14)06	CFDBH(14)07	CFDBH(14)08	CFDBH(14)09	CFD-BH(14)10			
		Depth	2.97-	0.74-	0.79-	1.90-	1.92-	1.39-	1.77-	1.46-	2.97-	2.73-	3.20-	0.87-	4.35-			
		AGS Id	EW															
		Sampled Date	25/02/2019	12/02/2019	12/02/2019	01/02/2019	01/02/2019	12/03/2019	12/02/2019	01/02/2019	01/02/2019	12/02/2019	25/02/2019	26/02/2019	11/02/2019			
		SDG	190227-11	190214-37	190214-37	190202-51	190202-51	190313-20	190214-37	190202-51	190202-51	190214-37	190227-11	190227-16	190213-59			
Analysis	Test	Method	Units	LOD														
Inorganics																		
	Chloride	TM184	µg/l	<10000	-	-	-	-	-	-	-	-	-	-	-			
GRO																		
	Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	-	-			
	Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	-	-			
TPH CWG																		
	GRO Surrogate % recovery**	TM245	%		100	103	101	95	108	99	107	94	90	102	98	105	85	
	GRO >C5-C12	TM245	µg/l	<50	1680	<50	3850	<50	<50	147	<50	<50	<50	992	80	132	332	
	Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	
	Benzene	TM245	µg/l	<7	159	<7	67	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	
	Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	
	Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	m,p-Xylene	TM245	µg/l	<8	<8	13	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	
	o-Xylene	TM245	µg/l	<3	3	<3	13	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	
	Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	26	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	
	Sum of detected BTEX	TM245	µg/l	<28	159	<28	93	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	
	Aliphatics >C5-C6	TM245	µg/l	<10	443	<10	954	<10	<10	<10	<10	<10	<10	<10	104	<10	18	36
	Aliphatics >C6-C8	TM245	µg/l	<10	620	<10	1600	<10	<10	22	<10	<10	<10	297	20	40	142	
	Aliphatics >C8-C10	TM245	µg/l	<10	93	<10	258	<10	<10	30	<10	<10	<10	86	17	15	43	
	Aliphatics >C10-C12	TM245	µg/l	<10	177	<10	467	<10	<10	42	<10	<10	<10	266	16	29	47	
	Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	46	<10	<10	37	<10	<10	145	<10	<10	14	<10	27	<10	
	Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	48	<10	19	57	72	<10	509	52	19	15	<10	47	<10	
	Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	30	<10	<10	67	111	<10	586	81	13	<10	<10	56	<10	
	Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	124	<10	19	161	183	<10	1240	133	32	29	<10	130	<10	
	Aromatics >EC5-EC7	TM245	µg/l	<10	159	<10	67	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
	Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
	Aromatics >EC8-EC10	TM245	µg/l	<10	66	<10	198	<10	<10	21	<10	<10	<10	60	12	10	30	
	Aromatics >EC10-EC12	TM245	µg/l	<10	118	<10	311	<10	<10	28	<10	<10	<10	177	11	20	32	
	Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	76	<10	36	<10	<10	<10	69	<10	<10	36	<10	12	28	
	Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	31	<10	<10	13	<10	<10	182	<10	<10	<10	<10	14	<10	
	Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	13	<10	<10	12	<10	<10	243	<10	<10	<10	<10	32	<10	
	Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	120	<10	36	25	<10	<10	494	<10	<10	36	<10	58	28	
	Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	1920	<10	3910	186	183	148	1730	133	32	1060	80	321	360	
PAHs																		
	Naphthalene (aq)	TM178	µg/l	<0.01	0.38	<0.01	0.141	<0.01	0.17	0.162	<0.01	<0.01	0.552	0.0122	0.131	0.0256		
	Acenaphthene (aq)	TM178	µg/l	<0.005	0.519	<0.005	0.102	0.00963	0.0768	0.154	0.0386	0.00928	<0.005	0.171	0.0485	0.0387	0.391	
	Acenaphthylene (aq)	TM178	µg/l	<0.005	0.12	<0.005	0.00694	<0.005	<0.005	0.0219	<0.005	<0.005	<0.005	0.0331	<0.005	0.00901	<0.005	
	Fluoranthene (aq)	TM178	µg/l	<0.005	0.0259	<0.005	0.015	0.0137	0.0336	0.0141	0.115	0.679	0.0802	0.00698	0.00974	0.0309	0.0238	
	Anthracene (aq)	TM178	µg/l	<0.005	0.0233	<0.005	0.00509	<0.005	0.0202	<0.005	0.0709	0.102	0.0112	<0.005	<0.005	0.01	0.0236	
	Phenanthrene (aq)	TM178	µg/l	<0.005	0.392	<0.005	0.0193	0.0179	0.0897	0.0197	0.396	0.363	0.0731	<0.005	<0.005	0.0556	0.125	
	Fluorene (aq)	TM178	µg/l	<0.005	0.998	<0.005	0.0253	0.00816	0.0171	0.075	0.108	0.0288	0.00603	0.137	0.0566	0.0622	0.526	
	Chrysene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.00741	0.00689	<0.005	0.0342	0.252	0.0292	<0.005	<0.005	<0.005	<0.005	

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Location:	Esso Bowling	Customer Sample ID	CFDBH(11)17	CFDBH(11)19	CFDBH(11)21	CFDBH(11)22	CFDBH(11)23	CFDBH(14)01	CFDBH(14)04	CFDBH(14)05	CFDBH(14)06	CFDBH(14)07	CFDBH(14)08	CFDBH(14)09	CFD-BH(14)10
		Depth	2.97-	0.74-	0.79-	1.90-	1.92-	1.39-	1.77-	1.46-	2.97-	2.73-	3.20-	0.87-	4.35-
		AGS Id	EW												
		Sampled Date	25/02/2019	12/02/2019	12/02/2019	01/02/2019	01/02/2019	12/03/2019	12/02/2019	01/02/2019	12/02/2019	25/02/2019	26/02/2019	11/02/2019	
Analysis	Test	Method	Units	LOD											
	Pyrene (aq)	TM178	µg/l	<0.005	0.0433	0.00818	0.0252	0.031	0.0445	0.0223	0.261	0.489	0.071	0.00952	0.0141
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.00876	0.0119	<0.005	0.0222	0.285	0.0281	<0.005	<0.005
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	0.00945	0.00727	0.00891	<0.005	0.038	0.429	0.0447	<0.005	<0.005
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.00643	<0.005	0.0172	0.174	0.0253	<0.005	<0.005
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	0.0035	<0.002	0.00711	0.0049	0.00452	<0.002	0.0162	0.254	0.0284	<0.002	<0.002
	Dibenzo(a,h)anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0561	0.00553	<0.005	<0.005	<0.005
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.00831	<0.005	0.0232	0.163	0.0331	<0.005	<0.005
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0117	0.122	0.0173	<0.005	<0.005
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	2.5	<0.082	0.357	0.109	0.499	0.469	1.15	3.41	0.453	0.909	0.141
VOCs															
Dibromofluoromethane**	TM208	%		128	116	113	107	108	110	118	107	-	118	124	127
Toluene-d8**	TM208	%		94.6	98.1	98.7	104	104	101	98.5	87.3	-	98.8	102	102
4-Bromofluorobenzene**	TM208	%		106	98.8	103	104	100	96.6	99.8	91.7	-	102	102	98.3
Dichlorodifluoromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Chloromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Vinyl chloride	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Bromomethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Chloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Trichlorofluoromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,1-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Carbon disulphide	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Dichlormethane	TM208	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	<3	<3
Methyl tertiary butyl ether (MTBE)	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
trans-1,2-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,1-Dichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
cis-1,2-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
2,2-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Bromochloromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Chloroform	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,1,1-Trichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,1-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Carbontetrachloride	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,2-Dichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Benzene	TM208	µg/l	<1	71.1	<1	106	<1	<1	<1	<1	<1	<1	-	<1	<1
Trichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,2-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Dibromomethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Bromodichloromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
cis-1,3-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
Toluene	TM208	µg/l	<1	2.87	<1	13.5	<1	<1	<1	<1	<1	<1	-	<1	<1
trans-1,3-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1
1,1,2-Trichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1

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Location:	Esso Bowling	Customer Sample ID	CFDBH(11)17	CFDBH(11)19	CFDBH(11)21	CFDBH(11)22	CFDBH(11)23	CFDBH(14)01	CFDBH(14)04	CFDBH(14)05	CFDBH(14)06	CFDBH(14)07	CFDBH(14)08	CFDBH(14)09	CFD-BH(14)10	
		Depth	2.97-	0.74-	0.79-	1.90-	1.92-	1.39-	1.77-	1.46-	2.97-	2.73-	3.20-	0.87-	4.35-	
		AGS Id	EW													
Sampled Date	25/02/2019	12/02/2019	12/02/2019	01/02/2019	01/02/2019	12/03/2019	12/02/2019	01/02/2019	01/02/2019	12/02/2019	25/02/2019	26/02/2019	11/02/2019			
SDG	190227-11	190214-37	190214-37	190202-51	190202-51	190313-20	190214-37	190202-51	190202-51	190214-37	190227-11	190227-16	190227-59			
Analysis	Test	Method	Units	LOD												
1,3-Dichloropropane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	
Tetrachloroethene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	
Dibromochloromethane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	
1,2-Dibromoethane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	
Chlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	
1,1,1,2-Tetrachloroethane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	
Ethylbenzene	TM208	µg/l	<1		<1	<1	3.57	<1	<1	<1	<1	-	<1	<1	<1	
m,p-Xylene	TM208	µg/l	<1		1.01	<1	9.75	<1	<1	<1	<1	-	<1	<1	<1	
o-Xylene	TM208	µg/l	<1		2.53	<1	8.99	<1	<1	<1	<1	-	<1	<1	<1	
Styrene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
Bromoform	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
Isopropylbenzene	TM208	µg/l	<1		<1	<1	3.23	<1	<1	<1	<1	-	<1	<1	<1	
1,1,2,2-Tetrachloroethane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,2,3-Trichloropropane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
Bromobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
Propylbenzene	TM208	µg/l	<1		<1	<1	1.89	<1	<1	<1	<1	-	<1	<1	<1	
2-Chlorotoluene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,3,5-Trimethylbenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
4-Chlorotoluene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
tert-Butylbenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,2,4-Trimethylbenzene	TM208	µg/l	<1		<1	<1	6.04	<1	<1	<1	<1	-	<1	<1	<1	
sec-Butylbenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
4-iso-Propyltoluene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,3-Dichlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,4-Dichlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
n-Butylbenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,2-Dichlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,2-Dibromo-3-chloropropane	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,2,4-Trichlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
Hexachlorobutadiene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
tert-Amyl methyl ether (TAME)	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
Naphthalene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,2,3-Trichlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
1,3,5-Trichlorobenzene	TM208	µg/l	<1		<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	
EPH CWG	Aliphatics >C16-C35 Aqueous	TM174	µg/l	<10		78	<10	19	124	183	<10	1100	133	32	15	<10
															103	<10

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Location:	Esso Bowling	Customer Sample ID	CFDBH(14)11	CFDBH(14)12	CFDBH(14)15	CFD-BH-17-101	CFD-BH-17-104	CFD-BH-17-105	CFD-BH-17-107	CFD-BH-17-108	CFD-BH-18-106	CFD-BH-18-109	CFD-BH-18-111	CFD-BH-18-112
		Depth	4.70-	4.66-	2.97-	4.39-	4.19-	4.30-	4.20-	4.10-	4.02-	3.94-	3.46-	2.27-
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW
		Sampled Date	11/02/2019	11/02/2019	25/02/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	31/01/2019	30/01/2019	31/01/2019	31/01/2019	30/01/2019
		SDG	190213-59	190213-59	190227-11	190201-29	190201-29	190201-29	190201-29	190202-51	190202-51	190202-51	190202-51	190201-29
Analysis	Test	Method	Units	LOD										
	Pyrene (aq)	TM178	µg/l	<0.005	0.13	0.00778	0.016	<0.005	0.0242	0.00707	0.0204	0.102	<0.005	0.00637
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.706
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	0.0134	<0.005	0.0105	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.56
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	0.00624	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.913
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	0.0114	<0.002	0.00688	<0.002	0.00567	<0.002	<0.002	0.0058	<0.002	<0.002
	Dibenzo(a,h)anthracene (aq)	TM178	µg/l	<0.005	0.00578	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.202
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	0.0078	<0.005	0.0141	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.26
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	0.00859	<0.005	0.00504	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.646
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	1.05	12.9	0.219	<0.082	0.175	<0.082	<0.082	2.15	<0.082	10.8
VOCs														
	Dibromofluoromethane**	TM208	%		110	108	127	111	-	109	110	105	107	105
	Toluene-d8**	TM208	%		101	98.8	102	91.9	-	90.2	98	98.7	92.2	91.6
	4-Bromofluorobenzene**	TM208	%		96.2	98.5	103	90	-	81.1	94.5	82.8	89.1	91.7
	Dichlorodifluoromethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Chloromethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Vinyl chloride	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Bromomethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Chloroethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Trichlorofluoromethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,1-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Carbon disulphide	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Dichloromethane	TM208	µg/l	<3	<3	<3	<3	<3	-	<3	<3	<3	<3	<3
	Methyl tertiary butyl ether (MTBE)	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	trans-1,2-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,1-Dichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	cis-1,2-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	2,2-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Bromoform	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,1,1-Trichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,1-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Carbontetrachloride	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2-Dichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Benzene	TM208	µg/l	<1	<1	868	<1	<1	-	<1	<1	<1	<1	<1
	Trichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Dibromomethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Bromodichloromethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	cis-1,3-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Toluene	TM208	µg/l	<1	<1	18.5	<1	<1	-	<1	<1	<1	<1	<1
	trans-1,3-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,1,2-Trichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1

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		Customer Sample ID	CFDBH(14)11	CFDBH(14)12	CFDBH(14)15	CFD-BH-17-101	CFD-BH-17-104	CFD-BH-17-105	CFD-BH-17-107	CFD-BH-17-108	CFD-BH-18-106	CFD-BH-18-109	CFD-BH-18-111	CFD-BH-18-112
Location:	Esso Bowling	Depth	4.70-	4.66-	2.97-	4.39-	4.19-	4.30-	4.20-	4.10-	4.02-	3.94-	3.46-	2.27-
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW
		Sampled Date	11/02/2019	11/02/2019	25/02/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	31/01/2019	30/01/2019	31/01/2019	31/01/2019	30/01/2019
		SDG	190213-59	190213-59	190227-11	190201-29	190201-29	190201-29	190201-29	190202-51	190201-29	190202-51	190202-51	190201-29
Analysis	Test	Method	Units	LOD										
	1,3-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1
	Tetrachloroethene	TM208	µg/l	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1
	Dibromochloromethane	TM208	µg/l	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1
	1,2-Dibromoethane	TM208	µg/l	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1
	Chlorobenzene	TM208	µg/l	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1
	Ethylbenzene	TM208	µg/l	<1	<1	12.4	<1	<1	-	<1	<1	<1	<1	28.5
	m,p-Xylene	TM208	µg/l	<1	<1	32	<1	<1	-	<1	<1	<1	<1	1.29
	o-Xylene	TM208	µg/l	<1	<1	32.5	<1	<1	-	<1	<1	<1	<1	14
	Styrene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Bromoform	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Isopropylbenzene	TM208	µg/l	<1	<1	2.95	<1	<1	-	<1	<1	<1	<1	3.67
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2,3-Trichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Bromobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Propylbenzene	TM208	µg/l	<1	<1	2.02	<1	<1	-	<1	<1	<1	<1	2.41
	2-Chlorotoluene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	<1	4.36	<1	<1	-	<1	<1	<1	<1	2.18
	4-Chlorotoluene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	tert-Butylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	<1	16.9	<1	<1	-	<1	<1	<1	<1	12.7
	sec-Butylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	1
	4-iso-Propyltoluene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,3-Dichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,4-Dichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	n-Butylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2-Dichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Hexachlorobutadiene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	Naphthalene	TM208	µg/l	<1	<1	17.2	<1	<1	-	<1	<1	<1	<1	98
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1

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		Customer Sample ID	CFD-BH-18-115	CFD-BH-18-201	CFD-BH-18-202	CFD-BH-18-501	CFD-BH-18-601	CFD-BH-18-602	CFD-BH-18-202A	CFDBHB2	FRSBH(08)01	FRSBH(08)02	FRSBH(08)03	GFDBH(08)01
Location:	Esso Bowling	Depth	3.72-	4.69-	2.11-	4.10-	0.30-	0.58-	1.80-	2.39-	1.32-	0.57-	2.00-	0.68-
		AGS Id	EW	EW	EW	EW	EW	EW						
		Sampled Date	30/01/2019	11/03/2019	12/02/2019	31/01/2019	01/02/2019	01/02/2019	26/02/2019	31/01/2019	30/01/2019	30/01/2019	11/03/2019	11/03/2019
		SDG	190201-29	190313-20	190214-37	190202-51	190202-51	190202-51	190227-16	190202-51	190201-29	190201-29	190313-20	190313-20
Analysis	Test	Method	Units	LOD										
Inorganics														
	Chloride	TM184	µg/l	<10000	41600	68400	1440000	585000	71300	37100	3650000	12600	-	-
GRO														
	Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	-	-	-	-	<10	<10	-
	Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	-	-	-	-	<10	<10	<10
TPH CWG														
	GRO Surrogate % recovery**	TM245	%		97	103	100	90	97	93	92	95	96	108
	GRO >C5-C12	TM245	µg/l	<50	<50	<50	151	<50	<50	<50	<50	<50	<50	105
	Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
	Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
	Aliphatics >C5-C6	TM245	µg/l	<10	<10	14	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C6-C8	TM245	µg/l	<10	<10	32	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C8-C10	TM245	µg/l	<10	<10	27	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C10-C12	TM245	µg/l	<10	<10	36	<10	<10	<10	<10	<10	<10	<10	45
	Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	20	<10	99	4520	<10	<10	<10	283	12	<10
	Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	34	<10	113	3500	<10	<10	<10	541	91	<10
	Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	11	<10	48	3200	<10	<10	<10	399	92	<10
	Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	65	<10	260	11200	<10	<10	<10	1220	195	<10
	Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC8-EC10	TM245	µg/l	<10	<10	18	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC10-EC12	TM245	µg/l	<10	<10	24	<10	<10	<10	<10	<10	<10	<10	30
	Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	<10	23	857	<10	<10	<10	<10	76	<10	<10
	Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	<10	36	1480	<10	<10	<10	213	33	<10	<10
	Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	<10	16	2390	<10	<10	<10	175	35	<10	<10
	Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	<10	75	4720	<10	<10	<10	464	68	<10	<10
	Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	91	<10	486	15900	<10	<10	<10	1690	263	<10
PAHs														
	Naphthalene (aq)	TM178	µg/l	<0.01	0.0141	<0.01	0.0209	1.53	<0.01	<0.01	<0.01	0.0138	<0.01	<0.01
	Acenaphthene (aq)	TM178	µg/l	<0.005	0.0165	<0.005	<0.005	8.22	<0.005	<0.005	<0.005	0.113	<0.005	<0.005
	Acenaphthylene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	0.0102	0.393	<0.005	<0.005	<0.005	0.0559	<0.005	<0.005
	Fluoranthene (aq)	TM178	µg/l	<0.005	0.00734	0.0184	<0.005	1.29	0.00767	0.022	0.0136	0.33	0.061	0.00761
	Anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.835	<0.005	<0.005	0.119	0.00545	<0.005	<0.005
	Phenanthrene (aq)	TM178	µg/l	<0.005	<0.005	0.00585	<0.005	3.78	<0.005	0.0116	<0.005	0.821	0.0842	<0.005
	Fluorene (aq)	TM178	µg/l	<0.005	0.0115	<0.005	<0.005	0.219	<0.005	<0.005	<0.005	0.31	<0.005	<0.005
	Chrysene (aq)	TM178	µg/l	<0.005	<0.005	0.00549	<0.005	0.616	<0.005	0.00838	<0.005	0.123	0.0158	<0.005

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Location:	Esso Bowling	Customer Sample ID	CFD-BH-18-115	CFD-BH-18-201	CFD-BH-18-202	CFD-BH-18-501	CFD-BH-18-601	CFD-BH-18-602	CFD-BH-18-202A	CFDBHB2	FRSBH(08)01	FRSBH(08)02	FRSBH(08)03	GFDBH(08)01		
		Depth	3.72-	4.69-	2.11-	4.10-	0.30-	0.58-	1.80-	2.39-	1.32-	0.57-	2.00-	0.68-		
		AGS Id	EW	EW	EW	EW	EW	EW								
		Sampled Date	30/01/2019	11/03/2019	12/02/2019	31/01/2019	01/02/2019	01/02/2019	26/02/2019	31/01/2019	30/01/2019	30/01/2019	11/03/2019	11/03/2019		
		SDG	190201-29	190313-20	190214-37	190202-51	190202-51	190202-51	190227-16	190202-51	190201-29	190201-29	190313-20	190313-20		
Analysis	Test	Method	Units	LOD												
	Pyrene (aq)	TM178	µg/l	<0.005	0.026	0.0242	0.0685	2.07	0.00981	0.0315	0.0204	0.523	0.0667	0.012	0.0163	<0.005
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	<0.005	0.00653	<0.005	0.364	<0.005	0.0115	<0.005	0.101	0.00993	<0.005	<0.005	<0.005
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	0.014	0.0268	0.483	0.0131	0.0196	0.0107	0.125	0.0218	0.00883	<0.005	<0.005
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	0.008	0.00982	0.174	0.00661	0.00866	0.00529	0.0494	0.00998	<0.005	<0.005	<0.005
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	0.00397	0.0111	0.0196	0.362	0.00825	0.0131	0.00746	0.0806	0.013	0.00674	<0.002	<0.002
	Dibenz(a,h)anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	0.00615	0.0712	<0.005	<0.005	<0.005	0.0136	<0.005	<0.005	<0.005	<0.005
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	<0.005	0.0143	0.0156	0.271	0.0128	<0.005	0.0125	0.0811	<0.005	<0.005	<0.005	<0.005
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	0.00869	0.134	0.00561	<0.005	<0.005	0.0454	<0.005	<0.005	<0.005	<0.005
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	<0.082	0.108	0.186	20.8	<0.082	0.126	<0.082	2.9	0.288	<0.082	<0.082	<0.082
VOCs																
	Dibromofluoromethane**	TM208	%		114	111	117	109	109	108	125	110	-	-	-	-
	Toluene-d8**	TM208	%		98.7	102	98.1	110	92.2	109	102	96.6	-	-	-	-
	4-Bromofluorobenzene**	TM208	%		98.3	97.6	98.9	83.4	91.2	107	103	90.7	-	-	-	-
	Dichlorodifluoromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Chloromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Vinyl chloride	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Bromomethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Chloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Trichlorofluoromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,1-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Carbon disulphide	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Dichloromethane	TM208	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	-	-
	Methyl tertiary butyl ether (MTBE)	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	trans-1,2-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,1-Dichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	cis-1,2-Dichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	2,2-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Bromoform	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,1,1-Trichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,1-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Carbontetrachloride	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2-Dichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Benzene	TM208	µg/l	<1	<1	<1	<1	4.08	<1	<1	<1	<1	<1	-	-	-
	Trichloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Dibromomethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Bromodichloromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	cis-1,3-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Toluene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	trans-1,3-Dichloropropene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,1,2-Trichloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-

ALS

Location:	Esso Bowling	Customer Sample ID	CFD-BH-18-115	CFD-BH-18-201	CFD-BH-18-202	CFD-BH-18-501	CFD-BH-18-601	CFD-BH-18-602	CFD-BH-18-202A	CFDBHB2	FRSBH(08)01	FRSBH(08)02	FRSBH(08)03	GFDBH(08)01
		Depth	3.72-	4.69-	2.11-	4.10-	0.30-	0.58-	1.80-	2.39-	1.32-	0.57-	2.00-	0.68-
		AGS Id	EW	EW	EW	EW	EW	EW						
Analysis	Test	Method	Units	LOD										
	1,3-Dichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Tetrachloroethene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Dibromochloromethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2-Dibromoethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Chlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Ethylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	m,p-Xylene	TM208	µg/l	<1	<1	<1	<1	1.39	<1	<1	<1	-	-	-
	o-Xylene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Styrene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Bromoform	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Isopropylbenzene	TM208	µg/l	<1	<1	<1	<1	3.89	<1	<1	<1	-	-	-
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2,3-Trichloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Bromobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Propylbenzene	TM208	µg/l	<1	<1	<1	<1	6.46	<1	<1	<1	-	-	-
	2-Chlorotoluene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	4-Chlorotoluene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	tert-Butylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	sec-Butylbenzene	TM208	µg/l	<1	<1	<1	<1	1.62	<1	<1	<1	-	-	-
	4-iso-Propyltoluene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,3-Dichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,4-Dichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	n-Butylbenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2-Dichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Hexachlorobutadiene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Naphthalene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-

EPH CWG

ALS

Location:	Esso Bowling	Customer Sample ID	GFDBH(08)03	NFDBH(08)01	NFDBH(08)02	NFDBH(08)03	NFDBH(08)04	NFDBH(08)05	NFD-BH-16-01	NFD-BH-16-02	NFD-BH-16-03	NFD-BH-16-04	NFD-BH-16-05	NFD-BH-16-06	NFD-BH-16-07
		Depth	7.32-	2.61-	1.06-	1.62-	0.48-	0.71-	1.64-	1.00-	0.78-	1.41-	0.43-	0.84-	1.08-
		AGS Id	EW	EW	EW	EW	EW	EW	EW						
		Sampled Date	05/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	05/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019
		SDG	190202-51	190202-51	190202-51	190202-51	190202-51	190202-51	190202-51	190202-51	190209-71	190202-51	190202-51	190202-51	190202-51
Analysis	Test	Method	Units	LOD											
Inorganics															
	Chloride	TM184	µg/l	<10000	-	-	-	-	-	7100	-	-	-	-	-
GRO															
	Total Aliphatics >C5-C12	TM245	µg/l	<10	<10	<10	<10	<10	<10	-	<10	-	33	<10	<10
	Total Aromatics >EC5-EC12	TM245	µg/l	<10	<10	<10	<10	<10	<10	-	<10	-	<10	<10	<10
TPH CWG															
	GRO Surrogate % recovery**	TM245	%		112	95	111	106	108	108	96	110	98	112	110
	GRO >C5-C12	TM245	µg/l	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	10	<3
	Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
	Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
	Aliphatics >C5-C6	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C6-C8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C8-C10	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C10-C12	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	<10	19	<10	<10	51	36	<10	<10	<10	18	<10
	Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	<10	12	<10	<10	74	50	<10	<10	<10	12	<10
	Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	<10	31	<10	<10	125	86	<10	<10	<10	30	<10
	Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC8-EC10	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC10-EC12	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	29	<10	<10
	Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	15	<10	<10	13	<10	<10	<10
	Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	24	<10	<10	<10	<10	<10	<10
	Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	39	<10	<10	42	<10	<10	<10
	Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	<10	31	<10	<10	164	86	<10	42	<10	63	<10
PAHs															
	Naphthalene (aq)	TM178	µg/l	<0.01	-	<0.01	<0.01	<0.01	<0.01	0.0232	<0.01	0.893	0.03	<0.01	0.0718
	Acenaphthene (aq)	TM178	µg/l	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	0.0673	<0.005	<0.005	<0.005	<0.005
	Acenaphthylene (aq)	TM178	µg/l	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Fluoranthene (aq)	TM178	µg/l	<0.005	-	0.0489	<0.005	<0.005	0.21	0.0202	<0.005	<0.005	0.0362	0.0193	0.0131
	Anthracene (aq)	TM178	µg/l	<0.005	-	0.00658	<0.005	<0.005	0.0162	<0.005	<0.005	<0.005	0.0781	<0.005	<0.005
	Phenanthrene (aq)	TM178	µg/l	<0.005	-	0.00945	<0.005	<0.005	0.134	0.0383	0.00538	<0.005	0.549	0.0221	0.0386
	Fluorene (aq)	TM178	µg/l	<0.005	-	<0.005	<0.005	<0.005	0.0125	<0.005	<0.005	<0.005	0.164	0.00653	<0.005
	Chrysene (aq)	TM178	µg/l	<0.005	-	0.0271	<0.005	<0.005	0.093	<0.005	<0.005	<0.005	0.0131	<0.005	0.00523

ALS

		Customer Sample ID	GFDBH(08)03	NFDBH(08)01	NFDBH(08)02	NFDBH(08)03	NFDBH(08)04	NFDBH(08)05	NFD-BH-16-01	NFD-BH-16-02	NFD-BH-16-03	NFD-BH-16-04	NFD-BH-16-05	NFD-BH-16-06	NFD-BH-16-07		
Location:	Esso Bowling	Depth	7.32-	2.61-	1.06-	1.62-	0.48-	0.71-	1.64-	1.00-	0.78-	1.41-	0.43-	0.84-	1.08-		
		AGS Id	EW	EW	EW	EW	EW	EW	EW								
		Sampled Date	05/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	05/02/2019	31/01/2019	31/01/2019	31/01/2019		
Analysis	Test	Method	Units	LOD	-	-	-	-	-	-	-	-	-	-	-		
	Pyrene (aq)	TM178	µg/l	<0.005	-	0.248	<0.005	<0.005	0.175	0.0224	0.00946	<0.005	0.092	0.0195	0.0163	0.035	0.0251
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	-	0.0298	<0.005	<0.005	0.0791	<0.005	<0.005	<0.005	0.00529	<0.005	<0.005	0.00512	0.00578
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	-	0.0528	<0.005	<0.005	0.166	0.00645	<0.005	<0.005	<0.005	<0.005	<0.005	0.0075	0.00718
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	-	0.0285	<0.005	<0.005	0.0648	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	-	0.0405	<0.002	<0.002	0.105	0.00322	0.00302	<0.002	<0.002	<0.002	<0.002	0.00348	0.00372
	Dibenz(a,h)anthracene (aq)	TM178	µg/l	<0.005	-	0.00505	<0.005	<0.005	0.0202	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	-	0.0292	<0.005	<0.005	0.067	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	-	0.0161	<0.005	<0.005	0.0462	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	-	0.542	<0.082	<0.082	1.19	0.0906	<0.082	<0.082	1.9	0.0974	<0.082	0.202	0.0973
VOCs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dibromofluoromethane**		TM208	%	-	-	-	-	-	-	-	112	-	-	-	-	-	
Toluene-d8**		TM208	%	-	-	-	-	-	-	-	99.6	-	-	-	-	-	
4-Bromofluorobenzene**		TM208	%	-	-	-	-	-	-	-	93.1	-	-	-	-	-	
Dichlorodifluoromethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Chloromethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Vinyl chloride		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Bromomethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Chloroethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Trichlorofluoromethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,1-Dichloroethene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Carbon disulphide		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Dichloromethane		TM208	µg/l	<3	-	-	-	-	-	-	<3	-	-	-	-	-	
Methyl tertiary butyl ether (MTBE)		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
trans-1,2-Dichloroethene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,1-Dichloroethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
cis-1,2-Dichloroethene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
2,2-Dichloropropane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Bromoform		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Chloroform		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,1,1-Trichloroethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,1-Dichloropropene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Carbontetrachloride		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,2-Dichloroethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Benzene		TM208	µg/l	<1	-	-	-	-	-	-	4.56	-	-	-	-	-	
Trichloroethene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,2-Dichloropropane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Dibromomethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Bromodichloromethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
cis-1,3-Dichloropropene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
Toluene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
trans-1,3-Dichloropropene		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	
1,1,2-Trichloroethane		TM208	µg/l	<1	-	-	-	-	-	-	<1	-	-	-	-	-	

ALS

Location:	Esso Bowling	Customer Sample ID	GFDBH(08)03	NFDBH(08)01	NFDBH(08)02	NFDBH(08)03	NFDBH(08)04	NFDBH(08)05	NFD-BH-16-01	NFD-BH-16-02	NFD-BH-16-03	NFD-BH-16-04	NFD-BH-16-05	NFD-BH-16-06	NFD-BH-16-07
		Depth	7.32-	2.61-	1.06-	1.62-	0.48-	0.71-	1.64-	1.00-	0.78-	1.41-	0.43-	0.84-	1.08-
		AGS Id	EW	EW	EW	EW	EW	EW	EW						
		Sampled Date	05/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	05/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019
		SDG	190202-51	190202-51	190202-51	190202-51	190202-51	190202-51	190202-51	190202-51	190209-71	190202-51	190202-51	190202-51	190202-51
Analysis	Test	Method	Units	LOD											
	1,3-Dichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Tetrachloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Dibromochloromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2-Dibromoethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Chlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Ethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	m,p-Xylene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	o-Xylene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Styrene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Bromoform	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Isopropylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-Trichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Bromobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Propylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	2-Chlorotoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	4-Chlorotoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	tert-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	sec-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	4-iso-Propyltoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,3-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,4-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	n-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobutadiene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	-	-

EPH CWG

ALS

Location:	Esso Bowling	Customer Sample ID	NFDBH2	WFABH(08)01	WFABH(08)02	WFABH(08)03	WFABH(08)04	WFABH(08)05	WFA-BH-16-02	WFA-BH-16-03	WFA-BH-16-04	WFA-BH-16-05	WFA-BH-16-06	WFA-BH-16-07
		Depth	0.81-	0.26-	0.00-0.00	0.00-0.00	0.70-	0.00-0.00	0.00-0.57	0.00-0.00	0.90-	0.63-	0.00-0.00	1.64-
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW
		Sampled Date	05/02/2019	12/03/2019	29/01/2019	29/01/2019	28/02/2019	29/01/2019	12/03/2019	29/01/2019	12/03/2019	12/03/2019	29/01/2019	28/02/2019
		SDG	190209-71	190313-20	190131-28	190131-28	190302-82	190131-28	190313-20	190131-28	190313-20	190131-28	190313-20	190302-82
Analysis	Test	Method	Units	LOD										
Inorganics														
	Chloride	TM184	µg/l	<10000	-	-	-	-	-	-	-	-	-	-
GRO														
	Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	-
	Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	-
TPH CWG														
	GRO Surrogate % recovery**	TM245	%		103	99	94	84	99	88	100	89	99	100
	GRO >C5-C12	TM245	µg/l	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	<3	31	<3	<3	<3	<3	<3	<3	<3
	Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
	Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
	Aliphatics >C5-C6	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C6-C8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C8-C10	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C10-C12	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC8-EC10	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC10-EC12	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
PAHs														
	Naphthalene (aq)	TM178	µg/l	<0.01	0.0255	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0148
	Acenaphthene (aq)	TM178	µg/l	<0.005	0.0652	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Acenaphthylene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Fluoranthene (aq)	TM178	µg/l	<0.005	0.0766	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005
	Anthracene (aq)	TM178	µg/l	<0.005	0.0162	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00774
	Phenanthrene (aq)	TM178	µg/l	<0.005	0.127	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0266
	Fluorene (aq)	TM178	µg/l	<0.005	0.0401	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0136
	Chrysene (aq)	TM178	µg/l	<0.005	0.0215	<0.005	<0.005	<0.005	<0.005	<0.005	0.0152	<0.005	<0.005	<0.005

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Location:	Esso Bowling	Customer Sample ID	WFA-BH-16-08	WFA-BH-16-09	WFA-BH-18-402	WFBBH(08)01	WFBBH(08)03	WFBBH(08)04	WFBBH(08)05	WFBBH(08)06	WFBBH(08)08	WFBBH(08)09	WFBBH(08)10	WFBBH(08)11
		Depth	0.60-	3.81-	2.93-	4.74-	1.37-	2.11-	1.60-	3.61-	2.76-	4.63-	0.60-	2.26-
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW
		Sampled Date	27/02/2019	28/02/2019	27/02/2019	27/02/2019	30/01/2019	27/02/2019	30/01/2019	30/01/2019	13/03/2019	27/02/2019	30/01/2019	13/03/2019
		SDG	190301-40	190302-82	190301-40	190301-40	190201-29	190301-40	190201-29	190314-17	190301-40	190201-29	190314-17	
Analysis	Test	Method	Units	LOD										
Inorganics														
	Chloride	TM184	µg/l	<10000	-	-	22400	-	-	-	-	-	-	-
GRO														
	Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	-	<10	-	<10	<10	-	<10
	Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	-	<10	-	<10	<10	-	<10
TPH CWG														
	GRO Surrogate % recovery**	TM245	%		98	94	88	101	103	104	92	103	99	99
	GRO >C5-C12	TM245	µg/l	<50	<50	652	<50	170	<50	189	<50	<50	<50	<50
	Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	3	<3	13	<3	<3	<3	<3	<3	<3
	Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
	Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
	o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
	Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
	Aliphatics >C5-C6	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C6-C8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aliphatics >C8-C10	TM245	µg/l	<10	<10	36	<10	19	<10	17	<10	<10	<10	<10
	Aliphatics >C10-C12	TM245	µg/l	<10	13	349	<10	54	<10	91	<10	<10	<10	<10
	Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	54	1190	<10	400	<10	116	<10	<10	<10	<10
	Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	59	469	<10	307	<10	81	<10	<10	<10	<10
	Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	92	724	<10	646	<10	102	<10	<10	<10	<10
	Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	205	2380	<10	1350	<10	299	<10	<10	<10	<10
	Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Aromatics >EC8-EC10	TM245	µg/l	<10	<10	24	<10	13	<10	11	<10	<10	<10	<10
	Aromatics >EC10-EC12	TM245	µg/l	<10	<10	232	<10	36	<10	61	<10	<10	<10	<10
	Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	16	200	<10	14	<10	<10	<10	<10	<10	<10
	Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	19	144	<10	71	<10	17	<10	<10	<10	<10
	Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	19	176	<10	136	<10	<10	<10	<10	<10	<10
	Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	54	520	<10	221	<10	17	<10	<10	<10	<10
	Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	293	3550	<10	1730	<10	505	<10	<10	<10	<10
PAHs														
	Naphthalene (aq)	TM178	µg/l	<0.01	0.0542	0.622	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Acenaphthene (aq)	TM178	µg/l	<0.005	0.0226	0.203	<0.005	<0.005	<0.005	<0.005	0.111	<0.005	<0.005	<0.005
	Acenaphthylene (aq)	TM178	µg/l	<0.005	<0.005	0.0819	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Fluoranthene (aq)	TM178	µg/l	<0.005	0.0148	0.0607	<0.005	<0.005	<0.005	0.0332	0.0569	<0.005	0.0093	<0.005
	Anthracene (aq)	TM178	µg/l	<0.005	<0.005	0.0957	<0.005	<0.005	<0.005	0.0144	<0.005	<0.005	<0.005	<0.005
	Phenanthrene (aq)	TM178	µg/l	<0.005	0.0269	0.33	<0.005	<0.005	<0.005	0.0455	<0.005	0.00739	0.00773	<0.005
	Fluorene (aq)	TM178	µg/l	<0.005	0.0315	0.293	<0.005	<0.005	<0.005	0.0385	<0.005	<0.005	<0.005	<0.005
	Chrysene (aq)	TM178	µg/l	<0.005	<0.005	0.0121	<0.005	<0.005	<0.005	0.00516	<0.005	<0.005	<0.005	0.0159

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Location:	Esso Bowling	Customer Sample ID	WFA-BH-16-08	WFA-BH-16-09	WFA-BH-18-402	WFBBH(08)01	WFBBH(08)03	WFBBH(08)04	WFBBH(08)05	WFBBH(08)06	WFBBH(08)08	WFBBH(08)09	WFBBH(08)10	WFBBH(08)11
		Depth	0.60-	3.81-	2.93-	4.74-	1.37-	2.11-	1.60-	3.61-	2.76-	4.63-	0.60-	2.26-
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW
		Sampled Date	27/02/2019	28/02/2019	27/02/2019	27/02/2019	30/01/2019	27/02/2019	30/01/2019	30/01/2019	13/03/2019	27/02/2019	30/01/2019	13/03/2019
		SDG	190301-40	190302-82	190301-40	190301-40	190201-29	190301-40	190201-29	190314-17	190301-40	190201-29	190314-17	
Analysis	Test	Method	Units	LOD										
	Pyrene (aq)	TM178	µg/l	<0.005	0.033	0.107	<0.005	0.0742	<0.005	0.149	0.0435	<0.005	0.00936	<0.005
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	<0.005	0.00936	<0.005	<0.005	<0.005	0.00872	<0.005	<0.005	<0.005	<0.005
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	0.00815	0.0255	<0.005	0.0238	<0.005	0.0104	0.00605	<0.005	<0.005	<0.005
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	0.0127	<0.005	0.0102	<0.005	0.00528	<0.005	<0.005	<0.005	<0.005
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	0.0044	0.0125	<0.002	0.0148	<0.002	0.00659	0.00429	<0.002	<0.002	<0.002
	Dibenzo(a,h)anthracene (aq)	TM178	µg/l	<0.005	<0.005	0.0154	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.00871	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	<0.005	0.0184	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	0.196	1.9	<0.082	0.132	<0.082	0.219	0.32	<0.082	<0.082	<0.082
VOCs														
	Dibromofluoromethane**	TM208	%	-	-	112	112	-	-	-	-	-	113	-
	Toluene-d8**	TM208	%	-	-	99.6	100	-	-	-	-	-	100	-
	4-Bromofluorobenzene**	TM208	%	-	-	96.6	98.3	-	-	-	-	-	97.5	-
	Dichlorodifluoromethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Chloromethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Vinyl chloride	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Bromomethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Chloroethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Trichlorofluoromethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,1-Dichloroethene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Carbon disulphide	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Dichloromethane	TM208	µg/l	<3	-	<3	<3	-	-	-	-	-	<3	-
	Methyl tertiary butyl ether (MTBE)	TM208	µg/l	<1	-	<1	6.42	-	-	-	-	-	<1	-
	trans-1,2-Dichloroethene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,1-Dichloroethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	cis-1,2-Dichloroethene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	2,2-Dichloropropane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Bromoform	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,1,1-Trichloroethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,1-Dichloropropene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Carbontetrachloride	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,2-Dichloroethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Benzene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Trichloroethene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,2-Dichloropropane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Dibromomethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Bromodichloromethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	cis-1,3-Dichloropropene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	Toluene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	trans-1,3-Dichloropropene	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-
	1,1,2-Trichloroethane	TM208	µg/l	<1	-	<1	<1	-	-	-	-	-	<1	-

ALS

Location:	Esso Bowling	Customer Sample ID	WFA-BH-16-08	WFA-BH-16-09	WFA-BH-18-402	WFBBH(08)01	WFBBH(08)03	WFBBH(08)04	WFBBH(08)05	WFBBH(08)06	WFBBH(08)08	WFBBH(08)09	WFBBH(08)10	WFBBH(08)11
		Depth	0.60-	3.81-	2.93-	4.74-	1.37-	2.11-	1.60-	3.61-	2.76-	4.63-	0.60-	2.26-
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW
		Sampled Date	27/02/2019	28/02/2019	27/02/2019	27/02/2019	30/01/2019	27/02/2019	30/01/2019	30/01/2019	13/03/2019	27/02/2019	30/01/2019	13/03/2019
		SDG	190301-40	190302-82	190301-40	190301-40	190201-29	190301-40	190201-29	190201-29	190314-17	190301-40	190201-29	190314-17
Analysis	Test	Method	Units	LOD										
	1,3-Dichloropropane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Tetrachloroethene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Dibromochloromethane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2-Dibromoethane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Chlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Ethylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	m,p-Xylene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	o-Xylene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Styrene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Bromoform	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Isopropylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2,3-Trichloropropane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Bromobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Propylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	2-Chlorotoluene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	4-Chlorotoluene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	tert-Butylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	sec-Butylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	4-iso-Propyltoluene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,3-Dichlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,4-Dichlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	n-Butylbenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2-Dichlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Hexachlorobutadiene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	Naphthalene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	-	-	<1	<1	-	-	-	-	<1	-
EPH CWG														
Aliphatics >C16-C35 Aqueous		TM174	µg/l	<10	151	1190	<10	953	<10	183	<10	<10	<10	<10

ALS

		Customer Sample ID	WFB-BH-16-03	WFB-BH-16-04	WFB-BH-16-05	WFB-BH-16-06	WFB-BH-16-07	WFB-BH-16-08	WFB-BH-16-09	WFB-BH-16-10	WFB-BH-16-11	WFB-BH-18-203	WFB-BH-18-204	WFB-BH-18-205		
Location:	Esso Bowling	Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	1.02-	1.53-	2.80-	1.78-	1.24-	1.34-	2.10-	0.00-0.00		
		AGS Id	EW	EW	EW											
		Sampled Date	29/01/2019	29/01/2019	29/01/2019	29/01/2019	30/01/2019	30/01/2019	30/01/2019	13/03/2019	13/03/2019	13/03/2019	13/03/2019	29/01/2019		
		SDG	190131-28	190131-28	190131-28	190131-28	190201-29	190201-29	190201-29	190314-17	190314-17	190314-17	190314-17	190131-28		
Analysis	Test	Method	Units	LOD												
Inorganics																
GRO		Chloride	TM184	µg/l	<10000	-	-	-	-	-	-	-	780000	555000	971000	
TPH CWG		Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	82	<10	<10	-	-	-	-	
		Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	46	<10	<10	-	-	-	-	
PAHs		GRO Surrogate % recovery**	TM245	%	85	91	92	83	111	110	102	97	104	99	104	99
		GRO >C5-C12	TM245	µg/l	<50	167	115	<50	<50	128	<50	<50	<50	<50	73	<50
		Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
		Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
		Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	4	<4
		Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
		m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
		o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
		Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
		Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
		Aliphatics >C5-C6	TM245	µg/l	<10	<10	23	<10	<10	<10	<10	<10	<10	<10	<10	<10
		Aliphatics >C6-C8	TM245	µg/l	<10	12	13	<10	<10	<10	<10	<10	<10	<10	52	<10
		Aliphatics >C8-C10	TM245	µg/l	<10	21	15	<10	<10	<10	<10	<10	<10	<10	<10	<10
		Aliphatics >C10-C12	TM245	µg/l	<10	68	33	<10	19	62	<10	<10	<10	<10	<10	<10
		Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	591	<10	<10	<10	962	<10	<10	<10	<10	<10	<10
		Aliphatics >C16-EC21 (aq)	TM174	µg/l	<10	446	<10	<10	<10	1040	<10	<10	<10	<10	<10	<10
		Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	396	<10	23	<10	802	<10	<10	<10	<10	<10	<10
		Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	1430	<10	23	<10	2800	<10	<10	<10	<10	<10	<10
		Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
		Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
		Aromatics >EC8-EC10	TM245	µg/l	<10	14	10	<10	<10	<10	<10	<10	<10	<10	<10	<10
		Aromatics >EC10-EC12	TM245	µg/l	<10	45	22	<10	13	41	<10	<10	<10	<10	<10	<10
		Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	89	<10	<10	<10	289	17	<10	<10	<10	<10	<10
		Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	86	<10	<10	<10	299	<10	<10	<10	<10	<10	<10
		Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	133	<10	<10	<10	267	<10	<10	<10	<10	<10	<10
		Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	308	<10	<10	<10	855	17	<10	<10	<10	<10	<10
		Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	1910	115	62	49	3655	34	<10	<10	<10	63	<10

ALS

ALS

		Customer Sample ID	WFB-BH-16-03	WFB-BH-16-04	WFB-BH-16-05	WFB-BH-16-06	WFB-BH-16-07	WFB-BH-16-08	WFB-BH-16-09	WFB-BH-16-10	WFB-BH-16-11	WFB-BH-18-203	WFB-BH-18-204	WFB-BH-18-205	
Location:	Esso Bowling	Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	1.02-	1.53-	2.80-	1.78-	1.24-	1.34-	2.10-	0.00-0.00	
		AGS Id	EW	EW	EW										
		Sampled Date	29/01/2019	29/01/2019	29/01/2019	29/01/2019	30/01/2019	30/01/2019	30/01/2019	13/03/2019	13/03/2019	13/03/2019	13/03/2019	29/01/2019	
		SDG	190131-28	190131-28	190131-28	190131-28	190201-29	190201-29	190201-29	190314-17	190314-17	190314-17	190314-17	190131-28	
Analysis	Test	Method	Units	LOD	-	-	-	-	-	-	-	-	-	<1	
	1,3-Dichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Tetrachloroethene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Dibromochloromethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2-Dibromoethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Chlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Ethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	m,p-Xylene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	o-Xylene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Styrene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Bromoform	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Isopropylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2,3-Trichloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Bromobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Propylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	2-Chlorotoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	4-Chlorotoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	tert-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	sec-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	4-iso-Propyltoluene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,3-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,4-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	n-Butylbenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2-Dichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Hexachlorobutadiene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	Naphthalene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	-	-	-	-	-	-	-	-	-	<1	
EPH CWG		Aliphatics >C16-C35 Aqueous	TM174	µg/l	<10	842	<10	23	<10	1840	<10	<10	<10	<10	<10

ALS

		Customer Sample ID WFBBH11-702 WFBBH11-703 WFBBH11-704 WFBBH11-705 WFBBH11-707 WFC-BH-16-01 WFC-BH-16-02 WFC-BH-16-03 WFC-BH-16-04 WFC-BH-16-05 WFC-BH-16-06 WFC-BH-16-07														
Location:	Esso Bowling	Depth	2.94-	2.92-	2.85-	1.57-	1.43-	2.49-	2.16-	2.70-	1.57-	1.27-	3.12-	3.11-		
		AGS Id	EW													
		Sampled Date	27/02/2019	27/02/2019	27/02/2019	27/02/2019	27/02/2019	12/02/2019	12/02/2019	11/02/2019	11/02/2019	30/01/2019	11/02/2019	11/02/2019		
Analysis	Test	Method	Units	LOD												
		Inorganics														
Chloride	TM184	µg/l	<10000	-	-	-	-	-	-	-	-	-	-	-	-	-
GRO																
Total Aliphatics >C5-C12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	<10	-	-	-
Total Aromatics >EC5-EC12	TM245	µg/l	<10	-	-	-	-	-	-	-	-	-	<10	-	-	-
TPH CWG																
GRO Surrogate % recovery**	TM245	%		94	109	98	97	96	102	105	96	96	94	91	94	
GRO >C5-C12	TM245	µg/l	<50	256	<50	342	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Methyl tertiary butyl ether (MTBE)	TM245	µg/l	<3	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Benzene	TM245	µg/l	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Toluene	TM245	µg/l	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Ethylbenzene	TM245	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
m,p-Xylene	TM245	µg/l	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
o-Xylene	TM245	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Sum of detected Xylenes	TM245	µg/l	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
Sum of detected BTEX	TM245	µg/l	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28	<28
Aliphatics >C5-C6	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8	TM245	µg/l	<10	44	<10	37	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics >C8-C10	TM245	µg/l	<10	36	<10	36	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics >C10-C12	TM245	µg/l	<10	87	<10	143	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics >C12-C16 (aq)	TM174	µg/l	<10	54	132	<10	<10	<10	<10	<10	<10	<10	<10	<10	26	<10
Aliphatics >C16-C21 (aq)	TM174	µg/l	<10	247	236	<10	<10	<10	<10	<10	<10	<10	<10	64	<10	
Aliphatics >C21-C35 (aq)	TM174	µg/l	<10	137	62	30	<10	<10	<10	<10	<10	<10	<10	21	<10	
Total Aliphatics >C12-C35 (aq)	TM174	µg/l	<10	438	430	30	<10	<10	<10	<10	<10	<10	<10	111	<10	
Aromatics >EC5-EC7	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8	TM245	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	TM245	µg/l	<10	25	<10	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	TM245	µg/l	<10	58	<10	96	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq)	TM174	µg/l	<10	20	17	17	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC16-EC21 (aq)	TM174	µg/l	<10	38	106	<10	<10	<10	<10	<10	<10	<10	<10	21	<10	
Aromatics >EC21-EC35 (aq)	TM174	µg/l	<10	21	56	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	
Total Aromatics >EC12-EC35 (aq)	TM174	µg/l	<10	79	179	17	<10	<10	<10	<10	<10	<10	<10	33	<10	
Total Aliphatics & Aromatics >C5-35 (aq)	TM174	µg/l	<10	770	627	388	<10	<10	<10	<10	<10	<10	<10	144	<10	
PAHs																
Naphthalene (aq)	TM178	µg/l	<0.01	0.0109	<0.01	0.318	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0738	
Acenaphthene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	0.0361	0.436	0.126	0.0131	0.00678	<0.005	0.0329	0.0229	<0.005	0.581	
Acenaphthylene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.0268	0.0199	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.00605	0.0454	0.00738	0.0184	<0.005	0.017	0.0118	0.0331	0.112	
Anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.0103	0.00537	<0.005	<0.005	0.0143	<0.005	0.00721	0.0429	
Phenanthrene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.0214	0.0118	0.00613	<0.005	0.0348	<0.005	0.0131	0.238	
Fluorene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.00902	<0.005	<0.005	<0.005	0.0242	<0.005	<0.005	0.194	
Chrysene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	0.0222	0.0215	

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		Customer Sample ID	WFBBH11-702	WFBBH11-703	WFBBH11-704	WFBBH11-705	WFBBH11-707	WFC-BH-16-01	WFC-BH-16-02	WFC-BH-16-03	WFC-BH-16-04	WFC-BH-16-05	WFC-BH-16-06	WFC-BH-16-07	
Location:	Esso Bowling	Depth	2.94-	2.92-	2.85-	1.57-	1.43-	2.49-	2.16-	2.70-	1.57-	1.27-	3.12-	3.11-	
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	
		Sampled Date	27/02/2019	27/02/2019	27/02/2019	27/02/2019	27/02/2019	12/02/2019	12/02/2019	11/02/2019	11/02/2019	30/01/2019	11/02/2019	11/02/2019	
Analysis	Test	Method	Units	LOD											
	Pyrene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.0775	0.12	0.0094	0.0302	<0.005	0.0277	0.0138	
	Benzo(a)anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.0157	<0.005	<0.005	<0.005	<0.005	0.0188	0.022
	Benzo(b)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	0.00519	0.0286	<0.005	0.0147	<0.005	<0.005	0.00932	0.067
	Benzo(k)fluoranthene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.0133	<0.005	0.00719	<0.005	<0.005	<0.005	0.0337
	Benzo(a)pyrene (aq)	TM178	µg/l	<0.002	<0.002	<0.002	<0.002	0.00394	0.0181	<0.002	0.0107	<0.002	<0.002	0.00597	0.0553
	Dibenzo(a,h)anthracene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.00591	<0.005	0.0166	<0.005	<0.005	<0.005	0.00876
	Benzo(g,h,i)perylene (aq)	TM178	µg/l	<0.005	<0.005	0.0065	<0.005	<0.005	0.00898	<0.005	<0.005	<0.005	<0.005	<0.005	0.0292
	Indeno(1,2,3-cd)pyrene (aq)	TM178	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	0.0122	<0.005	0.0148	<0.005	<0.005	0.00599	0.0224
	PAH, Total Detected USEPA 16 (aq)	TM178	µg/l	<0.082	<0.082	<0.082	0.355	0.555	0.47	<0.082	0.125	<0.082	0.151	<0.082	0.343
	VOCs													1.51	
Dibromofluoromethane**	TM208	%	-	-	115	-	-	-	-	117	-	-	-	-	
Toluene-d8**	TM208	%	-	-	102	-	-	-	-	100	-	-	-	-	
4-Bromofluorobenzene**	TM208	%	-	-	97.7	-	-	-	-	98.3	-	-	-	-	
Dichlorodifluoromethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Chloromethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Vinyl chloride	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Bromomethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Chloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Trichlorofluoromethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,1-Dichloroethene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Carbon disulphide	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Dichloromethane	TM208	µg/l	<3	-	-	<3	-	-	-	<3	-	-	-	-	
Methyl tertiary butyl ether (MTBE)	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
trans-1,2-Dichloroethene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,1-Dichloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
cis-1,2-Dichloroethene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
2,2-Dichloropropane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Bromochloromethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Chloroform	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,1,1-Trichloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,1-Dichloropropene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Carbontetrachloride	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,2-Dichloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Benzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Trichloroethene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,2-Dichloropropane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Dibromomethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Bromodichloromethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
cis-1,3-Dichloropropene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
Toluene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
trans-1,3-Dichloropropene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	
1,1,2-Trichloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	-	

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		Customer Sample ID	WFBBH11-702	WFBBH11-703	WFBBH11-704	WFBBH11-705	WFBBH11-707	WFC-BH-16-01	WFC-BH-16-02	WFC-BH-16-03	WFC-BH-16-04	WFC-BH-16-05	WFC-BH-16-06	WFC-BH-16-07	
Location:	Esso Bowling	Depth	2.94-	2.92-	2.85-	1.57-	1.43-	2.49-	2.16-	2.70-	1.57-	1.27-	3.12-	3.11-	
		AGS Id	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	EW	
		Sampled Date	27/02/2019	27/02/2019	27/02/2019	27/02/2019	27/02/2019	12/02/2019	12/02/2019	11/02/2019	11/02/2019	30/01/2019	11/02/2019	11/02/2019	
		SDG	190301-40	190301-40	190301-40	190301-40	190301-40	190214-37	190214-37	190213-59	190213-59	190201-29	190213-59	190213-59	
Analysis	Test	Method	Units	LOD											
	1,3-Dichloropropane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Tetrachloroethene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Dibromochloromethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2-Dibromoethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Chlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,1,1,2-Tetrachloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Ethylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	m,p-Xylene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	o-Xylene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Styrene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Bromoform	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Isopropylbenzene	TM208	µg/l	<1	-	-	1.02	-	-	-	<1	-	-	-	
	1,1,2,2-Tetrachloroethane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2,3-Trichloropropane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Bromobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Propylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	2-Chlorotoluene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,3,5-Trimethylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	4-Chlorotoluene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	tert-Butylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2,4-Trimethylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	sec-Butylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	4-iso-Propyltoluene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,3-Dichlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,4-Dichlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	n-Butylbenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2-Dichlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2-Dibromo-3-chloropropane	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2,4-Trichlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Hexachlorobutadiene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	tert-Amyl methyl ether (TAME)	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	Naphthalene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,2,3-Trichlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
	1,3,5-Trichlorobenzene	TM208	µg/l	<1	-	-	<1	-	-	-	<1	-	-	-	
EPH CWG															
Aliphatics >C16-C35 Aqueous		TM174	µg/l	<10	384	298	30	<10	<10	<10	<10	<10	<10	85	<10

		2.67-EW	0.57-EW	0.00-0.00 EW	0.00-0.00 EW	3.00-EW	1.99-EW	0.00-0.00 EW	0.00-0.00 EW	3.01-EW	1.62-EW	0.89-EW	1.64-EW	4.97-EW	5.05-EW	4.49-EW	
Location:		11/03/2019	12/02/2019	29/01/2019	29/01/2019	31/01/2019	12/02/2019	29/01/2019	29/01/2019	12/02/2019	12/03/2019	01/02/2019	01/02/2019	11/02/2019	11/02/2019	31/01/2019	
Analysis	Units	LOD	EOS														
Benzene	µg/l	<7	8														
Toluene	µg/l	<4															
Ethylbenzene	µg/l	<5															
m,p-Xylene	µg/l	<8															
o-Xylene	µg/l	<3															
Sum of detected Xylenes	µg/l	<11	30														
Sum of detected BTEX	µg/l	<28															
Aliphatics >C5-C6	µg/l	<10															
Aliphatics >C6-C8	µg/l	<10															
Aliphatics >C8-C10	µg/l	<10															
Aliphatics >C10-C12	µg/l	<10															
Aliphatics >C12-C16 (aq)	µg/l	<10															
Aliphatics >C16-C21 (aq)	µg/l	<10															
Aliphatics >C21-C35 (aq)	µg/l	<10															
Total Aliphatics >C12-C35 (aq)	µg/l	<10															
Aromatics >EC5-EC7	µg/l	<10															
Aromatics >EC7-EC8	µg/l	<10															
Aromatics >EC8-EC10	µg/l	<10															
Aromatics >EC10-EC12	µg/l	<10															
Aromatics >EC12-EC16 (aq)	µg/l	<10															
Aromatics >EC16-EC21 (aq)	µg/l	<10															
Aromatics >EC21-EC35 (aq)	µg/l	<10															
Total Aromatics >EC12-EC35 (aq)	µg/l	<10															
Total Aliphatics & Aromatics >C5-35 (aq) S	µg/l	<10															
Naphthalene (aq)	µg/l	<0.01	2		0.0166	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0275	<0.01	0.0277	0.0733	9.1	
Acenaphthene (aq)	µg/l	<0.005			0.461	0.00635	<0.005	<0.005	0.0631	0.0794	<0.005	0.0143	0.0353	<0.005	0.0668	0.0381	4.8
Acenaphthylene (aq)	µg/l	<0.005	5.8		0.0101	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0107	0.0179	2.32	<0.005
Fluoranthene (aq)	µg/l	<0.005	0.0063		0.227	0.0128	0.00678	<0.005	0.0157	0.0217	<0.005	0.0133	0.105	<0.005	0.00918	0.0169	6.68
Anthracene (aq)	µg/l	<0.005	0.1		0.0232	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00733	<0.005	<0.005	<0.005	<0.005	3.32
Phenanthrene (aq)	µg/l	<0.005			0.0496	0.0118	<0.005	<0.005	0.00883	0.0234	<0.005	0.00804	<0.005	<0.005	<0.005	0.0475	10.9
Fluorene (aq)	µg/l	<0.005			0.0656	0.00715	<0.005	<0.005	0.0088	0.0304	<0.005	<0.005	<0.005	<0.005	0.0466	0.0241	6.27
Chrysene (aq)	µg/l	<0.005			0.0413	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	2.55	<0.005
Pyrene (aq)	µg/l	<0.005			0.194	0.0184	0.00852	<0.005	0.014	0.03	<0.005	0.0435	0.15	<0.005	0.012	0.0369	15.8
Benzo(a)anthracene (aq)	µg/l	<0.005			0.0482	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	2.15	<0.005
Benzo(b)fluoranthene (aq)	µg/l	<0.005			0.0606	0.00742	<0.005	<0.005	0.00566	0.00727	<0.005	0.0107	<0.005	<0.005	<0.005	3.27	<0.005
Benzo(k)fluoranthene (aq)	µg/l	<0.005			0.0249	<0.005	<0.005	<0.005	0.00511	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.39	<0.005
Benzo(a)pyrene (aq)	µg/l	<0.002	0.00017		0.043	0.00486	<0.002	<0.002	0.00385	0.00511	<0.002	0.00696	<0.002	<0.002	<0.002	2.22	<0.002
Dibenzo(a,h)anthracene (aq)	µg/l	<0.005			0.00686	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.347	<0.005	
Benzo(g,h,i)perylene (aq)	µg/l	<0.005			0.0352	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.82	<0.005	
Indeno(1,2,3-cd)pyrene (aq)	µg/l	<0.005			0.0233	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.788	<0.005	
PAH, Total Detected USEPA 16 (aq)	µg/l	<0.082			1.33	<0.082	<0.082	<0.082	0.125	0.197	<0.082	0.104	0.318	<0.082	0.173	0.255	73.8

3.50-EW	0.43-EW	0.68-EW	4.06-EW	3.36-EW	4.80-EW	4.26-EW	4.77-EW	2.55-EW	2.35-EW	2.71-EW	2.97-EW	0.74-EW	0.79-EW	1.90-EW	1.92-EW	1.39-EW	1.77-EW	1.46-EW	2.97-EW
31/01/2019	01/02/2019	01/02/2019	26/02/2019	26/02/2019	25/02/2019	26/02/2019	26/02/2019	11/03/2019	12/02/2019	26/02/2019	25/02/2019	12/02/2019	12/02/2019	01/02/2019	01/02/2019	12/03/2019	12/02/2019	01/02/2019	01/02/2019
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<10	<10	<10	<10	52	<10	<10	81	23	<10	<10	443	<10	954	<10	<10	<10	<10	<10	<10
<10	<10	<10	<10	130	12	<10	121	72	<10	<10	620	<10	1600	<10	<10	22	<10	<10	<10
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27700	<10	25	<10	206	88	27	185	<10	219	188	124	<10	19	161	183	<10	1240	133	32
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3.48	<0.01	<0.01	<0.01	<0.01	0.0774	2.22	0.0397	0.172	<0.01	-	0.38	<0.01	0.141	<0.01	0.17	0.162	<0.01	<0.01	<0.01
7.82	<0.005	<0.005	0.18	0.56	0.292	0.195	0.063	0.0225	<0.005	-	0.519	<0.005	0.102	0.00963	0.0768	0.154	0.0386	0.00928	<0.005
1.8	<0.005	<0.005	0.0059	<0.005	0.289	0.0527	<0.005	<0.005	<0.005	-	0.12	<0.005	0.00694	<0.005	0.0219	<0.005	<0.005	<0.005	<0.005
3.72	<0.005	0.0228	0.0108	0.0227	0.105	0.0375	0.0223	0.0128	<0.005	-	0.0259	<0.005	0.015	0.0137	0.0336	0.0141	0.115	0.679	0.0802
4.02	<0.005	<0.005	<0.005	0.0157	0.0764	0.0539	0.0106	<0.005	<0.005	-	0.0233	<0.005	0.00509	<0.005	0.0202	<0.005	0.0709	0.102	0.0112
15.4	<0.005	0.0284	0.0127	0.0212	0.14	0.42	0.0835	0.0137	<0.005	-	0.392	<0.005	0.0193	0.0179	0.0897	0.0197	0.396	0.363	0.0731
8.45	<0.005	<0.005	0.0271	0.0302	0.584	0.251	0.0855	<0.005	<0.005	-	0.998	<0.005	0.0253	0.00816	0.0171	0.075	0.108	0.0288	0.00603
1.48	<0.005	<0.005	<0.005	0.0122	0.00585	<0.005	0.00732	<0.005	<0.005	-	<0.005	<0.005	<0.005	0.00741	0.00689	<0.005	0.0342	0.252	0.0292
11.7	0.00879	0.0227	0.037	0.0416	0.117	0.0535	0.032	0.0154	0.0483	-	0.0433	0.00818	0.0252	0.031	0.0445	0.0223	0.261	0.489	0.071
1.13	<0.005	<0.005	<0.005	<0.005	0.0109	0.00562	0.011	<0.005	<0.005	-	<0.005	<0.005	<0.005	0.00876	0.0119	<0.005	0.0222	0.285	0.0281
0.928	<0.005	<0.005	0.00693	0.0191	0.00913	<0.005	0.00512	0.00848	<0.005	-	<0.005	<0.005	0.00945	0.00727	0.00891	<0.005	0.038	0.429	0.0447
0.271	<0.005	<0.005	<0.005	0.00743	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	0.00643	<0.005	0.0172	0.174	0.0253
0.804	<0.002	<0.002	0.00503	0.0135	0.00624	0.00353	0.00416	0.00449	<0.002	-	0.0035	<0.002	0.00711	0.0049	0.00452	<0.002	0.0162	0.254	0.0284
0.236	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0561	0.00553	
0.715	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	0.00831	<0.005	0.0232	0.163	0.0331
0.206	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0117	0.122	0.0173
62.1	<0.082	<0.082	0.286	0.744	1.71	3.29	0.364	0.249	<0.082	-	2.5	<0.082	0.357	0.109	0.499	0.469	1.15	3.41	0.453

2.73-EW	3.20-EW	0.87-EW	4.35-EW	4.70-EW	4.66-EW	2.97-EW	4.39-EW	4.19-EW	4.30-EW	4.20-EW	4.10-EW	4.02-EW	3.94-EW	3.46-EW	2.27-EW	3.72-EW	4.69-EW	2.11-EW	4.10-EW	
12/02/2019	25/02/2019	26/02/2019	11/02/2019	11/02/2019	11/02/2019	25/02/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	31/01/2019	30/01/2019	31/01/2019	31/01/2019	30/01/2019	30/01/2019	11/03/2019	12/02/2019	31/01/2019	
						190213-59	190213-59	190227-11	190201-29	190201-29	190201-29	190201-29	190202-51	190201-29	190202-51	190202-51	190201-29			
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0.171	0.0485	0.0387	0.391	0.382	0.0751	0.0462	0.0101	0.0175	<0.005	0.0109	0.991	<0.005	<0.005	<0.005	1.02	0.0165	<0.005	<0.005	8.22	
0.0331	<0.005	0.00901	<0.005	0.033	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.319	0.283	<0.005	<0.005	0.0102	0.393	
0.00698	0.00974	0.0309	0.0238	0.0582	<0.005	0.00984	<0.005	0.025	<0.005	0.0123	0.0681	<0.005	<0.005	1.08	0.0881	0.00734	0.0184	<0.005	1.29	
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0.137	0.0566	0.0622	0.526	0.358	0.0725	0.0524	<0.005	0.00768	<0.005	<0.005	0.263	<0.005	<0.005	<0.005	0.688	0.0115	<0.005	<0.005	0.219	
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0.909	0.141	0.386	1.14	1.05	12.9	0.219	<0.082	0.175	<0.082	0.175	<0.082	0.175	<0.082	10.8	93.8	<0.082	0.108	0.186	20.8	

0.30-EW	0.58-EW	1.80-EW	2.39-EW	1.32-EW	0.57-EW	2.00-EW	0.68-EW	7.32-EW	2.61-EW	1.06-EW	1.62-EW	0.48-EW	0.71-EW	1.64-EW	1.00-EW	0.78-EW	1.41-EW	0.43-EW	0.84-EW
01/02/2019	01/02/2019	26/02/2019	31/01/2019	30/01/2019	30/01/2019	11/03/2019	11/03/2019	05/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	05/02/2019	31/01/2019	31/01/2019	31/01/2019
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0.00767	0.022	0.0136	0.33	0.061	0.00761	<0.005	<0.005 -	0.0489	<0.005	<0.005	0.21	0.0202	<0.005	<0.005	0.0362	0.0193	0.0131	0.0273	
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0.00981	0.0315	0.0204	0.523	0.0667	0.012	0.0163	<0.005 -	0.248	<0.005	<0.005	0.175	0.0224	0.00946	<0.005	0.092	0.0195	0.0163	0.035	
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0.0131	0.0196	0.0107	0.125	0.0218	0.00883	<0.005	<0.005 -	0.0528	<0.005	<0.005	0.166	0.00645	<0.005	<0.005	<0.005	<0.005	<0.005	0.0075	
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0.00825	0.0131	0.00746	0.0806	0.013	0.00674	<0.002	<0.002 -	0.0405	<0.002	<0.002	0.105	0.00322	0.00302	<0.002	<0.002	<0.002	<0.002	0.00348	
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1.08-EW	0.81-EW	0.26-EW	0.00-0.00	0.00-0.00	0.70-EW	0.00-0.00	0.00-0.57	0.00-0.00	0.90-EW	0.63-EW	0.00-0.00	1.64-EW	0.60-EW	3.81-EW	2.93-EW	4.74-EW	1.37-EW	2.11-EW	1.60-EW
31/01/2019	05/02/2019	12/03/2019	29/01/2019	29/01/2019	28/02/2019	29/01/2019	12/03/2019	29/01/2019	12/03/2019	12/03/2019	29/01/2019	28/02/2019	27/02/2019	28/02/2019	27/02/2019	27/02/2019	30/01/2019	27/02/2019	30/01/2019
	190209-71	190313-20	190131-28	190131-28	190302-82	190131-28	190313-20	190131-28	190313-20	190313-20	190131-28	190302-82							
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0.0191	0.0766	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	0.0173	0.0148	0.0607	<0.005	<0.005	<0.005	0.0332	0.0569
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0.0227	0.127	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0266	0.0269	0.33	<0.005	<0.005	<0.005	<0.005	0.0455
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0.00372	0.0224	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0328	<0.002	<0.002	<0.002	0.0044	0.0125	<0.002	0.0148	<0.002	0.00659	0.00429	
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1.57-EW	1.43-EW	2.49-EW	2.16-EW	2.70-EW	1.57-EW	1.27-EW	3.12-EW	3.11-EW
27/02/2019	27/02/2019	12/02/2019	12/02/2019	11/02/2019	11/02/2019	30/01/2019	11/02/2019	11/02/2019

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0.0268	0.0199	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.1003
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0.555	0.47	<0.082	0.125	<0.082	0.151	<0.082	0.343	1.51	



APPENDIX C

AMBIENT CURRENT VELOCITY SURVEY DATA

Bowling ADCP Survey: Transect: 000														
Survey Date			28/06/2010											
Ensembles Taken Along Transect:			101											
High Water Offset			-2:30											
Key														
Portion of transect undertaken adjacent to Westfield (WFD) shoreline														
Portion of transect undertaken adjacent to Centrefield (CFD) shoreline														
Portion of transect undertaken adjacent to Eastfield (EFD) shoreline														
Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)						
1	55.92991708	-4.52521618	14.00	5.98	16.29	27.01	37.90	104.33						
2	55.92987763	-4.52494590	32.97	6.48	14.01	27.17	38.17	102.45						
3	55.92985407	-4.52470107	52.26	6.48	19.68	25.04	30.17	98.83						
4	55.92982760	-4.52445247	71.54	6.98	14.81	27.37	36.72	95.50						
5	55.92979488	-4.52419988	90.61	6.98	11.82	22.12	30.15	96.92						
6	55.92975697	-4.52390933	109.70	6.48	10.86	21.82	33.38	107.29						
7	55.92972783	-4.52365158	128.70	6.48	9.42	19.43	31.36	92.19						
8	55.92971305	-4.52335322	148.00	6.48	8.54	17.35	28.74	111.54						
9	55.92970585	-4.52309122	167.40	5.98	8.86	15.38	22.48	86.93						
10	55.92970237	-4.52282705	186.60	5.98	5.98	16.06	26.08	85.94						
11	55.92969373	-4.52252445	205.50	5.98	6.79	14.60	22.50	89.08						
12	55.92967708	-4.52222597	224.30	5.48	6.07	14.28	19.46	106.56						
13	55.92966395	-4.52196433	243.10	5.48	11.27	17.62	22.09	86.96						
14	55.92965670	-4.52170280	261.70	5.48	9.97	13.48	16.64	87.53						
15	55.92964595	-4.52140617	280.50	5.48	3.87	9.41	14.10	117.76						
16	55.92963100	-4.52115258	299.50	5.98	6.48	10.29	13.77	78.48						
17	55.92962110	-4.52086162	318.70	5.98	0.39	8.44	15.80	126.51						
18	55.92960525	-4.52060810	338.10	5.98	1.20	6.42	12.15	106.01						
19	55.92958187	-4.52031855	357.70	5.98	0.43	8.27	14.92	142.48						
20	55.92956020	-4.52006347	377.90	5.98	3.56	8.15	11.48	148.94						
21	55.92953945	-4.51980788	397.90	5.48	2.97	6.82	11.41	162.62						
22	55.92952050	-4.51951272	417.70	5.48	3.14	6.37	9.54	140.24						
23	55.92950958	-4.51924858	437.50	5.98	3.81	7.85	12.21	173.44						
24	55.92950638	-4.51893963	456.80	5.98	2.33	5.79	10.60	121.66						
25	55.92950203	-4.51866628	475.70	5.98	1.98	7.13	14.76	136.80						
26	55.92949818	-4.51834908	493.80	5.98	4.23	8.54	15.93	126.29						
27	55.92948215	-4.51807882	511.10	5.98	1.98	6.19	11.38	149.41						
28	55.92946202	-4.51777348	528.30	5.98	2.57	7.20	14.66	138.78						
29	55.92944770	-4.51751022	545.60	5.98	2.77	6.32	12.65	143.22						
30	55.92943282	-4.51725278	562.80	5.98	2.59	7.04	13.71	121.85						
31	55.92941098	-4.51696825	580.10	5.98	1.98	5.36	10.84	161.98						
32	55.92939905	-4.51673167	597.70	5.98	3.60	8.19	15.57	144.79						
33	55.92938985	-4.51646303	615.50	5.98	1.23	7.94	15.38	156.82						
34	55.92937838	-4.51623013	633.30	5.98	0.39	5.45	8.36	178.12						
35	55.92936993	-4.51596275	651.10	5.98	1.17	6.35	14.64	153.06						
36	55.92935958	-4.51572693	668.80	6.48	1.54	8.87	14.50	142.36						
37	55.92935022	-4.51545922	686.40	6.98	2.29	8.58	17.20	180.63						
38	55.92935225	-4.51522002	704.20	7.48	3.91	8.00	15.44	137.03						
39	55.92934832	-4.51494113	722.10	8.48	1.45	8.57	25.49	160.35						
40	55.92933613	-4.51469508	739.70	8.48	2.62	7.92	17.15	145.33						
41	55.92931063	-4.51445355	757.90	8.48	0.52	7.00	16.64	122.85						
42	55.92928302	-4.51421653	775.50	8.48	1.52	9.25	24.29	90.91						
43	55.92925915	-4.51394585	794.20	8.98	1.59	7.07	18.22	118.20						
44	55.92922563	-4.51371087	813.40	8.98	1.58	6.44	13.95	136.40						
45	55.92919857	-4.51347338	832.30	7.98	0.51	7.45	19.44	128.79						
46	55.92916772	-4.51319580	850.70	6.98	1.19	6.82	22.13	127.72						
47	55.92914482	-4.51295120	868.20	5.98	1.10	7.81	13.73	190.56						
48	55.92913120	-4.51266992	885.80	5.48	1.21	6.18	15.40	137.30						
49	55.92911968	-4.51241613	904.10	5.98	3.41	7.20	10.03	101.32						
50	55.92911215	-4.51212673	922.10	5.98	1.92	6.69	12.13	135.61						
51	55.92911023	-4.51186668	940.00	5.98	1.13	6.35	12.25	188.76						
52	55.92911707	-4.51160695	958.30	5.98	1.29	7.19	15.20	169.79						
53	55.92914722	-4.51132227	977.00	5.98	1.37	5.80	12.80	149.08						
54	55.92916907	-4.51103907	995.80	5.98	4.41	8.05	11.54	135.40						
55	55.92915943	-4.51079262	1014.00	5.98	0.93	7.11	13.13	108.40						
56	55.92912807	-4.51055540	1033.00	5.98	1.54	5.71	8.65	151.45						
57	55.92910277	-4.51028333	1052.00	5.98	0.88	5.94	9.10	138.95						
58	55.92908943	-4.51002863	1071.00	5.98	3.15	6.51	13.22	107.19						
59	55.92907138	-4.50976060	1090.00	5.98	1.17	6.23	11.62	90.29						
60	55.92905445	-4.50951142	1109.00	5.98	1.92	5.29	10.66	99.15						
61	55.92903318	-4.50922360	1129.00	5.98	3.22	6.52	13.71	80.36						
62	55.92901615	-4.50897025	1148.00	5.98	0.66	7.50	13.04	114.52						
63	55.92900377	-4.50871323	1167.00	6.48	1.52	6.90	13.20	112.22						
64	55.92898927	-4.50841805	1186.00	6.48	2.29	8.37	12.37	113.89						
65	55.92897803	-4.50815828	1205.00	6.98	0.81	5.07	9.92	117.40						
66	55.92896832	-4.50786078	1225.00	6.98	6.26	9.83	17.78	97.27						
67	55.92895708	-4.50760272	1244.00	7.48	6.48	10.07	16.07	69.79						
68	55.92894278	-4.50734468	1264.00	7.98	5.63	12.36	22.10	86.59						
69	55.92892533	-4.50705127	1283.00	7.98	1.90	11.15	17.37	97.67						
70	55.92891280	-4.50679073	1302.00	8.48	2.08	9.50	15.99	96.89						
71	55.92889987	-4.50649393	1321.00	8.98	2.11	10.14	14.29	88.83						
72	55.92888558	-4.50623512	1340.00	8.98	5.78	11.91	24.04	100.45						
73	55.92887060	-4.50597722	1358.00	8.98	4.72	12.33	22.61	85.32						
74	55.92885212	-4.50567948	1376.00	8.98	5.15	13.02	21.41	87.04						
75	55.92884308	-4.50541640	1395.00	9.48	6.96	14.09	20.75	89.02						
76	55.92883572	-4.50511365	1413.00	9.48	9.01	16.03	22.56	95.32						
77	55.92882775	-4.50484978	1432.00	8.48	0.81	16.33	26.73	88.98						
78	55.92882510	-4.50454797	1451.00	7.98	5.65	16.34	24.94	99.60						
79	55.92881578	-4.50428340	1469.00	6.48	0.28	13.97	22.10	95.04						
80	55.92880667	-4.50402688	1487.00	6.48	2.18	12.88	29.73	145.80						
81	55.92881462	-4.50373427	1505.00	6.98	5.46	13.54	26.12	141.85						
82	55.92882373	-4.50348020	1523.00	6.98	2.93	14.94	26.07	141.09						
83	55.92882757	-4.50319232	1540.00	6.48	1.21	11.07	21.03	178.57						
84	55.92882645	-4.50294342	1557.00	6.98	1.92	7.46	21.59	158.71						
85	55.92882522	-4.50269510	1574.00	7.48	1.90	8.01	20.44	134.10						
86	55.92882492	-4.50241517	1592.00	7.98	0.11	6.43	17.31	152.58						
87	55.92882760	-4.50217118	1610.00	7.48	1.65	8.38	17.03	225.76						
88	55.92881977	-4.50192838	1629.00	6.48	2.61	9.14	16.24	274.88						
89	55.92881977	-4.50165257	1648.00	6.48	2.76	7.15	13.44	238.92						
90	55.92889132	-4.50140355	1667.00	6.48	1.18	5.80	12.13	239.72						
91	55.92900695	-4.50112333	1686.00	6.48	2.68	6.90	11.04	216.16						
92	55.92901905	-4.50088313	1706.00	6.48	1.86	5.26	9.58	145.73						
93	55.92905120	-4.50061700	1725.00	6.48	2.33	8.04	23.82	155.20						
94	55.92906797	-4.50038317	1744.00	5.98	2.74	5.76	9.90	144.42						
95	55.92907315	-4.50014963	1762.00	5.98	1.98	5.66	9.49	199.32						
96	55.92907788	-4.49987793	1781.00	6.48	0.51	5.84	13.71	148.36						
97	55.92910165	-4.49964360	1800.00	6.48	2.05	7.87	19.30	126.02						
98	55.92913892	-4.49936583	1819.00	7.48	3.68	11.74	18.81	101.31						
99	55.92917053	-4.49911667	1838.00	7.48	3.60	12.86	2							

	Portion of transect undertaken adjacent to Westfield (WFD) shoreline
	Portion of transect undertaken adjacent to Centrefield (CFD) shoreline
	Portion of transect undertaken adjacent to Eastfield (EFD) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92964480	-4.52378885		12.15	5.98	16.11	24.58	33.52	99.51
2	55.92965995	-4.52376888		28.80	6.48	16.47	21.11	27.42	99.46
3	55.92967250	-4.52374962		45.79	6.48	12.97	22.26	28.99	105.44
4	55.92968468	-4.52372705		63.08	6.48	13.92	26.22	33.19	102.75
5	55.92969663	-4.52369978		80.37	6.48	17.02	23.85	34.17	105.32
6	55.92970633	-4.52367638		97.94	6.48	11.83	23.78	30.04	107.96
7	55.92971160	-4.52365078		115.80	6.48	14.23	20.08	28.45	107.91
8	55.92972562	-4.52362995		133.80	6.48	3.53	17.58	33.33	93.61
9	55.92973620	-4.52360780		151.60	5.98	8.38	16.81	21.71	83.33
10	55.92974657	-4.52359017		169.80	5.98	15.77	20.20	25.01	95.60
11	55.92977085	-4.52359010		188.10	5.98	10.28	17.95	23.97	94.73
12	55.92979578	-4.52361378		206.90	5.48	12.45	17.44	25.59	84.34
13	55.92982152	-4.52366910		225.90	5.48	10.70	16.77	19.56	91.54
14	55.92982678	-4.52372745		244.80	5.48	5.59	14.20	22.20	108.78
15	55.92984895	-4.52382783		263.80	5.48	8.14	14.54	20.19	99.69
16	55.92985573	-4.52391175		282.80	5.98	9.58	16.08	24.53	101.37
17	55.92985707	-4.52400625		302.10	5.98	11.98	16.86	22.86	108.41
18	55.92984607	-4.52418258		321.30	5.98	8.85	18.13	22.72	90.84
19	55.929879040	-4.52434452		340.50	5.98	11.09	16.64	21.55	91.42
20	55.929869513	-4.52450432		359.50	5.98	5.17	11.88	22.80	92.21
21	55.92969035	-4.52465197		378.50	5.48	5.65	14.03	23.62	107.51
22	55.92977040	-4.52473503		397.40	5.98	6.46	14.39	26.34	104.44
23	55.92983625	-4.52466788		416.30	5.98	2.25	13.47	24.87	98.36
24	55.92984223	-4.52449617		434.80	6.48	1.83	13.85	29.11	120.55
25	55.92980130	-4.52431137		452.80	6.48	1.36	14.21	23.52	159.15
26	55.92978152	-4.52407027		470.80	6.48	5.90	14.28	22.73	85.64
27	55.92976347	-4.52384855		488.80	6.48	3.67	13.15	21.97	87.65
28	55.92974372	-4.52362070		506.70	6.48	0.31	12.05	30.05	120.61
29	55.92971988	-4.52335733		524.40	6.48	1.23	11.27	20.20	125.82
30	55.92970177	-4.52312535		542.00	6.48	1.65	10.48	24.17	90.70
31	55.92968498	-4.52285820		559.90	6.48	1.35	11.35	24.82	103.46
32	55.92967343	-4.52261812		577.90	6.48	2.36	11.23	24.60	108.62
33	55.92966717	-4.52233875		596.00	6.48	1.23	12.96	22.03	109.74
34	55.92966193	-4.52209317		614.10	6.98	3.72	13.38	26.77	119.22
35	55.92965152	-4.52184778		631.90	6.98	1.68	11.95	21.14	128.43
36	55.92963905	-4.52156620		649.80	6.98	4.64	13.34	22.33	113.34
37	55.92962750	-4.52131805		667.60	7.48	3.90	12.40	24.03	101.96
38	55.92961860	-4.52106442		685.30	7.98	3.74	11.50	20.81	93.38
39	55.92960220	-4.52077028		703.60	8.48	0.97	11.65	20.06	118.55
40	55.92958330	-4.52051203		721.90	8.48	3.27	12.41	24.88	109.12
41	55.92957203	-4.52021705		740.20	8.48	4.89	11.12	20.59	106.79
42	55.92955228	-4.51995857		758.70	8.98	3.00	13.98	32.21	105.35
43	55.92952885	-4.51966227		776.80	9.48	3.36	11.09	20.57	110.78
44	55.92951257	-4.51940343		794.90	8.98	2.03	12.25	26.82	93.24
45	55.929494970	-4.51914405		812.80	7.48	5.47	15.80	29.09	83.66
46	55.92949505	-4.51884782		830.80	6.98	5.33	13.69	24.24	97.58
47	55.92949147	-4.51858523		848.90	6.98	4.03	16.56	25.51	104.34
48	55.92947943	-4.51828602		866.30	6.48	4.03	12.84	20.81	93.34
49	55.92945728	-4.51803067		883.00	5.98	6.97	14.14	24.75	82.47
50	55.929434240	-4.51773882		901.20	5.98	2.18	11.65	22.03	119.50
51	55.92941448	-4.51748853		919.10	5.98	5.46	13.73	24.17	98.18
52	55.92939613	-4.51721150		937.10	5.98	4.88	13.25	21.39	95.61
53	55.92938930	-4.51696675		955.30	5.98	4.39	10.59	20.10	92.96
54	55.92937880	-4.51668610		973.20	5.98	3.33	10.66	17.90	102.16
55	55.92936677	-4.51644170		991.10	5.98	6.52	11.16	16.89	97.77
56	55.92935787	-4.51616482		1009.00	5.98	7.26	13.20	18.52	78.09
57	55.92935105	-4.51592208		1027.00	5.98	5.93	14.11	17.51	91.23
58	55.92933718	-4.51568037		1045.00	5.98	7.07	12.33	21.28	87.44
59	55.92931735	-4.51540248		1063.00	6.48	4.76	13.29	23.26	88.04
60	55.92929967	-4.51515768		1081.00	6.48	8.04	13.31	24.80	99.07
61	55.92927667	-4.51487903		1099.00	6.48	8.75	13.87	22.42	95.93
62	55.92925415	-4.51463513		1117.00	6.48	5.21	13.51	21.56	108.84
63	55.92923428	-4.51439187		1136.00	6.48	8.29	16.58	27.28	83.07
64	55.92921748	-4.51411153		1153.00	6.98	2.81	16.25	27.34	98.33
65	55.92920667	-4.51386478		1171.00	6.98	3.39	14.52	25.84	96.04
66	55.92918912	-4.51358287		1189.00	6.98	7.58	15.61	24.95	89.43
67	55.92916807	-4.51333738		1208.00	6.98	3.26	13.52	23.70	96.70
68	55.92914722	-4.51309270		1226.00	7.48	1.46	12.85	25.51	115.69
69	55.92913457	-4.51281202		1244.00	7.48	2.54	14.29	28.18	102.02
70	55.92912683	-4.51256195		1262.00	7.48	2.01	11.84	23.64	113.04
71	55.92911713	-4.51231073		1280.00	7.48	4.62	10.27	23.56	93.03
72	55.92911248	-4.51202730		1298.00	7.48	6.40	13.89	23.37	84.23
73	55.92911415	-4.51177818		1316.00	7.98	4.87	11.70	20.55	91.30
74	55.92910800	-4.51153028		1334.00	7.98	2.92	11.95	20.09	102.11
75	55.92909463	-4.51125242		1352.00	7.98	3.22	14.47	29.49	110.46
76	55.92909598	-4.51101245		1371.00	8.98	4.71	17.55	41.57	86.70
77	55.92910858	-4.51077148		1389.00	8.98	7.60	16.63	28.52	103.50
78	55.92910557	-4.51049330		1408.00	8.48	3.08	16.46	24.52	87.75
79	55.92908542	-4.51025482		1426.00	7.48	6.14	14.37	26.46	86.52
80	55.92906302	-4.50998448		1443.00	5.48	3.96	10.56	21.31	94.31
81	55.92904445	-4.50974545		1461.00	6.48	3.81	16.08	28.30	100.82
82	55.92902655	-4.50946820		1479.00	6.98	5.64	15.59	26.33	84.12
83	55.92901645	-4.50922443		1497.00	6.98	0.91	15.75	26.05	91.43
84	55.92901585	-4.50898043		1515.00	6.48	8.67	16.33	26.07	83.78
85	55.92900898	-4.50869832		1534.00	6.48	5.10	12.89	25.94	84.30
86	55.92899293	-4.50845345		1553.00	6.98	2.92	14.52	32.89	90.36
87	55.92897209	-4.50817670		1571.00	6.98	4.45	14.87	29.52	90.06
88	55.92895718	-4.50793332		1590.00	6.98	3.62	13.95	28.17	98.15
89	55.92892583	-4.50765652		1608.00	7.48	2.80	7.70	15.31	116.42
90	55.92889897	-4.50741553		1626.00	7.98	2.74	8.51	19.06	101.83
91	55.92887858	-4.50717267		1644.00	7.98	3.24	9.76	21.18	133.59
92	55.92886398	-4.50692608		1662.00	7.98	4.48	13.98	27.01	80.17
93	55.92885515	-4.5067725		1680.00	7.48	10.04	16.51	25.68	95.08
94	55.92884620	-4.50639662		1699.00	6.98	10.65	15.60	28.06	83.21
95	55.92885065	-4.50615157		1718.00	6.48	3.38	11.12	19.92	94.48
96	55.92885852	-4.50587033		1737.00	5.98	1.09	10.06	18.74	161.00
97	55.92885792	-4.50562187		1756.00	5.98	3.86	12.72	22.70	124.76
98	55.92885253	-4.50533823		1774.00	5.98	5.55	16.26	44.33	105.02
99	55.92884983	-4.50509043		1793.00	6.98	2.61	14.33	26.02	116.79

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m) AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92911413	-4.5177143		13.13	3.48	11.85	22.16	27.98	104.69
2	55.92914403	-4.51806390		31.24	3.98	12.20	24.22	32.74	95.26
3	55.92916600	-4.51832070		49.66	4.98	16.61	25.44	32.97	98.62
4	55.92918252	-4.51857922		68.26	5.48	14.79	24.88	32.02	99.62
5	55.92919802	-4.51887705		86.99	6.48	19.73	28.81	47.07	98.91
6	55.92921185	-4.51913932		105.90	6.48	18.69	30.27	34.64	97.45
7	55.92922310	-4.51943458		124.80	6.48	21.16	30.71	35.26	104.25
8	55.92923417	-4.51969455		144.00	6.98	2.81	26.89	36.00	111.93
9	55.92922732	-4.51998872		163.10	6.48	15.08	28.46	35.66	96.00
10	55.92921622	-4.52024525		182.10	6.48	19.52	29.45	34.92	93.69
11	55.92920912	-4.52050095		200.80	6.48	14.64	25.88	36.47	99.26
12	55.92921695	-4.52079917		220.50	6.48	7.17	25.34	38.28	98.84
13	55.92922408	-4.52105287		239.90	6.48	15.05	25.51	33.88	101.60
14	55.92924853	-4.52134258		260.00	5.98	11.52	21.85	29.06	107.07
15	55.92928663	-4.52159413		280.10	5.98	11.79	23.64	30.31	95.45
16	55.92933577	-4.52184172		300.10	5.48	12.03	21.02	31.92	99.65
17	55.92937632	-4.52211950		320.00	5.48	9.63	20.10	30.68	98.98
18	55.92936098	-4.52236143		339.50	5.48	8.39	19.77	32.54	98.94
19	55.92935853	-4.52262693		359.40	5.48	11.63	17.50	25.45	100.75
20	55.92937962	-4.52293937		379.50	5.48	13.28	16.44	21.90	101.83
21	55.92939918	-4.52320432		399.50	5.98	5.74	19.38	32.35	99.13
22	55.92940733	-4.52349998		419.50	5.98	5.69	18.28	27.81	110.44
23	55.92940712	-4.52376163		439.10	5.98	11.79	17.59	23.03	92.16
24	55.92939947	-4.52406698		458.70	5.98	10.77	19.47	27.11	100.64
25	55.92937537	-4.52429323		477.80	5.98	12.09	20.86	28.72	101.18
26	55.92938212	-4.52446585		496.70	5.98	5.17	19.64	40.40	119.56
27	55.92938493	-4.52458367		515.40	5.98	8.47	19.16	24.64	108.66
28	55.92938737	-4.52469312		534.50	6.48	14.74	22.96	29.42	96.61
29	55.92939272	-4.52481723		553.30	6.48	6.85	18.05	28.74	110.47
30	55.92939862	-4.52492070		572.40	6.48	7.68	20.18	42.63	98.95
31	55.92941012	-4.52503660		591.60	6.48	10.25	19.07	34.46	113.15
32	55.92942418	-4.52513115		610.70	6.48	2.99	17.51	25.51	92.41
33	55.92944792	-4.52524807		629.50	6.48	11.44	23.02	33.80	95.85
34	55.92950048	-4.52533737		648.20	6.48	2.63	22.97	41.75	95.20
35	55.92958647	-4.52530850		667.00	6.98	11.89	23.29	49.05	92.41
36	55.92969308	-4.52514967		686.10	6.98	5.67	22.43	29.14	91.58
37	55.92976318	-4.52494972		704.90	7.48	3.95	19.38	30.75	100.70
38	55.92978623	-4.52471520		722.80	8.48	1.12	20.53	34.30	101.35
39	55.92977718	-4.52451327		741.50	8.98	6.14	20.76	36.78	99.70
40	55.92975275	-4.52436622		759.40	8.48	5.48	21.20	39.17	87.04
41	55.92965968	-4.52428425		778.00	8.98	11.77	25.69	41.15	97.90
42	55.92962103	-4.52432995		796.90	8.98	5.86	23.88	37.73	96.04
43	55.92963720	-4.52459598		816.30	9.48	6.57	21.34	33.86	91.98
44	55.92976902	-4.52485758		835.80	8.48	10.85	22.37	36.55	96.23
45	55.92992867	-4.52484995		855.40	7.48	3.78	23.61	32.11	95.36
46	55.92997092	-4.52468150		874.70	6.98	4.94	23.38	37.55	100.29
47	55.92994568	-4.52444212		894.30	6.48	5.55	21.08	27.59	102.70
48	55.92990572	-4.52418432		913.60	5.48	6.94	19.73	31.25	97.04
49	55.92985930	-4.52396048		932.60	4.98	5.14	18.15	28.15	122.62
50	55.92980667	-4.52369053		952.00	5.48	8.42	20.13	29.41	97.95
51	55.92976208	-4.524545043		971.30	5.48	12.02	21.97	29.42	92.83
52	55.92971630	-4.52317178		990.60	5.48	8.97	22.12	30.83	83.95
53	55.92969978	-4.52292110		1009.00	5.48	6.86	18.81	29.44	87.48
54	55.9268323	-4.52266580		1029.00	5.48	8.19	20.21	33.77	90.75
55	55.92966880	-4.52236860		1048.00	5.98	6.11	19.09	29.68	82.45
56	55.92965408	-4.52211002		1067.00	5.98	6.12	21.74	31.26	80.52
57	55.92962620	-4.52181163		1086.00	5.98	8.52	20.40	32.45	111.03
58	55.92960900	-4.52155608		1105.00	5.98	8.68	21.71	32.45	109.87
59	55.92960122	-4.52125425		1123.00	5.98	4.60	18.07	31.19	110.04
60	55.92960033	-4.52099125		1142.00	5.98	10.04	21.45	32.29	102.58
61	55.92958852	-4.52071447		1160.00	5.98	11.49	19.96	32.49	93.24
62	55.92958113	-4.52040187		1178.00	6.48	4.78	19.74	36.98	86.02
63	55.92957960	-4.52013322		1197.00	6.48	6.32	17.87	30.21	93.47
64	55.92957403	-4.51982205		1215.00	6.48	7.08	18.79	30.47	93.12
65	55.92957363	-4.51955072		1234.00	6.98	4.35	18.97	32.87	93.71
66	55.92955638	-4.51928442		1253.00	7.48	7.54	19.74	34.68	100.39
67	55.92952672	-4.51897400		1274.00	8.48	5.30	21.24	33.97	96.75
68	55.92950850	-4.51870465		1294.00	8.98	7.65	23.06	32.45	100.62
69	55.92948915	-4.51843788		1315.00	8.98	9.13	22.06	32.78	79.31
70	55.92947630	-4.51813000		1336.00	9.48	7.19	22.77	40.72	93.93
71	55.92946800	-4.51786260		1358.00	9.98	9.17	24.41	35.48	93.50
72	55.92944518	-4.51755572		1379.00	9.98	9.72	23.53	34.10	94.01
73	55.92942838	-4.51729477		1401.00	9.98	8.48	25.35	34.45	89.01
74	55.92941735	-4.51700123		1424.00	9.48	13.07	25.92	33.76	92.04
75	55.92939678	-4.51674552		1447.00	8.48	12.65	26.76	40.23	80.78
76	55.92937768	-4.51644993		1469.00	6.98	9.92	21.37	33.42	90.33
77	55.92936585	-4.51619280		1492.00	5.98	6.15	21.36	33.37	82.38
78	55.92934947	-4.51593522		1514.00	6.48	6.83	20.71	27.28	93.55
79	55.92933753	-4.51563675		1537.00	5.98	8.55	19.95	26.69	77.81
80	55.92932308	-4.51537360		1559.00	5.98	9.08	20.40	32.68	121.77
81	55.92930862	-4.51511387		1581.00	6.48	5.79	19.15	33.52	110.27
82	55.92929228	-4.51482115		1603.00	6.48	3.61	19.49	31.85	120.97
83	55.92928132	-4.51456675		1625.00	5.98	3.72	17.26	31.54	112.60
84	55.92926475	-4.51427325		1647.00	6.48	2.11	17.03	33.20	131.58
85	55.92924875	-4.51401575		1669.00	6.98	6.58	19.67	37.86	83.21
86	55.92923173	-4.51375767		1691.00	6.98	6.38	18.28	30.23	92.73
87	55.92920967	-4.51347018		1713.00	6.98	6.71	18.93	29.56	100.66
88	55.92918168	-4.51321893		1736.00	7.48	4.67	17.78	29.34	93.81
89	55.92915843	-4.51296745		1758.00	6.98	6.04	19.93	30.47	70.75
90	55.92912767	-4.51268160		1781.00	6.98	4.47	20.24	36.71	89.68
91	55.92910280	-4.51242550		1803.00	6.48	5.77	18.39	31.44	95.33
92	55.92908265	-4.51216942		1826.00	6.48	3.12	17.66	31.66	105.19
93	55.92907290	-4.51187255		1848.00	6.48	7.40	19.17	36.89	96.77
94	55.92907362	-4.51168397		1865.00	5.98	8.62	16.31	28.00	92.41

Bowling ADCP Survey: Transect: 007

Section of Site	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
-	cm/s	cm/s	cm/s	degrees true	m AOD
WFD	1.12	1.12	21.67	49.05	97.49
CFD	4.35	4.35	20.64	40.72	7.21
FFD	2.11	2.11	19.36	37.86	6.59

Survey Date	28/06/2010

<tbl_r cells="2" ix="3" maxcspan="1"

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92881565	-4.50384453	14.77	6.98	32.88	38.02	43.89	112.18	
2	55.92881777	-4.50357367	34.85	6.98	37.11	41.81	49.93	106.77	
3	55.92882433	-4.50373792	54.91	6.98	32.60	38.29	45.31	107.29	
4	55.92883102	-4.50291918	75.25	6.98	34.65	38.87	47.20	101.74	
5	55.92883378	-4.50265612	95.66	6.98	31.24	38.66	47.43	103.70	
6	55.92885390	-4.50235610	115.80	6.98	30.31	38.18	44.85	106.02	
7	55.92889792	-4.50205622	135.30	6.98	30.23	37.71	51.49	108.77	
8	55.92895957	-4.50177398	154.50	6.98	23.26	36.73	45.86	112.26	
9	55.92899092	-4.50148787	173.90	6.98	28.99	37.82	48.59	109.66	
10	55.92900180	-4.50119680	193.20	6.98	34.05	40.03	46.71	113.29	
11	55.92902005	-4.50090065	212.30	6.98	28.14	35.49	41.27	107.09	
12	55.92904803	-4.50064240	231.60	6.98	28.74	41.55	48.64	110.87	
13	55.92907265	-4.50029338	250.90	5.98	34.21	41.13	47.25	107.65	
14	55.92910107	-4.50003610	268.70	5.98	30.26	39.73	46.68	106.07	
15	55.92912840	-4.49973370	280.00	5.98	31.11	40.06	49.08	109.09	
16	55.92915173	-4.49943758	298.30	5.98	26.20	35.42	42.88	106.27	
17	55.92917393	-4.49914355	319.50	5.98	26.58	34.44	42.08	99.18	
18	55.92918574	-4.49885173	340.00	5.98	31.90	35.12	40.86	105.47	
19	55.92920458	-4.49856125	360.00	5.98	26.63	31.09	36.70	98.18	
20	55.92922343	-4.49831367	379.90	5.98	27.47	34.54	42.90	103.74	
21	55.92924638	-4.49802287	399.90	5.98	24.47	33.96	39.46	104.48	
22	55.92926785	-4.49772723	419.80	5.98	20.76	34.08	42.98	102.02	
23	55.92928665	-4.49742968	439.80	6.48	26.18	36.69	47.28	105.29	
24	55.92930870	-4.49712813	459.60	6.48	25.04	33.59	46.75	102.97	
25	55.92933198	-4.49682470	479.00	6.48	26.09	32.78	39.90	101.85	
26	55.92934933	-4.49656592	496.90	6.48	9.86	35.50	45.37	95.47	
27	55.92937160	-4.49622178	515.00	6.48	16.53	33.08	45.18	102.07	
28	55.92939038	-4.495956478	533.30	6.98	22.80	36.04	47.35	89.54	
29	55.92940742	-4.49566335	551.10	6.98	21.86	32.76	40.90	97.33	
30	55.92941832	-4.49535892	569.00	6.98	21.18	36.22	46.93	99.34	
31	55.92943053	-4.49505405	586.50	7.48	15.86	35.01	44.00	100.35	
32	55.92944415	-4.49479230	604.50	7.48	14.88	37.33	48.41	91.87	
33	55.92942152	-4.49445557	622.70	7.48	18.29	37.36	51.30	95.45	
34	55.92931848	-4.49430070	640.90	7.98	15.34	37.27	47.79	98.26	
35	55.92917032	-4.49420872	658.90	7.98	8.98	34.33	45.82	99.67	
36	55.92901970	-4.49415682	676.60	8.98	6.67	33.02	41.04	98.18	
37	55.92890487	-4.49426713	694.90	9.48	18.62	33.37	45.14	103.62	
38	55.92886158	-4.49448438	713.30	8.98	22.12	34.30	43.54	100.53	
39	55.92883553	-4.49470643	731.90	9.48	20.49	33.09	44.02	99.91	
40	55.92880098	-4.49492280	750.60	9.48	19.60	31.15	41.36	99.03	
41	55.92876735	-4.49510828	769.30	9.98	15.39	28.28	36.25	95.29	
42	55.92872112	-4.49532307	788.20	8.98	13.76	25.05	38.34	99.79	
43	55.92868356	-4.49554458	807.20	7.48	11.07	23.89	33.05	90.28	
44	55.92865322	-4.49576738	825.80	6.98	8.79	22.44	33.86	89.04	
45	55.92862978	-4.49599332	844.10	5.98	15.48	23.88	30.93	93.44	
46	55.92861607	-4.49622085	862.40	5.98	7.38	22.44	33.27	105.09	
47	55.92861132	-4.49641663	880.80	5.98	17.33	25.78	31.93	86.95	
48	55.92860355	-4.49664415	899.60	5.98	17.00	29.39	34.64	88.05	
49	55.92859192	-4.49686690	918.20	5.98	17.05	33.50	50.47	83.19	
50	55.92857440	-4.49709875	936.40	5.98	12.22	28.85	37.18	85.73	
51	55.92856530	-4.49733465	954.10	5.98	15.77	31.32	41.45	90.99	
52	55.92855557	-4.49753372	971.70	5.98	17.24	28.28	33.44	91.37	
53	55.92852880	-4.49779345	989.40	5.98	16.12	29.00	39.57	83.15	
54	55.92851745	-4.49799393	1000.70	5.98	10.81	27.14	34.62	87.69	
55	55.92850378	-4.49822363	1025.00	5.98	10.84	30.23	38.82	91.68	
56	55.92849023	-4.49845170	1043.00	5.98	23.25	32.37	39.34	103.69	
57	55.92847272	-4.49867890	1061.00	5.98	21.13	34.36	45.50	86.75	
58	55.92846402	-4.49831128	1079.00	6.48	21.76	33.64	43.93	90.08	
59	55.92845917	-4.49914540	1097.00	6.48	24.89	34.36	43.50	97.03	
60	55.92845872	-4.49937982	1115.00	6.48	21.42	32.68	36.63	91.85	
61	55.92846332	-4.49961187	1134.00	6.48	15.54	30.94	37.86	98.72	
62	55.92847317	-4.49980912	1152.00	6.48	20.77	31.55	38.77	98.91	
63	55.92847425	-4.50003858	1170.00	6.48	23.23	31.45	42.83	100.68	
64	55.92846637	-4.50027135	1189.00	6.48	10.08	27.41	36.12	99.70	
65	55.92846707	-4.50050498	1208.00	6.98	16.32	28.23	38.53	95.95	
66	55.92846943	-4.50073980	1226.00	6.98	11.62	26.70	34.95	94.46	
67	55.92847398	-4.50093925	1245.00	6.98	5.80	26.73	40.22	85.24	
68	55.92847197	-4.50117342	1263.00	6.98	3.92	24.85	37.52	100.13	
69	55.92846688	-4.50140877	1282.00	6.98	14.65	27.25	40.61	94.32	
70	55.92845255	-4.50164333	1301.00	7.48	0.72	23.92	32.74	86.81	
71	55.92843448	-4.50187872	1320.00	7.48	11.68	26.44	34.29	91.30	
72	55.92843007	-4.50211685	1339.00	7.98	11.02	27.21	35.38	96.82	
73	55.92842668	-4.50235272	1359.00	9.48	17.39	31.90	41.84	83.15	
74	55.92842923	-4.50255587	1378.00	9.48	16.26	34.54	51.22	87.41	
75	55.92842780	-4.50279338	1398.00	8.48	20.32	29.85	43.13	84.75	
76	55.92842503	-4.50303678	1416.00	7.48	13.35	30.30	39.59	80.83	
77	55.92842523	-4.50325390	1434.00	7.48	10.23	30.91	39.22	79.13	
78	55.92842746	-4.50351327	1452.00	6.98	18.16	30.54	40.53	79.76	
79	55.92842305	-4.50377270	1470.00	6.98	25.35	31.48	39.31	80.04	
80	55.92842050	-4.50399683	1488.00	6.98	20.60	36.62	48.48	83.35	
81	55.92842485	-4.50426045	1506.00	6.48	20.69	33.75	42.41	77.90	
82	55.92843218	-4.50452548	1524.00	6.98	15.40	32.24	38.66	80.42	
83	55.92843820	-4.50479027	1541.00	7.48	18.56	32.20	36.78	82.81	
84	55.92844638	-4.50505582	1559.00	7.48	20.39	34.17	46.22	82.97	
85	55.92845248	-4.50532270	1576.00	6.98	17.59	32.60	43.47	87.04	
86	55.92845795	-4.50555193	1594.00	6.48	12.55	28.98	39.16	84.76	
87	55.92846382	-4.50582177	1613.00	5.98	13.37	27.60	35.55	94.46	
88	55.92846715	-4.50609213	1631.00	5.98	10.29	24.74	35.69	87.95	
89	55.92847440	-4.50636208	1650.00	5.98	3.66	21.22	33.70	117.88	
90	55.92848622	-4.50663020	1669.00	5.98	2.26	23.42	35.83	109.86	
91	55.92849765	-4.50689955	1688.00	5.98	3.38	22.35	35.32	104.43	
92	55.92850830	-4.50712933	1707.00	5.98	6.79	21.04	32.12	87.19	
93	55.92851663	-4.50743610	1726.00	5.98	5.64	22.17	33.10	98.87	
94	55.92852163	-4.50766517	1745.00	5.98	9.12	20.48	35.72	93.30	
95	55.92853022	-4.50793088	1764.00	5.98	3.60	21.38	33.12	91.98	
96	55.92853610	-4.50819013	1783.00	5.98	2.80	18.33	36.85	80.11	
97	55.92853868	-4.50844895	1802.00	5.98	2.24	20.62	31.43	87.75	
98	55.92854882	-4.50870500	1821.00	6.48	12.40	23.56	37.83	84.13	

Bowling ADCP Survey: Transect: 009

Survey Date 28/06/2010

Ensembles Taken Along Transect: 99

High Water Offset 0:00

Key

Portion of transect undertaken adjacent to Westfield (WFD) shoreline

Portion of transect undertaken adjacent to Centrefield (CFD

8	55.92914810	-4.51082495	151.00	6.98	15.11	30.00	40.99	111.70
9	55.92914248	-4.51061012	169.70	6.98	20.75	30.91	39.91	108.52
10	55.92913677	-4.51036020	183.00	6.98	22.95	30.73	35.40	108.45
11	55.92913288	-4.51010888	208.40	6.48	20.24	27.72	33.34	114.10
12	55.92913173	-4.50985160	228.00	6.48	17.13	28.41	34.53	112.45
13	55.92911948	-4.50959548	247.20	6.48	21.57	26.62	31.73	107.07
14	55.92910565	-4.50938528	266.60	5.98	21.38	26.61	33.08	108.46
15	55.92909540	-4.50910575	285.70	5.98	17.11	24.36	35.70	108.68
16	55.92908743	-4.50889842	305.20	6.48	17.17	25.80	34.53	111.06
17	55.92907533	-4.50865868	324.60	6.48	23.91	28.71	32.70	111.10
18	55.92906285	-4.50841945	343.80	5.98	22.11	27.12	34.42	99.87
19	55.92904943	-4.50817628	363.10	5.98	18.03	27.42	35.81	102.59
20	55.92903250	-4.50793198	382.40	5.98	20.75	27.59	33.90	113.39
21	55.92901352	-4.50768890	401.40	6.48	15.02	27.16	34.59	102.15
22	55.92900177	-4.50742982	420.40	6.48	20.31	27.85	36.77	105.59
23	55.92899247	-4.50723723	439.30	6.48	16.31	26.70	34.50	105.46
24	55.92897833	-4.50699257	458.40	6.48	17.75	25.21	33.54	103.80
25	55.92896515	-4.50674547	477.20	6.48	15.99	26.37	32.29	108.79
26	55.92895567	-4.50649600	495.80	6.98	16.79	24.07	32.09	111.37
27	55.92894493	-4.50624577	514.50	6.98	11.51	21.21	33.84	101.22
28	55.92893263	-4.50599677	532.00	6.48	12.50	21.50	36.52	106.44
29	55.92892790	-4.50578132	551.20	6.48	8.66	19.77	31.53	112.85
30	55.9289132	-4.50552865	570.00	6.98	9.96	22.49	31.68	106.19
31	55.92891532	-4.50527625	589.00	6.98	12.84	22.38	32.53	107.17
32	55.92890808	-4.50502335	608.00	6.98	6.04	21.19	28.83	91.19
33	55.92890003	-4.50477167	626.90	7.48	10.09	22.97	31.32	105.89
34	55.92889443	-4.50451703	645.80	7.98	3.49	23.23	31.73	112.72
35	55.9288825	-4.50429637	664.70	8.98	6.07	21.54	35.78	112.27
36	55.92889023	-4.50403508	684.10	9.48	3.80	21.08	30.97	101.71
37	55.92888717	-4.50377438	703.20	8.98	7.24	21.18	33.54	104.49
38	55.92888477	-4.50351458	722.20	9.48	7.35	21.63	32.21	93.07
39	55.92887435	-4.50325583	741.00	9.98	5.72	23.60	38.45	90.67
40	55.92886227	-4.50299633	759.60	9.98	6.93	20.25	32.64	105.20
41	55.92884102	-4.50273892	777.50	8.98	5.23	23.85	38.54	100.37
42	55.92884063	-4.50247998	794.90	7.48	7.45	23.36	31.82	109.62
43	55.92887010	-4.50222678	811.90	6.98	10.16	24.05	35.67	98.97
44	55.92890748	-4.50200525	829.10	6.48	7.70	23.51	31.84	102.11
45	55.92892572	-4.50175052	846.50	6.48	2.85	23.86	36.10	83.60
46	55.92895045	-4.50150175	863.90	6.48	0.41	23.97	34.68	76.69
47	55.92898127	-4.50125057	881.20	6.48	0.70	25.23	37.10	98.90
48	55.92900327	-4.50099632	898.80	6.48	4.69	24.08	33.51	100.18
49	55.92902728	-4.500724633	916.50	6.48	11.43	25.44	34.75	87.62
50	55.92904598	-4.50050078	934.20	6.48	6.40	25.95	38.12	100.89
51	55.92906278	-4.50029337	952.00	6.48	7.34	26.08	35.30	87.66
52	55.92907708	-4.50005512	969.50	6.48	11.43	27.65	38.25	87.52
53	55.92909317	-4.49981727	987.20	6.48	3.94	27.10	35.57	85.55
54	55.92910842	-4.49950838	1004.00	6.48	2.61	27.54	40.59	83.30
55	55.92912610	-4.49934395	1022.00	6.48	19.71	30.45	38.32	95.75
56	55.92915425	-4.49910802	1040.00	6.48	11.36	27.42	39.01	88.38
57	55.92919398	-4.49887070	1058.00	6.48	17.90	30.53	38.33	84.15
58	55.92922655	-4.49862343	1076.00	6.48	11.85	30.37	41.03	91.28
59	55.92924998	-4.49840755	1094.00	6.48	13.24	29.09	38.73	100.64
60	55.92927042	-4.49815093	1112.00	6.48	14.36	30.91	39.67	93.71
61	55.92927765	-4.49789715	1130.00	6.48	11.21	26.17	34.50	105.44
62	55.92929820	-4.49764415	1148.00	6.98	2.89	26.43	36.46	110.51
63	55.92932488	-4.49738718	1166.00	6.98	6.06	25.22	34.30	121.90
64	55.92934703	-4.49712845	1185.00	6.98	8.63	25.20	34.39	115.53
65	55.92936723	-4.49687025	1203.00	6.98	10.47	23.87	36.74	102.68
66	55.92938650	-4.49660997	1221.00	7.48	7.71	24.02	40.25	99.17
67	55.92940195	-4.49638708	1239.00	7.48	12.81	28.18	47.36	102.27
68	55.92941608	-4.49612507	1257.00	7.48	6.59	23.98	36.12	95.70
69	55.92942130	-4.49586588	1276.00	7.48	3.67	21.79	31.47	97.18
70	55.92942568	-4.49560808	1295.00	7.98	4.43	22.56	34.91	93.83
71	55.92943462	-4.49534875	1314.00	7.98	7.41	19.37	25.88	90.94
72	55.92944263	-4.49512763	1333.00	7.98	11.86	22.48	29.74	98.21
73	55.92941217	-4.49488777	1353.00	9.48	14.50	25.14	38.10	93.12
74	55.92932434	-4.49472793	1372.00	8.98	11.40	25.04	35.27	82.89
75	55.92920517	-4.49463368	1391.00	8.48	10.05	20.56	37.61	103.69
76	55.92906413	-4.49455695	1409.00	7.48	3.68	19.15	35.45	90.71
77	55.92891793	-4.49459168	1427.00	6.48	5.86	18.59	33.08	83.49
78	55.92883417	-4.49477475	1446.00	6.98	9.45	20.98	32.62	76.95
79	55.92880600	-4.49497320	1465.00	6.98	5.40	19.66	32.60	83.42
80	55.92878023	-4.49524047	1483.00	6.98	14.09	25.42	35.69	83.80
81	55.92876058	-4.49543785	1501.00	6.98	14.07	25.44	30.96	79.80
82	55.92872812	-4.49566490	1519.00	7.48	5.50	22.89	33.20	81.32
83	55.92870558	-4.49586320	1536.00	7.48	10.88	21.99	28.39	85.61
84	55.92868838	-4.49610008	1553.00	7.48	12.81	21.80	29.15	80.80
85	55.92867818	-4.49633728	1571.00	6.48	10.61	20.51	29.92	83.44
86	55.92866910	-4.49657372	1589.00	6.48	4.62	22.90	29.88	91.79
87	55.92865638	-4.49680843	1606.00	5.98	9.14	23.65	34.55	69.53
88	55.92863913	-4.49704333	1624.00	5.98	3.13	21.14	33.32	88.68
89	55.92861990	-4.49738023	1642.00	5.98	2.32	20.32	28.81	100.89
90	55.92860280	-4.49751877	1660.00	5.98	6.28	20.91	33.87	79.96
91	55.92857226	-4.49772265	1678.00	6.48	3.97	20.46	31.23	116.14
92	55.92856725	-4.49739928	1697.00	6.48	8.57	21.26	31.83	83.47
93	55.92854657	-4.49811977	1716.00	5.98	6.02	20.63	31.23	112.72
94	55.92852100	-4.49844333	1735.00	5.98	3.00	18.49	33.32	127.85
95	55.92850168	-4.49869050	1754.00	6.48	3.84	20.12	32.41	90.72
96	55.92848362	-4.49853970	1773.00	5.98	4.49	17.97	31.73	139.91
97	55.92846065	-4.49918783	1792.00	5.98	1.87	17.58	32.48	138.80
98	55.92843508	-4.49939807	1811.00	5.98	7.02	16.34	24.76	135.12
99	55.92841342	-4.49964595	1830.00	6.48	1.79	18.84	33.79	134.14

Transsect Summary								
Section of Site Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth	Mean AOD	Mean Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
WFD	7.28	0.41	22.62	38.54	100.63	7.66		
CFD	8.48	2.83	24.46	47.36	101.74	7.23		
EFD	6.14	2.33	21.70	35.69	90.01	6.57		

Bowling ADCP Survey: Transect: 011

Survey Date	28/06/2010				
Ensembles Taken Along Transect:					
109					
High Water Offset					
+0:30					
Key					
Portion of transect undertaken adjacent to Westfield (WFD) shoreline					
Portion of transect undertaken adjacent to Centrefield (CFD) shoreline					
Portion of transect undertaken adjacent to Eastfield (EFD) shoreline					
Ensemble#	Ensemble Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m)	Minimum Velocity Across Depth (cm/s

18	55.92932600	-4.51495418	314.70	5.98	2.90	13.78	21.24	119.28
19	55.92931188	-4.51469618	332.40	5.98	2.04	15.91	26.89	116.71
20	55.92929557	-4.51443780	350.00	5.98	4.06	13.42	21.99	134.07
21	55.92927378	-4.51418165	367.40	5.98	4.44	13.42	19.82	138.57
22	55.92924738	-4.51392738	385.10	6.48	6.90	16.76	23.50	122.78
23	55.92920275	-4.51367587	402.50	6.98	4.87	13.72	20.96	125.76
24	55.92919367	-4.51341987	420.20	6.98	1.87	12.20	23.38	83.91
25	55.92916702	-4.51316177	437.90	6.98	5.66	14.20	22.63	130.90
26	55.92915015	-4.51290325	455.50	6.48	0.41	12.42	21.16	129.02
27	55.92913810	-4.51264457	473.10	6.48	1.87	6.69	15.44	116.76
28	55.92912470	-4.51242502	490.80	6.48	3.57	11.09	19.64	151.20
29	55.92910670	-4.51217480	508.00	6.48	1.16	8.81	17.57	152.19
30	55.92910600	-4.51192710	525.60	6.98	0.14	11.25	22.57	143.70
31	55.92912210	-4.51168018	543.30	6.98	2.11	11.09	22.67	164.48
32	55.92913730	-4.51143870	560.80	6.48	3.89	9.98	19.58	202.15
33	55.92915037	-4.51119785	578.10	6.98	1.16	12.08	23.14	151.76
34	55.92914218	-4.51096402	595.00	6.98	5.37	10.47	17.70	155.28
35	55.92912637	-4.51073265	612.00	6.98	3.34	11.71	18.47	179.07
36	55.92911273	-4.51049772	629.10	6.98	5.13	11.40	21.01	91.82
37	55.92909988	-4.51026180	646.00	7.48	1.67	10.51	20.91	96.43
38	55.92908665	-4.51002535	662.90	7.48	3.53	13.34	21.96	137.71
39	55.92907650	-4.50982185	679.10	7.48	1.68	10.68	20.59	128.96
40	55.92906970	-4.50958287	695.50	8.98	1.52	11.13	20.92	152.02
41	55.92906100	-4.50934223	712.00	9.48	2.31	10.20	22.26	121.37
42	55.92904985	-4.50910215	728.40	9.48	3.23	12.79	23.90	152.09
43	55.92903917	-4.50886277	744.70	9.48	3.97	13.65	27.64	153.76
44	55.92903280	-4.50862282	761.10	9.48	0.88	12.08	25.62	168.45
45	55.92902548	-4.50838495	777.60	9.98	2.56	12.28	26.22	117.65
46	55.92902330	-4.50814253	794.30	9.98	2.72	11.37	25.25	143.18
47	55.92901305	-4.50793618	811.00	8.98	0.39	11.62	20.00	134.63
48	55.92900182	-4.50769448	827.30	7.48	4.02	11.36	19.42	157.54
49	55.92899252	-4.50745150	843.20	6.48	2.55	9.59	15.39	162.81
50	55.92897758	-4.50720985	859.40	5.98	0.60	9.85	18.95	159.59
51	55.92896287	-4.50696670	876.00	6.48	0.94	11.59	26.94	194.21
52	55.92894940	-4.50672350	892.60	6.48	5.05	10.36	16.69	174.18
53	55.92893760	-4.50647835	909.30	6.48	1.04	10.03	16.97	148.80
54	55.92892555	-4.50623240	926.10	6.48	1.62	11.88	22.64	168.76
55	55.92891458	-4.50598667	943.40	6.98	4.85	13.89	24.47	140.93
56	55.92890663	-4.50573872	960.70	6.98	1.42	12.21	22.47	119.45
57	55.92890268	-4.50552425	978.10	6.98	4.07	12.56	19.49	103.02
58	55.92889732	-4.50527395	995.50	6.98	3.08	12.57	20.60	101.18
59	55.92889192	-4.50502280	1013.00	6.98	5.75	11.49	18.50	117.34
60	55.92888663	-4.50477118	1030.00	6.98	2.48	11.78	21.60	113.26
61	55.92887982	-4.50451880	1048.00	6.98	4.86	11.06	18.52	78.09
62	55.92887163	-4.50430478	1065.00	6.98	2.69	9.57	17.01	102.76
63	55.92886930	-4.50405437	1082.00	6.98	1.96	9.06	16.24	111.43
64	55.92887220	-4.50380008	1099.00	6.98	3.21	8.00	15.43	161.95
65	55.92887207	-4.50354425	1116.00	6.98	1.99	12.47	20.92	133.50
66	55.92886700	-4.50328722	1133.00	6.98	0.93	8.62	18.40	132.67
67	55.92885920	-4.50302925	1150.00	7.48	1.85	12.06	23.45	121.35
68	55.92884915	-4.50276938	1167.00	7.48	2.36	10.34	19.43	116.57
69	55.92884820	-4.50251062	1184.00	7.48	2.60	10.38	22.67	117.03
70	55.92887100	-4.50228833	1201.00	7.48	0.93	8.57	19.49	138.39
71	55.92889400	-4.50202840	1217.00	7.48	1.25	8.37	16.98	152.56
72	55.92893248	-4.50181135	1234.00	7.98	2.91	9.94	17.24	97.83
73	55.92896668	-4.50156760	1251.00	7.98	0.47	8.24	25.10	157.22
74	55.92894940	-4.50132028	1268.00	7.98	1.27	7.66	12.94	151.09
75	55.92902063	-4.50110592	1285.00	8.48	2.46	8.47	15.94	128.01
76	55.92902342	-4.50085373	1303.00	8.48	2.46	8.24	18.94	132.72
77	55.92904093	-4.50060382	1319.00	8.48	2.21	8.32	18.02	142.23
78	55.92905817	-4.50035797	1336.00	8.48	0.35	7.22	16.07	163.75
79	55.92907160	-4.50011483	1352.00	8.98	2.08	10.89	21.34	136.47
80	55.92909440	-4.49987327	1368.00	9.48	3.53	12.69	24.45	140.18
81	55.92911368	-4.49962528	1383.00	9.48	1.68	12.59	24.52	127.32
82	55.92913632	-4.49930660	1399.00	8.98	2.21	12.94	22.02	145.49
83	55.92915745	-4.49915333	1415.00	8.48	2.06	12.47	22.29	128.74
84	55.92918300	-4.49895777	1430.00	7.48	1.59	9.20	20.17	96.73
85	55.92921050	-4.49872223	1446.00	6.48	3.51	9.74	17.97	110.89
86	55.92923335	-4.49848452	1462.00	6.98	2.87	10.55	17.87	124.95
87	55.92925583	-4.49824490	1478.00	7.98	0.77	11.09	18.50	103.36
88	55.92927587	-4.49800347	1493.00	7.98	1.11	13.04	22.85	118.45
89	55.92929497	-4.49779262	1509.00	7.48	3.95	14.40	20.53	100.22
90	55.92930978	-4.49754247	1524.00	7.48	5.15	13.03	20.01	125.06
91	55.92932515	-4.49729022	1539.00	7.48	4.33	13.28	19.56	119.90
92	55.92934747	-4.49703390	1555.00	7.48	3.74	10.68	16.28	111.49
93	55.92936572	-4.49681408	1571.00	7.48	4.61	14.41	19.76	119.11
94	55.92938232	-4.49655703	1587.00	6.98	2.36	13.39	22.33	121.24
95	55.92939400	-4.49630107	1603.00	5.98	2.09	9.92	18.61	141.69
96	55.92940905	-4.49604613	1620.00	6.48	2.26	11.24	19.06	153.21
97	55.92942605	-4.49579252	1636.00	6.98	4.00	11.86	19.36	142.42
98	55.92944582	-4.49553735	1653.00	7.48	3.18	9.63	20.72	140.42
99	55.92946458	-4.49531652	1669.00	6.98	2.62	9.63	21.54	143.07
100	55.92947848	-4.49505580	1685.00	6.98	0.91	8.13	12.51	153.54
101	55.92948815	-4.49479803	1702.00	6.98	5.69	11.20	15.83	136.57
102	55.92948888	-4.49454003	1718.00	6.98	1.29	11.55	22.82	133.66
103	55.92943102	-4.49435205	1734.00	6.98	2.39	11.63	20.16	136.74
104	55.92929518	-4.49427523	1751.00	6.98	5.16	13.73	25.67	145.15
105	55.92916952	-4.49413972	1767.00	7.48	4.39	12.67	21.25	156.57
106	55.92903613	-4.49449479	1784.00	7.48	1.87	12.18	21.26	154.24
107	55.92890232	-4.49449113	1801.00	7.98	0.78	10.23	19.47	162.60
108	55.92880358	-4.49464305	1818.00	8.48	1.90	10.73	23.75	160.54
109	55.92879227	-4.49488663	1835.00	8.48	0.95	10.02	19.55	170.10

Bowling ADCP Survey Transect: 013

Survey Date	28/06/2010							
Ensembles Taken Along Transect:								
High Water Offset:								
Key:								
Portion of transect undertaken adjacent to Westfield (WFD) shoreline								
Portion of transect undertaken adjacent to Centrefield (CFD) shoreline								
Portion of transect undertaken adjacent to Eastfield (EFD) shoreline								
Ensemble	Ensemble Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92938627	-4.52795792	9.34	7.48	1.45	6.83	12.24	141.83
2	55.92938627	-4.52795792	10.34	7.48	1.45	6.83	12.24	141.83
3	55.92938627	-4.52795792	37.27	6.98	5.29	9.03	15.63	166.00
4	55.92938417	-4.52795767	52.05	6.98	3.24	8.84	17.83	165.17
5	55.92938672	-4.52707105	67.03	7.48	2.68	9.44	17.83	161.54
6	55.92938373	-4.52704648	81.40	7.48	3.63	9.43	16.24	159.69
7	55.92938373	-4.52704648	81.40	7.48	3.45	9.03	16.24	157.73
8	55.92941867	-4.52749753	111.30	7.48	2.19	10.10	16.35	149.60
9	55.92941867							

29	55.92975792	-4.52412098	407.20	6.48	0.58	12.05	32.44	162.91
30	55.92979118	-4.52391875	421.10	6.48	2.47	10.59	27.13	237.67
31	55.92977588	-4.52365687	435.10	6.48	1.16	11.00	37.38	180.27
32	55.92976260	-4.52341864	449.10	6.48	8.44	11.04	38.48	185.84
33	55.92976260	-4.52331953	462.70	5.98	3.15	13.75	40.70	206.60
34	55.92970498	-4.52798497	476.30	5.98	7.11	9.41	25.76	216.70
35	55.92968933	-4.52778197	489.80	6.48	2.28	10.19	25.98	189.09
36	55.92967230	-4.52754270	503.40	6.48	5.57	17.68	22.81	178.91
37	55.92966691	-4.52736194	516.90	6.48	3.21	10.48	20.00	216.70
38	55.92963895	-4.52206167	531.60	6.58	1.08	11.19	28.35	223.81
39	55.92962693	-4.52181943	545.70	6.58	1.18	11.41	35.58	225.00
40	55.92961813	-4.52157578	560.00	7.48	1.45	11.83	31.68	170.53
41	55.92961813	-4.52136584	574.60	7.48	3.84	13.82	38.28	226.00
42	55.92960500	-4.52111907	588.10	7.48	1.73	12.92	31.96	213.08
43	55.92959343	-4.52087373	602.30	7.58	1.57	12.82	34.02	229.57
44	55.92958505	-4.52062767	616.40	7.58	0.80	12.63	31.19	236.93
45	55.92952807	-4.52038542	630.40	7.58	5.24	13.51	38.49	227.43
46	55.92952807	-4.52018542	644.60	7.58	3.57	13.51	38.55	227.43
47	55.92953728	-4.51992520	657.60	8.48	6.20	13.64	33.04	225.87
48	55.92957853	-4.51968343	671.00	8.98	1.46	12.66	35.95	247.06
49	55.92954998	-4.51947558	684.80	8.48	3.04	13.59	37.79	249.26
50	55.92954998	-4.51925588	700.60	8.48	1.54	12.69	32.28	235.88
51	55.92952683	-4.51895647	713.10	9.48	1.90	12.44	39.07	237.41
52	55.92951948	-4.51875415	727.00	9.48	2.01	12.65	30.98	215.87
53	55.9295145	-4.51851603	741.20	9.48	2.91	13.43	36.14	227.76
54	55.92947705	-4.51827205	755.40	9.48	5.57	13.43	38.88	228.83
55	55.92947705	-4.51805705	769.60	9.48	0.54	12.66	32.48	232.00
56	55.92945582	-4.51780680	784.60	9.48	5.35	12.69	25.63	246.71
57	55.92947768	-4.51760200	799.00	8.48	2.62	14.13	33.88	261.80
58	55.92947733	-4.51735958	813.00	7.48	4.07	15.36	29.71	256.38
59	55.92947733	-4.51714788	827.10	7.48	2.29	12.66	22.44	232.31
60	55.92942653	-4.51687352	842.10	7.48	2.61	15.09	27.23	261.08
61	55.92942307	-4.51663749	856.50	7.48	0.49	11.38	23.45	236.15
62	55.92941683	-4.51642555	871.50	7.48	2.57	13.75	31.50	273.09
63	55.92940553	-4.51597712	885.60	7.48	2.83	14.04	27.70	260.00
64	55.92939553	-4.51596720	904.20	7.48	2.40	15.46	21.48	218.63
65	55.92936258	-4.51571377	920.30	7.48	2.09	11.53	25.84	240.69
66	55.92935240	-4.51547497	936.10	7.48	1.69	12.05	24.87	232.71
67	55.92933958	-4.51529671	951.70	7.48	1.29	10.84	21.84	269.94
68	55.92933958	-4.51514662	966.90	7.48	1.19	10.43	21.44	264.70
69	55.92930317	-4.51481778	983.10	7.48	4.44	10.71	20.98	228.00
70	55.92929311	-4.51459750	999.20	7.48	1.31	9.65	26.45	224.77
71	55.92927560	-4.51435300	1014.00	7.48	1.05	9.38	21.61	270.83
72	55.92927560	-4.51414662	1029.00	7.48	1.04	9.18	22.84	234.11
73	55.92926047	-4.51388442	1044.00	7.48	2.39	11.83	23.98	288.93
74	55.92927042	-4.51366713	1058.00	7.48	3.24	11.52	30.02	234.53
75	55.92927933	-4.51344662	1072.00	7.48	1.25	10.07	24.34	187.38
76	55.92926480	-4.51322522	1086.00	7.48	0.60	11.86	23.11	228.94
77	55.92926480	-4.51301253	1101.00	7.48	1.03	10.52	22.83	232.31
78	55.92916360	-4.51281662	1114.00	7.48	2.21	10.92	24.67	237.31
79	55.92913131	-4.51259700	1128.00	7.48	1.60	10.44	21.95	256.73
80	55.92912023	-4.51237758	1142.00	7.48	2.06	11.37	26.43	249.46
81	55.92912023	-4.51216789	1157.00	7.48	1.60	10.43	22.41	231.11
82	55.92905377	-4.51197115	1170.00	7.48	1.60	8.34	23.25	247.64
83	55.92910375	-4.51176922	1184.00	7.48	2.71	10.72	21.16	271.43
84	55.92910788	-4.51155390	1197.00	8.48	3.04	8.39	16.78	200.20
85	55.92914770	-4.51133752	1211.00	8.48	0.34	7.65	15.30	222.20
86	55.92914770	-4.51113752	1226.00	8.48	1.13	9.53	21.49	233.33
87	55.92916183	-4.51089867	1239.00	8.48	0.83	8.34	22.03	259.47
88	55.92914488	-4.51070442	1253.00	8.48	1.88	7.09	18.73	174.73
89	55.92915338	-4.51048385	1267.00	8.48	1.47	6.70	20.45	223.80
90	55.92915338	-4.51027467	1282.00	8.48	1.60	6.57	22.45	231.81
91	55.92903370	-4.51003743	1296.00	7.98	1.38	7.84	21.12	260.41
92	55.92905995	-4.50980520	1310.00	8.48	1.82	10.80	26.35	270.43
93	55.92904793	-4.50957608	1324.00	8.48	1.49	8.96	25.48	257.33
94	55.92903312	-4.50934562	1339.00	8.48	0.42	9.49	37.80	269.80
95	55.92903312	-4.50913300	1353.00	8.48	4.38	14.34	41.49	203.33
96	55.92900727	-4.50887373	1368.00	9.98	2.50	15.09	38.60	255.67
97	55.92908958	-4.50863765	1383.00	9.48	3.06	18.05	37.41	245.80
98	55.92899720	-4.50843788	1399.00	9.48	0.31	18.42	38.19	238.29
99	55.92898452	-4.50823691	1414.00	9.48	8.56	18.42	37.40	237.53
100	55.92895573	-4.50795355	1430.00	8.98	2.30	14.78	31.40	223.10
101	55.92895573	-4.50771538	1445.00	8.98	3.33	14.07	35.60	229.10
102	55.92895480	-4.50747888	1460.00	8.98	1.80	13.22	28.24	249.19
103	55.92895480	-4.50724840	1475.00	8.98	2.44	13.63	37.63	268.83
104	55.92894924	-4.50705540	1490.00	8.48	2.98	13.83	38.28	247.31
105	55.92890473	-4.50678567	1504.00	7.98	0.27	15.53	34.67	251.86
106	55.92889108	-4.50658905	1519.00	7.98	3.51	15.67	34.82	267.21
107	55.92887853	-4.50637998	1533.00	8.48	3.44	16.38	33.80	254.21
108	55.92887853	-4.50617408	1548.00	8.48	2.59	15.82	32.53	232.31
109	55.92887252	-4.50588477	1563.00	7.98	1.37	13.59	31.08	240.14
110	55.92887075	-4.50566305	1577.00	7.98	4.50	16.21	41.17	256.08
111	55.92886853	-4.50542963	1592.00	7.98	7.50	15.31	37.14	260.31
112	55.92886853	-4.50521670	1607.00	7.98	1.34	13.84	30.84	235.80
113	55.92886021	-4.50508513	1622.00	7.98	4.25	14.86	35.76	267.31
114	55.92885513	-4.50487833	1637.00	8.48	5.24	15.17	27.14	269.93
115	55.92885153	-4.50467455	1652.00	8.48	2.54	14.08	35.76	257.07
116	55.92885153	-4.50447323	1667.00	8.48	3.70	15.19	33.73	269.00
117	55.92885107	-4.50384708	1687.00	8.48	3.72	13.89	32.71	258.31
118	55.92884997	-4.50361537	1711.00	7.48	2.00	16.30	30.02	249.08
119	55.92884826	-4.50341859	1726.00	6.58	5.58	17.05	34.74	278.09
120	55.92884826	-4.50321674	1741.00	6.58	8.04	17.44	34.74	278.09
121	55.92883350	-4.50297242	1755.00	6.58	5.26	13.28	26.90	269.64
122	55.92883880	-4.50276537	1771.00	6.58	6.24	12.77	35.34	224.00
123	55.92886355	-4.50257373	1786.00	6.58	5.83	15.79	31.74	260.00
124	55.92886283	-4.50239065	1800.00	6.58	6.58	16.88	34.49	265.00
125	55.92886283	-4.50221341	1815.00	6.58	5.20	15.83	34.49	231.33
126	55.92882372	-4.50203193	1826.00	7.48	4.24	18.02	43.86	279.14
127	55.92883937	-4.50197285	1829.00	7.48	3.46	17.37	37.93	281.15

Section of Site	Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
95%ile velocity	cm/s	cm/s	cm/s	cm/s	degrees true	m AOD
WED	2.18	0.49	13.28	19.71	216.83	8.29
FED	1.70	0.33	1.28	2.81	238.63	8.09
FDO	1.53	0.27	15.07	41.17	256.83	8.03

56	55.92977025	-4.52401055	771.60	9.48	12.47	31.54	47.98	283.11
57	55.92975922	-4.52392852	786.30	9.48	21.21	31.65	46.72	268.00
58	55.92975078	-4.52372468	802.10	9.48	18.65	30.02	48.61	271.18
59	55.92974950	-4.52361680	817.90	9.48	19.24	30.64	48.84	274.38
60	55.92973050	-4.52331825	831.10	9.48	8.03	29.38	48.75	274.38
61	55.92971223	-4.52311826	845.50	9.48	19.68	29.63	47.73	272.20
62	55.92963347	-4.52292802	860.10	9.48	19.31	31.28	58.11	280.71
63	55.92957323	-4.52282701	874.20	7.48	19.01	30.34	58.84	278.44
64	55.92957323	-4.52282701	888.00	9.48	20.03	30.91	49.84	278.44
65	55.92956409	-4.52223741	901.50	6.48	22.13	32.80	56.48	282.38
66	55.92956409	-4.52223741	914.90	6.48	19.57	27.98	40.63	281.91
67	55.92956409	-4.52190952	928.20	6.48	20.62	26.52	42.86	270.70
68	55.92956409	-4.52190952	941.60	6.48	19.54	26.24	45.84	274.38
69	55.92953332	-4.52161565	954.80	6.48	14.53	23.24	33.65	269.58
70	55.92953360	-4.52111962	968.20	6.48	17.09	24.06	37.30	268.00
71	55.92951763	-4.52111952	981.40	6.48	13.48	24.55	37.82	274.38
72	55.92953552	-4.52090578	984.80	6.48	13.85	22.92	32.79	274.38
73	55.92953552	-4.52090578	1000.20	6.48	13.85	23.24	30.74	274.38
74	55.92954757	-4.52063375	1021.00	6.48	13.95	22.35	37.52	281.15
75	55.92954473	-4.52063391	1034.00	6.48	16.23	26.24	38.74	279.93
76	55.92954524	-4.52062454	1047.00	6.48	14.70	23.86	32.44	278.44
77	55.92954524	-4.52062454	1060.40	6.48	14.84	23.44	30.44	278.44
78	55.92955963	-4.51966050	1072.00	6.48	16.31	24.45	36.86	280.28
79	55.92955730	-4.51966677	1085.00	6.48	12.97	24.79	34.47	276.38
80	55.92954623	-4.51950922	1098.00	6.48	11.07	24.15	41.63	277.67
81	55.92953063	-4.51957283	1111.00	6.48	17.77	22.05	40.24	277.67
82	55.92953063	-4.51957283	1124.00	6.48	11.85	21.36	40.41	277.67
83	55.92950623	-4.51889560	1137.00	6.48	14.80	23.80	44.50	274.38
84	55.92949600	-4.51876767	1150.00	6.48	13.67	21.51	29.62	275.91
85	55.92948513	-4.51885458	1163.00	6.48	7.36	18.67	34.38	271.48
86	55.92948513	-4.51885458	1176.00	6.48	10.61	19.24	34.24	271.48
87	55.92947392	-4.51874285	1189.00	6.48	9.75	18.21	32.65	261.32
88	55.92947000	-4.51889570	1202.00	6.48	14.41	21.63	39.03	279.93
89	55.92946484	-4.51786600	1215.00	6.48	11.99	20.97	38.88	272.47
90	55.92945568	-4.51786781	1228.00	6.48	8.82	20.10	43.00	272.47
91	55.92945568	-4.51786781	1241.00	6.48	9.81	19.84	30.74	272.47
92	55.92944613	-4.51730075	1253.00	7.48	10.70	20.33	40.41	274.38
93	55.92944446	-4.51733905	1266.00	7.48	7.31	19.03	37.18	272.00
94	55.92944551	-4.51695052	1278.00	7.48	5.62	19.89	49.36	269.48
95	55.92944551	-4.51695052	1291.00	7.48	11.41	19.24	49.41	269.48
96	55.92947863	-4.51653732	1303.00	7.48	12.52	20.94	32.34	288.38
97	55.92943197	-4.51630900	1315.00	7.48	5.79	20.45	48.43	286.38
98	55.92943103	-4.51632742	1328.00	7.48	5.13	20.49	50.00	280.71
99	55.92943103	-4.51632742	1341.00	7.48	7.99	20.63	48.67	284.38
100	55.92937815	-4.51596322	1353.00	7.48	4.92	20.89	45.60	281.38
101	55.92936091	-4.51526782	1366.00	7.48	6.92	24.36	55.52	284.38
102	55.92934081	-4.51526807	1378.00	7.48	16.30	30.40	52.07	267.38
103	55.92931668	-4.51529492	1391.00	8.48	8.89	29.68	52.11	274.41
104	55.92931668	-4.51529492	1404.00	8.48	10.51	30.24	52.11	274.41
105	55.92933117	-4.51491527	1418.00	8.48	23.39	32.12	39.27	256.48
106	55.92935953	-4.51472721	1437.00	8.48	22.20	34.97	51.44	244.11
107	55.92941372	-4.51465651	1445.00	7.48	21.47	38.51	50.61	249.48
108	55.92941372	-4.51465651	1458.00	7.48	14.84	30.84	50.61	249.48
109	55.92938189	-4.51479788	1471.00	7.48	21.19	36.31	45.50	251.38
110	55.92929725	-4.51389802	1484.00	7.48	18.41	33.56	59.28	252.39
111	55.92919568	-4.51302048	1496.00	7.48	15.89	33.88	59.65	257.00
112	55.92917883	-4.51302048	1509.00	7.48	14.64	31.14	58.39	254.41
113	55.92917883	-4.51302048	1521.00	7.48	14.49	32.30	59.41	254.41
114	55.92915033	-4.51322440	1534.00	7.48	19.05	34.60	52.77	260.48
115	55.92913867	-4.51308180	1547.00	7.48	12.82	33.59	64.97	259.48
116	55.92913434	-4.51288945	1559.00	7.48	15.21	32.76	53.22	261.18
117	55.92913434	-4.51288945	1572.00	7.48	11.84	32.82	52.95	261.18
118	55.92917722	-4.51261382	1585.00	7.48	21.00	34.73	64.13	263.18
119	55.92911537	-4.51274740	1597.00	7.48	18.43	34.35	70.35	259.38
120	55.92911537	-4.51274740	1609.00	6.48	20.34	35.40	62.00	257.48
121	55.92910493	-4.51274740	1622.00	6.48	17.44	37.24	67.28	256.48
122	55.92909446	-4.51274740	1634.00	6.48	16.49	36.30	59.41	256.48
123	55.92912689	-4.51156787	1647.00	6.48	23.11	34.64	55.04	257.00
124	55.92912689	-4.51156787	1660.00	6.48	19.22	35.93	62.06	268.00
125	55.92912728	-4.51119464	1673.00	5.98	21.50	38.33	65.88	255.88
126	55.92912728	-4.51119464	1686.00	5.98	23.30	39.94	61.81	255.88
127	55.92909300	-4.51080142	1699.00	5.98	24.77	37.47	51.64	257.00
128	55.92906988	-4.51080152	1711.00	6.48	17.88	34.55	49.82	262.08
129	55.92905038	-4.51080524	1724.00	6.48	14.00	35.36	56.00	260.97
130	55.92904931	-4.51080524	1736.00	6.48	11.00	35.60	62.00	257.48
131	55.92903460	-4.51082655	1750.00	6.48	10.00	36.51	59.00	258.38
132	55.92901612	-4.50977535	1763.00	6.48	23.00	35.91	60.00	269.08
133	55.92901003	-4.50955474	1776.00	6.48	17.00	34.75	57.00	262.58
134	55.92902923	-4.50953385	1789.00	6.48	18.00	35.08	59.00	262.42
135	55.92902923	-4.50953385	1791.00	6.48	17.00	35.21	59.00	262.42
136	55.92876270	-4.50830928	1814.00	7.48	10.00	33.71	52.00	258.38
137	55.92895467	-4.50872547	1827.00	7.48	12.00	30.57	54.00	265.50
138	55.92845683	-4.50831028	1840.00	7.48	20.00	34.07	52.00	262.41
139	55.92839560	-4.50830888	1856.00	7.48	22.00	36.86	51.00	253.28
140	55.92839560	-4.50830888	1866.00	7.48	22.00	36.86	51.00	253.28
141	55.92834338	-4.50830277	1889.00	7.48	22.00	40.71	61.00	254.68

Transect Summary

Section of Site	Shoreline	Min Section	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
95%ile velocity	cm/s	cm/s	cm/s	cm/s	degrees true	m AOD

WFD 11.78 6.12 27.76 58.11 276.20 8.12

FWD 8.40 5.43 26.04 50.04 277.41 7.26

EDO 18.43 12.02 34.55 70.35 258.73 7.31

Bowling ADCP Survey: Transect: 017

Survey Date: 28/06/2010

Bottom Elevation Along Transect: 153

High Water Offset: +2.00

Key: Portion of transect undertaken adjacent to Westfield (WFD) shoreline

Portion of transect undertaken adjacent to Centrefield (FCDO) shoreline

Portion of transect undertaken adjacent to Eastfield (EDO) shoreline

Ensemble# Ensemble Lat Ensemble Long Distance Along Transect (m) Bottom Depth (m AOD) Minimum Velocity Across Depth (cm/s) Mean Velocity Across Depth (cm/s) Max Velocity Across Depth (cm/s) Mean Flow Direction (degrees)

1	55.92839068	-4.50047061	9.10	6.48	20.58	31.83	65.57	275.83
2	55.92839567	-4.50104588	21.33	6.48	20.56	38.08	57.48	276.75
3	55.92838523	-4.50104588	33.76	6.48	21.75	40.83	56.36	284.27
4	55.92836480	-4.50161743	55.88	6.48	30.21	43.29	71.74	279.00
5	55.92835511	-4.50189515	73.12	6.48	25.47	47.34	61.80	281.18
6	55.92834314	-4.50217585	86.47	6.48	26.40	47.28	69.63	279.82
7	55.92834314	-4.5021758						

73	55.92924895	-4.51987247	893.90	6.48	29.63	36.81	50.78	272.22
73	55.92926652	-4.520167420	907.10	6.48	24.35	37.87	55.19	270.00
73	55.92927985	-4.52045813	920.00	6.48	30.21	40.16	56.52	270.45
73	55.92928003	-4.52074918	934.00	6.48	30.24	38.81	56.54	270.45
73	55.92928032	-4.52100118	946.00	6.48	25.28	37.70	53.60	272.71
74	55.92931268	-4.52129460	959.10	6.48	21.02	37.97	64.51	275.00
73	55.92928388	-4.52158798	972.00	6.48	29.54	39.95	60.88	270.33
73	55.92928457	-4.52161882	986.00	6.48	28.47	35.28	67.00	272.50
73	55.92928481	-4.52162692	992.00	6.48	29.31	38.21	57.70	272.50
80	55.92938418	-4.52247095	1010.00	6.48	24.00	38.86	56.41	271.58
83	55.92940733	-4.52276510	1023.00	6.48	23.56	38.23	61.07	275.33
82	55.92942000	-4.52301727	1036.00	6.48	27.43	41.24	63.44	275.67
84	55.92943049	-4.52320482	1048.00	6.48	24.41	41.24	56.50	270.50
84	55.92943912	-4.52330387	1062.00	6.48	24.85	35.14	55.78	270.75
85	55.92952247	-4.52385980	1075.00	6.48	29.61	40.94	56.57	274.97
86	55.92955017	-4.52418900	1088.00	6.48	27.59	39.87	55.40	274.67
87	55.92957931	-4.52448112	1101.00	6.48	22.92	37.80	55.84	275.00
87	55.92958003	-4.52451112	1114.00	6.48	24.00	38.21	55.23	275.00
88	55.92958609	-4.52452333	1126.00	6.48	24.31	40.00	65.27	276.62
90	55.92957518	-4.52461680	1139.00	6.48	20.81	37.73	58.81	272.33
95	55.92957518	-4.52461680	1139.00	6.48	21.18	37.41	62.20	277.48
95	55.92957518	-4.52464005	1159.00	6.48	21.43	37.41	62.20	277.48
101	55.92957518	-4.52464005	1171.00	6.48	21.43	37.41	62.20	277.48
102	55.92957518	-4.52481322	1295.00	7.48	10.44	34.82	61.63	272.62
103	55.92958890	-4.52481323	1474.00	7.48	10.96	33.35	59.48	285.15
104	55.92958890	-4.52480695	1308.00	7.48	11.63	34.73	67.76	286.31
104	55.92958890	-4.52480695	1311.00	7.48	11.63	34.73	67.76	286.31
105	55.92958637	-4.52481323	1324.00	7.48	11.63	34.73	67.76	286.31
105	55.92958637	-4.52481323	1326.00	7.48	12.45	35.07	57.04	275.75
107	55.92953372	-4.52315555	1243.00	6.48	21.76	37.42	61.29	275.58
107	55.92953372	-4.52315555	1256.00	6.48	14.72	37.13	64.18	279.33
108	55.92951538	-4.52277392	1269.00	7.48	19.00	37.39	65.04	275.34
108	55.92951538	-4.52277392	1271.00	7.48	19.43	37.39	65.04	275.34
109	55.92950452	-4.52443132	1295.00	7.48	10.44	34.82	61.63	272.62
113	55.92957545	-4.52245667	1308.00	7.48	10.96	33.35	59.48	285.15
113	55.92957545	-4.52245667	1311.00	7.48	11.63	34.73	67.76	286.31
114	55.92956430	-4.52020592	1463.00	6.48	11.63	34.73	67.76	286.31
115	55.92956430	-4.52020592	1463.00	6.48	33.23	49.32	61.60	252.92
116	55.92956330	-4.51916183	1475.00	6.48	37.39	50.52	65.86	260.25
117	55.92956330	-4.51916183	1488.00	7.48	37.96	46.54	65.05	262.00
118	55.92956330	-4.51916183	1491.00	7.48	37.96	46.54	65.05	262.00
119	55.92956348	-4.51836113	1513.00	7.48	28.11	45.03	68.62	263.33
120	55.92955910	-4.51917360	1526.00	7.48	26.47	45.12	67.50	262.53
121	55.92955277	-4.51801172	1535.00	7.48	28.46	47.45	65.81	263.88
122	55.92954262	-4.51882163	1545.00	7.48	25.63	41.24	63.24	261.49
122	55.92954262	-4.51882163	1548.00	7.48	25.63	41.24	63.24	261.49
124	55.92951009	-4.51844093	1563.00	7.48	28.88	43.64	70.51	257.47
125	55.92951009	-4.51826275	1577.00	7.48	25.60	43.92	68.10	263.28
126	55.92951009	-4.51808488	1587.00	7.48	26.47	38.80	65.68	259.12
127	55.92951009	-4.51808488	1590.00	7.48	26.47	38.80	65.68	259.12
128	55.92950925	-4.51771443	1593.00	7.48	22.05	40.93	68.53	262.41
129	55.92958970	-4.51752543	1594.00	7.48	22.00	40.41	68.00	263.18
130	55.92957650	-4.51733608	1597.00	7.48	30.00	43.79	76.00	261.76
131	55.92953521	-4.51745434	1600.00	7.48	28.00	45.78	69.00	261.88
132	55.92953521	-4.51745434	1603.00	7.48	28.00	45.78	69.00	261.88
133	55.92934422	-4.51679023	1605.00	7.48	25.00	41.88	64.00	261.47
134	55.92932668	-4.51659788	1611.00	7.48	18.00	40.41	67.00	265.88
135	55.92932668	-4.51640191	1623.00	7.48	27.00	41.29	70.00	259.34
136	55.92930567	-4.51601148	1650.00	7.48	29.00	47.53	68.00	257.17
137	55.92929872	-4.51587068	1664.00	7.48	20.00	41.00	69.00	262.35
139	55.92939110	-4.51562795	1678.00	7.48	16.00	41.47	65.00	259.76
140	55.92938833	-4.51562795	1681.00	7.48	22.00	41.84	65.84	260.50
141	55.92938833	-4.51562795	1684.00	7.48	22.00	41.84	65.84	260.50
142	55.92927817	-4.51507988	1713.00	7.48	20.00	42.43	69.00	263.29
143	55.92927817	-4.51488835	1726.00	7.48	19.00	39.59	64.00	261.00
144	55.92927673	-4.51469637	1739.00	7.48	17.00	41.29	70.00	261.71
145	55.92927414	-4.51488117	1800.00	7.48	25.28	44.36	72.52	283.21
146	55.92927414	-4.51488117	1803.00	7.48	25.28	44.36	72.52	283.21
147	55.92935372	-4.51431273	1764.00	7.48	20.00	41.00	69.00	258.65
148	55.92924547	-4.51396567	1777.00	7.48	21.00	40.98	69.00	264.76
149	55.92924547	-4.51396567	1780.00	7.48	21.00	40.98	69.00	264.76
150	55.92924547	-4.51396567	1784.00	7.48	21.00	40.98	69.00	264.76
151	55.92920778	-4.51340560	1830.00	8.98	27.00	44.48	63.00	271.54
152	55.92919777	-4.51321542	1843.00	9.48	25.00	43.47	61.00	263.06
153	55.92918705	-4.51303124	1857.00	9.48	34.00	46.29	62.00	262.06
154	55.92918705	-4.51303124	1860.00	9.48	34.00	46.29	62.00	262.06
155	55.92915230	-4.51271605	1881.00	9.48	38.00	47.63	64.00	256.24

Transect Summary:

Section of Site	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
Shoreline	95%ile velocity (cm/s)	Velocity (cm/s)	Velocity (cm/s)	degrees true	in AOD
WFD	72.22	15.77	44.84	72.33	7.73
FCD	14.54	3.15	35.33	69.30	326.76
FED	29.05	23.67	45.19	70.93	260.55
					8.38

Bowling ADCP Survey: Transect: 019

Survey Date	28/05/2010							
Ensembles Taken Along Transect:	119							
High Water Offset	+2.30							
Key								
Section of transect undertaken adjacent to Westfield (WFD) shoreline								
Section of transect undertaken adjacent to Centralfield (CWD) shoreline								
Section of transect undertaken adjacent to Eastfield (FED) shoreline								
Ensemble#	Ensemble Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92191615	-4.49931018	9.27	5.98	28.67	50.63	83.46	280.10
5	55.92190503	-4.49914107	21.60	5.98	27.85	47.00	70.99	284.30
3	55.92190503	-4.49807093	34.19	6.48	27.35	46.07	70.06	286.51
5	55.92190503	-4.49807093	56.70	5.98	28.00	46.07	70.06	286.51
6	55.92194467	-4.49824558	73.95	6.48	28.18	44.44	70.06	286.51
7	55.92197007	-4.49828587	87.52	6.48	27.72	44.14	75.65	291.18
7	55.92197007	-4.49828587	100.50	6.48	27.72	44.14	75.65	291.18
10	55.92195912	-4.49776670	125.80	6.58	30.60	44.67	62.48	284.07
11	55.92193185	-4.49731713	138.10	6.48	23.49	45.47	88.81	284.37
12	55.92193272	-4.49732873	140.00	6.48	24.00	45.91	81.43	281.85
13	55.92193272	-4.49554477	187.20	6.48	24.53	45.91	81.43	281.85
24	55.92193533	-4.49536958	300.40	6.48	22.08	46.95	86.07	288.77
25	55.92194553	-4.49519353	313.10	6.48	21.99	45.86	78.02	281.68
26	55.92194725	-4.49514688	325.80	6.48	23.81	46.85	77.51	280.45
27	55.92194725	-4.49514688	339.80	6.48	23.81	46.85	77.51	280.45
28	55.92194725	-4.49466933	351.70	6.48	19.31	45.78	80.47	287.00
29	55.92193883	-4.49459412	364.40	6.48	20.77	48.84	78.64	287.00
30	55.92191319	-4.49464813	377.30	6.48	23.56	47.87	73.83	285.76
31	55.92191319	-4.						

72	55.92836653	-4.50720445	939.10	6.48	30.72	50.00	71.25	281.31
73	55.92838017	-4.50726288	952.70	6.48	35.65	52.19	71.81	281.09
74	55.92838624	-4.50720172	966.10	6.48	32.61	53.97	73.31	286.16
75	55.92840043	-4.50944212	979.60	6.48	33.84	54.81	74.74	284.42
76	55.92844338	-4.50944212	983.10	6.48	34.28	53.75	81.84	281.53
77	55.92847174	-4.50876055	1006.00	6.48	33.21	53.06	76.68	285.31
78	55.92850025	-4.50987680	1019.00	6.48	36.66	49.55	66.77	278.03
79	55.92853052	-4.50939562	1033.00	6.48	36.91	49.70	67.67	279.38
80	55.92853162	-4.50939562	1036.00	6.48	36.94	49.71	67.67	279.38
81	55.92853180	-4.50939795	1060.00	6.48	34.90	50.34	69.10	285.71
82	55.92862517	-4.51039387	1074.00	6.48	31.19	49.14	69.10	288.8
83	55.92863483	-4.51065073	1087.00	6.48	32.66	46.46	65.64	278.61
84	55.92864483	-4.51065073	1101.00	6.48	30.84	47.64	65.64	278.61
85	55.92870351	-4.51113282	1114.00	6.48	25.74	41.72	63.22	280.53
86	55.92871562	-4.51113446	1128.00	6.48	23.34	43.21	66.95	283.38
87	55.92872020	-4.51113576	1142.00	6.48	24.46	44.24	71.88	282.38
88	55.92873392	-4.51217250	1146.00	6.48	21.88	41.14	65.84	281.41
89	55.92873418	-4.51217250	1160.00	6.48	23.24	39.82	65.84	281.41
90	55.92873823	-4.51218042	1183.00	6.48	16.67	36.83	59.07	284.33
91	55.92874588	-4.51312158	1197.00	6.48	25.87	38.00	65.20	287.33
92	55.92875293	-4.51333013	1210.00	7.48	18.51	35.27	67.55	274.48
93	55.92875621	-4.51333013	1214.00	7.48	17.64	34.84	66.91	274.48
94	55.92884084	-4.51403724	1235.00	7.48	14.76	32.57	52.46	278.33
95	55.92885872	-4.51432942	1248.00	7.48	12.65	30.89	60.03	267.58
96	55.92887452	-4.51461088	1261.00	7.48	19.71	37.16	58.12	289.07
97	55.92889562	-4.51482720	1275.00	7.48	18.47	34.03	60.32	279.38
98	55.92890475	-4.51482720	1288.00	7.48	13.31	31.31	61.43	284.41
99	55.92893828	-4.51536363	1301.00	8.98	17.03	35.03	71.33	280.19
100	55.92895562	-4.51538347	1314.00	8.98	4.66	26.88	61.25	280.81
101	55.92897274	-4.51651567	1327.00	9.48	3.37	32.39	68.04	265.34
102	55.92901627	-4.51671782	1341.00	9.48	3.24	31.84	65.54	274.37
103	55.92901767	-4.51671782	1353.00	9.48	1.78	39.37	72.74	250.33
104	55.92903632	-4.51794935	1366.00	9.48	12.77	43.60	68.06	261.32
105	55.92904443	-4.51794935	1379.00	9.48	33.00	42.76	65.68	258.88
106	55.92904443	-4.51794935	1394.00	9.48	29.64	42.81	69.26	254.81
107	55.92904675	-4.51804520	1407.00	9.48	24.53	38.48	61.17	240.57
108	55.92904853	-4.51813175	1420.00	6.48	13.51	31.39	64.03	236.68
109	55.92905949	-4.51863402	1434.00	6.48	19.96	35.80	64.24	241.08
110	55.92907454	-4.51885168	1458.00	6.48	30.80	42.96	62.39	247.41
111	55.92907507	-4.51885168	1469.00	6.48	31.94	43.84	64.07	248.48
112	55.92913780	-4.51958775	1476.00	6.48	26.68	45.31	64.46	247.08
113	55.92914173	-4.51990813	1489.00	6.48	28.35	45.79	63.12	246.38
114	55.92915228	-4.52027272	1503.00	6.48	23.73	46.02	63.44	254.81
115	55.92915228	-4.52027272	1516.00	6.48	24.61	46.02	70.84	254.81
116	55.92918373	-4.52062480	1531.00	6.48	21.92	44.56	72.71	255.35
117	55.92919700	-4.52114712	1544.00	7.48	28.60	45.10	65.01	255.35
118	55.92921326	-4.52146932	1558.00	7.48	24.64	42.24	72.70	251.88
119	55.92923424	-4.52179160	1572.00	7.48	24.52	40.68	63.42	252.42
120	55.92923424	-4.52179160	1585.00	7.48	23.44	39.44	63.42	252.42
121	55.92927887	-4.52238357	1599.00	7.48	20.48	39.82	68.72	253.68
122	55.92931293	-4.52765873	1613.00	7.48	18.97	39.61	68.53	247.71
123	55.92934637	-4.52781282	1627.00	8.48	19.75	38.19	58.81	254.88
124	55.92934637	-4.52781282	1640.00	8.48	18.84	38.84	60.47	254.88
125	55.92941983	-4.53084100	1655.00	7.48	21.17	39.76	68.73	257.31
126	55.92944831	-4.53231022	1668.00	7.48	20.94	40.63	64.31	252.00
127	55.92947592	-4.53425215	1682.00	7.48	19.63	39.90	74.70	255.38
128	55.92950972	-4.53482426	1695.00	7.48	17.84	38.61	58.81	262.41
129	55.92951207	-4.53482426	1708.00	7.48	16.43	37.46	61.60	259.48
130	55.92963850	-4.52524563	1724.00	6.48	23.00	41.83	68.00	252.38
131	55.92982621	-4.52598675	1738.00	6.48	19.00	39.82	63.18	244.00
132	55.92982782	-4.52598201	1751.00	6.48	22.00	39.64	60.00	253.35
133	55.92982782	-4.52598201	1764.00	6.48	21.80	39.54	60.00	253.35
134	55.92984477	-4.52472163	1779.00	6.48	20.00	39.90	58.00	264.31
135	55.92984553	-4.52457155	1793.00	6.48	20.00	40.00	60.00	261.33
136	55.92985050	-4.52441187	1807.00	6.48	21.00	41.75	64.00	257.83
137	55.92985100	-4.52441187	1824.00	6.48	22.00	42.00	74.00	267.38
138	55.92985164	-4.52461264	1836.00	6.48	19.00	39.00	50.33	254.33
139	55.92979007	-4.52238507	1845.00	6.48	23.00	40.00	54.00	258.77
Bowling ADCP Survey: Transect: 001								
Survey Date 28/06/2010								
Ensembles Taken: Transect: 134								
High Water Offset +3.00								
Key								
Portion of transect undertaken adjacent to Westfield (WFD) shoreline								
Portion of transect undertaken adjacent to Centrefield (CFD) shoreline								
Portion of transect undertaken adjacent to Eastfield (EFD) shoreline								
Transect Summary								
Section of Site Shoreline	95%ile velocity	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean direction of flow (across depth and section)	Mean bottom depth		
-	cm/s	cm/s	cm/s	cm/s	degrees true	m AOD		
WFD	31.40	17.35	53.94	80.36	279.01	7.60		
FED	9.28	3.47	36.06	71.88	278.03	7.77		
EFD	27.81	15.98	62.41	72.41	278.58	7.58		
Ensemble# Ensemble Lat Ensemble Long Transect (m)								
1	55.92914755	-4.51077470	9.83	5.48	33.70	51.73	68.53	276.22
2	55.92912813	-4.51056068	22.70	5.48	34.45	53.31	75.45	283.00
3	55.92911113	-4.51041920	43.60	5.48	34.64	53.41	74.00	287.40
4	55.92908143	-4.51039563	49.27	5.48	30.68	50.53	75.30	287.40
5	55.92907933	-4.51006713	64.10	6.48	28.07	49.27	78.02	279.73
6	55.92905495	-4.50988153	77.60	6.48	26.04	49.24	81.68	285.09
7	55.92905207	-4.50971508	80.43	6.48	19.94	43.20	73.92	281.24
8	55.92905207	-4.50971508	81.00	6.48	24.84	43.20	73.92	281.24
9	55.92905250	-4.50938893	115.50	6.48	21.07	45.71	75.53	277.91
10	55.92901372	-4.50914100	128.50	6.48	16.60	43.34	77.17	279.45
11	55.92899523	-4.50939248	141.40	6.48	16.66	47.00	82.60	277.73
12	55.92897743	-4.50939248	142.00	6.48	24.64	46.84	77.00	278.38
13	55.92897318	-4.50860103	147.00	6.48	23.76	43.81	70.44	279.82
14	55.92896218	-4.50851622	148.00	6.48	16.77	44.54	78.84	274.64
15	55.92895165	-4.50834153	193.00	6.48	20.32	46.30	72.93	278.36
16	55.92895248	-4.50829123	200.00	6.48	20.60	46.61	79.50	279.30
17	55.92895248	-4.50764085	211.00	6.48	23.41	46.61	84.00	284.00
18	55.92895248	-4.50764085	211.00	6.48	23.41	46.61	84.00	284.00
19	55.92895248	-4.50764085	212.00	6.48	23.41	46.61	84.00	284.00
20	55.92895248	-4.50764085	218.00	6.48	22.68	40.93	54.64	278.00
21	55.92895248	-4.50764085	220.00	6.48	22.68	40.93	54.64	278.00
22	55.92895248	-4.50764085	224.00	6.48	20.29	39.50	59.54	281.10
23	55.92895223	-4.50696223	227.40	6.48	23.76	43.77	54.06	279.73
24	55.92895265	-4.50676887	310.50	6.48	23.43	40.76	58.81</	

88	55.92913580	-4.49783783	1175.00	7.48	20.25	39.99	61.49	274.62
89	55.92916980	-4.49767800	1189.00	7.48	18.59	39.94	62.21	270.15
90	55.92917100	-4.49753307	1203.00	7.48	19.32	37.74	59.50	277.31
91	55.92917140	-4.49753307	1204.00	7.48	19.24	38.01	59.53	278.88
92	55.92920550	-4.49719562	1230.00	7.48	10.88	31.56	57.88	275.72
93	55.92921907	-4.49702667	1244.00	7.98	11.31	38.29	62.45	270.28
94	55.92923503	-4.49688188	1258.00	8.48	7.57	24.92	56.94	273.00
95	55.92926683	-4.49670448	1272.00	8.48	6.40	24.01	56.54	270.67
96	55.92927044	-4.49661303	1283.00	8.48	4.41	28.08	56.54	270.56
97	55.92926188	-4.49634195	1299.00	8.98	5.46	30.38	61.39	276.78
98	55.92927098	-4.49615768	1314.00	8.98	10.16	35.53	62.41	283.50
99	55.92927903	-4.49597413	1328.00	9.48	13.94	38.63	58.22	276.62
100	55.92928054	-4.49580348	1343.00	9.48	4.58	38.84	58.53	276.58
101	55.92928643	-4.49560315	1357.00	8.98	74.73	47.26	49.38	261.38
102	55.92931718	-4.49541673	1372.00	7.98	34.98	40.74	49.74	260.04
103	55.92930083	-4.49527367	1386.00	6.98	37.93	40.43	49.17	262.08
104	55.92920824	-4.49517717	1402.00	6.98	32.41	40.41	50.41	257.00
105	55.92919542	-4.49507363	1414.00	6.98	24.58	40.60	50.44	253.43
106	55.92915427	-4.49546963	1432.00	6.98	34.39	44.72	52.27	262.50
107	55.92883818	-4.49577667	1446.00	7.48	29.26	48.87	57.46	264.00
108	55.92875827	-4.49565393	1461.00	7.48	28.32	44.00	60.22	264.43
109	55.92866440	-4.49561662	1476.00	6.98	33.81	48.84	58.84	263.84
110	55.92868440	-4.49561162	1490.00	6.98	33.18	43.14	54.36	260.00
111	55.92863673	-4.49705353	1505.00	6.98	29.35	46.05	56.48	260.17
112	55.92858458	-4.49739118	1520.00	6.98	27.56	44.41	57.66	267.50
113	55.92856188	-4.49785663	1534.00	6.98	22.45	47.81	56.41	258.40
114	55.92856188	-4.49785663	1549.00	6.98	24.45	47.81	56.41	254.43
115	55.92848343	-4.49836805	1563.00	6.98	29.47	44.16	56.41	267.38
116	55.92845327	-4.49870598	1578.00	6.98	25.92	47.48	57.24	266.50
117	55.92841607	-4.49903734	1592.00	7.48	25.24	40.24	57.92	262.54
118	55.92839244	-4.49915300	1606.00	7.48	23.81	43.81	54.81	263.81
119	55.92840713	-4.49701652	1622.00	7.48	26.13	39.72	52.78	257.62
120	55.92839237	-4.50000238	1637.00	6.98	28.74	43.88	55.24	269.33
121	55.92837248	-4.50035592	1651.00	6.98	28.45	41.33	59.70	257.73
122	55.92836587	-4.50070272	1666.00	6.98	24.65	40.55	57.89	269.43
123	55.92835575	-4.50136822	1696.00	6.98	24.18	43.89	73.00	269.55
125	55.92835027	-4.50176000	1710.00	6.98	18.64	42.23	57.12	262.00
126	55.92834738	-4.50208222	1725.00	6.98	23.38	41.24	54.84	268.48
128	55.92833800	-4.50279210	1754.00	6.98	20.86	39.85	56.71	261.18
129	55.92835632	-4.50314392	1769.00	6.98	18.00	38.58	59.00	265.17
130	55.92834460	-4.50349365	1783.00	6.98	15.00	38.08	54.00	265.58
131	55.92833952	-4.50374720	1798.00	6.98	20.60	39.87	52.00	264.03
Survey Summary								
Section of Site	Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth		
	95%ile velocity	cm/s	cm/s	cm/s	degrees true	m AOD		
WWD	18.80	6.11	40.82	81.94	77.38	7.46		
FWD	10.50	4.42	35.58	70.77	77.74	7.91		
FED	26.73	23.13	42.48	73.00	263.52	7.04		
Bowling ADCP Survey: Transect: 023								
Survey Date 28/05/2019								
Survey Points Along Transect:								
High Water Offset								+3.30
Key								
Portion of transect undertaken adjacent to Westfield (WFD) shoreline								
Portion of transect undertaken adjacent to Centrefield (CFD) shoreline								
Portion of transect undertaken adjacent to Eastfield (EFD) shoreline								
Ensemble#	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92950461	-4.52113553	9.49	6.48	10.95	45.43	84.33	205.44
2	55.92950547	-4.52113553	22.49	6.48	22.19	45.84	74.31	281.00
3	55.92953117	-4.52097197	36.00	5.98	26.82	46.51	65.99	281.60
4	55.92952367	-4.52080310	50.26	5.98	32.63	45.28	64.24	285.40
5	55.92952714	-4.52065280	64.41	5.98	27.42	44.83	64.82	298.85
6	55.92951923	-4.52056164	66.00	5.98	25.57	44.93	62.49	292.60
7	55.92951923	-4.52029042	83.79	5.98	22.89	43.38	69.68	287.90
8	55.92950732	-4.52012193	106.60	5.98	29.20	45.96	66.63	287.44
9	55.92949543	-4.51995355	120.00	5.98	24.55	40.33	62.58	285.61
10	55.92948183	-4.51981563	123.00	5.98	25.53	44.89	72.33	281.80
11	55.92946415	-4.51961588	146.50	5.98	30.23	44.53	65.43	272.80
12	55.92945060	-4.51944677	159.70	5.98	30.23	43.78	65.54	279.00
13	55.92944333	-4.51927713	173.40	5.98	24.52	47.05	77.38	278.20
14	55.92943818	-4.51915303	184.00	5.98	24.86	43.89	64.34	278.80
15	55.92942693	-4.51892789	200.40	5.98	29.31	42.30	61.06	281.60
16	55.92944072	-4.51875063	213.90	5.98	31.78	44.07	65.73	281.00
17	55.92943575	-4.51857498	227.40	5.98	30.28	45.19	68.09	283.70
18	55.92943212	-4.51842460	240.40	5.98	31.27	45.11	60.09	288.80
19	55.92942812	-4.51835263	249.00	5.98	29.20	44.88	62.88	284.50
20	55.92942127	-4.51807100	268.10	6.48	28.22	44.96	68.15	280.36
21	55.92941975	-4.51789128	281.70	6.48	35.68	49.79	68.43	277.77
22	55.92941610	-4.51771045	295.40	6.48	33.98	46.45	57.78	281.91
23	55.92940914	-4.51757043	304.00	6.48	34.80	46.00	60.44	284.64
24	55.92939693	-4.51732293	327.40	6.48	30.71	44.99	60.32	286.64
25	55.92937913	-4.51719892	336.10	6.48	24.46	45.56	68.31	281.00
26	55.92936638	-4.51700398	349.80	6.48	29.51	43.68	59.68	283.09
27	55.92936272	-4.51690372	363.40	6.48	24.82	44.39	57.08	289.00
28	55.92935215	-4.51682513	374.20	6.48	24.05	43.85	54.22	286.54
29	55.92934853	-4.51678188	381.80	6.48	24.05	43.85	54.22	286.54
30	55.92931300	-4.51645568	390.90	6.48	25.50	43.80	56.84	287.91
31	55.92931455	-4.51630097	404.80	6.48	24.44	39.56	54.96	280.73
32	55.92929246	-4.51617132	418.90	6.48	23.23	36.36	49.03	280.00
33	55.92928683	-4.51607232	427.40	6.48	24.74	40.89	54.24	284.24
34	55.92926083	-4.51576372	447.40	6.48	27.53	37.10	59.44	271.91
35	55.92924345	-4.51558438	461.60	6.48	27.41	36.77	49.86	285.00
36	55.92921475	-4.51543015	475.50	6.48	28.26	37.81	51.88	285.10
37	55.92921475	-4.51522517	489.00	6.48	24.89	31.29	45.22	278.14
38	55.92918753	-4.51489188	518.30	6.48	18.01	41.83	58.57	279.00
39	55.92917128	-4.51477145	517.60	6.48	20.71	40.23	60.36	286.09
40	55.92917207	-4.51453865	546.90	6.48	9.44	38.17	57.86	280.00
41	55.92916988	-4.51449083	554.00	6.48	18.82	39.88	54.84	280.00
42	55.92911768	-4.51442919	575.40	6.98	11.25	41.12	64.05	276.31
43	55.92911168	-4.51403197	589.50	6.98	10.83	40.94	68.79	280.83
44	55.92907883	-4.51385665	603.70	7.48	12.41	37.09	66.34	275.00
45	55.92907343	-4.51374833	612.00	7.48	15.41	32.12	57.36	287.00
46	55.92907207	-4.51300173	610.50	6.48	28.38	35.81	64.21	283.92
47	55.92905675	-4.51332617	646.00	7.48	3.81	32.49	39.09	273.71
48	55.92904707	-4.51314685	660.00	7.98	10.01	39.79	67.00	273.71
49	55.92904593	-4.51298752	674.00	6.48	5.40	40.88	75.85	276.00
50	55.92904593	-4.51298752	684.00	6.48	3.88	39.88	72.88	276.00
51	55.92903850	-4.50948398	699.50	6.48	23.93	46.67	64.38	

112	55.92894943	-4.50187352	1567.00	7.98	22.11	38.93	55.01	257.21	
113	55.92896552	-4.50168810	1582.00	7.98	22.71	39.48	61.63	259.21	
114	55.92897295	-4.50157732	1596.00	7.98	25.87	41.75	60.57	260.57	
115	55.92898534	-4.50156382	1604.00	7.98	26.47	40.84	58.41	260.84	
116	55.92898533	-4.50156363	1624.00	7.98	21.71	39.82	53.06	255.14	
117	55.92901167	-4.50097143	1638.00	7.98	23.52	41.01	59.58	258.92	
118	55.92902630	-4.50081373	1653.00	7.98	23.04	42.77	56.92	255.00	
119	55.92903348	-4.50059970	1667.00	7.98	24.48	20.04	55.74	263.31	
120	55.92903348	-4.50059970	1683.00	7.98	24.68	48.00	58.42	263.31	
121	55.92905378	-4.50025752	1696.00	6.98	33.29	43.63	53.76	264.67	
122	55.92906065	-4.50006545	1711.00	6.98	29.15	44.43	62.58	264.09	
123	55.92906723	-4.49876785	1725.00	6.98	27.08	43.00	57.79	266.09	
124	55.92907250	-4.49876785	1734.00	6.98	29.24	43.88	58.82	266.17	
125	55.92907250	-4.49959668	1754.00	6.98	25.11	44.61	61.21	264.00	
126	55.92910583	-4.49937498	1768.00	6.98	16.07	41.02	58.03	264.17	
127	55.92911775	-4.49917378	1782.00	6.98	23.23	42.67	60.07	262.25	
128	55.92912427	-4.49897207	1797.00	6.98	24.58	47.78	57.24	263.94	
129	55.92912427	-4.49897207	1814.00	6.98	24.68	37.08	56.28	263.94	
130	55.92915448	-4.49859850	1826.00	5.98	28.00	39.80	48.00	254.60	
Transect Summary									
Section of Site	Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth			
95%ile velocity		cm/s	cm/s	cm/s	degrees true	m AOD			
WFD	10.77	1.24	38.24	78.83	276.57	7.36			
CFD	19.88	2.14	42.75	70.74	276.86	7.76			
HFD	24.05	15.46	31.71	86.41	261.47	7.04			
Bowling ADCP Survey: Transect: 025									
Survey Date: 28/06/2010									
Ensembles Taken Along Transect: 132									
High Water Offset: +4.00									
Key:									
Portion of transect undertaken adjacent to Westfield (WFD) shoreline									
Portion of transect undertaken adjacent to Centrefield (CFD) shoreline									
Portion of transect undertaken adjacent to Eastfield (HFD) shoreline									
Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92892017	-4.51559887		9.75	6.98	73.81	48.47	71.30	286.67
2	55.92893605		55.92956008	23.02	6.98	78.49	46.50	76.83	287.17
3	55.92895718	-4.51631748		38.49	6.98	28.4	50.34	85.72	286.61
4	55.92896355	-4.51631748		45.48	6.98	54.68	46.50	76.83	285.64
5	55.92893355	-4.51667812		63.83	5.98	29.50	47.73	74.97	281.40
6	55.92901690		55.92733623	78.04	5.98	34.07	46.57	63.35	282.20
7	55.92893052	-4.51769313		92.60	5.98	29.38	44.07	58.84	278.10
8	55.92893052	-4.51769313		103.00	5.98	25.24	44.07	58.84	278.10
9	55.92905040	-4.51840501		170.80	5.98	75.11	45.47	66.41	273.40
10	55.92911115	-4.51879568		134.40	5.98	79.14	43.43	61.12	273.20
11	55.92910502	-4.51911605		148.20	5.98	28.85	45.73	77.45	279.50
12	55.92917260	-4.51842487		161.60	5.98	27.80	46.40	68.61	279.50
13	55.92917260	-4.51842487		174.00	5.98	24.84	46.41	68.64	279.50
14	55.92924872	-4.52013178		189.20	5.98	26.68	46.42	69.17	278.30
15	55.92928013	-4.52084815		203.10	5.98	20.02	47.54	67.08	278.10
16	55.92730467		55.92805383	217.10	5.98	16.98	46.68	67.58	278.33
17	55.92927658	-4.52084583		232.00	5.98	37.45	46.68	67.58	278.33
18	55.92936758	-4.52158072		244.60	5.98	71.25	47.68	61.72	277.56
19	55.92940053	-4.52191170		258.70	5.98	27.18	47.10	66.04	281.67
20	55.92943758	-4.52265760		272.50	5.98	30.38	42.30	56.72	275.60
21	55.92946503	-4.52265700		286.60	5.98	30.41	46.41	67.64	279.30
22	55.92952668	-4.52323638		301.40	5.98	25.68	47.24	56.26	280.56
23	55.92952668	-4.52323498		314.30	5.98	27.86	50.89	63.38	283.60
24	55.92952672	-4.52362853		328.30	5.98	27.35	48.43	62.15	280.00
25	55.92963892	-4.52394277		342.50	5.98	27.48	47.62	61.31	280.60
26	55.92963892	-4.52394277		354.00	5.98	24.84	46.41	58.84	280.60
27	55.92983085	-4.52388028		371.00	5.98	32.50	48.70	62.95	280.50
28	55.92979557	-4.52375972		385.10	5.98	24.43	46.60	61.34	282.40
29	55.92976328		55.92765782	399.20	6.48	18.15	47.46	65.97	285.87
30	55.92975303	-4.52264543		413.00	6.48	16.41	46.41	58.41	285.18
31	55.92975303	-4.52264543		424.50	6.48	24.24	48.11	66.06	284.34
32	55.92971305	-4.52307072		442.70	6.48	14.86	42.86	55.17	285.45
33	55.92970005	-4.52788148		457.50	6.48	13.46	43.48	60.75	272.43
34	55.92687713	-4.52687713		472.60	6.48	19.32	40.51	54.74	282.00
35	55.92687713	-4.52687713		487.00	6.48	28.84	43.41	53.71	283.85
36	55.92658448	-4.52233048		502.30	6.48	28.34	39.83	48.72	282.73
37	55.92647213	-4.52181398		517.10	6.48	28.52	39.00	45.29	278.03
38	55.92631773	-4.52201375		531.70	6.48	19.82	38.12	49.44	285.55
39	55.92626120	-4.52248133		546.40	6.48	16.84	38.41	49.84	278.03
40	55.92626120	-4.52248133		560.50	6.48	17.28	34.40	46.70	284.64
41	55.92606768	-4.52498883		574.80	6.48	16.59	38.73	46.78	288.00
42	55.92595703	-4.52132652		589.10	6.48	17.41	37.81	51.69	274.82
43	55.92595692	-4.51820330		604.50	6.48	16.40	38.72	46.40	275.50
44	55.92595692	-4.51820330		617.00	6.48	17.41	38.44	49.48	274.82
45	55.92595327	-4.52082628		618.00	6.48	16.00	35.33	48.39	272.73
46	55.92595692	-4.52065003		646.00	6.48	12.00	35.10	57.77	275.00
47	55.92595717		55.92782355	659.80	6.48	13.10	36.73	63.42	277.58
48	55.92595717		55.92782355	674.00	6.48	14.41	38.41	58.41	276.50
49	55.92585713	-4.52014583		687.40	7.48	14.26	37.12	59.35	282.34
50	55.92555020	-4.51997070		700.78	7.98	9.81	35.50	63.01	266.43
51	55.92542177	-4.51978432		714.50	7.98	10.27	39.01	63.22	283.57
52	55.92537500	-4.51964770		727.80	7.98	4.82	38.61	64.40	269.26
53	55.92537500	-4.51964770		742.50	7.98	12.45	29.84	54.56	286.30
54	55.92537500	-4.51771318		758.40	7.98	14.44	33.81	48.31	264.70
55	55.92539905	-4.51753482		807.20	5.98	27.14	34.06	48.73	276.67
56	55.92539242	-4.51752432		911.30	5.98	21.58	32.26	52.26	263.80
57	55.92539242	-4.51545641		924.00	5.98	26.84	34.84	58.84	283.85
58	55.92533585	-4.51208188		939.10	5.98	40.90	47.95	61.40	274.10
59	55.92534338	-4.51683755		953.20	5.98	30.59	46.79	64.86	270.10
60	55.92533275	-4.51665782		967.40	5.98	34.47	45.93	52.12	276.50
61	55.92533275	-4.51647853		985.40	5.98	35.43	47.29	67.00	272.91
62	55.92519305	-4.51455720		1131.00	5.98	73.43	43.18	58.32	278.00
63	55.92518082	-4.51377455		1144.00	5.98	26.82	41.79	62.37	267.20
64	55.92519758	-4.51490908		1158.00	6.48	22.43	41.30	64.61	276.27
65	55.92519758	-4.51490908		1172.00	6.48	20.82	41.51	65.41	276.25
66	55.92507105	-4.51277003		1303.00	7.98	12.88	32.63	63.39	292.00
67	55.92508775	-4.51208383		1316.00	7.98	3.92	28.01	76.17	289.86
68	55.92509083	-4.51859760		1330.00	7.98	0.63	31.83	72.74	301.07
69	55.92509083	-4.51859760		1343.00	7.98	0.63	31.83	58.84	292.00
70	55.92513132	-4.51515670		1357.00	7.98	13.42	40.96	61.53	285.43
71	55.92511047	-4.51134310		1371.00</td					

Section of Site	Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
		cm/s	cm/s	cm/s	degrees true	m AOD
WFD	12.57	2.18	16.28	64.88	274.03	7.04
FID	10.02	0.63	37.85	76.17	279.13	7.14
FED	28.19	22.05	45.30	69.97	262.06	6.74

Bowling ADCP Survey: Transect: 027

Survey Date: 28/06/2010						
Ensembles Taken Along Transect: 118						
High Water Offset: +4.30						
Key:						

Portion of transect undertaken adjacent to Westfield (WFD) shoreline

Portion of transect undertaken adjacent to Central (FID) shoreline

Portion of transect undertaken adjacent to Eastfield (FED) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m) AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (true)
1	55.92831527	-4.50411480	9.87	6.48	33.35	46.55	64.24	280.45	
2	55.92832967	-4.50451539	73.05	6.48	33.86	45.89	64.19	281.68	
3	55.92833363	-4.50479467	36.31	6.48	28.66	47.02	65.24	274.37	
4	55.92834615	-4.50513540	49.59	6.48	31.15	46.98	74.19	278.45	
5	55.92835001	-4.50527447	52.41	6.48	32.53	46.51	64.24	272.77	
6	55.92835812	-4.50532415	77.36	6.48	25.52	43.90	61.35	272.77	
7	55.92841492	-4.50651703	91.38	5.98	34.73	47.92	58.14	279.00	
8	55.92843392	-4.50651683	106.60	5.98	27.34	50.16	73.40	281.68	
9	55.92844382	-4.50701644	117.41	5.98	34.73	48.69	64.24	272.77	
10	55.92846721	-4.50716368	130.70	5.98	39.23	56.06	76.30	281.48	
11	55.92848712	-4.50726342	142.90	5.98	26.77	46.77	63.93	280.48	
12	55.92850142	-4.50766297	155.70	5.98	31.07	51.36	67.82	276.00	
13	55.92851401	-4.50801544	168.50	5.98	30.07	48.81	64.24	276.48	
14	55.92851402	-4.50801568	181.60	5.98	23.31	49.84	64.28	278.48	
15	55.92851357	-4.50808523	193.40	5.98	28.72	46.02	62.30	279.44	
16	55.92855511	-4.50957500	206.00	5.98	26.68	39.81	55.98	274.78	
17	55.92856663	-4.50994603	218.70	5.98	35.77	50.70	79.00		
18	55.92857142	-4.51011646	231.40	5.98	39.23	55.81	72.40		
19	55.92861575	-4.51017387	243.60	4.98	29.31	38.75	53.81	269.48	
20	55.92861701	-4.51055987	256.80	4.98	29.58	38.00	53.16	269.48	
21	55.92866867	-4.51095963	269.70	4.98	28.70	38.56	54.16	274.78	
22	55.92870121	-4.51121642	282.40	4.98	29.01	38.83	54.51	274.48	
23	55.92871322	-4.51142455	285.60	4.98	24.31	38.83	50.11	274.48	
24	55.92873492	-4.51163695	308.60	5.98	25.51	38.49	48.57	274.48	
25	55.92875663	-4.51207062	321.40	5.98	28.52	39.27	55.85	274.78	
26	55.92876793	-4.51244792	334.20	5.98	24.67	41.97	69.65	273.78	
27	55.92877021	-4.51251680	346.90	5.98	32.84	48.94	55.81	272.48	
28	55.92881080	-4.51323205	360.00	5.98	20.85	41.70	59.35	275.27	
29	55.92883663	-4.51351773	373.00	5.98	17.40	42.66	64.21	275.00	
30	55.92884281	-4.51392574	386.40	5.98	26.51	46.44	55.55	278.47	
31	55.92884652	-4.51401680	399.10	5.98	16.41	40.81	54.01	274.48	
32	55.92885210	-4.51415680	413.50	5.98	22.31	41.78	59.32	278.48	
33	55.92885453	-4.51436352	427.00	5.98	25.08	40.69	54.64	280.08	
34	55.92885753	-4.51451058	440.70	5.98	26.45	37.66	46.02	280.48	
35	55.92889392	-4.51505582	454.70	5.98	28.80	33.05	42.27	283.48	
36	55.92890342	-4.51511680	467.40	5.98	23.01	38.41	54.21	278.48	
37	55.92904392	-4.51613010	482.70	5.98	25.20	31.87	43.78	272.48	
38	55.92907133	-4.51664608	496.50	5.98	25.98	37.02	46.49	270.40	
39	55.92908530	-4.51695198	510.20	5.98	23.93	32.22	42.92	281.68	
40	55.92910501	-4.51701641	524.40	5.98	17.41	31.84	44.41	274.48	
41	55.92914562	-4.51728812	537.80	5.98	18.73	30.04	44.43	265.48	
42	55.92918823	-4.51727788	551.80	5.98	22.20	30.62	41.90	274.48	
43	55.92921797	-4.51832450	565.60	5.98	22.93	30.38	42.59	269.58	
44	55.92923168	-4.51837492	579.60	5.98	17.95	43.87	46.67	273.48	
45	55.92924182	-4.51842564	593.40	5.98	18.00	32.04	54.01	268.48	
46	55.92931910	-4.51936267	608.00	5.98	20.00	25.35	34.02	266.68	
47	55.92933643	-4.51970728	621.80	5.98	22.01	28.45	37.60	279.70	
48	55.92934591	-4.52061500	635.80	5.98	13.42	24.34	39.33	265.58	
49	55.92935080	-4.52071680	649.60	5.98	20.81	31.84	42.49	269.48	
50	55.92936040	-4.52073775	663.20	5.98	18.64	39.36	55.68	265.58	
51	55.92936282	-4.52102822	676.90	5.98	4.61	32.81	53.66	274.48	
52	55.92936233	-4.52138370	690.80	7.08	7.00	34.75	59.10	281.08	
53	55.92937624	-4.52173852	704.60	7.08	3.52	35.01	59.00	264.48	
54	55.92938081	-4.52187341	718.40	7.08	2.33	34.84	58.41	274.48	
55	55.92937639	-4.52223817	732.40	7.08	7.41	34.89	53.26	270.48	
56	55.92940087	-4.52277913	746.50	7.08	8.07	32.46	53.58	266.91	
57	55.92943345	-4.52331453	760.30	8.48	1.52	31.15	49.18	262.88	
58	55.92944591	-4.52361500	774.80	8.48	1.81	30.84	45.81	273.48	
59	55.92944742	-4.52393073	789.30	8.48	1.73	24.82	34.56	267.47	
60	55.92957437	-4.52410363	804.20	6.48	16.94	26.48	35.01	271.58	
61	55.92970420	-4.52416030	818.70	5.98	13.30	20.35	31.51	276.88	
62	55.92975624	-4.52420233	833.60	5.98	6.73	19.32	32.62	278.48	
63	55.92976024	-4.52423764	847.40	5.98	13.33	22.41	34.41	269.48	
64	55.92978493	-4.52386748	862.40	5.98	15.93	24.80	35.23	269.58	
65	55.92974531	-4.52384962	876.20	5.98	14.79	28.43	42.03	276.48	
66	55.92973728	-4.52330762	889.80	5.98	20.85	33.16	46.78	270.48	
67	55.92974021	-4.52331461	903.50	5.98	23.84	32.44	46.78	270.48	
68	55.92979873	-4.52321458	916.90	5.98	27.53	41.75	52.00	271.38	
69	55.92979721	-4.52327442	930.30	5.98	29.59	44.37	56.80	265.58	
70	55.92970486	-4.52325258	943.50	5.98	26.34	46.66	55.67	262.68	
71	55.92952233	-4.52361471	958.60	5.98	31.02	46.94	56.81	269.48	
72	55.92952381	-4.52371860	969.50	5.98	44.43	44.53	56.81	269.48	
73	55.92953881	-4.52302712	982.60	5.98	40.78	52.37	60.90	268.48	
74	55.92956933	-4.52312735	995.40	5.98	41.59	50.67	57.32	271.41	
75	55.92953224	-4.52435524	1008.00	5.98	40.37	58.77	75.39	270.48	
76	55.92953321	-4.52436751	1021.80	5.98	33.84	45.41	56.81	268.48	
77	55.92962022	-4.52411665	1034.00	5.98	28.19	50.95	47.74	268.58	
78	55.92967333	-4.52417943	1047.00	5.98	35.56	50.33	64.86	269.38	
79	55.92950808	-4.52424591	1050.50	5.98	31.73	50.67	70.89	267.58	
80	55.92952720	-4.52427303	1065.20	5.98	26.00	46.44	68.44	274.48	
81	55.92953247	-4.52505830	1085.00	5.98	33.06	51.33	76.47	274.48	
82	55.92953882	-4.52502010	1098.00	5.98	29.17	51.80	78.91	269.58	
83	55.92953526	-4.52501852	1110.00	5.98	22.26	47.67	77.27	274.48	
84	55.92951970	-4.52603334	1123.00	5.98	28.81	44.77	69.33	267.48	
85	55.92951971	-4.52603335	1136.00	5.98	23.43	44.77	69.33	267.48	
86	55.92947812	-4.51967685	1148.00	5.98	16.72	44.27	66.35	276.48	
87	55.92946531	-4.51950588	1143.00	5.98	38.73	46.76	50.93	264.48	
88	55.92922853	-4.51532357	1147.00	5.98	31.06</td				

Portion of transect undertaken adjacent to Centrefield (CFD) shoreline									
Portion of transect undertaken adjacent to Eastfield (EFD) shoreline									
Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m) AOD	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees)
1	55.92876008	-4.49630305	0.24	5.68	25.18	41.37	57.73	270.45	
2	55.92874491	-4.49645141	21.38	5.68	35.48	45.60	57.44	272.80	
3	55.92874441	-4.49645141	31.38	5.68	35.46	45.60	62.38	272.80	
4	55.92863285	-4.49728008	46.35	5.68	35.69	48.41	69.80	279.20	
5	55.92865682	-4.49762303	58.94	5.68	39.78	47.29	64.78	271.70	
6	55.92862801	-4.49762368	71.88	5.68	32.60	47.37	65.58	276.10	
7	55.92862801	-4.49762368	83.88	5.68	32.61	47.37	59.84	276.50	
8	55.92854507	-4.49864567	98.64	5.68	33.87	45.53	56.51	272.44	
9	55.92852120	-4.49889472	117.40	5.68	37.16	43.88	57.62	273.56	
10	55.92849300	-4.49933988	125.70	5.68	32.68	45.13	61.88	268.78	
11	55.92846601	-4.49958581	138.40	5.68	37.40	45.13	59.91	266.22	
12	55.92846601	-4.49958581	149.40	5.68	37.45	45.13	59.91	264.11	
13	55.92841832	-4.50032387	163.30	5.68	30.32	40.74	58.21	265.11	
14	55.92839330	-4.50017185	175.60	5.68	30.58	42.27	56.00	265.75	
15	55.92837521	-4.50114193	187.80	5.68	35.26	45.28	57.06	267.43	
16	55.92837521	-4.50114193	208.00	5.68	35.24	45.28	56.82	267.43	
17	55.92833871	-4.50117026	217.50	5.68	36.11	44.98	51.08	270.57	
18	55.92833271	-4.50205348	225.00	4.48	26.78	40.91	53.06	265.14	
19	55.92830950	-4.50233855	237.50	4.48	17.93	39.47	53.83	267.75	
20	55.92829580	-4.50272426	249.50	4.48	20.64	42.00	55.23	272.88	
21	55.92829580	-4.50272426	260.50	4.48	20.64	42.00	55.23	272.88	
22	55.92833173	-4.50342288	274.40	4.48	22.60	40.03	52.93	265.75	
23	55.92877663	-4.50376288	286.80	4.48	22.68	45.35	60.18	277.50	
24	55.92877750	-4.50405753	299.50	4.48	31.58	48.28	57.46	270.50	
25	55.92877750	-4.50405753	310.50	4.48	31.58	48.28	57.46	270.50	
26	55.92852850	-4.50474953	325.50	5.68	22.23	45.53	55.60	274.22	
27	55.92834242	-4.50599892	338.70	5.68	21.83	50.71	64.55	271.56	
28	55.92831343	-4.50544783	351.90	5.68	26.10	47.55	60.82	275.00	
29	55.92831343	-4.50544783	361.50	5.68	26.10	47.55	54.70	280.88	
30	55.92831343	-4.50544783	371.50	5.68	26.10	47.55	54.70	287.64	
31	55.92831343	-4.50544783	380.50	5.68	26.10	47.55	54.70	281.33	
32	55.92832327	-4.50679955	403.60	4.48	35.90	39.83	45.84	280.75	
33	55.92832327	-4.50679955	414.50	4.48	34.48	38.24	45.84	285.22	
34	55.92832327	-4.50679955	426.50	4.48	34.48	38.24	45.84	285.22	
35	55.92841110	-4.50723447	443.80	4.48	29.52	37.33	47.37	275.56	
36	55.92842965	-4.50819183	456.60	4.48	26.54	36.77	56.07	275.67	
37	55.92845013	-4.50853800	460.70	4.48	21.48	35.26	55.31	275.22	
38	55.92845013	-4.50853800	468.50	4.48	21.48	35.26	55.31	275.22	
39	55.92845013	-4.50853800	476.10	4.48	26.64	37.13	50.74	274.44	
40	55.92850220	-4.50957467	509.60	5.68	25.68	34.97	48.82	287.33	
41	55.92851712	-4.50966900	523.30	5.68	24.58	36.51	45.78	280.67	
42	55.92853372	-4.51041132	536.50	5.68	22.20	32.50	40.40	287.33	
43	55.92853372	-4.51041132	546.50	5.68	22.20	32.50	40.40	287.33	
44	55.92853335	-4.51089113	563.90	5.68	33.33	42.89	54.86	275.00	
45	55.92850860	-4.51112633	577.20	5.68	35.38	43.20	55.58	281.72	
46	55.92850554	-4.51165013	590.80	5.68	31.78	41.72	49.31	276.56	
47	55.92850554	-4.51165013	600.80	5.68	31.78	41.72	49.31	276.56	
48	55.92817451	-4.51371845	617.60	5.68	36.53	45.06	52.32	280.80	
49	55.92863437	-4.51323229	631.50	5.68	34.79	41.78	48.40	278.40	
50	55.92865532	-4.51266418	645.00	5.68	29.78	42.12	51.02	277.90	
51	55.92867919	-4.51334041	658.80	5.68	35.18	44.86	50.30	289.50	
52	55.92867919	-4.51334041	668.80	5.68	35.18	44.86	50.30	287.40	
53	55.92873653	-4.51388893	686.00	5.68	23.17	43.04	54.34	272.82	
54	55.92876603	-4.51433112	690.30	5.68	19.98	40.23	54.48	273.00	
55	55.92878884	-4.51452245	714.70	5.68	12.23	33.66	50.11	276.38	
56	55.92878884	-4.51452245	725.50	5.68	12.23	33.66	50.11	276.38	
57	55.92883673	-4.51501573	730.90	7.48	14.07	33.18	43.16	272.22	
58	55.92884887	-4.51552532	753.40	5.68	16.52	35.87	49.99	277.08	
59	55.92886510	-4.51595648	766.50	7.48	21.78	37.51	49.38	277.83	
60	55.92887473	-4.51624031	789.60	5.68	13.68	37.64	48.82	283.07	
61	55.92887473	-4.51624031	798.80	5.68	13.68	37.64	48.82	283.07	
62	55.92888067	-4.51629277	809.80	5.68	7.81	21.22	40.98	277.20	
63	55.92887252	-4.51727063	824.50	5.68	9.98	24.50	40.44	280.33	
64	55.92885333	-4.51765654	828.20	5.68	15.38	26.50	42.78	278.64	
65	55.92885333	-4.51765654	838.50	5.68	15.38	26.50	42.78	278.64	
66	55.92883820	-4.51825680	865.50	5.68	18.13	28.05	44.19	276.20	
67	55.92893760	-4.51851560	876.60	5.68	18.13	28.05	44.19	276.20	
68	55.92893734	-4.51893827	891.70	5.68	20.88	30.89	39.33	275.50	
69	55.92893734	-4.51893827	903.80	5.68	28.41	33.16	39.33	275.50	
70	55.92893734	-4.51893827	913.50	5.68	28.41	33.16	39.33	275.50	
71	55.92893523	-4.51997687	930.50	5.68	31.57	41.95	52.13	268.78	
72	55.92901313	-4.52076645	941.50	5.68	31.26	42.77	51.42	277.33	
73	55.92901313	-4.52060442	952.50	5.68	31.26	42.77	51.42	277.33	
74	55.92901313	-4.52060442	962.50	5.68	31.26	42.77	51.42	277.33	
75	55.92917688	-4.52117302	981.60	5.68	18.01	45.83	58.30	272.00	
76	55.92913721	-4.52161367	993.90	5.68	14.44	44.41	56.88	271.67	
77	55.92914524	-4.52161367	1006.00	5.68	30.48	41.72	58.38	275.14	
78	55.92914524	-4.52161367	1016.00	5.68	30.48	41.72	58.38	275.14	
79	55.92915261	-4.52326565	1031.00	5.68	34.41	44.83	63.57	272.21	
80	55.92917172	-4.52326568	1043.00	5.68	34.14	44.84	62.82	272.21	
81	55.92930982	-4.52323960	1055.00	5.68	30.26	51.41	64.25	275.11	
82	55.92933322	-4.52323957	1067.00	5.68	35.34	49.99	59.23	277.44	
83	55.92934572	-4.52420473	1088.00	5.68	35.34	49.99	59.23	277.44	
84	55.92945472	-4.52420373	1092.00	5.68	36.64	43.35	66.43	273.44	
85	55.92951867	-4.52452463	1109.00	5.68	29.33	42.69	57.62	273.11	
86	55.92953030	-4.52464917	1116.00	5.68	32.78	42.70	72.04	273.30	
87	55.92953030	-4.52464917	1126.00	5.68	32.78	42.70	72.04	273.30	
88	55.92953777	-4.52522907	1246.00	5.68	30.48	46.35	61.81	278.80	
89	55.92956560	-4.52523343	1258.00	5.68	28.81	43.57	63.14	281.70	
90	55.92953420	-4.52604952	1283.00	5.68	32.08	46.81	63.30	275.25	
91	55.92954067	-4.52612160	1409.00	5.68	32.08	46.81	63.30	275.25	
92	55.92954067	-4.52612160	1427.00	5.68	36.41	45.13	55.63	265.74	
93	55.92951740	-4.51993333	1472.00	7.48	39.16	47.18	51.93	262.77	
94	55.92951740	-4.51993333	1482.00	5.68	36.41	45.13	55.63	265.74	
95	55.92951740	-4.51993333	1492.00	5.68	35.00	44.89	63.00	260.22	
96	55.92948663	-4.51761657	1585.00	5.68	36.93	46.27	57.00	261.44	
97	55.92936663	-4.51718872	1597.00	5.68	35.93	44.75	56.72	265.11	
98	55.92935645	-4.51741972	1610.00	5.68	32.53	43.83	55.12	265.63	
99	55.92935645	-							

4	55 92925665	-4.49752127	47.45	5.98	35.11	48.07	69.36	278.30
5	55 92927320	-4.49772818	60.77	5.48	26.63	47.00	56.80	276.78
6	55 92926552	-4.49713657	58.47	5.48	23.38	48.48	74.48	275.44
7	55 92931242	-4.49697545	57.47	5.48	22.68	48.49	55.24	275.44
8	55 92931242	-4.49697545	56.78	5.48	17.84	45.01	65.26	275.25
9	55 92931243	-4.49698507	112.40	4.98	17.83	45.70	71.06	280.75
10	55 92933400	-4.49653962	175.00	4.98	23.66	44.15	61.03	277.88
11	55 92934548	-4.49572095	137.90	4.98	18.00	46.88	60.63	278.33
12	55 92934548	-4.49572095	150.00	4.98	20.00	46.88	50.24	278.33
13	55 92936802	-4.49542415	163.70	4.98	27.43	41.38	52.08	273.88
14	55 92937907	-4.49563053	176.70	4.98	27.28	41.31	52.78	277.25
15	55 92938001	-4.49543520	189.90	4.98	29.53	43.49	55.40	275.60
16	55 92938001	-4.49543520	202.00	4.98	29.53	43.49	55.40	275.60
17	55 92947351	-4.49543017	216.00	4.98	22.54	36.61	46.12	283.75
18	55 92937128	-4.49486518	219.20	4.98	23.11	38.13	48.22	276.38
19	55 92926038	-4.49481367	247.30	4.98	27.70	42.20	50.81	278.63
20	55 92919002	-4.49486278	255.40	4.98	23.63	37.51	48.68	274.23
21	55 92919002	-4.49486278	268.00	4.98	23.63	37.51	48.68	274.23
22	55 92981372	-4.49530785	281.70	5.48	25.91	40.32	52.77	270.89
23	55 92981372	-4.49530785	294.90	5.48	28.85	43.02	51.30	277.33
24	55 92883454	-4.49592043	308.20	5.48	27.33	40.08	52.68	278.20
25	55 92883454	-4.49592043	312.00	5.48	27.33	40.08	52.68	278.20
26	55 92875008	-4.49655773	314.50	5.48	26.61	41.46	52.32	281.00
27	55 92871743	-4.49658862	347.70	5.48	73.51	38.73	45.58	275.00
28	55 92867768	-4.49721988	361.10	5.48	19.04	37.64	47.55	278.33
29	55 92868053	-4.49755314	374.40	5.48	35.97	41.48	52.44	272.43
30	55 92868053	-4.49755314	381.50	5.48	35.97	41.48	52.44	272.43
31	55 92857320	-4.49811795	401.30	5.48	21.74	31.37	38.95	281.11
32	55 92853327	-4.49811662	414.90	5.48	27.86	33.05	38.08	277.73
33	55 92853327	-4.49811662	428.60	5.48	19.44	29.53	36.07	276.38
34	55 92841649	-4.49811662	432.40	5.48	22.49	31.49	36.07	276.38
35	55 92841649	-4.49932765	456.60	4.48	20.17	28.85	44.98	280.00
36	55 92846115	-4.49986727	470.60	4.48	18.70	23.89	30.68	277.44
37	55 92843347	-4.50020723	484.50	4.48	21.38	24.33	29.98	272.43
38	55 92843347	-4.50020723	496.60	4.48	20.88	24.33	29.98	272.43
39	55 92841950	-4.50026520	514.00	4.48	27.98	31.71	37.75	276.75
40	55 92841308	-4.50123665	528.70	4.48	21.20	29.85	37.15	268.13
41	55 92841311	-4.50118172	542.60	4.48	18.76	30.81	49.52	268.38
42	55 92841311	-4.50118172	554.00	4.48	18.58	28.94	44.42	269.00
43	55 92841311	-4.50118172	560.00	4.48	18.58	28.94	44.42	269.00
44	55 92841651	-4.50252509	582.70	5.48	21.50	28.57	35.33	277.44
45	55 92841618	-4.50288613	595.80	5.48	19.30	31.48	42.12	273.70
46	55 92841281	-4.50321842	609.00	5.48	28.05	34.84	45.08	270.50
47	55 92841281	-4.50321842	624.00	5.48	19.04	31.88	45.08	270.50
48	55 92842517	-4.50389348	635.00	5.48	26.24	38.78	51.22	274.27
49	55 92843713	-4.50418773	647.40	5.48	15.50	37.72	53.10	277.73
50	55 92843713	-4.50453133	659.90	5.48	15.21	35.93	54.43	277.17
51	55 92848000	-4.50478476	672.50	5.48	18.11	40.63	57.43	269.00
52	55 92848000	-4.50478476	686.00	5.48	18.00	37.21	50.93	270.00
53	55 92853389	-4.50526163	697.50	7.48	8.30	35.96	51.38	279.83
54	55 92854751	-4.50590915	709.90	7.48	17.52	36.51	48.74	258.54
55	55 92852721	-4.50652572	722.30	7.48	16.34	37.48	48.65	285.62
56	55 92852721	-4.50652572	734.40	7.48	16.34	37.48	48.65	285.62
57	55 92854613	-4.50965637	748.40	7.48	4.03	27.60	34.84	277.93
58	55 92862481	-4.50720478	761.70	7.48	6.68	25.15	34.34	274.07
59	55 92861874	-4.50705078	775.20	6.58	3.43	20.40	43.46	261.33
60	55 92863214	-4.50724741	788.40	5.48	18.04	28.86	37.28	266.54
61	55 92863214	-4.50724741	800.00	5.48	18.04	27.83	36.54	266.54
62	55 92865458	-4.50883237	814.80	5.48	17.37	27.60	34.93	258.63
63	55 92866601	-4.50886663	828.00	5.48	27.91	33.38	40.18	263.13
64	55 92865347	-4.50920718	841.20	5.48	21.53	34.14	44.45	271.38
65	55 92865347	-4.50920718	854.00	5.48	18.00	34.14	44.45	271.38
66	55 92863077	-4.50926663	862.50	5.48	37.27	42.11	46.68	270.38
67	55 92871045	-4.51029673	880.30	5.48	31.01	42.25	52.34	269.25
68	55 92872913	-4.51057907	893.10	5.48	36.00	47.83	55.92	268.00
69	55 92872913	-4.51057907	905.00	5.48	36.00	48.85	52.49	271.00
70	55 92872913	-4.51057907	914.00	5.48	31.65	48.85	52.49	271.00
71	55 92872032	-4.51117237	930.30	5.48	35.97	53.71	68.95	270.25
72	55 92872032	-4.51107033	942.70	5.48	34.77	54.15	69.84	272.50
73	55 92881715	-4.51245288	955.00	5.48	36.36	55.19	68.16	271.00
74	55 92881715	-4.51245288	967.50	5.48	36.36	55.19	68.16	271.00
75	55 92883352	-4.51297998	979.70	5.48	36.71	53.82	71.33	277.00
76	55 92884670	-4.51322355	992.00	5.48	36.71	54.21	67.63	273.45
77	55 92885863	-4.51326563	1004.00	5.48	34.28	52.74	65.98	273.38
78	55 92885863	-4.51326563	1014.00	5.48	34.28	52.74	65.98	273.38
79	55 92890513	-4.51453880	1028.00	5.48	38.80	53.19	64.66	270.50
80	55 92890513	-4.51453880	1041.00	5.48	37.13	52.26	67.88	283.63
81	55 92891912	-4.51459390	1053.00	5.48	28.07	47.60	65.83	270.50
82	55 92891912	-4.51528275	1066.00	5.48	26.77	48.53	65.56	272.38
83	55 92912902	-4.51921672	1197.00	5.48	22.24	44.41	69.62	280.00
84	55 92914581	-4.51935968	1208.00	5.48	23.93	48.27	62.28	277.30
85	55 92918872	-4.51970013	1270.00	5.48	19.60	48.28	68.80	273.60
86	55 92988454	-4.51985637	1313.00	5.48	45.81	50.81	56.25	272.25
87	55 92988454	-4.51985637	1344.00	5.48	15.88	49.00	56.26	276.09
88	55 92930021	-4.52070520	1357.00	5.48	20.93	38.49	64.34	275.67
89	55 92931896	-4.52092655	1369.00	5.48	14.69	38.47	67.76	280.92
90	55 92903331	-4.52102327	1373.00	5.48	31.87	48.93	65.36	277.13
91	55 92904872	-4.52102327	1381.00	5.48	30.35	53.52	76.78	276.63
92	55 92904872	-4.52102327	1393.00	5.48	45.86	45.86	52.19	276.63
93	55 92975881	-4.52102327	1402.00	5.48	39.76	48.07	61.68	263.75
94	55 92974383	-4.52466483	1405.00	5.48	34.21	48.07	52.41	272.43
95	55 92971058	-4.52312490	1470.00	5.48	16.67	41.86	53.54	265.25
96	55 92968958	-4.52353963	1483.00	4.48	43.65	49.71	56.85	269.86
97	55 92967462	-4.52356253	1495.00	4.48	34.18	48.73	56.73	264.86
98	55 92930021	-4.52070520	1527.00	5.48	38.80	46.81	52.44	270.50
99	55 92968972	-4.52261188	1521.00	5.48	37.74	46.81	52.44	268.43
100	55 92968972	-4.52261188	1533.00	5.48	36.61	46.25	56.08	267.88
101	55 92961661	-4.52116607	1664.00	5.48	35.41	47.46	50.46	264.54
102	55 92973120	-4.52436463	1619.00	5.48	34.48	49.15	64.36	259.67
103	55 92975881	-4.52433438	1632.00	5.48	39.76	48.07	61.68	263.75
104	55 92965462	-4.52620767	1703.00	5.48	32.00	48.00	58.00	271.63
105	55 92958827	-4.52047883	1716.00	5.48	30.00	44.88	57.00	268.75
106	55 92953726	-4.52179317	1729.00	5.48	23.08	47.03	53.00	269.00
107	55 92953726	-4.52179317	1741.00	5.48	24.08	48.03	52.00	271.40
108	55 92953726	-4.52179317	1767.00	5.48	31.00	44.80	57.00	269.44
109	55 92951912	-						

17	55 92896728	-4.50144977	221.40	4.48	21.37	29.90	43.21	278.31
18	55 92897647	-4.50137252	234.50	4.48	22.08	31.41	40.51	282.39
19	55 92898330	-4.50111777	247.70	4.48	22.01	32.02	42.34	284.40
20	55 92900000	-4.50091464	259.80	4.48	22.34	32.44	40.84	280.40
21	55 92900300	-4.50076560	274.70	4.48	26.42	32.57	32.41	281.38
22	55 92902350	-4.50058963	288.20	4.48	23.58	30.82	40.88	278.38
23	55 92904500	-4.50044372	301.60	4.48	15.24	28.54	36.52	281.34
24	55 92905851	-4.50034626	315.70	4.48	24.56	31.88	43.71	279.64
25	55 92907000	-4.50024874	329.80	4.48	23.38	31.91	50.21	282.38
26	55 92910042	-4.49958902	340.80	4.48	27.75	36.30	49.48	286.38
27	55 92911950	-4.49971732	353.80	4.48	14.70	33.03	41.76	287.33
28	55 92914078	-4.49955850	366.90	4.48	24.07	38.27	49.90	280.43
29	55 92915000	-4.49948164	380.00	4.48	23.84	39.24	52.41	282.38
30	55 92916747	-4.49919605	393.10	5.48	25.32	36.17	45.38	286.57
31	55 92917860	-4.49941442	406.40	5.48	24.51	36.79	42.27	287.33
32	55 92918873	-4.49883185	420.00	5.48	25.91	36.01	50.14	283.46
33	55 92918624	-4.49884585	433.40	5.48	24.73	34.38	43.96	283.46
34	55 92919000	-4.49884585	447.50	5.48	23.84	33.84	41.41	282.38
35	55 92921112	-4.49883185	460.70	5.48	19.35	31.81	43.77	281.46
36	55 92923048	-4.49841450	474.50	5.48	21.70	28.83	36.42	279.56
37	55 92923652	-4.49796333	488.30	5.48	22.68	30.61	41.48	284.44
38	55 92924000	-4.49796333	501.40	5.48	14.83	30.24	36.42	282.38
39	55 92924931	-4.49791168	515.50	5.48	20.06	29.68	40.79	279.57
40	55 92925663	-4.49723353	529.30	5.48	21.37	32.50	48.00	281.44
41	55 92926315	-4.49725702	543.10	5.48	13.99	32.67	48.09	279.51
42	55 92927450	-4.49782141	556.90	5.48	12.72	33.56	46.54	279.56
43	55 92928000	-4.49782141	569.60	5.48	13.77	33.83	45.95	279.56
44	55 92930552	-4.49676232	584.80	5.48	18.13	32.83	52.60	276.57
45	55 92931215	-4.49655904	597.50	5.48	16.17	30.27	46.82	276.58
46	55 92935340	-4.49641653	611.30	5.48	16.93	33.86	47.66	280.43
47	55 92936163	-4.49641653	624.40	5.48	16.84	33.64	46.81	280.43
48	55 92937725	-4.49645268	637.50	5.48	12.73	33.34	53.40	280.48
49	55 92941533	-4.49588995	651.10	5.48	16.18	33.00	45.73	284.56
50	55 92943424	-4.49571117	664.20	6.48	12.52	31.86	46.87	286.57
51	55 92945140	-4.49571117	674.30	6.48	8.84	22.61	46.87	273.44
52	55 92946140	-4.49571140	689.80	6.48	8.91	24.88	51.07	277.31
53	55 92947370	-4.49514788	702.90	6.48	8.09	31.88	55.62	284.36
54	55 92948357	-4.49495607	715.70	6.48	6.78	27.35	48.80	275.54
55	55 92949352	-4.49477853	728.70	6.48	6.71	22.33	44.72	252.44
56	55 92950000	-4.49477853	741.80	6.48	10.40	20.24	50.21	282.38
57	55 92913760	-4.49474755	754.30	7.48	3.43	26.65	50.98	274.58
58	55 92902045	-4.49484905	767.40	7.48	7.23	23.87	45.55	284.67
59	55 92896331	-4.49524812	780.60	6.48	7.78	22.11	36.33	278.73
60	55 92897000	-4.49524812	793.70	6.48	11.69	26.61	40.89	279.56
61	55 92886673	-4.49588687	807.60	5.48	9.67	25.27	41.73	285.38
62	55 92883949	-4.49612128	812.70	5.48	14.41	24.61	33.76	277.88
63	55 92881222	-4.49653900	834.80	5.48	20.76	28.47	38.96	272.56
64	55 92877853	-4.49656777	848.40	5.48	20.69	27.02	46.70	273.44
65	55 92878125	-4.49656777	859.50	5.48	17.35	26.41	47.41	273.44
66	55 92871998	-4.49727817	875.00	5.48	34.61	39.12	45.04	268.38
67	55 92868783	-4.49790563	888.10	5.48	29.89	42.45	60.58	265.58
68	55 92851621	-4.49812747	901.30	5.48	26.79	38.92	49.19	267.58
69	55 92852000	-4.49812747	914.40	5.48	14.40	34.24	47.44	274.58
70	55 92853107	-4.49877505	927.70	5.48	26.56	40.31	52.53	270.58
71	55 92854423	-4.49910013	940.80	5.48	17.04	38.44	55.50	274.58
72	55 92853116	-4.49527868	953.80	5.48	22.38	41.05	53.86	271.56
73	55 92845088	-4.49797054	966.80	5.48	26.18	34.54	53.71	262.44
74	55 92845265	-4.49797054	979.90	5.48	20.85	34.54	50.43	262.44
75	55 92841883	-4.50005387	992.90	5.48	25.73	47.69	69.07	266.50
76	55 92839161	-4.50008778	1005.00	5.48	33.53	47.54	58.32	270.38
77	55 92835823	-4.50161672	1018.00	5.48	27.42	46.86	67.21	270.38
78	55 92836163	-4.50161672	1031.10	5.48	23.41	46.83	59.50	270.38
79	55 92837241	-4.50163324	1044.00	5.48	30.73	46.51	64.77	269.38
80	55 92826957	-4.50166402	1057.00	5.48	25.64	46.51	60.93	267.58
81	55 92827058	-4.50229524	1070.20	5.48	34.93	46.35	60.53	270.58
82	55 92827074	-4.50229524	1083.30	5.48	28.81	45.31	59.89	271.44
83	55 92827075	-4.50229524	1096.40	5.48	20.85	44.34	50.43	270.38
84	55 92828209	-4.50327780	1109.00	5.48	24.53	42.53	59.47	270.00
85	55 92827257	-4.50308035	1122.00	5.48	23.80	42.00	59.14	266.00
86	55 92827363	-4.50309312	1134.00	5.48	17.59	42.78	73.35	276.38
87	55 92827363	-4.50309312	1147.10	5.48	14.40	41.61	67.51	271.44
88	55 92821601	-4.50454893	1159.00	5.48	14.60	40.79	74.19	272.58
89	55 92820851	-4.50488462	1172.00	5.48	13.19	41.58	59.43	271.67
90	55 92820663	-4.50522173	1185.00	5.48	24.15	42.25	61.70	278.63
91	55 92821640	-4.50522173	1198.10	5.48	16.83	40.64	71.49	276.44
92	55 92821640	-4.50538987	1211.00	5.48	15.78	40.84	62.91	274.48
93	55 92824887	-4.50618908	1223.00	6.48	13.16	36.93	62.06	265.91
94	55 92827730	-4.50627832	1236.00	6.48	12.38	35.94	59.43	270.38
95	55 92828905	-4.50686605	1249.00	6.48	7.92	35.84	58.80	274.44
96	55 92829000	-4.50686605	1262.10	6.48	12.34	35.81	59.43	273.44
97	55 92831051	-4.50744112	1275.00	7.48	12.88	36.45	60.99	272.38
98	55 92830851	-4.50747757	1289.00	7.48	13.34	37.07	62.75	271.68
99	55 92833312	-4.50821303	1302.00	7.48	5.87	30.09	57.90	275.68
100	55 92833312	-4.50821303	1315.10	7.48	11.40	31.89	63.09	269.44
101	55 92836581	-4.50983345	1327.00	7.48	0.79	31.19	53.82	253.48
102	55 92837874	-4.50916235	1340.00	7.48	2.87	29.00	58.51	253.07
103	55 92840965	-4.50968838	1353.00	8.48	5.98	33.63	52.86	276.00
104	55 92842403	-4.50976712	1366.00	7.48	16.71	33.87	48.61	256.44
105	55 92843330	-4.51040902	1393.00	6.48	22.51	34.67	48.03	255.42
106	55 92845576	-4.51073263	1406.00	6.48	20.80	32.66	41.99	252.74
107	55 92847810	-4.51105383	1420.00	5.48	27.92	37.39	46.48	256.63
108	55 92848100	-4.51105383	1433.10	5.48	20.49	36.44	46.48	256.63
109	55 92863124	-4.51456982	1447.00	5.48	22.09	35.07	42.28	257.58
110	55 92851367	-4.51123768	1460.00	5.48	27.73	37.81	49.79	253.38
111	55 92851367	-4.51123768	1474.00	5.48	9.61	32.66	50.37	253.38
112	55 92851387	-4.51234205	1488.00	5.48	22.35	36.26	48.31	260.40
113	55 92872541	-4.51261506	1501.00	6.48	16.30	34.54	47.71	254.48
114	55 92872523	-4.51361387	1642.00	6.48	15.31	33.27	50.62	261.97
115	55 92889938	-4.51616163	1656.00	6.48	16.45	32.53	42.96	259.91
116	55 92882024	-4.51672623	1671.00	6.48	20.74	35.11	44.33	253.48
117	55 92882024	-4.51672623	1684.00	6.48	17.41	34.74	46.48	252.44
118	55 92883447	-4.51737340	1699.00	5.48	20.75	38.04	55.67	257.38
119	55 92883988	-4.51759305	1713.00	5.48	21.00	38.30	50.00	258.58
120	55 92885953	-4.51821337	1727.00	5.48	21.00	40.30	54.00	264.70
121	55 92885953	-4.51821337	1740.00	5.48	20.00	39.00	52.00	264.44

22	55.92956880	-4.52019148	353.40	3.98	2.58	12.70	23.83	259.33
23	55.92955187	-4.51997703	369.40	3.98	4.41	9.77	15.63	222.33
24	55.92953535	-4.51975678	386.00	3.98	3.33	10.83	19.01	307.50
25	55.92952438	-4.51954027	402.70	3.98	12.26	15.48	19.34	232.83
26	55.92951305	-4.51932493	419.00	3.98	2.16	9.43	20.63	275.17
27	55.92950247	-4.51910528	435.40	3.98	4.60	10.87	20.47	253.00
28	55.92949482	-4.51888838	451.70	3.98	3.21	11.77	25.00	258.33
29	55.92948632	-4.51866930	468.50	3.98	4.38	12.19	24.46	247.17
30	55.92948025	-4.51848287	484.90	3.98	5.03	11.30	21.10	247.17
31	55.92946477	-4.51825767	501.20	3.98	1.84	10.69	24.90	228.83
32	55.92945088	-4.51803912	517.40	3.98	6.06	9.11	12.71	227.00
33	55.92944083	-4.51781338	534.20	4.48	5.75	11.82	17.30	236.29
34	55.92943628	-4.51759563	550.90	3.98	3.73	7.88	13.81	261.83
35	55.92942992	-4.51737522	567.30	4.48	4.20	7.00	13.10	278.29
36	55.92941863	-4.51718382	584.20	4.48	0.51	7.75	13.44	303.86
37	55.92941110	-4.51692458	601.10	4.48	0.50	7.27	10.49	224.86
38	55.92940755	-4.51673773	617.80	4.48	0.64	6.42	13.63	204.00
39	55.92939817	-4.51650785	635.10	4.48	3.42	8.62	12.94	186.14
40	55.92938907	-4.51625982	652.10	4.98	1.68	7.99	14.47	146.13
41	55.92936608	-4.51603942	669.50	4.98	1.34	7.29	15.05	209.88
42	55.92934765	-4.51581272	687.00	5.48	3.14	9.27	13.48	199.00
43	55.92933717	-4.51559097	704.50	6.48	1.05	4.94	11.37	159.91
44	55.92932705	-4.51540128	722.50	6.48	2.25	7.30	11.90	187.36
45	55.92931590	-4.51517312	740.10	6.48	5.86	9.53	14.61	161.45
46	55.92930325	-4.51494698	757.50	6.48	1.24	6.77	12.56	167.73
47	55.92929262	-4.51471738	774.80	6.98	1.15	8.20	16.48	149.83
48	55.92928137	-4.51448875	792.30	7.48	1.16	7.01	12.30	192.23
49	55.92926832	-4.51425580	809.50	5.48	4.62	9.79	20.32	189.44
50	55.92925720	-4.51405873	826.80	4.48	1.08	7.98	19.33	183.57
51	55.92924042	-4.51382590	844.60	3.98	2.97	9.19	16.32	165.83
52	55.92922687	-4.51359352	861.90	3.98	5.77	8.65	17.36	124.50
53	55.92921638	-4.51335205	879.30	3.98	2.61	8.08	15.16	181.33
54	55.92920633	-4.51311250	896.60	3.98	4.01	11.26	20.04	128.67
55	55.92919297	-4.51286910	913.90	3.98	0.86	12.05	30.71	84.17
56	55.92918203	-4.51263182	931.30	3.98	1.95	7.82	15.36	127.00
57	55.92916915	-4.51239790	948.70	3.98	3.42	11.45	18.17	155.50
58	55.92915323	-4.51216635	966.00	3.98	5.83	12.52	18.66	196.17
59	55.92914952	-4.51193097	983.50	3.98	3.59	11.91	18.54	78.00
60	55.92914692	-4.51173128	1000.00	3.98	6.25	9.64	15.04	120.00
61	55.92913878	-4.51149517	1017.00	3.98	1.07	6.62	11.33	140.83
62	55.92917140	-4.51126075	1035.00	3.98	3.01	9.35	15.56	124.83
63	55.92915978	-4.51102620	1052.00	3.98	1.21	10.95	20.21	94.17
64	55.92914967	-4.51078948	1069.00	3.98	4.99	10.00	22.84	113.50
65	55.92913582	-4.51055380	1086.00	3.98	1.21	8.47	15.31	202.50
66	55.92911792	-4.51032247	1103.00	3.98	5.79	8.28	11.91	167.33
67	55.92910328	-4.51008963	1120.00	3.98	2.66	7.03	13.11	150.83
68	55.92908537	-4.50989027	1137.00	4.48	4.59	7.10	9.81	179.29
69	55.92907075	-4.50965820	1153.00	4.48	2.48	8.42	14.71	170.43
70	55.92905742	-4.50942480	1170.00	4.48	5.07	10.87	18.05	140.00
71	55.92904452	-4.50918927	1187.00	4.48	4.77	10.31	17.73	157.43
72	55.92903463	-4.50895383	1203.00	4.98	1.62	13.02	25.25	184.38
73	55.92902188	-4.50871515	1220.00	4.98	5.05	16.89	25.94	182.63
74	55.92900865	-4.50848488	1236.00	5.48	5.64	19.57	28.12	171.11
75	55.92899997	-4.50825068	1253.00	5.48	5.74	17.75	27.05	186.11
76	55.92898853	-4.50801830	1270.00	5.98	4.00	17.00	30.54	168.60
77	55.92897778	-4.50781923	1286.00	6.48	7.18	19.10	35.38	148.91
78	55.92896448	-4.50758425	1303.00	6.48	6.67	18.39	30.79	159.82
79	55.92895008	-4.50735572	1320.00	6.98	4.82	20.25	32.06	148.67
80	55.92893333	-4.50712502	1336.00	6.98	0.93	16.46	39.14	118.00
81	55.92891788	-4.50690157	1352.00	7.48	6.36	16.69	26.69	144.46
82	55.92890460	-4.50667387	1368.00	7.48	6.43	20.75	36.66	162.31
83	55.92888953	-4.50644813	1385.00	7.48	5.04	20.36	30.83	160.23
84	55.92888262	-4.50625158	1401.00	6.98	2.23	17.40	29.64	164.83
85	55.92887527	-4.50602907	1418.00	6.48	2.41	13.88	24.82	199.27
86	55.92887173	-4.50580622	1435.00	5.98	7.16	12.89	17.97	215.70
87	55.92887465	-4.50557665	1452.00	4.98	6.46	10.70	15.59	344.63
88	55.92887092	-4.50534885	1469.00	4.48	3.29	11.48	17.20	272.00
89	55.92886427	-4.50512785	1487.00	4.48	0.59	7.95	16.54	213.57
90	55.92885832	-4.50490317	1504.00	3.98	4.14	7.69	12.26	304.83
91	55.92885463	-4.504741453	1521.00	3.98	1.69	5.68	16.92	167.83
92	55.92884652	-4.50448812	1539.00	3.98	1.36	6.38	13.04	165.83
93	55.92883902	-4.50425277	1557.00	4.48	4.98	7.12	9.69	114.43
94	55.92883092	-4.50403138	1575.00	4.48	2.88	5.73	10.16	144.43
95	55.92882597	-4.50380558	1593.00	4.48	1.71	6.47	16.33	175.29
96	55.92881930	-4.50358343	1611.00	4.48	1.58	6.84	11.57	119.86
97	55.92881173	-4.50336073	1629.00	4.98	3.14	6.88	12.82	205.25
98	55.92880323	-4.50314837	1647.00	4.98	1.24	3.04	7.47	177.38
99	55.92880743	-4.50296570	1665.00	4.48	1.58	6.95	14.30	251.00
100	55.92881333	-4.50274925	1683.00	4.48	0.81	6.38	13.16	203.43
101	55.92882445	-4.50252250	1701.00	4.48	4.77	9.31	13.73	187.00
102	55.92885540	-4.50230877	1718.00	3.98	3.10	5.23	10.96	166.50
103	55.92887373	-4.50208943	1736.00	3.98	1.75	6.30	8.70	187.33
104	55.92891768	-4.50186803	1754.00	4.48	1.16	6.50	15.91	247.00
105	55.92895902	-4.50164610	1772.00	4.48	2.10	6.93	13.29	204.57
106	55.92899258	-4.50145485	1790.00	4.48	1.58	4.89	10.23	202.71
107	55.92901120	-4.50122270	1808.00	4.48	3.65	7.21	10.27	253.71
108	55.92903493	-4.50099418	1826.00	4.48	0.53	3.94	9.36	213.00
109	55.92905468	-4.50079590	1843.00	4.48	6.95	11.22	14.30	246.29

Transact Summary

Section of Site Shoreline	95%ile velocity (across depth and section)	Min Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
WFD	1.28	0.50	8.18	30.71	186.59
CFD	4.03	0.93	14.98	39.14	160.55
EFD	1.41	0.59	6.81	17.20	193.60

Bowling DQRA, July 2010

Prepared by PB Ltd on b

APPENDIX C - SURFACE WATER CURRENT VELOCITY DATA

Bowling ADCP Survey: Transect: 035

Survey Date	28/06/2010							
Ensembles Taken Along Transect:	93							
High Water Offset	-5:00							
Key								
1	55.92924797	-4.51386958	13.22	5.48	26.24	35.10	46.84	100.89
2	55.92927933	-4.51414477	31.11	5.48	17.42	32.98	50.72	105.22
3	55.92930318	-4.51437890	49.36	4.98	28.78	39.50	49.82	100.75
4	55.92932642	-4.51464978	67.68	4.48	16.27	29.31	40.85	106.14
5	55.92935142	-4.51492142	86.33	4.48	2			

16	55.92942920	-4.51794450	292.70	3.48	27.07	33.12	40.64	97.60
17	55.92942865	-4.51822093	311.70	3.48	24.19	30.50	34.88	106.00
18	55.92942878	-4.51845948	330.80	3.48	27.10	31.97	37.36	107.80
19	55.92943508	-4.51873865	349.70	3.48	25.58	31.68	35.97	100.60
20	55.92944140	-4.51901555	369.10	3.98	28.72	32.80	39.45	101.50
21	55.92943997	-4.51929160	388.50	3.98	29.20	36.08	46.50	101.00
22	55.92943122	-4.51956828	407.90	3.98	28.09	34.78	39.76	108.83
23	55.92942497	-4.51984815	427.30	3.98	30.43	36.49	46.28	100.33
24	55.92942700	-4.52008977	446.70	3.98	27.25	34.42	43.86	103.83
25	55.92943735	-4.52037270	466.00	3.98	24.14	30.96	39.63	104.50
26	55.92944928	-4.52065570	485.00	3.98	23.08	30.28	39.53	106.67
27	55.92946110	-4.52093840	504.20	3.98	23.17	31.62	40.87	102.33
28	55.92946870	-4.52122140	523.50	4.48	20.75	35.02	46.05	94.86
29	55.92947590	-4.52150517	542.40	4.48	20.47	36.02	43.23	101.86
30	55.92949248	-4.52178725	560.90	4.48	21.12	35.36	52.84	96.71
31	55.92951902	-4.52206267	579.50	4.98	32.63	37.75	47.74	96.63
32	55.92954023	-4.52230155	598.10	4.98	28.66	35.89	43.65	94.63
33	55.92955858	-4.52257480	617.30	4.98	20.04	37.81	44.82	94.38
34	55.92957620	-4.52284617	636.20	5.98	23.76	37.05	54.40	97.60
35	55.92958645	-4.52308730	655.00	6.48	28.77	41.11	66.14	108.18
36	55.92957122	-4.52331665	674.50	6.48	29.94	39.83	52.67	100.64
37	55.92954608	-4.52354400	694.60	6.48	30.89	39.68	47.31	93.73
38	55.92951390	-4.52376322	714.60	6.98	28.63	39.63	63.95	94.00
39	55.92954523	-4.52393375	734.10	6.98	26.92	37.40	48.01	102.67
40	55.92956240	-4.52398977	754.50	6.98	23.72	34.31	45.20	92.83
41	55.92972068	-4.52385888	774.80	4.98	23.29	35.17	40.99	103.88
42	55.92971138	-4.52368887	795.00	4.48	21.66	34.30	46.70	88.71
43	55.92967283	-4.52348127	815.10	3.98	29.88	35.21	45.42	101.33
44	55.92966988	-4.52324973	834.60	3.98	34.00	37.88	42.98	97.33
45	55.92968810	-4.52300943	853.90	3.98	31.50	38.36	46.56	100.33
46	55.92970167	-4.52275857	873.30	3.98	25.21	32.47	41.76	99.00
47	55.92969197	-4.52250735	892.80	3.98	21.96	31.97	37.13	95.00
48	55.92967492	-4.52225512	912.20	3.98	28.68	35.64	40.13	90.00
49	55.92966017	-4.52200100	931.30	4.48	26.97	36.18	44.15	89.57
50	55.92964783	-4.52174438	950.70	4.48	23.63	38.43	54.33	95.14
51	55.92963860	-4.52152608	970.10	4.48	15.14	32.88	40.92	98.14
52	55.92962792	-4.52127037	989.70	4.48	29.35	35.64	45.21	89.71
53	55.92962313	-4.52101548	1009.00	4.48	35.24	44.20	61.31	93.43
54	55.92962533	-4.52076170	1028.00	4.48	31.42	37.24	44.15	94.29
55	55.92963388	-4.52054538	1048.00	4.48	25.90	37.06	44.64	96.86
56	55.92963038	-4.52025430	1067.00	4.48	38.24	42.74	47.74	98.57
57	55.92961183	-4.52004347	1087.00	4.48	29.42	40.84	48.53	97.57
58	55.92958575	-4.51979567	1106.00	4.48	33.26	39.52	46.68	97.86
59	55.92956167	-4.51954737	1126.00	4.98	37.65	44.59	49.67	95.88
60	55.92954927	-4.51929400	1146.00	4.98	36.66	47.34	55.61	101.25
61	55.92954597	-4.51903677	1165.00	5.48	35.43	42.38	52.52	101.11
62	55.92954272	-4.51877558	1184.00	5.98	29.36	41.80	51.67	98.00
63	55.92953528	-4.51855285	1204.00	6.48	37.07	45.77	55.35	97.91
64	55.92952830	-4.51825943	1224.00	6.98	39.33	45.10	56.22	98.50
65	55.92951632	-4.51803277	1244.00	6.98	34.03	43.81	48.92	96.75
66	55.92948632	-4.51778145	1264.00	7.48	35.50	44.65	57.53	99.31
67	55.92946910	-4.51752500	1284.00	7.48	33.60	45.43	55.81	96.31
68	55.92945790	-4.51726210	1304.00	7.98	33.90	43.13	48.20	95.07
69	55.92944780	-4.51699827	1324.00	7.98	37.59	46.49	57.34	93.50
70	55.92943417	-4.51677403	1345.00	7.48	41.35	47.33	55.38	90.15
71	55.92941907	-4.51651372	1365.00	6.98	33.36	43.37	52.03	84.42
72	55.92940978	-4.51624995	1386.00	6.48	22.17	39.36	50.65	76.82
73	55.92940057	-4.51599105	1408.00	5.48	35.67	46.26	54.84	85.11
74	55.92938542	-4.51573178	1429.00	5.48	37.72	46.62	50.89	85.22
75	55.92936980	-4.51547210	1450.00	5.48	42.00	46.28	53.38	86.56
76	55.92935340	-4.51521403	1471.00	4.98	38.06	46.05	55.34	88.63
77	55.92934192	-4.51498560	1492.00	4.48	33.35	45.77	72.35	86.29
78	55.92932243	-4.51474640	1512.00	4.98	33.23	37.57	41.26	81.88
79	55.92929895	-4.51450052	1532.00	4.98	31.65	41.82	49.91	80.75
80	55.92927930	-4.51425148	1553.00	3.98	41.57	45.70	48.34	84.83
81	55.92926122	-4.51399813	1573.00	4.48	38.05	41.15	45.34	84.29
82	55.92924243	-4.51374373	1594.00	4.98	36.15	50.39	84.09	86.00
83	55.92922282	-4.51349018	1615.00	4.98	24.81	45.30	78.82	93.63
84	55.92919668	-4.51323780	1637.00	4.48	38.78	42.32	50.38	87.43
85	55.92916857	-4.51298600	1658.00	4.48	31.68	41.97	61.09	83.57
86	55.92914903	-4.51272048	1679.00	4.48	27.10	39.47	48.96	85.29
87	55.92912575	-4.51245405	1700.00	4.48	32.29	41.76	51.62	88.29
88	55.92912043	-4.51222602	1720.00	4.48	39.40	44.62	50.93	87.71
89	55.92912960	-4.51195830	1741.00	4.48	42.15	48.46	54.23	87.71
90	55.92915043	-4.51168395	1763.00	4.98	41.46	47.60	55.33	88.88
91	55.92916110	-4.51140792	1784.00	4.98	44.20	53.06	58.04	85.38
92	55.92916375	-4.51113463	1805.00	4.98	37.14	47.81	57.37	84.00
93	55.92916492	-4.511109510	1810.00	4.98	35.01	46.78	58.25	75.88

Transect Summary

Section of Site Shoreline	95%ile velocity	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
-	cm/s	cm/s	cm/s	cm/s	degrees true	m AOD
WFD	24.55	20.04	37.00	66.14	97.64	5.18
CFD	35.16	29.36	44.33	57.53	97.37	6.44
EFD	32.99	24.81	44.02	84.09	86.37	4.65

bowling DQRA, July 2010

Prepared by PB Ltd on beh

Bowling ADCP Survey: Transect: 036

Survey Date		28/06/2010
Ensembles Taken Along Transect:		76
High Water Offset		-4:30

Key

- Portion of transect undertaken adjacent to Westfield (WFD) shoreline
- Portion of transect undertaken adjacent to Centrefield (CFD) shoreline
- Portion of transect undertaken adjacent to Eastfield (EFD) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92912195	-4.50898478		17.78	4.98	55.49	74.75	83.83	100.25
2	55.92911915	-4.50918557		42.00	4.98	63.69	78.01	83.26	99.88
3	55.92911503	-4.50938797		66.44	4.98	56.98	85.71	147.91	100.75
4	55.92910960	-4.50956178		90.42	4.98	62.25	75.15	88.34	100.25
5	55.92910257	-4.50976407		113.70	4.98	53.22	71.73	89.95	101.13
6	55.92909520	-4.50996513		137.50	4.98	49.66	68.26	80.26	99.50
7	55.92908285	-4.51016257		161.40	4.98	49.88	70.67	86.08	98.25
8	55.92907325	-4.51036087		185.30	4.48	63.36	75.47	86.96	101.00
9	55.92907583	-4.51055832		208.60	4.48	58.77	74.19	83.79	102.71
10	55.92908218	-4.51075092		232.20	4.48	52.96	70.15	80.72	102.43
11	55.92908087	-4.51094773		255.90	4.98	48.71	69.92	79.53	100.75

14	55.92907792	-4.51151148	326.70	4.48	53.82	67.52	74.46	104.86
15	55.92907792	-4.51171202	349.60	4.98	50.45	68.75	79.62	99.13
16	55.92907813	-4.51191677	372.40	4.98	47.43	63.89	80.90	98.88
17	55.92907873	-4.51212857	395.20	4.98	43.14	65.57	85.46	105.00
18	55.92909138	-4.51234060	418.30	4.48	34.18	57.02	66.98	96.86
19	55.92910940	-4.51255018	441.20	4.48	49.10	63.02	73.81	100.57
20	55.92912043	-4.51276168	463.00	4.48	44.36	61.67	70.74	97.29
21	55.92912347	-4.51297237	484.90	4.48	45.66	62.60	73.34	93.14
22	55.92912782	-4.51315490	507.50	4.48	48.81	70.48	93.35	96.71
23	55.92913670	-4.51336452	530.40	4.98	37.81	62.08	84.05	99.25
24	55.92916040	-4.51356813	553.90	4.98	24.27	64.48	88.24	99.00
25	55.92919028	-4.51376238	577.20	5.48	51.15	70.98	100.18	99.89
26	55.92920557	-4.51396167	600.70	5.48	56.97	71.35	83.88	98.44
27	55.92921217	-4.51413372	624.00	5.98	36.80	70.20	84.15	101.00
28	55.92921568	-4.51428510	647.00	6.98	46.89	69.13	88.80	96.17
29	55.92921977	-4.51439497	669.80	6.98	48.81	68.42	82.92	100.25
30	55.92922697	-4.51457517	692.60	6.98	50.81	67.85	75.96	104.17
31	55.92924407	-4.51477482	715.60	7.48	55.54	63.96	72.70	93.31
32	55.92928517	-4.51496387	738.40	7.48	42.49	56.25	74.25	102.00
33	55.92931933	-4.51515172	761.60	5.48	51.01	58.60	74.94	96.22
34	55.92933562	-4.51535100	784.90	4.98	40.22	52.03	62.76	100.13
35	55.92935698	-4.51554953	808.50	3.98	43.55	58.90	70.99	92.67
36	55.92937950	-4.51574453	831.60	3.98	49.20	65.84	82.59	100.83
37	55.92938478	-4.51594168	855.30	4.48	52.11	68.58	83.94	88.29
38	55.92938043	-4.51614165	879.10	4.48	47.06	72.98	92.26	93.57
39	55.92938520	-4.51634413	903.00	4.48	48.80	70.60	80.33	91.00
40	55.92939728	-4.51654040	926.80	4.48	55.85	79.86	104.19	93.86
41	55.92939930	-4.51671397	950.50	4.48	43.81	75.10	89.10	96.00
42	55.92940062	-4.51692032	974.30	4.48	49.40	74.68	89.83	94.57
43	55.92940005	-4.51712430	998.30	4.48	51.76	79.18	99.96	97.00
44	55.92939697	-4.51732617	1022.00	4.48	56.75	81.40	103.18	98.00
45	55.92940085	-4.51752342	1046.00	4.48	61.00	76.21	87.83	95.29
46	55.92940688	-4.51769300	1069.00	4.48	61.75	75.82	86.59	97.43
47	55.92941713	-4.51788758	1093.00	4.98	69.03	80.68	94.54	100.13
48	55.92942143	-4.51808152	1117.00	4.98	74.86	86.35	101.23	96.13
49	55.92941927	-4.51827345	1142.00	5.48	62.28	83.78	94.13	99.78
50	55.92940972	-4.51846462	1165.00	5.98	57.65	75.71	89.79	98.70
51	55.92939738	-4.51865623	1189.00	6.48	50.60	73.04	93.97	98.09
52	55.92939595	-4.51884613	1213.00	6.48	46.65	74.41	90.09	100.82
53	55.92940252	-4.51903335	1238.00	6.98	46.04	69.68	83.14	98.42
54	55.92940518	-4.51921972	1262.00	7.48	51.28	68.49	81.10	99.69
55	55.92940118	-4.51938017	1286.00	7.98	57.17	70.25	83.11	95.57
56	55.92938610	-4.51956717	1311.00	7.98	66.78	80.70	95.20	94.71
57	55.92937813	-4.51975413	1335.00	7.98	70.03	80.25	89.97	87.36
58	55.92935310	-4.51993748	1360.00	7.48	69.12	79.49	85.28	86.23
59	55.92933045	-4.52012420	1385.00	6.98	60.53	76.07	88.37	77.25
60	55.92933893	-4.52028185	1411.00	6.48	56.78	72.93	92.91	79.45
61	55.92936020	-4.52046133	1436.00	6.48	47.81	71.83	91.39	83.91
62	55.92938172	-4.52064162	1461.00	5.48	59.20	76.24	89.52	85.67
63	55.92939657	-4.52082467	1486.00	5.98	60.92	78.19	92.47	84.00
64	55.92940980	-4.52098090	1511.00	5.98	58.08	76.35	88.63	88.10
65	55.92943328	-4.52118417	1536.00	5.98	59.91	71.29	87.62	82.80
66	55.92944852	-4.52133857	1562.00	5.48	57.40	68.88	82.72	84.22
67	55.92947288	-4.52151618	1586.00	5.48	55.10	68.38	81.96	87.44
68	55.92949227	-4.52169418	1611.00	4.98	48.95	66.77	86.43	83.88
69	55.92950523	-4.52187623	1635.00	4.48	41.07	66.61	82.49	84.00
70	55.92951617	-4.52205643	1659.00	4.48	61.72	69.22	80.14	88.57
71	55.92952363	-4.52223568	1683.00	4.48	70.94	75.90	82.46	84.14
72	55.92954410	-4.52241158	1707.00	4.48	67.78	76.86	83.37	83.86
73	55.92956778	-4.52258237	1731.00	4.98	71.25	77.92	89.04	85.25
74	55.92957332	-4.52273160	1755.00	4.98	71.00	77.39	86.25	84.25
75	55.92958530	-4.52290903	1780.00	4.98	72.18	78.58	81.08	83.75
76	55.92959323	-4.52295910	1786.00	4.98	61.73	77.88	92.79	78.38

Transect Summary

Section of Site	Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
	95%ile velocity	cm/s	cm/s	cm/s	degrees true	m AOD
WFD		45.37	24.27	65.56	100.18	97.78
CFD		53.68	46.04	75.75	101.23	96.60
EFD		55.72	41.07	73.18	92.47	85.10

Bowling ADCP Survey: Transect: 038

Survey Date

28/06/2010

Ensembles Taken Along Transect:

72

High Water Offset

-4:00

Key

- Portion of transect undertaken adjacent to Westfield (WFD) shoreline
- Portion of transect undertaken adjacent to Centrefield (CFD) shoreline
- Portion of transect undertaken adjacent to Eastfield (EFD) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92851093	-4.50370590		14.39	4.98	49.49	77.06	96.10	106.25
2	55.92851127	-4.50386357		36.43	5.48	55.10	78.55	94.23	101.33
3	55.92851243	-4.50402172		60.84	5.48	60.12	80.23	100.30	102.00
4	55.92851400	-4.50415565		84.63	5.48	56.81	79.99	97.85	101.00
5	55.92851817	-4.50431078		109.80	5.48	55.62	75.10	92.77	106.44
6	55.92852713	-4.50446580		136.60	5.48	56.44	71.43	82.94	104.00
7	55.92853705	-4.50462022		163.30	5.48	47.13	70.37	84.78	103.89
8	55.92854447	-4.50477187		190.50	4.98	49.32	69.70	84.43	107.50
9	55.92855203	-4.50492388		217.50	4.98	56.12	69.11	80.88	109.75
10	55.92855597	-4.50505540		244.90	4.98	61.71	75.15	84.00	103.13
11	55.92855657	-4.50521000		271.90	5.48	54.61	71.27	83.83	101.00
12	55.92855558	-4.50536550		298.40	5.48	51.11	69.96	94.26	101.56
13	55.92857007	-4.50551692		324.40	5.48	52.82	72.18	91.30	103.67
14	55.92859942	-4.50566512		350.50	5.48	55.77	73.77	87.99	103.11
15	55.92861613	-4.50581193		377.00	5.48	58.48	72.45	86.59	99.00
16	55.92862673	-4.50595705		403.20	5.48	64.80	72.21	84.70	99.22
17	55.92864618	-4.50610468		429.60	5.48	64.38	73.12	83.28	101.00

18	55.92865723	-4.50623148	455.70	5.48	59.30	70.71	81.74	100.78
19	55.92867678	-4.50637982	481.70	5.48	54.41	69.12	81.01	99.78
20	55.92869527	-4.50652838	508.00	5.48	48.99	69.06	87.17	96.33
21	55.92871112	-4.50667382	533.70	5.98	37.21	67.35	85.02	90.50
22	55.92872457	-4.50681957	560.00	5.98	41.22	66.98	83.56	95.20
23	55.92873185	-4.50696503	585.70	5.98	47.86	65.47	81.20	97.30
24	55.92873635	-4.50711012	610.10	6.48	55.78	68.53	78.75	96.64
25	55.92873658	-4.50723553	633.30	6.98	54.29	71.10	87.98	94.42
26	55.92873305	-4.50737873	655.50	7.48	50.66	66.91	81.15	95.77
27	55.92874807	-4.50752157	677.50	7.48	50.93	66.43	82.03	97.00
28	55.92877003	-4.50766372	700.30	7.48	49.79	64.05	75.33	90.46
29	55.92876408	-4.50779908	723.30	7.48	43.11	61.99	74.28	90.77
30	55.92874708	-4.50793370	747.00	7.48	41.38	55.57	67.25	94.77
31	55.92875707	-4.50807677	771.10	6.48	45.90	55.98	63.03	93.64
32	55.92877888	-4.50821940	794.80	5.48	51.40	56.73	63.34	88.11
33	55.92879392	-4.50833992	818.20	5.48	46.68	55.63	68.22	89.22
34	55.92880563	-4.50848032	841.50	4.98	47.24	56.20	64.65	92.63
35	55.92881480	-4.50862178	865.40	4.98	51.97	58.51	61.32	92.25
36	55.92882262	-4.50876563	889.60	4.98	51.74	61.52	68.46	90.00
37	55.92882497	-4.50891178	914.30	4.98	53.05	65.18	73.97	87.75
38	55.92883220	-4.50905980	939.40	4.98	52.84	64.45	74.56	93.00
39	55.92884833	-4.50921047	964.50	4.98	50.52	61.69	70.81	93.63
40	55.92885890	-4.50936238	990.10	4.98	49.39	62.06	75.24	91.63
41	55.92886728	-4.50952627	1015.00	4.98	46.90	62.43	74.06	93.13
42	55.92887398	-4.50967285	1041.00	4.98	53.18	66.33	76.49	91.88
43	55.92888373	-4.50987135	1068.00	4.98	54.43	66.39	77.86	94.00
44	55.92889390	-4.51002187	1094.00	5.48	45.33	63.99	77.50	94.56
45	55.92890717	-4.51019452	1121.00	5.48	52.35	67.34	90.93	91.89
46	55.92891867	-4.51036847	1147.00	5.98	45.65	62.21	86.81	96.60
47	55.92892915	-4.51054413	1174.00	6.98	46.66	63.13	89.18	91.33
48	55.92894275	-4.51072165	1201.00	7.48	50.77	67.07	90.81	95.00
49	55.92895747	-4.51087592	1228.00	7.48	64.59	75.30	95.55	95.00
50	55.92897393	-4.51105718	1254.00	7.98	58.16	72.21	94.93	93.86
51	55.92899105	-4.51124158	1281.00	8.48	60.42	73.79	99.64	92.67
52	55.92900715	-4.51143162	1308.00	8.48	66.94	75.46	94.14	89.93
53	55.92901700	-4.51159458	1334.00	8.48	74.30	83.03	98.90	87.87
54	55.92902718	-4.51178050	1358.00	7.48	69.34	76.93	86.34	84.62
55	55.92904022	-4.51196773	1382.00	6.48	64.24	71.88	76.98	77.55
56	55.92904812	-4.51216378	1407.00	5.48	60.83	66.55	72.26	80.56
57	55.92905467	-4.51236765	1431.00	5.48	33.43	59.82	71.33	76.78
58	55.92905955	-4.51256942	1456.00	4.98	45.44	62.69	72.46	85.63
59	55.92906815	-4.51273865	1481.00	5.48	55.84	65.35	78.84	86.89
60	55.92907702	-4.51296452	1506.00	6.48	55.80	65.51	79.10	92.91
61	55.92907110	-4.51313405	1531.00	6.48	55.74	67.47	77.15	86.73
62	55.92905250	-4.51332448	1556.00	6.48	60.52	67.92	72.36	84.00
63	55.92905918	-4.51350340	1581.00	6.48	64.01	69.92	76.04	82.73
64	55.92907533	-4.51367618	1607.00	6.48	58.85	67.45	75.44	85.82
65	55.92906973	-4.51384517	1632.00	5.98	59.32	64.66	70.04	88.10
66	55.92904902	-4.51401452	1657.00	5.98	53.10	65.35	74.54	88.00
67	55.92903483	-4.51418660	1683.00	5.48	55.69	66.41	74.74	90.11
68	55.92903025	-4.51433867	1708.00	5.48	58.26	65.13	70.78	88.00
69	55.92902502	-4.51451968	1734.00	5.98	59.31	67.65	76.48	87.00
70	55.92902118	-4.51470187	1759.00	5.98	58.83	67.77	84.72	91.00
71	55.92902065	-4.51483300	1777.00	5.98	60.84	67.09	74.38	89.10
72	55.92902060	-4.51488570	1784.00	5.98	62.51	68.53	73.61	87.70

Transect Summary

Section of Site Shoreline	95%ile velocity	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
-	cm/s	cm/s	cm/s	cm/s	degrees true	m AOD
WFD	47.93	37.21	62.89	87.98	93.00	6.24
CFD	51.04	45.65	71.82	99.64	92.50	7.42
EFD	56.70	45.44	66.53	84.72	87.42	5.98

Bowling ADCP Survey: Transect: 040

Survey Date 28/06/2010

Ensembles Taken Along Transect:

81

High Water Offset

-3:30

Key

Portion of transect undertaken adjacent to Westfield (WFD) shoreline

Portion of transect undertaken adjacent to Centrefield (CFD) shoreline

Portion of transect undertaken adjacent to Eastfield (EFD) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92933108	-4.49686555		18.67	6.98	49.47	70.11	91.87	100.83
2	55.92935480	-4.49652070		44.37	6.98	50.94	68.44	88.20	103.50
3	55.92937915	-4.49617155		69.67	6.48	59.11	71.08	79.73	107.73
4	55.92940168	-4.49582862		93.87	5.98	54.70	64.01	74.43	109.50
5	55.92942460	-4.49549772		118.00	5.48	56.52	66.68	73.59	108.33
6	55.92945577	-4.49516700		141.90	5.48	52.51	66.90	84.45	100.11
7	55.92948165	-4.49489102		165.50	5.48	51.78	64.11	74.53	102.33
8	55.92946802	-4.49458638		189.00	5.98	55.31	67.86	76.28	102.10
9	55.92935213	-4.49436667		212.00	5.98	52.43	65.94	74.42	101.50
10	55.92920572	-4.49435508		234.00	5.98	62.36	66.67	72.29	100.00
11	55.92911297	-4.49445848		255.70	5.98	55.42	64.30	69.73	101.00
12	55.92906728	-4.49462072		276.90	5.98	49.31	60.36	70.26	98.00
13	55.92902852	-4.49478065		297.30	5.98	50.16	59.37	74.74	101.40
14	55.92899708	-4.49491787		317.70	5.98	48.31	61.96	74.26	103.40
15	55.92896753	-4.49508472		338.00	5.98	49.72	60.93	71.10	103.40
16	55.92894747	-4.49525917		358.10	5.98	47.85	60.17	71.02	96.80
17	55.92893010	-4.49543395		377.80	5.98	40.90	53.82	71.99	102.20
18	55.92891155	-4.49560637		397.80	5.98	41.56	58.53	69.83	102.50
19	55.92889775	-4.49578218		418.00	5.98	48.12	58.85	70.77	99.40
20	55.928888775	-4.49593262		438.30	5.98	50.60	64.74	77.56	101.00
21	55.92887507	-4.49611055		458.50	5.98	40.40	58.32	74.18	98.10
22	55.92885458	-4.49628297		478.50	5.98	42.27	55.00	67.84	99.10
23	55.92883568	-4.49645027		498.90	5.98	46.06	60.50	72.24	99.40
24	55.92881413	-4.49662118		519.20	5.98	39.60	56.04	66.01	98.00
25	55.92879772	-4.49679183		539.70	5.98	43.13	60.28	73.14	100.70

26	55.92878392	-4.49696790	560.50	5.98	45.40	60.09	72.97	96.70
27	55.92977167	-4.49712105	581.80	6.48	50.39	60.28	74.57	95.00
28	55.92875602	-4.49730135	603.40	6.48	47.29	60.97	75.99	95.09
29	55.92874143	-4.49748440	624.90	6.48	52.57	59.61	69.24	97.27
30	55.92872628	-4.49767060	646.10	6.98	49.25	60.95	72.48	92.50
31	55.92870797	-4.49785903	667.00	7.48	42.25	58.41	74.16	95.69
32	55.92869047	-4.49801882	687.50	7.48	40.42	56.64	73.25	95.77
33	55.92866577	-4.49820142	708.50	7.48	44.12	61.58	77.75	99.77
34	55.92864365	-4.49838018	730.40	7.98	43.70	58.22	75.28	93.21
35	55.92863827	-4.49856262	751.30	7.98	40.61	55.87	67.10	102.86
36	55.92863225	-4.49874402	772.90	7.48	36.66	52.81	67.45	98.54
37	55.92861522	-4.49889467	794.80	5.98	45.61	53.05	58.17	96.70
38	55.92857582	-4.49906185	816.80	5.98	38.92	49.00	60.33	91.10
39	55.92852873	-4.49922235	839.10	5.48	37.30	48.83	55.93	93.89
40	55.92849753	-4.49930922	861.40	5.48	37.60	46.78	56.33	101.78
41	55.92848157	-4.49956357	884.30	5.48	35.27	44.38	49.72	100.22
42	55.92845847	-4.49972622	907.30	5.48	40.29	44.99	52.61	96.89
43	55.92843297	-4.49988508	930.60	5.48	38.89	45.28	48.44	100.00
44	55.92841512	-4.50005047	954.50	5.48	41.23	46.94	56.08	93.67
45	55.92840365	-4.50019460	978.40	5.48	41.10	46.84	57.27	97.56
46	55.92839625	-4.50036413	1002.00	5.48	43.40	48.91	53.30	94.67
47	55.92839328	-4.50053257	1027.00	5.48	40.21	49.18	57.62	94.89
48	55.92839135	-4.50070115	1052.00	5.48	44.05	53.84	60.59	96.89
49	55.92839050	-4.50087072	1077.00	5.48	49.35	56.68	73.59	102.89
50	55.92838985	-4.50101655	1102.00	5.98	44.88	54.36	68.38	104.30
51	55.92839040	-4.50118730	1127.00	5.98	38.95	49.71	57.49	97.70
52	55.92839580	-4.50136060	1152.00	6.48	42.34	54.27	64.81	101.91
53	55.92840332	-4.50153360	1178.00	6.98	34.26	51.10	73.57	98.83
54	55.92841135	-4.50170550	1204.00	7.48	34.22	46.86	66.14	92.85
55	55.92841862	-4.50187900	1230.00	7.48	30.29	46.81	77.70	92.85
56	55.92842468	-4.50205558	1256.00	7.48	31.17	42.53	66.92	95.00
57	55.92843233	-4.50220763	1281.00	7.48	24.31	39.49	62.20	92.62
58	55.92844265	-4.50238617	1305.00	7.48	32.62	43.72	67.40	97.69
59	55.92845648	-4.50256345	1328.00	7.98	32.00	46.62	64.83	89.43
60	55.92847090	-4.50273940	1351.00	7.98	38.42	44.76	55.64	86.36
61	55.92848608	-4.50291220	1372.00	6.98	31.08	40.02	48.57	92.83
62	55.92849747	-4.50306078	1394.00	5.98	28.20	38.02	47.12	82.40
63	55.92851207	-4.50323230	1416.00	5.98	33.43	38.45	46.51	80.80
64	55.92853222	-4.50340448	1438.00	6.48	36.13	41.17	47.82	78.64
65	55.92855360	-4.50357868	1461.00	6.48	37.42	42.97	48.67	85.36
66	55.92857580	-4.50375392	1483.00	5.48	29.67	36.77	39.18	77.67
67	55.92859603	-4.50393102	1506.00	5.98	38.27	43.88	49.34	73.90
68	55.92860927	-4.50410817	1528.00	6.48	26.62	37.39	46.43	85.27
69	55.92861582	-4.50429347	1550.00	6.48	28.66	42.52	52.22	88.27
70	55.92861457	-4.50446310	1572.00	6.98	28.38	42.38	49.24	80.08
71	55.92861098	-4.50466945	1594.00	6.98	28.56	43.80	55.39	78.17
72	55.92861237	-4.50488025	1617.00	6.98	31.24	40.86	49.81	85.25
73	55.92861493	-4.50509368	1639.00	6.48	32.71	40.43	45.40	78.91
74	55.92862375	-4.50530675	1662.00	5.98	30.23	35.10	42.64	75.10
75	55.92863458	-4.50552020	1684.00	5.98	32.04	38.31	45.07	87.30
76	55.92864122	-4.50573577	1706.00	5.48	30.46	34.57	38.19	82.56
77	55.92864580	-4.50594992	1727.00	5.48	28.09	37.39	44.32	86.56
78	55.92864650	-4.50612968	1747.00	5.48	17.20	36.68	49.44	89.00
79	55.92865713	-4.50634103	1765.00	5.98	11.42	36.66	51.90	86.50
80	55.92866575	-4.50655140	1784.00	6.48	5.42	35.24	51.73	84.18
81	55.92867010	-4.50669970	1797.00	6.48	3.37	35.16	55.94	75.91

Transect Summary

Section of Site Shoreline	95%ile velocity	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
WFD	40.59	35.27	55.67	77.75	96.87	6.56
CED	31.79	24.31	47.18	77.70	95.92	7.08
FFD	28.33	11.42	39.55	55.39	82.62	6.18

Bowling ADCP Survey: Transect: 042

Survey Date	28/06/2010
Ensembles Taken Along Transect:	98
High Water Offset:	-3.00

Key

Portion of transect undertaken adjacent to Westfield (WFD) shoreline

Portion of transect undertaken adjacent to Centrefield (CED) shoreline

Portion of transect undertaken adjacent to Eastfield (FFD) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92913552	-4.51347928	15.74	7.48	39.69	49.03	65.32	90.77	
2	55.92912002	-4.51319875	36.55	7.48	34.04	46.21	55.41	90.54	
3	55.92910867	-4.51292295	56.32	7.48	35.10	43.60	55.79	93.62	
4	55.92910108	-4.51263710	76.28	6.98	30.57	40.73	58.16	91.67	
5	55.92909468	-4.51234250	95.73	6.98	30.59	39.10	49.83	94.83	
6	55.92910350	-4.51204675	114.90	6.48	21.68	34.75	48.33	95.73	
7	55.92911780	-4.51179348	134.40	5.98	23.91	31.79	45.33	93.50	
8	55.92911573	-4.51144973	153.80	5.98	28.84	32.70	45.74	91.10	
9	55.92911143	-4.51119293	173.00	5.48	28.12	32.68	37.54	92.22	
10	55.92910260	-4.51089232	192.20	5.48	23.45	29.50	38.29	97.56	
11	55.92908832	-4.51059142	211.10	5.48	21.34	27.98	35.91	99.89	
12	55.92910752	-4.51028772	230.20	5.48	21.33	29.44	42.20	93.34	
13	55.92905618	-4.50998057	249.30	5.48	22.22	28.30	34.28	86.44	
14	55.92903862	-4.50967065	268.56	5.98	16.46	26.73	38.37	89.80	
15	55.92902775	-4.50940303	287.60	5.98	16.00	23.67	34.44	92.90	
16	55.92900867	-4.50908530	306.70	5.98	17.68	25.50	34.53	87.00	
17	55.92898487	-4.50876360	325.80	5.98	17.83	22.59	28.37	110.10	
18	55.92897287	-4.50844058	344.90	5.98	14.47	19.65	25.10	97.00	
19	55.92895195	-4.50811638	363.90	5.98	14.49	20.42	30.79	96.60	
20	55.92892935	-4.50778588	383.00	6.48	17.15	22.70	29.01	105.27	
21	55.92891090	-4.50745182	402.00	6.48	12.19	19.22	27.63	104.27	
22	55.92888812	-4.50711317	421.20	6.48	14.21	19.62	23.42	94.73	
23	55.92887515	-4.50682390	440.10	6.48	10.64	16.07	21.79	101.36	
24	55.92886050	-4.50648473	459.30	6.48	12.27	17.08	24.41	100.36	
25	55.92884478	-4.50614480	478.50	6.48	16.93	20.81	23.56	107.00	
26	55.92883337	-4.50580053	497.60	6.48	14.18	24.51	32.18	94.64	
27	55.92882875	-4.50545325	516.40	6.48	14.44	21.27	27.19	88.42	
28	55.92882507	-4.50510170	535.30	6.98	13.60	24.72	31.33	104.08	
29	55.92882113	-4.50475002	554.40	6.98	16.08	21.04	25.53	85.42	
30	55.92882445	-4.50439523	573.50	6.98	14.31	21.73	28.05	99.00	
31	55.92883202	-4.50404215	592.80	6.98	13.40	23.18	29.02	108.67	
32	55.92882785	-4.50373985	611.80	6.98	12.95	20.54	28.67	95.83	
33	55.92884204	-4.50349003	631.30	6.98	10.24	19.09	25.34	92.94	
34	55.92884515	-4.50304967	651.00	6.98					

46	55.92912088	-4.49954748	882.20	6.48	15.73	23.52	30.66	91.64
47	55.92914108	-4.49925085	901.60	5.98	20.14	27.88	35.60	86.70
48	55.92915335	-4.49895378	920.30	5.98	18.41	25.69	32.54	95.90
49	55.92917952	-4.49865428	939.70	5.98	22.36	27.62	32.94	98.10
50	55.92920398	-4.49839720	959.00	5.98	20.25	28.19	37.34	94.80
51	55.92923742	-4.49805398	978.60	5.98	21.88	28.92	34.62	91.80
52	55.92925880	-4.49779340	998.50	5.98	20.02	28.58	32.84	95.20
53	55.92928507	-4.49749102	1018.00	5.98	17.37	30.22	37.79	90.40
54	55.92931475	-4.49719285	1039.00	5.98	15.73	28.57	33.98	88.10
55	55.92933653	-4.49689832	1060.00	6.48	24.84	31.21	39.21	93.36
56	55.92935390	-4.49660532	1081.00	6.48	23.90	30.31	38.78	88.09
57	55.92936845	-4.49633520	1103.00	6.48	18.43	28.81	33.77	92.55
58	55.92937365	-4.49607750	1124.00	6.48	27.31	33.05	37.81	90.64
59	55.92938380	-4.49582802	1146.00	6.98	26.50	35.55	51.34	86.83
60	55.92939252	-4.49561562	1168.00	7.48	25.85	35.70	45.48	94.15
61	55.92940413	-4.49537187	1188.00	7.48	21.95	34.59	41.39	98.77
62	55.92940513	-4.49513838	1209.00	7.98	20.03	35.13	45.35	87.43
63	55.92929712	-4.49499113	1230.00	7.98	22.36	32.67	41.82	89.00
64	55.92915273	-4.49476768	1250.00	8.48	27.38	35.18	48.83	99.60
65	55.92903822	-4.49508318	1271.00	8.48	27.87	36.85	49.64	94.87
66	55.92807552	-4.49523297	1291.00	8.48	36.14	35.79	43.61	93.02
67	55.92802307	-4.49533962	1311.00	8.98	25.16	34.87	48.76	95.63
68	55.92888248	-4.49557747	1332.00	8.98	22.48	33.72	41.07	96.25
69	55.92885185	-4.49527653	1352.00	9.48	19.08	34.07	47.11	94.08
70	55.92882875	-4.49593380	1373.00	9.48	20.43	32.72	43.82	93.47
71	55.92880147	-4.49615782	1393.00	8.98	26.95	40.17	52.96	94.94
72	55.92877922	-4.49632300	1412.00	8.48	10.93	29.68	40.01	90.20
73	55.92875003	-4.49651408	1430.00	7.48	5.17	24.35	36.53	89.62
74	55.92872050	-4.49670650	1447.00	6.98	8.90	20.66	29.66	87.75
75	55.92869365	-4.49690165	1465.00	6.98	8.85	19.68	24.73	105.08
76	55.92867938	-4.49709827	1483.00	6.98	4.33	14.11	25.46	111.67
77	55.92867117	-4.49730023	1500.00	6.98	2.19	10.63	19.81	127.58
78	55.92865798	-4.49747275	1517.00	6.48	2.74	7.29	12.81	93.91
79	55.92863735	-4.49767318	1535.00	6.98	0.83	5.98	11.77	101.75
80	55.92861600	-4.49787395	1552.00	7.48	1.51	6.22	12.84	137.00
81	55.92859613	-4.49807815	1569.00	7.98	1.89	8.47	17.44	131.07
82	55.92858112	-4.49828448	1586.00	7.98	3.04	9.98	15.52	82.71
83	55.92857340	-4.49846300	1603.00	7.98	1.77	9.96	18.33	118.71
84	55.92856937	-4.49866990	1619.00	7.98	3.07	9.07	15.47	102.64
85	55.92856722	-4.49887658	1636.00	7.98	1.55	8.65	16.19	112.86
86	55.92856375	-4.49908335	1652.00	7.48	5.14	10.41	18.15	88.23
87	55.92856192	-4.49926070	1669.00	7.48	2.21	7.79	15.22	139.38
88	55.92856270	-4.49946959	1685.00	6.98	4.68	7.80	11.77	104.33
89	55.92855325	-4.49966968	1702.00	6.98	2.15	7.45	11.93	135.92
90	55.92854697	-4.49987310	1719.00	5.98	2.74	7.12	10.99	176.50
91	55.92853185	-4.50007365	1735.00	5.98	3.82	10.06	19.57	179.50
92	55.92851302	-4.50027323	1752.00	5.48	4.96	11.31	26.25	205.11
93	55.92849713	-4.50046877	1769.00	5.48	2.86	11.35	21.43	242.00
94	55.92848483	-4.50065933	1785.00	5.48	1.29	10.45	21.08	232.78
95	55.92847567	-4.50084342	1802.00	6.48	0.77	9.19	24.97	215.00
96	55.92847258	-4.50102905	1819.00	6.48	2.52	8.44	17.87	194.64
97	55.92846673	-4.50121577	1837.00	6.98	5.52	13.50	26.07	96.58
98	55.92846535	-4.50124197	1841.00	6.98	9.48	18.41	38.73	88.18

Transect Summary

Section of Site Shoreline	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth
	cm/s	cm/s	cm/s	degrees true	m AOD
WFD	13.61	7.35	21.61	35.60	94.88
CFD	24.26	18.43	34.45	51.34	93.52
EFD	2.21	0.83	9.52	26.25	122.49

Bowling ADCP Survey: Transect: 044

Survey Date

28/06/2010

Ensembles Taken Along Transect:

105

High Water Offset

-2.30

Key

- Portion of transect undertaken adjacent to Westfield (WFD) shoreline
- Portion of transect undertaken adjacent to Centrefield (CFD) shoreline
- Portion of transect undertaken adjacent to Eastfield (EFD) shoreline

Ensemble#	Ensemble	Lat	Ensemble Long (m)	Distance Along Transect (m)	Bottom Depth (m AOD)	Minimum Velocity Across Depth (cm/s)	Mean Velocity Across Depth (cm/s)	Max Velocity Across Depth (cm/s)	Mean Flow Direction (degrees true)
1	55.92956178	-4.52058307	13.27	7.48	20.01	34.12	41.20	101.85	
2	55.92954187	-4.52032552	31.05	7.48	19.81	29.62	40.69	100.69	
3	55.92951967	-4.52006717	48.75	6.98	16.68	28.63	37.92	92.67	
4	55.92949853	-4.51984570	66.27	6.98	16.03	25.74	37.00	101.75	
5	55.92947740	-4.51958840	83.72	6.48	15.01	23.12	32.31	96.45	
6	55.92945945	-4.51933078	101.10	6.48	13.94	22.14	34.21	102.27	
7	55.92944470	-4.51907262	118.50	6.48	13.88	20.57	29.39	104.27	
8	55.92943412	-4.51885057	135.90	5.98	10.20	21.00	27.84	103.70	
9	55.92940683	-4.51858523	153.40	5.98	14.81	20.84	30.06	107.30	
10	55.92938227	-4.51833932	170.60	5.98	5.69	15.76	24.17	109.90	
11	55.92935872	-4.51808438	188.20	5.98	0.48	13.05	22.82	85.50	
12	55.92933687	-4.51782813	205.80	5.98	5.94	14.72	24.43	92.20	
13	55.92931423	-4.51757062	223.30	5.98	7.06	16.00	27.74	114.30	
14	55.92929188	-4.51731260	240.90	5.98	2.49	11.86	21.59	102.30	
15	55.92927733	-4.51705045	258.60	5.98	0.94	10.41	20.93	89.40	
16	55.92926337	-4.51679097	276.20	6.48	1.84	10.42	23.24	140.82	
17	55.92924157	-4.51653265	293.70	6.48	7.84	10.46	14.72	117.82	
18	55.92922160	-4.51627895	311.30	6.48	1.52	8.83	18.71	135.09	
19	55.92920293	-4.51602490	328.90	6.48	3.53	7.92	11.43	115.27	
20	55.92918867	-4.51597127	346.70	6.48	2.21	8.30	14.19	132.64	
21	55.92917817	-4.51594597	364.10	6.98	2.24	8.91	19.20	127.17	
22	55.92916537	-4.51590077	381.00	6.98	2.98	8.49	15.21	125.67	
23	55.92915197	-4.51502772	398.20	6.98	2.65	8.76	14.70	159.17	
24	55.92913893	-4.51476672	415.00	6.98	6.59	9.87	14.57	177.17	
25	55.92912482	-4.51450335	431.90	6.98	4.35	12.30	18.06	170.83	
26	55.92910842	-4.51423747	448.70	6.98	4.26	11.05	17.92	164.83	
27	55.92909558	-4.51397175	465.60	6.98	2.63	9.79	16.25	150.92	
28	55.92908180	-4.51374520	482.20	6.98	5.35	11.08	19.60	164.08	
29	55.92907775	-4.51347925	499.00	6.98	2.54	8.38	15.66	127.58	
30	55.92905242	-4.51321778	516.20	6.98	4.91	10.77	20.66	169.42	
31	55.92904207	-4.51295745	533.30	6.98	6.92	12.06	17.41	173.67	
32	55.92903568	-4.51273197	550.70	6.98	2.68	12.65	22.41	174.08	
33	55.92903273	-4.51246618	568.30	6.98	2.40	9.62	19.01	169.83	
34	55.92903290	-4.51220105	586.10	6.98	4.94	8.27	14.30	166.42	
35	55.92903995	-4.512193638	603.50	6.98	0.66	7.03	11.95	162.75	
36	55.92908523	-4.51167778	621.50	6.98	1.11	6.84	13.59	198.82	
37	55.92906968	-4.51141532	639.20	7.48	2.63	10.34	16.97	148.92	
38</td									

57	55.92878092	-4.50603092	980.80	6.48	1.46	3.11	6.17	132.36
58	55.92877827	-4.50574873	998.80	6.48	0.28	4.33	10.14	163.73
59	55.92877640	-4.505205435	1017.00	6.48	1.68	4.82	12.08	157.55
60	55.92877990	-4.50522063	1036.00	6.48	1.06	6.28	16.11	186.73
61	55.92877980	-4.50494102	1054.00	6.48	2.29	7.52	20.97	200.45
62	55.92877687	-4.50466137	1073.00	6.48	1.43	8.19	25.99	142.45
63	55.92877122	-4.50438155	1091.00	6.48	1.73	7.40	20.41	171.27
64	55.92876527	-4.50410302	1110.00	6.48	2.62	9.10	23.21	101.82
65	55.92876367	-4.50382490	1128.00	6.98	2.39	8.97	21.30	96.58
66	55.92876368	-4.50354608	1147.00	7.48	6.95	12.08	20.03	85.54
67	55.92876568	-4.50330555	1165.00	7.98	7.49	14.32	26.62	80.93
68	55.92877743	-4.50299102	1184.00	8.48	7.94	15.18	28.01	76.13
69	55.92879018	-4.50275530	1203.00	8.48	9.41	16.41	28.06	87.87
70	55.92880933	-4.50248232	1222.00	8.48	8.11	13.74	22.66	88.93
71	55.92884742	-4.50222677	1240.00	8.48	9.18	16.00	30.24	97.00
72	55.92889562	-4.50198872	1259.00	8.48	9.22	15.97	26.92	99.93
73	55.92892227	-4.50173807	1277.00	8.48	13.87	19.48	25.71	93.87
74	55.92895100	-4.50149927	1297.00	8.98	11.28	17.08	22.82	96.38
75	55.92897232	-4.50125990	1315.00	8.48	10.63	19.05	26.87	102.53
76	55.92898958	-4.50105657	1333.00	8.48	3.75	18.25	31.31	108.20
77	55.92901030	-4.50082152	1350.00	8.48	1.83	12.47	24.50	160.07
78	55.92903098	-4.50059080	1367.00	7.98	2.44	10.13	18.61	142.14
79	55.92905322	-4.50036092	1383.00	7.48	0.56	10.16	25.59	202.54
80	55.92906315	-4.50019542	1400.00	5.98	7.99	12.09	24.94	267.70
81	55.92907028	-4.49992087	1416.00	5.98	5.56	10.70	22.90	253.30
82	55.92907772	-4.49968485	1432.00	6.98	0.39	8.67	24.80	184.33
83	55.92908530	-4.49944937	1447.00	7.48	2.40	7.81	17.33	167.54
84	55.92909682	-4.49925068	1463.00	7.98	0.62	8.78	26.98	146.79
85	55.92911713	-4.49902612	1479.00	7.98	2.06	6.17	23.74	172.50
86	55.92913812	-4.49880085	1494.00	7.98	1.28	5.40	13.19	229.43
87	55.92915833	-4.49857623	1510.00	8.48	0.95	7.31	18.68	160.73
88	55.92917722	-4.49838432	1525.00	8.48	1.23	6.33	12.85	157.60
89	55.92920258	-4.49816335	1541.00	8.48	1.25	7.32	15.09	137.47
90	55.92922660	-4.49794047	1557.00	8.48	2.31	6.35	10.12	130.40
91	55.92925235	-4.49771647	1574.00	8.48	1.49	7.29	13.16	139.40
92	55.92928053	-4.49749395	1590.00	8.48	2.76	6.39	9.99	163.13
93	55.92930982	-4.49727342	1607.00	8.98	1.68	6.08	9.56	131.25
94	55.92932870	-4.49708650	1624.00	8.98	2.11	6.70	15.21	97.50
95	55.92934392	-4.49685850	1641.00	8.98	2.20	9.50	16.24	101.06
96	55.92936142	-4.49663352	1658.00	8.98	2.53	8.38	15.93	96.69
97	55.92938110	-4.49641125	1676.00	8.98	2.04	8.63	15.20	71.06
98	55.92938718	-4.49618702	1693.00	8.98	0.24	7.20	15.58	98.75
99	55.92939080	-4.49595523	1710.00	8.48	0.41	6.07	12.52	117.00
100	55.92937658	-4.49573483	1728.00	8.48	2.54	8.35	13.75	85.87
101	55.92939835	-4.49549378	1745.00	7.98	2.24	8.07	15.09	94.62
102	55.92940515	-4.49529070	1762.00	7.98	5.01	13.39	21.55	49.64
103	55.92941097	-4.49505537	1780.00	7.48	5.48	12.07	21.46	66.62
104	55.92941395	-4.49481457	1796.00	6.98	2.74	13.62	24.11	81.17
105	55.92938543	-4.49472422	1805.00	6.48	1.63	12.82	21.86	72.09

Transect Summary

Section of Site Shoreline	95%ile velocity	Min Section Velocity (across depth and section)	Mean Section Velocity (across depth and section)	Max Section Velocity (across depth and section)	Mean Direction of Flow (across depth and section)	Mean Bottom Depth	
-	cm/s	cm/s	cm/s	cm/s	degrees true	m AOD	
WFD	1.75	0.22	8.32	22.41	165.88	7.46	
CFD	5.84	2.39	15.32	31.31	93.46	8.13	
EFD	1.90	0.24	7.55	26.98	124.64	8.51	



APPENDIX D

SSSI DATA



Scottish Natural Heritage

INNER CLYDE SITE OF SPECIAL SCIENTIFIC INTEREST

SITE MANAGEMENT STATEMENT

Site code: 1701

Caspian House
Clydebank Business Park
Clydebank
G81 2NR

Tel: 0141 951 4488
Fax: 0141 951 8948

Purpose



This is a public statement prepared by SNH for owners and occupiers of the SSSI. It outlines the reasons it is designated as an SSSI and provides guidance on how its special natural features should be conserved or enhanced. This Statement does not affect or form part of the statutory notification and does not remove the need to apply for consent for operations requiring consent.

We welcome your views on this statement.

Description of the site

The Inner Clyde Site of Special Scientific Interest (SSSI) principally encompasses the intertidal zone of the Clyde estuary from Clydebank in the east to a line between Helensburgh on the north shore and Greenock on the south shore. The seaward boundary of the site extends as far as Mean Low Water Springs. The site is important for its extensive saltmarsh habitats and as one of the most northerly of the large west coast estuaries used by migrating birds.

The large and diverse assemblage of wintering bird species includes the following species of national or international importance: cormorant, eider, goldeneye, oystercatcher, red-breasted merganser, red-throated diver and redshank. These birds depend on a corresponding variety of plants and invertebrates supported by the intertidal habitats. Gulls and wading birds, for example, subsist on the invertebrate fauna of the mudflats, sandflats and saltmarsh, with redshank feeding largely on ragworms and curlew on sandhoppers. Meanwhile, many ducks such as the eider feed on molluscs such as mussels and cockles, while wigeon – along with mute and whooper swans – feed on the dwarf eelgrass and seaweed growing on the lower saltmarsh. On adjacent open waters are found fish-eating birds including cormorant, which feed on flatfish and eels, and red-breasted merganser and red-throated diver which feed mainly on sticklebacks.

Besides their important wintering population, redshank are known also to breed within the SSSI, at Newshot Island, although breeding redshank are not a notified natural feature of the SSSI.

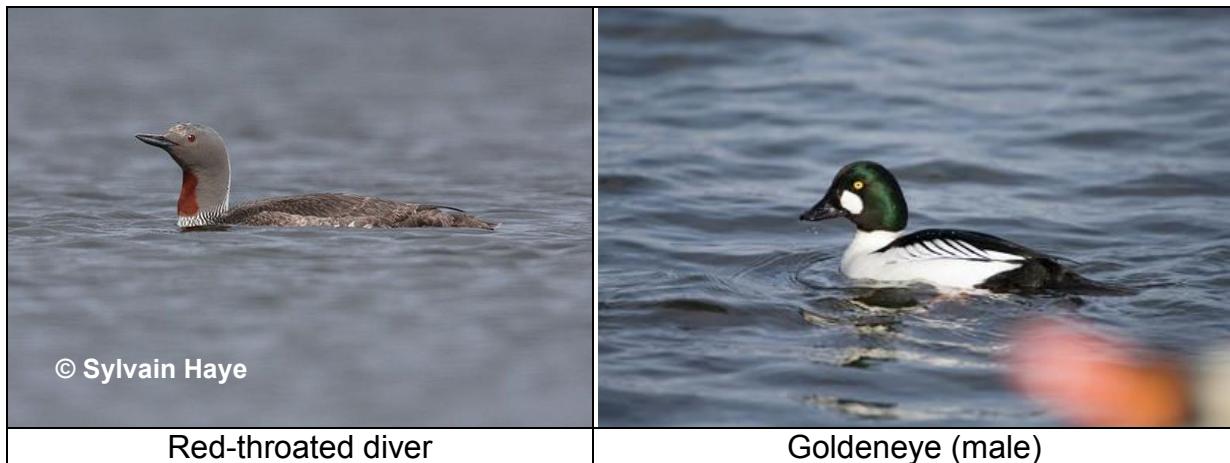
The condition of the wintering populations of each of the notified bird species has been assessed based on peak winter counts obtained using the Wetland Birds Survey (WeBS) methodology. These indicate that all species have maintained more or less stable wintering populations, having maintained mean peak winter populations above an earlier minimum. A further species, scaup, formerly occurred within the site in nationally important numbers but have since declined substantially and are no longer considered part of the notified interests.

Towards the landward side the intertidal habitat grades into grassland dominated by red fescue and rushes, via a saltmarsh dominated by common saltmarsh grass. Within the landward section there are pockets of brackish water which support vegetation more commonly associated with swamps and are dominated by common reed and sea club rush. Further inland still there are wet grasslands dominated by tufted hair grass and Yorkshire fog.

The condition of the saltmarsh feature is considered to remain in a favourable condition, as it has suffered no evident loss of extent and continues to exhibit an appropriate diversity of structure and floristic composition.

Natural features of Inner Clyde SSSI	Condition of feature (date monitored)	Other relevant designations
Saltmarsh	Favourable, maintained (August 2002)	
Cormorant <i>Phalacrocorax carbo</i> (non-breeding)	Favourable, recovered (February 2007)	
Eider <i>Somateria mollissima</i> (non-breeding)	Favourable, maintained (February 2007)	
Goldeneye <i>Bucephala clangula</i> (non-breeding)	Favourable, maintained (February 2007)	
Oystercatcher <i>Haematopus ostralegus</i> (non-breeding)	Favourable, recovered (February 2007)	
Red-breasted merganser <i>Mergus serrator</i> (non-breeding)	Favourable, maintained (February 2007)	
Red-throated diver <i>Gavia stellata</i> (non-breeding)	Favourable, maintained (February 2007)	
Redshank <i>Tringa totanus</i> (non-breeding)	Favourable, maintained (February 2007)	SPA / Ramsar

The site is also designated as Inner Clyde Special Protection Area (SPA) for redshank *Tringa tetanus* (non-breeding). The condition of the redshank has been assessed as favourable maintained as the mean peak winter populations have been maintained above an earlier minimum.



Past and present management

Approximately half of the land adjoining the site, along with areas of saltmarsh on the southern shore, is managed for agriculture (arable land and grazing pasture). Areas of foreshore and intertidal habitat at Dumbuck and Parklea are managed by the RSPB as a nature reserve.

Several areas adjacent to the site are used for recreation, with Brucehill playing fields and Levengrove Park at Dumbarton on the north shore, and Kelburn Park at Port Glasgow on the south shore. Public access to the foreshore is facilitated over much of the site by the existence of more or less formalised footpaths, notably including the coastal path running along the southern shore from Newark Castle to Parklea. Elsewhere, railway lines and roads abut much of the intertidal land within the SSSI.

Some areas close to the site on both north and south shores are subject to industrial and residential development, although in the past heavy industrial development was more widespread, with former oil terminals at Bowling and Mountblow for example.

To keep the river navigable, the central channel of the estuary is dredged to a depth of 10m at high tide and dredging spoil is dumped beyond the site boundary. The impact of current dredging practice on the site is unknown. Similarly, the potential impact of a cessation in dredging is not known with certainty, although it is possible that the retention of the sediment previously removed by dredging would result in a larger intertidal area within the site to the benefit of feeding waterfowl.

Inputs of organic pollution have declined markedly in recent years with the implementation of the EC Urban Waste Water Treatment Directive and consequent addition and upgrading of sewage treatment facilities. Ironically, the cleaner water supports lower densities of many invertebrates that are the food source for wintering birds, and this may in part be responsible for the recent decline in the wintering population of scaup.

Cockle gathering, especially on Pillar Bank, has taken place for many years, as have bait digging and wildfowling. These activities are generally carried out informally and at low intensity and are not thought likely to have a significant direct impact on the birds for which the site is notified or their food source. There is, however, a minor risk of intermittent disturbance to feeding birds.

Anticipated long-term sea level rises associated with climate change are likely to have significant effects on the extent and distribution of intertidal and saltmarsh habitats, although the nature of these changes is uncertain. Saltmarsh may be lost as sea levels rise and landward migration is impeded by man-made sea defences; however, the magnitude of loss may be offset if saltmarsh can gain height through accumulation of sediment. Sedimentation inflows and dynamics, as well as human activities such as dredging, will likewise influence the changes in extent and distribution of intertidal sand and mudflats.

Objectives for Management (and key factors influencing the condition of natural features)

We wish to work with the owners and occupiers to protect the site and to maintain and where necessary enhance its features of special interest. SNH aims to carry out site survey, monitoring and research as appropriate to increase our knowledge and understanding of the site and its natural features and to monitor the effectiveness of management.

The EU Habitats and Birds Directives oblige Government to avoid, in SACs and SPAs, the deterioration of natural habitats and the habitats of species, as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of these Directives. The objectives below have been assessed against these requirements. All authorities proposing to carry out or permit to be carried out operations likely to have a significant effect on the European interests of this SSSI must assess those operations against the relevant Natura conservation objectives (which are listed on our website through the SNHi - SiteLink facility).

- 1. To maintain the extent and condition of saltmarsh habitat** by ensuring protection from damaging impacts.

The saltmarsh is susceptible to coastal squeeze in places whereby erosion at the seaward edge reduces the size of the saltmarsh as it is unable to migrate further inland by fixed protection structures. Changes in the grazing regimes may also allow undesirable species to dominate the marsh areas – for example cessation of grazing pressure can lead to rank grasses suppressing the botanical diversity of a site.

The features of the site should also be safeguarded from tipping or other obstruction, such as the construction of pipelines, dumping of waste or coastal protection works. Any future coastal protection or flood prevention works would need to ensure there are no adverse impacts on the saltmarsh.

- 2. To maintain the extent and forage value of intertidal sand and mudflats** by minimising or avoiding mechanical damage and harmful pollution.

Removal of intertidal or subtidal sediments (as by dredging) may affect the availability of suitable foraging habitat for wildfowl, and should be avoided where possible. Organic pollution of intertidal areas has declined substantially in recent years with improved waste water treatment, although, ironically, the

reduced nutrient inputs have in some cases lowered the availability of the mud- and sand-dwelling invertebrates that some birds feed on. Inorganic pollution, too, is likely to have declined substantially with a reduction in heavy industry adjacent to the Clyde, fewer movements of large boats, and improved regulation.

3. **To maintain or increase the populations of wintering waterfowl and waders** by minimising disturbance from development or inappropriate recreational use of adjoining land.

It is important that any land management practices – existing and proposed – and any land use changes are carefully planned to avoid disturbance to wintering birds. SNH will assist land managers and others in planning existing or proposed land uses in a manner sensitive to the needs of the natural features.

Access to the site and adjoining land should follow the Scottish Outdoor Access Code (SOAC) to ensure disturbance to the wintering birds is minimised.

Other factors affecting the natural features of the site

Wintering populations of waterfowl may be influenced by miscellaneous factors affecting the birds while in passage or in breeding areas.

Informal bait and cockle collecting is a frequent occurrence, and may cause temporary and localised disturbance to roosting or feeding wildfowl. At current levels, this activity is unlikely to have an adverse effect on the distribution and abundance of important bird species.

Front page photograph: redshank *Tringa totanus*

Date last reviewed: 3 August 2010



APPENDIX E

DILUTION MODEL WORKSHEETS

Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

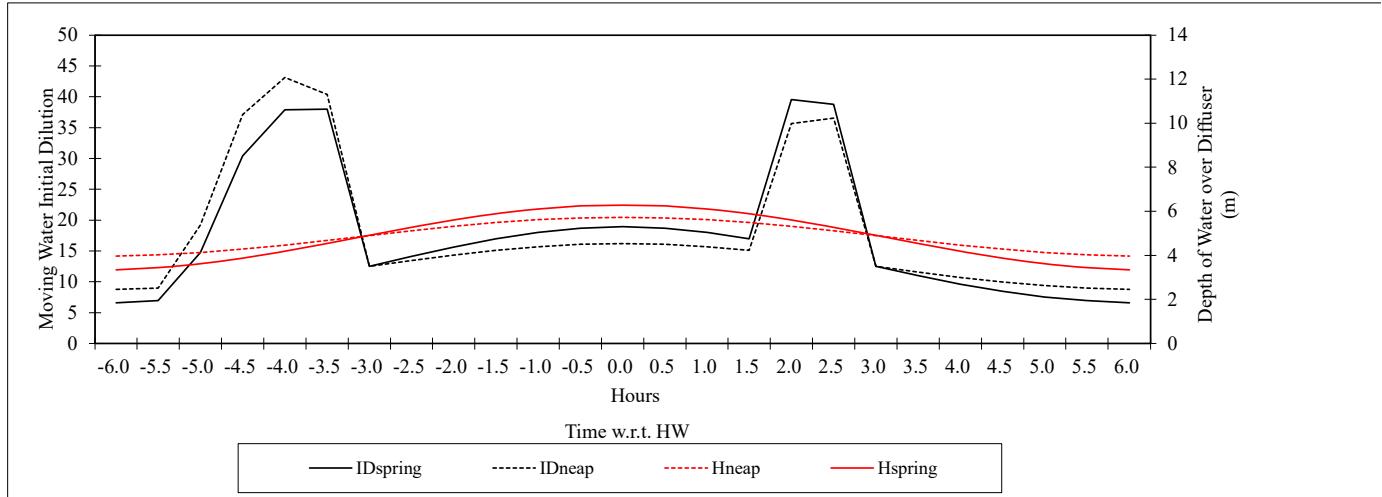
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0600	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	7.6394	Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	68.0863	No saline intrusion
Total Effluent Flow (m^3/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0076	
Number of Diffuser Ports	1				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		27.85

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.2	1.4	7	9
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.1	1.3	7	9
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	1.3	1.5	15	19
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	1.5	1.7	30	37
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	1.7	1.8	38	43
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	1.8	1.8	38	40
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	1.7	1.7	13	12
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	1.7	1.6	14	13
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	1.8	1.7	16	14
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	1.9	1.8	17	15
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	1.9	1.8	18	16
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	2.2	2.0	19	16
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	2.1	1.9	19	16
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	2.0	1.9	19	16
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	2.0	1.8	18	16
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	2.1	1.9	17	15
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	2.1	2.0	40	36
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	2.0	1.9	39	37
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	1.8	1.8	13	12
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	1.6	1.6	11	12
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	1.5	1.6	10	11
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	1.3	1.5	8	10
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	1.3	1.5	8	9
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	1.2	1.4	7	9
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.2	1.4	7	9

Minimum	7
Mean	18
Median	15
Maximum	43
Std. Dev.	10.71
95%ile.	6.93



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

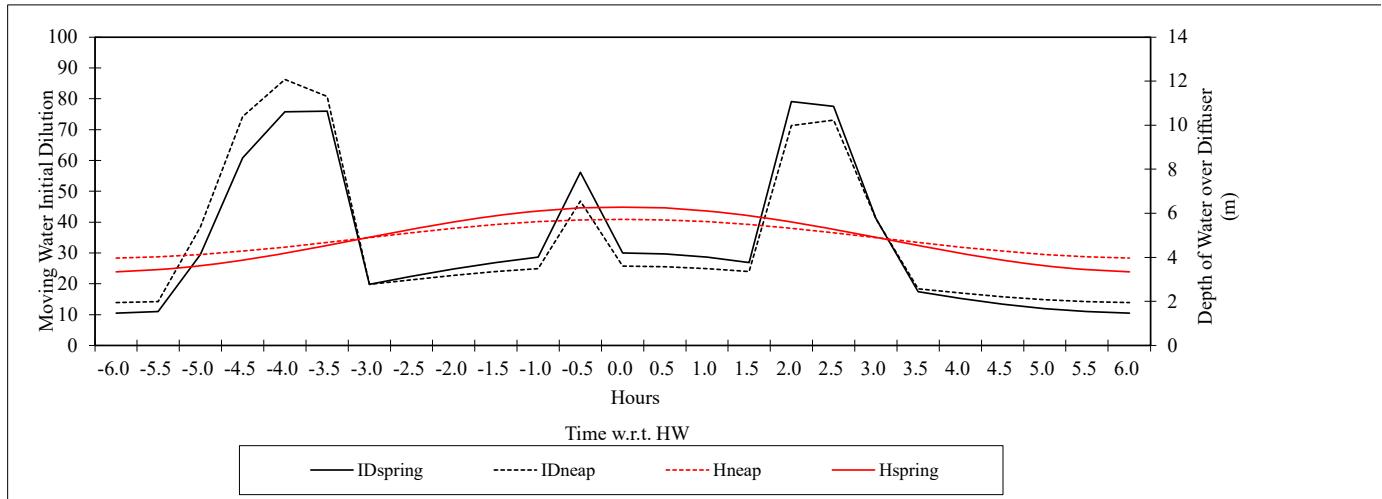
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0300	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	3.8197	Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	0.6112	Not Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	34.0432	No saline intrusion
Total Effluent Flow (m^3/s)	0.0300	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0038	
Number of Diffuser Ports	1				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		19.40

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.2	1.4	11	14
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.1	1.3	11	14
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	1.5	1.7	30	38
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	1.7	1.9	61	74
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	1.8	2.0	76	86
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	2.0	2.0	76	81
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	1.8	20	20	
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	1.7	22	21	
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	1.8	1.7	25	23
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	2.0	1.9	27	24
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	2.0	1.8	29	25
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	2.4	2.2	56	47
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	2.2	2.0	30	26
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	2.1	1.9	30	26
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	2.0	1.8	29	25
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	2.2	2.0	27	24
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	2.3	2.2	79	71
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	2.2	2.1	78	73
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	1.9	1.9	41	41
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	1.7	1.7	17	18
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	1.6	1.7	15	17
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	1.4	1.6	13	16
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	1.4	1.6	12	15
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	1.3	1.5	11	14
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.2	1.4	11	14

Minimum	11
Mean	34
Median	25
Maximum	86
Std. Dev.	23.27
95%ile.	11.01



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

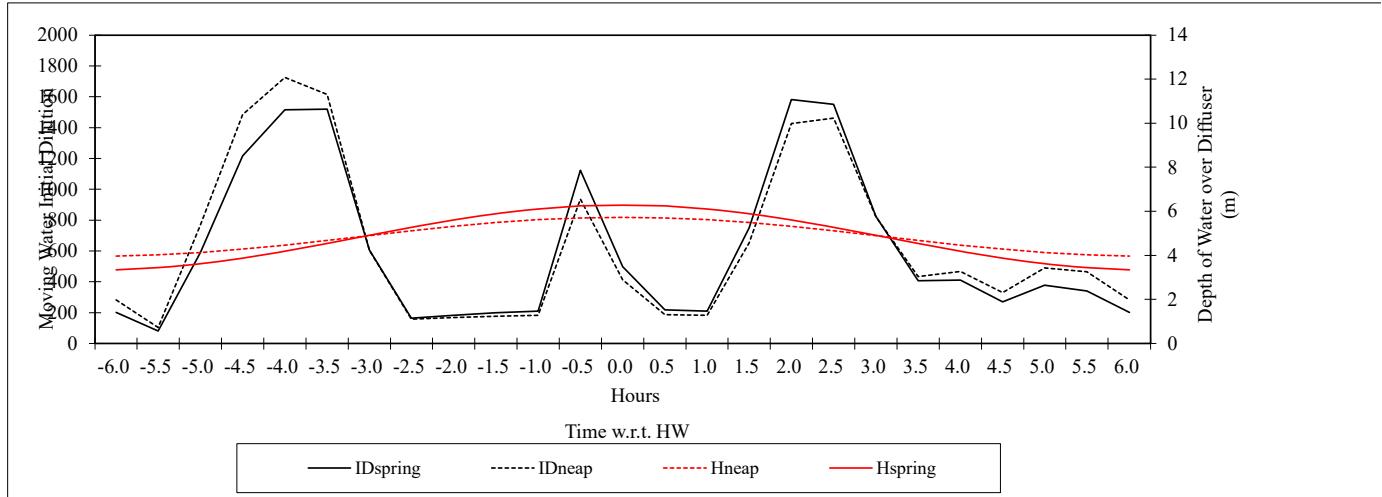
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0015	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	0.1910	Not Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	0.6112	Not Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	1.7022	No saline intrusion
Total Effluent Flow (m^3/s)	0.0300	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0002	
Number of Diffuser Ports	20				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		30.13

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	HSpring	HNeap	USpring	UNeap	WSpring	WNeap	DSpring	DNeap	Spring	Neap	IDSpring	IDNeap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	2.0	2.3	202	283
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.3	1.6	81	105
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	2.7	3.1	590	767
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	3.5	3.9	1216	1484
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	3.9	4.2	1515	1725
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	4.0	4.1	1520	1616
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	3.2	3.1	607	605
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	2.3	2.2	165	157
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	2.4	2.3	183	167
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	2.8	2.7	198	176
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	2.4	2.2	211	183
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	4.2	3.8	1123	936
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	3.4	3.1	499	414
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	2.9	2.6	219	188
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	2.6	2.4	211	183
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	3.6	3.4	749	651
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	4.4	4.2	1584	1426
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	4.3	4.1	1550	1462
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	3.4	3.4	824	821
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	2.7	2.8	408	434
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	2.6	2.8	410	467
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	2.3	2.5	270	330
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	2.4	2.8	378	491
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	2.3	2.7	342	466
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	2.0	2.3	202	283

Minimum	81
Mean	622
Median	424
Maximum	1725
Std. Dev.	505.65
95%ile.	160.53



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

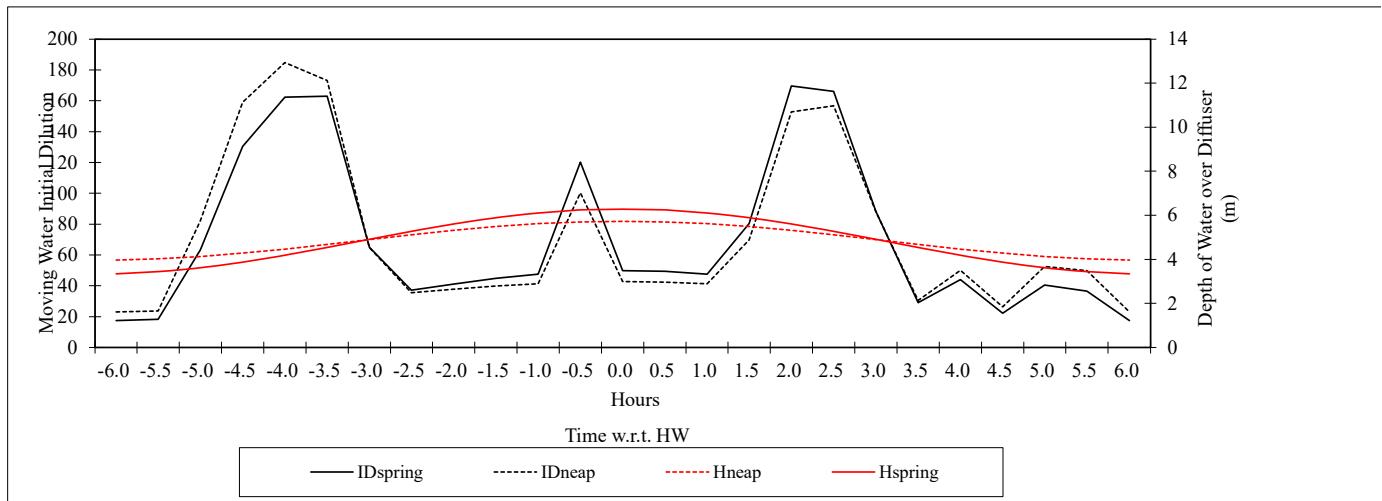
Flow Conditions:-

Rate :-		95th Percentile ambient water
Year :-		2010
Season :-		June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0140	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	1.7825	Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	0.2852	Not Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	15.8868	No saline intrusion
Total Effluent Flow (m^3/s)	0.0140	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0018	
Number of Diffuser Ports	1				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		16.10

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t. HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.3	1.6	17	23
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.1	1.3	18	24
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	1.6	1.9	63	82
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	1.9	2.1	130	159
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	2.1	2.3	162	185
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	2.2	2.3	163	173
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	2.0	2.0	65	65
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	1.8	1.8	37	35
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	1.9	1.8	41	38
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	2.1	2.0	45	40
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	2.0	1.9	48	41
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	2.6	2.4	120	100
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	2.4	2.2	50	43
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	2.2	2.0	49	42
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	2.1	1.9	48	41
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	2.4	2.2	80	70
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	2.6	2.4	170	153
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	2.5	2.4	166	157
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	2.1	2.1	88	88
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	1.8	1.9	29	30
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	1.7	1.8	44	50
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	1.5	1.7	22	26
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	1.5	1.7	40	53
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	1.4	1.7	37	50
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.3	1.6	17	23

Minimum	17
Mean	71
Median	48
Maximum	185
Std. Dev.	50.92
95%ile.	20.08



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

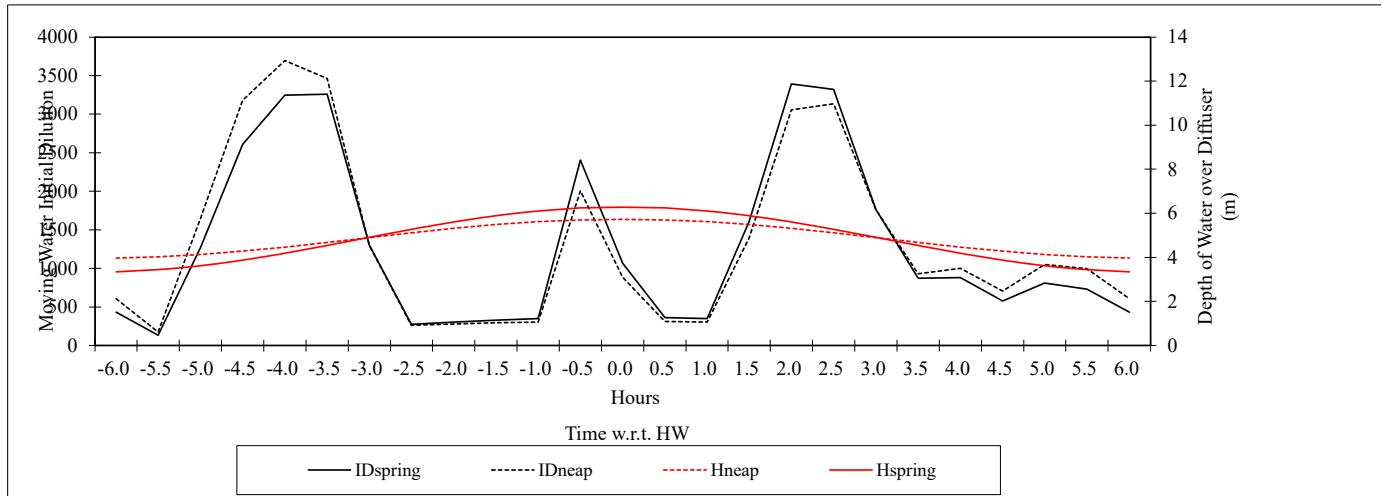
Flow Conditions:-

Rate :-		95th Percentile ambient water
Year :-		2010
Season :-		June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0007	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	0.0891	Not Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	0.2852	Not Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	0.7943	Saline Intrusion
Total Effluent Flow (m^3/s)	0.0140	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0001	
Number of Diffuser Ports	20				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		46.51

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t. HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	HSpring	HNeap	USpring	UNeap	WSpring	WNeap	DSpring	DNeap	Spring	Neap	IDSpring	IDNeap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	2.4	2.9	433	607
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.5	1.7	135	175
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	3.5	4.0	1265	1644
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	4.6	5.1	2606	3181
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	5.1	5.5	3246	3696
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	5.3	5.4	3258	3462
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	3.9	3.9	1301	1297
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	2.6	2.5	274	261
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	2.7	2.6	304	278
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	3.3	3.1	330	293
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	2.7	2.4	350	305
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	5.2	4.8	2406	2007
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	4.1	3.8	1068	886
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	3.3	3.0	363	312
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	3.0	2.8	350	305
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	4.5	4.2	1606	1395
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	5.7	5.4	3393	3056
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	5.5	5.4	3322	3133
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	4.3	4.3	1765	1760
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	3.4	3.5	874	929
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	3.3	3.5	879	1001
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	2.8	3.1	579	707
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	3.0	3.5	809	1052
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	2.9	3.4	732	998
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	2.4	2.9	433	607

Minimum	135
Mean	1309
Median	908
Maximum	3696
Std. Dev.	1104.77
95%ile.	266.82



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

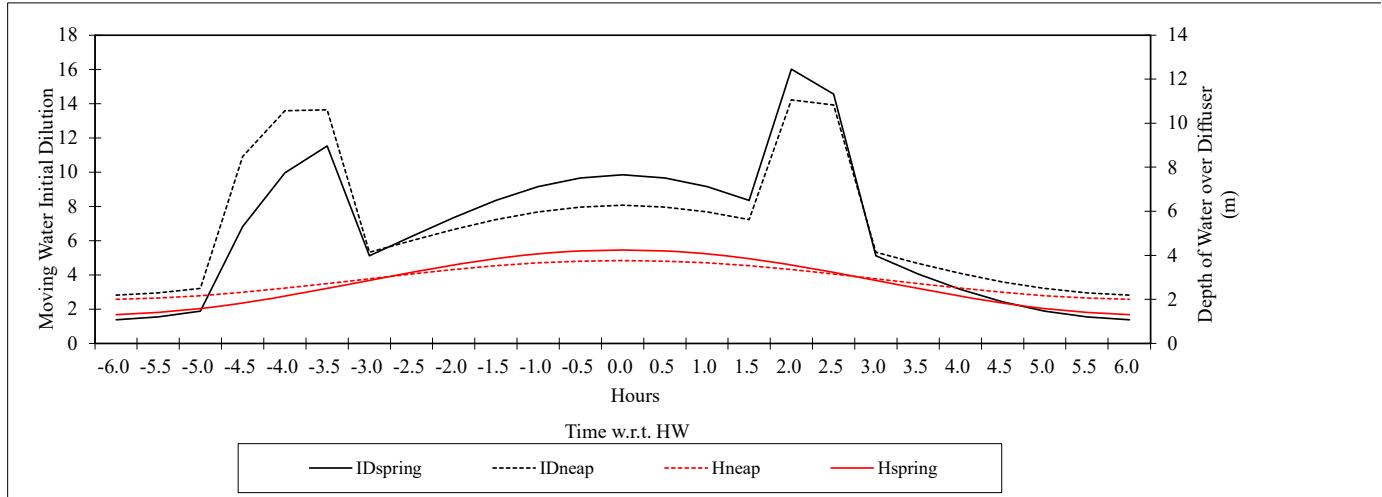
Flow Conditions:-

Rate :-		95th Percentile ambient water
Year :-		2010
Season :-		June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m³/s)	0.0600	
Total Water Depth at MLWS (m)	1.4		Velocity at Port, Ui (m/s)	7.6394	Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	2.1		Densimetric Froude No, F	68.0863	No saline intrusion
Total Effluent Flow (m³/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0076	
Number of Diffuser Ports	1				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m³)	1013				
Effluent Density (kg/m³)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		1.30
			Still Water Plume Width, W (m)		0.338
			Still Water Plume Depth, D (m)		0.169
			Still Water Initial Dilution, S		21.89

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	1.31	2.01	0.10	0.10	1.0	1.5	0.5	0.7	0.5	0.7	1	3
-5.5	1.40	2.06	0.01	0.01	1.1	1.6	0.5	0.8	0.4	0.6	2	3
-5.0	1.58	2.17	0.25	0.25	1.2	1.6	0.6	0.8	0.6	0.8	2	3
-4.5	1.83	2.32	0.45	0.45	1.4	1.8	0.7	0.9	0.7	0.9	7	11
-4.0	2.15	2.51	0.48	0.48	1.6	1.9	0.8	0.9	0.9	1.0	10	14
-3.5	2.50	2.72	0.41	0.41	1.9	2.1	0.9	1.0	1.0	1.1	12	14
-3.0	2.87	2.94	0.14	0.14	2.2	2.2	1.1	1.1	1.0	1.0	5	5
-2.5	3.23	3.16	0.02	0.02	2.5	2.4	1.2	1.2	1.0	1.0	6	6
-2.0	3.57	3.36	0.02	0.02	2.7	2.6	1.3	1.2	1.1	1.1	7	7
-1.5	3.85	3.53	0.04	0.04	2.9	2.7	1.4	1.3	1.3	1.2	8	7
-1.0	4.07	3.66	0.01	0.01	3.1	2.8	1.5	1.4	1.3	1.2	9	8
-0.5	4.20	3.74	0.16	0.16	3.2	2.8	1.6	1.4	1.5	1.3	10	8
0.0	4.25	3.77	0.07	0.07	3.2	2.9	1.6	1.4	1.4	1.3	10	8
0.5	4.20	3.74	0.03	0.03	3.2	2.8	1.6	1.4	1.4	1.2	10	8
1.0	4.07	3.66	0.02	0.02	3.1	2.8	1.5	1.4	1.3	1.2	9	8
1.5	3.85	3.53	0.12	0.12	2.9	2.7	1.4	1.3	1.3	1.2	8	7
2.0	3.57	3.36	0.28	0.28	2.7	2.6	1.3	1.2	1.3	1.3	16	14
2.5	3.23	3.16	0.31	0.31	2.5	2.4	1.2	1.2	1.2	1.2	15	14
3.0	2.87	2.94	0.19	0.19	2.2	2.2	1.1	1.1	1.0	1.1	5	5
3.5	2.50	2.72	0.11	0.11	1.9	2.1	0.9	1.0	0.9	0.9	4	5
4.0	2.15	2.51	0.13	0.13	1.6	1.9	0.8	0.9	0.8	0.9	3	4
4.5	1.83	2.32	0.10	0.10	1.4	1.8	0.7	0.9	0.6	0.8	2	4
5.0	1.58	2.17	0.16	0.16	1.2	1.6	0.6	0.8	0.6	0.8	2	3
5.5	1.40	2.06	0.16	0.16	1.1	1.6	0.5	0.8	0.5	0.7	2	3
6.0	1.31	2.01	0.10	0.10	1.0	1.5	0.5	0.7	0.5	0.7	1	3

Minimum	1
Mean	7
Median	7
Maximum	16
Std. Dev.	3.95
95%ile.	1.55



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

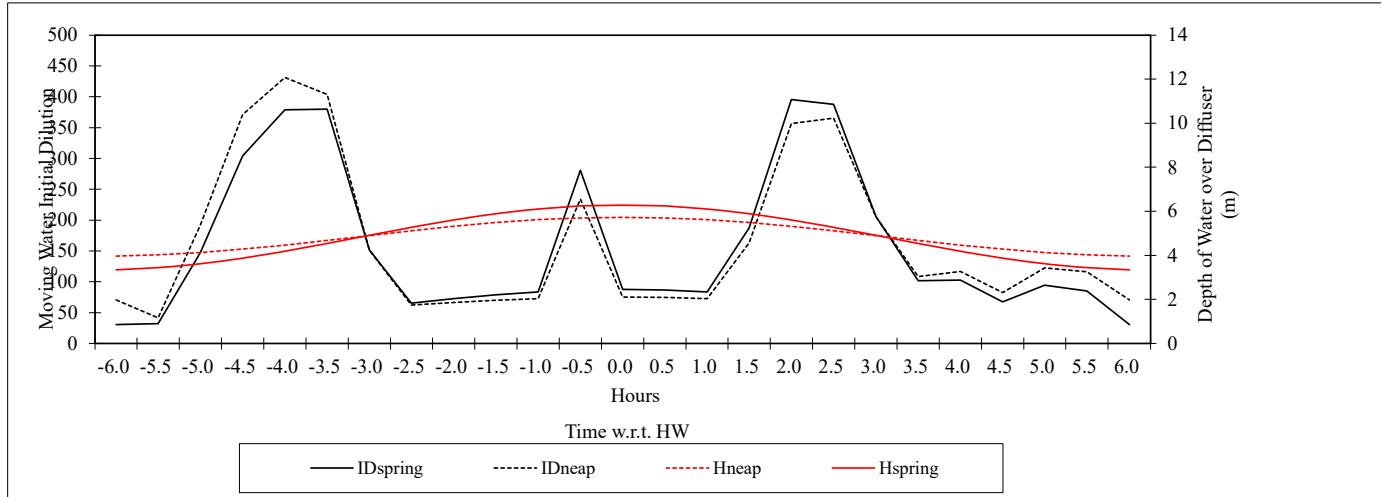
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0060	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	0.7639	Not Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	6.8086	No saline intrusion
Total Effluent Flow (m^3/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0008	
Number of Diffuser Ports	10				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		17.20

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	HSpring	HNeap	USpring	UNeap	WSpring	WNeap	DSpring	DNeap	Spring	Neap	IDSpring	IDNeap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.5	1.8	31	71
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.2	1.4	32	42
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	1.9	2.2	148	192
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	2.4	2.6	304	371
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	2.6	2.8	379	431
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	2.7	2.8	380	404
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	2.3	2.3	152	151
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	1.9	1.9	65	62
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	2.0	1.9	72	66
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	2.3	2.1	79	70
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	2.1	1.9	84	73
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	3.0	2.8	281	234
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	2.6	2.4	88	75
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	2.4	2.2	87	75
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	2.2	2.0	84	73
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	2.7	2.5	187	163
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	3.0	2.9	396	357
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	2.9	2.8	388	365
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	2.5	2.4	206	205
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	2.1	2.1	102	108
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	1.9	2.1	103	117
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	1.7	1.9	68	82
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	1.7	2.0	94	123
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	1.7	1.9	85	116
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.5	1.8	31	71

Minimum	31
Mean	160
Median	102
Maximum	431
Std. Dev.	121.99
95%ile.	36.46



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

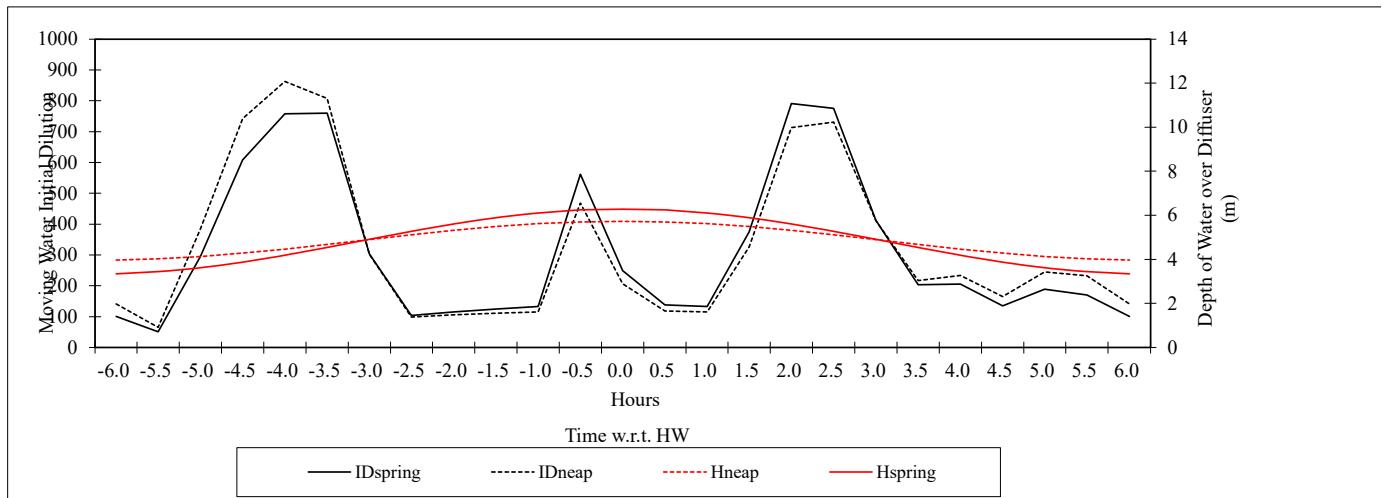
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0030	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	0.3820	Not Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	3.4043	No saline intrusion
Total Effluent Flow (m^3/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0004	
Number of Diffuser Ports	20				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		21.62

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t. HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.7	2.0	101	142
-5.5	3.44	4.02	0.01	0.01	2.6	3.1	1.3	1.5	1.3	1.5	51	66
-5.0	3.62	4.13	0.25	0.25	2.8	3.1	1.3	1.5	2.3	2.6	295	384
-4.5	3.87	4.28	0.45	0.45	2.9	3.3	1.4	1.6	2.8	3.1	608	742
-4.0	4.19	4.47	0.48	0.48	3.2	3.4	1.5	1.7	3.1	3.3	757	862
-3.5	4.54	4.68	0.41	0.41	3.4	3.6	1.7	1.7	3.2	3.3	760	808
-3.0	4.91	4.90	0.14	0.14	3.7	3.7	1.8	1.8	2.7	2.7	303	303
-2.5	5.27	5.12	0.02	0.02	4.0	3.9	2.0	1.9	2.1	2.0	104	99
-2.0	5.61	5.32	0.02	0.02	4.3	4.0	2.1	2.0	2.2	2.1	115	105
-1.5	5.89	5.49	0.04	0.04	4.5	4.2	2.2	2.0	2.5	2.4	125	111
-1.0	6.11	5.62	0.01	0.01	4.6	4.3	2.3	2.1	2.2	2.0	133	116
-0.5	6.24	5.70	0.16	0.16	4.7	4.3	2.3	2.1	3.5	3.2	561	468
0.0	6.29	5.73	0.07	0.07	4.8	4.4	2.3	2.1	3.0	2.7	249	207
0.5	6.24	5.70	0.03	0.03	4.7	4.3	2.3	2.1	2.6	2.3	138	118
1.0	6.11	5.62	0.02	0.02	4.6	4.3	2.3	2.1	2.4	2.2	133	116
1.5	5.89	5.49	0.12	0.12	4.5	4.2	2.2	2.0	3.1	2.9	375	326
2.0	5.61	5.32	0.28	0.28	4.3	4.0	2.1	2.0	3.6	3.4	792	713
2.5	5.27	5.12	0.31	0.31	4.0	3.9	2.0	1.9	3.5	3.4	775	731
3.0	4.91	4.90	0.19	0.19	3.7	3.7	1.8	1.8	2.9	2.9	412	411
3.5	4.54	4.68	0.11	0.11	3.4	3.6	1.7	1.7	2.3	2.4	204	217
4.0	4.19	4.47	0.13	0.13	3.2	3.4	1.5	1.7	2.2	2.4	205	234
4.5	3.87	4.28	0.10	0.10	2.9	3.3	1.4	1.6	2.0	2.2	135	165
5.0	3.62	4.13	0.16	0.16	2.8	3.1	1.3	1.5	2.0	2.3	189	246
5.5	3.44	4.02	0.16	0.16	2.6	3.1	1.3	1.5	1.9	2.2	171	233
6.0	3.35	3.97	0.10	0.10	2.5	3.0	1.2	1.5	1.7	2.0	101	142

Minimum	51
Mean	317
Median	212
Maximum	862
Std. Dev.	247.38
95%ile.	99.89



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

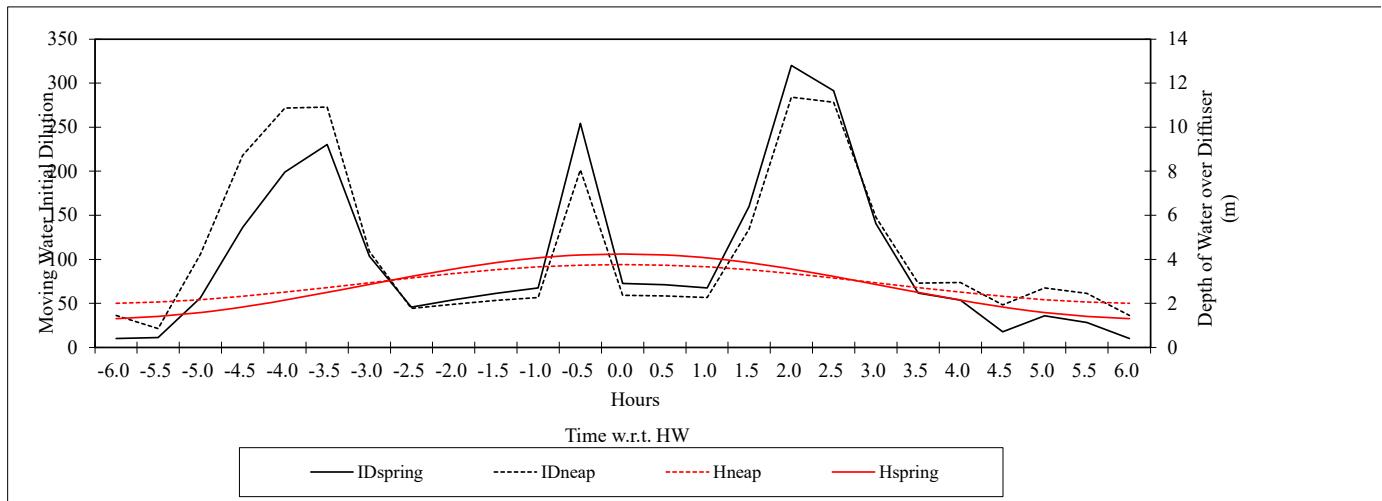
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m^3/s)	0.0030	
Total Water Depth at MLWS (m)	1.4		Velocity at Port, Ui (m/s)	0.3820	Not Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	2.1		Densimetric Froude No, F	3.4043	No saline intrusion
Total Effluent Flow (m^3/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0004	
Number of Diffuser Ports	20				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		1.30
			Still Water Plume Width, W (m)		0.338
			Still Water Plume Depth, D (m)		0.169
			Still Water Initial Dilution, S		6.39

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	1.31	2.01	0.10	0.10	1.0	1.5	0.5	0.7	0.7	1.0	10	36
-5.5	1.40	2.06	0.01	0.01	1.1	1.6	0.5	0.8	0.5	0.8	11	22
-5.0	1.58	2.17	0.25	0.25	1.2	1.6	0.6	0.8	1.0	1.4	56	106
-4.5	1.83	2.32	0.45	0.45	1.4	1.8	0.7	0.9	1.3	1.7	136	218
-4.0	2.15	2.51	0.48	0.48	1.6	1.9	0.8	0.9	1.6	1.9	199	272
-3.5	2.50	2.72	0.41	0.41	1.9	2.1	0.9	1.0	1.8	1.9	230	273
-3.0	2.87	2.94	0.14	0.14	2.2	2.2	1.1	1.1	1.6	1.6	104	109
-2.5	3.23	3.16	0.02	0.02	2.5	2.4	1.2	1.2	1.3	1.2	46	44
-2.0	3.57	3.36	0.02	0.02	2.7	2.6	1.3	1.2	1.4	1.3	54	49
-1.5	3.85	3.53	0.04	0.04	2.9	2.7	1.4	1.3	1.7	1.5	62	53
-1.0	4.07	3.66	0.01	0.01	3.1	2.8	1.5	1.4	1.5	1.3	67	57
-0.5	4.20	3.74	0.16	0.16	3.2	2.8	1.6	1.4	2.3	2.1	254	202
0.0	4.25	3.77	0.07	0.07	3.2	2.9	1.6	1.4	2.0	1.8	73	59
0.5	4.20	3.74	0.03	0.03	3.2	2.8	1.6	1.4	1.7	1.5	71	59
1.0	4.07	3.66	0.02	0.02	3.1	2.8	1.5	1.4	1.6	1.4	67	57
1.5	3.85	3.53	0.12	0.12	2.9	2.7	1.4	1.3	2.0	1.9	160	135
2.0	3.57	3.36	0.28	0.28	2.7	2.6	1.3	1.2	2.3	2.2	320	284
2.5	3.23	3.16	0.31	0.31	2.5	2.4	1.2	1.2	2.1	2.1	291	278
3.0	2.87	2.94	0.19	0.19	2.2	2.2	1.1	1.1	1.7	1.7	141	148
3.5	2.50	2.72	0.11	0.11	1.9	2.1	0.9	1.0	1.3	1.4	62	73
4.0	2.15	2.51	0.13	0.13	1.6	1.9	0.8	0.9	1.1	1.3	54	74
4.5	1.83	2.32	0.10	0.10	1.4	1.8	0.7	0.9	0.9	1.2	18	48
5.0	1.58	2.17	0.16	0.16	1.2	1.6	0.6	0.8	0.9	1.2	36	68
5.5	1.40	2.06	0.16	0.16	1.1	1.6	0.5	0.8	0.8	1.2	28	61
6.0	1.31	2.01	0.10	0.10	1.0	1.5	0.5	0.7	0.7	1.0	10	36

Minimum	10
Mean	108
Median	67
Maximum	320
Std. Dev.	88.53
95%ile.	14.35



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe 0

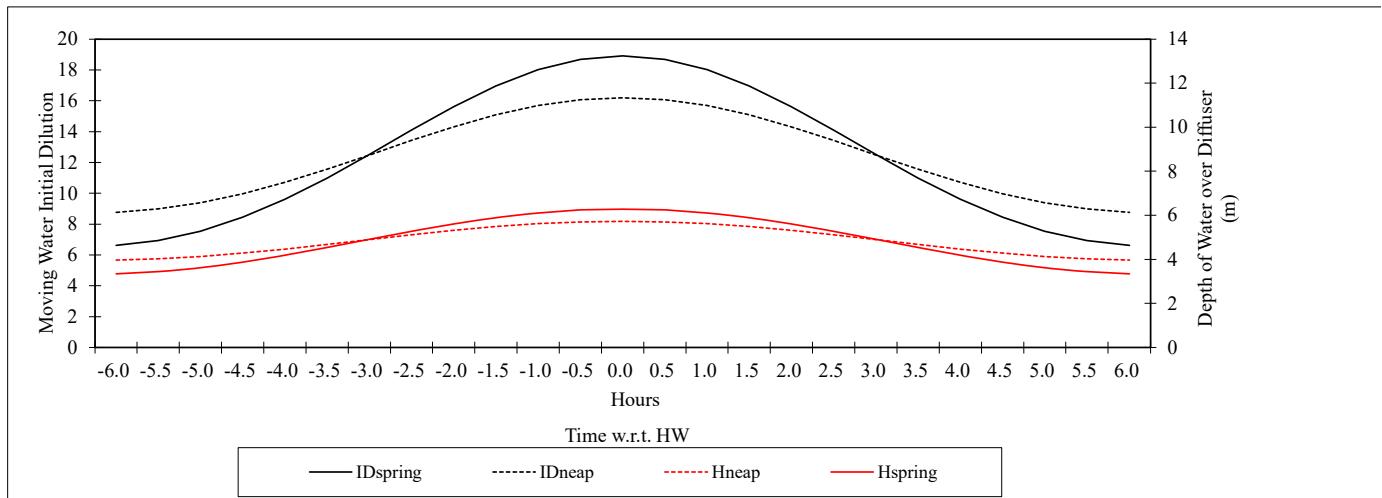
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Qi (m³/s)	0.0600	
Total Water Depth at MLWS (m)	3.4		Velocity at Port, Ui (m/s)	7.6394	Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	4.1		Densimetric Froude No, F	68.0863	No saline intrusion
Total Effluent Flow (m³/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0076	
Number of Diffuser Ports	1				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m³)	1013				
Effluent Density (kg/m³)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		3.34
			Still Water Plume Width, W (m)		0.8684
			Still Water Plume Depth, D (m)		0.4342
			Still Water Initial Dilution, S		27.85

Moving Water Predictions using WRc (1990) equations. (with dilution constants C1 & C3 = 0.27)												
Time w.r.t. HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	Hspring	Hneap	Uspring	Uneap	Wspring	Wneap	Dspring	Dneap	Spring	Neap	IDspring	IDneap
-6.0	3.35	3.97	0.00	0.00	2.5	3.0	1.2	1.5	1.0	1.2	7	9
-5.5	3.44	4.02	0.00	0.00	2.6	3.1	1.3	1.5	1.0	1.2	7	9
-5.0	3.62	4.13	0.00	0.00	2.8	3.1	1.3	1.5	1.1	1.2	8	9
-4.5	3.87	4.28	0.00	0.00	2.9	3.3	1.4	1.6	1.2	1.3	8	10
-4.0	4.19	4.47	0.00	0.00	3.2	3.4	1.5	1.7	1.3	1.3	10	11
-3.5	4.54	4.68	0.00	0.00	3.4	3.6	1.7	1.7	1.4	1.4	11	12
-3.0	4.91	4.90	0.00	0.00	3.7	3.7	1.8	1.8	1.5	1.5	13	12
-2.5	5.27	5.12	0.00	0.00	4.0	3.9	2.0	1.9	1.6	1.5	14	13
-2.0	5.61	5.32	0.00	0.00	4.3	4.0	2.1	2.0	1.7	1.6	16	14
-1.5	5.89	5.49	0.00	0.00	4.5	4.2	2.2	2.0	1.8	1.6	17	15
-1.0	6.11	5.62	0.00	0.00	4.6	4.3	2.3	2.1	1.8	1.7	18	16
-0.5	6.24	5.70	0.00	0.00	4.7	4.3	2.3	2.1	1.9	1.7	19	16
0.0	6.29	5.73	0.00	0.00	4.8	4.4	2.3	2.1	1.9	1.7	19	16
0.5	6.24	5.70	0.00	0.00	4.7	4.3	2.3	2.1	1.9	1.7	19	16
1.0	6.11	5.62	0.00	0.00	4.6	4.3	2.3	2.1	1.8	1.7	18	16
1.5	5.89	5.49	0.00	0.00	4.5	4.2	2.2	2.0	1.8	1.6	17	15
2.0	5.61	5.32	0.00	0.00	4.3	4.0	2.1	2.0	1.7	1.6	16	14
2.5	5.27	5.12	0.00	0.00	4.0	3.9	2.0	1.9	1.6	1.5	14	13
3.0	4.91	4.90	0.00	0.00	3.7	3.7	1.8	1.8	1.5	1.5	13	12
3.5	4.54	4.68	0.00	0.00	3.4	3.6	1.7	1.7	1.4	1.4	11	12
4.0	4.19	4.47	0.00	0.00	3.2	3.4	1.5	1.7	1.3	1.3	10	11
4.5	3.87	4.28	0.00	0.00	2.9	3.3	1.4	1.6	1.2	1.3	8	10
5.0	3.62	4.13	0.00	0.00	2.8	3.1	1.3	1.5	1.1	1.2	8	9
5.5	3.44	4.02	0.00	0.00	2.6	3.1	1.3	1.5	1.0	1.2	7	9
6.0	3.35	3.97	0.00	0.00	2.5	3.0	1.2	1.5	1.0	1.2	7	9

Minimum	7
Mean	12
Median	12
Maximum	19
Std. Dev.	3.65
95%ile.	6.93



Scheme Title :-	Rest of Bowline
Diffuser Arrangement:-	Single pipe

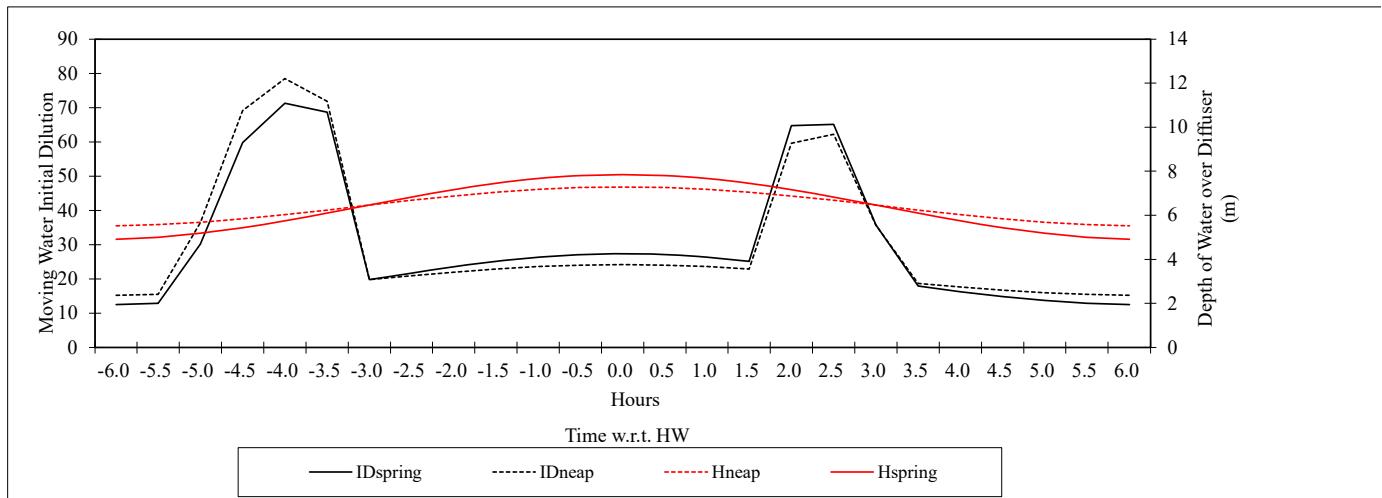
Flow Conditions:-

Rate :-	95th Percentile ambient water
Year :-	2010
Season :-	June

Design Parameter	Value	Comment	Hydraulic Condition	Value	Comment
Mean Spring Tidal Range (m)	3.0		Flow per port, Q_i (m^3/s)	0.0600	
Total Water Depth at MLWS (m)	5.0		Velocity at Port, U_i (m/s)	7.6394	Self-Cleansing
Mean Neap Tidal Range (m)	1.8		Velocity in Outfall (m/s)	1.2223	Self-Cleansing
Total Water Depth at MLWN (m)	5.6		Densimetric Froude No, F	68.0863	No saline intrusion
Total Effluent Flow (m^3/s)	0.0600	Max flow for min ID, mean flow for mean ID	Buoyancy Flux, B	0.0076	
Number of Diffuser Ports	1				
Height of Ports above Bed (m)	0.1				
Diameter of Diffuser Ports (m)	0.100	Internal, could be same as diameter of outfall			
Diameter of Outfall (m)	0.250	Internal			
Ambient Water Density (kg/m^3)	1013				
Effluent Density (kg/m^3)	1000				
Still Water Prediction at MLWS using Cederwall (1988) equations.					
			Water Depth over Diffuser Port, H (m)		4.90
			Still Water Plume Width, W (m)		1.274
			Still Water Plume Depth, D (m)		0.637
			Still Water Initial Dilution, S		32.78

Moving Water Predictions using WRc (1990) equations. (with dilution constants $C_1 & C_3 = 0.27$)												
Time w.r.t HW (hours)	Depth of water over Diffuser Port (m)		Ambient Current Velocity (m/s)		Moving Water Plume Width (m)		Moving Water Plume Depth (m)		Minimum required port separation (m)		Moving Water Initial Dilution	
	HSpring	HNeap	USpring	UNeap	WSpring	WNeap	DSpring	DNeap	Spring	Neap	IDSpring	IDNeap
-6.0	4.91	5.53	0.10	0.10	3.7	4.2	1.8	2.0	1.7	1.9	13	15
-5.5	5.00	5.58	0.01	0.01	3.8	4.2	1.9	2.1	1.6	1.8	13	16
-5.0	5.18	5.69	0.25	0.25	3.9	4.3	1.9	2.1	1.9	2.1	30	36
-4.5	5.43	5.84	0.45	0.45	4.1	4.4	2.0	2.2	2.2	2.3	60	69
-4.0	5.75	6.03	0.48	0.48	4.4	4.6	2.1	2.2	2.3	2.4	71	78
-3.5	6.10	6.24	0.41	0.41	4.6	4.7	2.3	2.3	2.4	2.4	69	72
-3.0	6.47	6.46	0.14	0.14	4.9	4.9	2.4	2.4	2.3	2.3	20	20
-2.5	6.83	6.68	0.02	0.02	5.2	5.1	2.5	2.5	2.2	2.1	22	21
-2.0	7.17	6.88	0.02	0.02	5.4	5.2	2.7	2.5	2.3	2.2	24	22
-1.5	7.45	7.05	0.04	0.04	5.7	5.4	2.8	2.6	2.5	2.3	25	23
-1.0	7.67	7.18	0.01	0.01	5.8	5.5	2.8	2.7	2.4	2.3	26	24
-0.5	7.80	7.26	0.16	0.16	5.9	5.5	2.9	2.7	2.8	2.6	27	24
0.0	7.85	7.29	0.07	0.07	6.0	5.5	2.9	2.7	2.7	2.5	27	24
0.5	7.80	7.26	0.03	0.03	5.9	5.5	2.9	2.7	2.5	2.4	27	24
1.0	7.67	7.18	0.02	0.02	5.8	5.5	2.8	2.7	2.5	2.3	26	24
1.5	7.45	7.05	0.12	0.12	5.7	5.4	2.8	2.6	2.6	2.5	25	23
2.0	7.17	6.88	0.28	0.28	5.4	5.2	2.7	2.5	2.7	2.6	65	60
2.5	6.83	6.68	0.31	0.31	5.2	5.1	2.5	2.5	2.6	2.5	65	62
3.0	6.47	6.46	0.19	0.19	4.9	4.9	2.4	2.4	2.3	2.3	36	36
3.5	6.10	6.24	0.11	0.11	4.6	4.7	2.3	2.3	2.1	2.2	18	19
4.0	5.75	6.03	0.13	0.13	4.4	4.6	2.1	2.2	2.0	2.1	16	18
4.5	5.43	5.84	0.10	0.10	4.1	4.4	2.0	2.2	1.9	2.0	15	17
5.0	5.18	5.69	0.16	0.16	3.9	4.3	1.9	2.1	1.9	2.0	14	16
5.5	5.00	5.58	0.16	0.16	3.8	4.2	1.9	2.1	1.8	2.0	13	16
6.0	4.91	5.53	0.10	0.10	3.7	4.2	1.8	2.0	1.7	1.9	13	15

Minimum	13
Mean	31
Median	24
Maximum	78
Std. Dev.	19.45
95%ile.	12.92





APPENDIX F

CALCULATION EQUATIONS



Buoyancy dominated near field (BDNF)

In this case the discharge is influenced primarily by the density difference between the effluent and the receiving water and occurs in conditions of weak ambient current, i.e. when:

$$\underline{H < \frac{5B}{U_a^3}}$$

Where:

H = water depth from point of discharge to free surface (m)
U_a = ambient current velocity (m/s)

B = buoyancy flux of effluent discharge $B = \left[\frac{\rho_a - \rho_o}{\rho_a} \right] g q_p$

ρ_a = Ambient water density

ρ_o = Jet effluent density

g = Acceleration due to gravity

q_p = Port flow

C₁ and C₃ Dilution constants (assume median minimum values: C₁ and C₃ = 0.27)

In this condition, the minimum initial dilution (S) at the water surface is given by:

$$\underline{S = C_1 \frac{B^{1/3} H^{5/3}}{q_p}}$$

NB: minimum initial dilution refers to the point of maximum effluent concentration in surface boil above discharge.

Buoyancy Dominated Far Field (BDFF)

The BDFF condition exists where:

$$\underline{H > \frac{5B}{U_a^3}}$$

and in this case:

$$\underline{S = C_3 \frac{U_a H^2}{q_p}}$$

The dilution constants (C1 and C3) are used to express the variability of minimum dilution which occurs in practice. In line with the EA and WRc guidance, it is assumed that the dilution constants equal 0.27, yielding a value of minimum dilution, which is likely to be exceeded in 50% of samples collected from the area of maximum effluent concentration.

While the salinity of the estuary will vary over the tidal cycle, the model does not have the facility to model varying density with time. Therefore, a brackish density has been utilised for the receiving water course.

Variation over a Tidal Cycle

Initial dilution will vary significantly over a tidal cycle due to changes in both water depth and ambient velocity. The calculation of initial dilution therefore calculates dilution at 30 min intervals over a tidal cycle,

accounting for changes in water depth and current velocity. Adopting a conservative approach, the 95th percentile initial dilution calculated over the period of a tidal cycle is then adopted as the dilution factor.