AGL Upstream Investments Pty Ltd

2015 Groundwater and Surface Water Monitoring Status Report

Gloucester Gas Project

9 December 2015

PARSONS BRINCKERHOFF

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Author, Reviewer and Approver details			
Prepared by:	Chris Richard, Carolina Sardella	Date: 09/12/2015	Signature: 
Reviewed by:	Becky Rollins	Date: 09/12/2015	Signature: 
Approved by:	David Whiting	Date: 09/12/2015	Signature: 

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Parsons Brinckerhoff Australia Pty Limited *ABN 80 078 004 798* Level 27 Ernst & Young Centre 680 George Street Sydney NSW 2000 GPO Box 5394 Sydney NSW 2001 Australia Tel: +61 2 9272 5100 Fax: +61 2 9272 5101 www.pbworld.com *Certified to ISO 9001, ISO 14001, OHSAS 18001*

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Glossary

Alluvium	Unconsolidated sediments (clays, sands, gravels and other materials) deposited by flowing water. Deposits can be made by streams on river beds, floodplains, and alluvial fans.
Alluvial aquifer	Permeable zones that store and produce groundwater from unconsolidated alluvial sediments. Shallow alluvial aquifers are generally unconfined aquifers.
Ammonia	A compound of nitrogen and hydrogen (NH_3) that is a common by-product of animal waste and landfills but is also found naturally in reduced environments. Ammonia readily converts to nitrate in soils and streams.
Aquifer	Rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water.
Aquifer, confined	An aquifer that is overlain by low permeability strata. The hydraulic conductivity of the confining bed is significantly lower than that of the aquifer.
Aquifer, semi-confined	An aquifer overlain by a low-permeability layer that permits water to slowly flow through it. During pumping, recharge to the aquifer can occur across the leaky confining layer – also known as a leaky artesian or leaky confined aquifer.
Aquifer, unconfined	Also known as a water table aquifer. An aquifer in which there are no confining beds between the zone of saturation and the surface. The water table is the upper boundary of an unconfined aquifer.
Australian Height Datum (AHD)	The reference point (very close to mean sea level) for all elevation measurements, and used for correlating depths of aquifers and water levels in bores.
Baseline sampling	A period of regular water quality and water level measurements that are carried out over a period long enough to determine the variability in groundwater conditions.
Beneficial aquifer	Aquifers found in the alluvium and Narrabeen Group sandstones less than 75 m from surface.
Bore	A structure drilled below the surface to obtain water from an aquifer or series of aquifers.
Claystone	A non-fissile rock of sedimentary origin composed primarily of clay-sized particles (less than 0.004 mm).
Coal	A sedimentary rock derived from the compaction and consolidation of vegetation or swamp deposits to form a fossilised carbonaceous rock.
Coal seam	A layer of coal within a sedimentary rock sequence.

Coal seam gas (CSG)	Coal seam gas is a form of natural gas (predominantly methane) that is extracted from coal seams.
Concentration	The amount or mass of a substance present in a given volume or mass of sample, usually expressed as milligram per litre (water sample) or micrograms per kilogram (sediment sample).
Conceptual model	A simplified and idealised representation (usually graphical) of the physical hydrogeologic setting and the hydrogeological understanding of the essential flow processes of the system. This includes the identification and description of the geologic and hydrologic framework, media type, hydraulic properties, sources and sinks, and important aquifer flow and surface-groundwater interaction processes.
Confining layer	Low permeability strata that may be saturated but will not allow water to move through it under natural hydraulic gradients.
Data logger	A digital recording instrument that is inserted in monitoring and pumping bores to record pressure measurements and water level variations.
Drawdown	A lowering of the water table in an unconfined aquifer or the pressure surface of a confined aquifer caused by pumping of groundwater from bores and wells.
Dual permeability aquifer	An aquifer in which groundwater flow is through both the primary porosity of the rock matrix and the secondary porosity of fractures and fissures.
Electrical conductivity (EC)	A measure of a fluid's ability to conduct an electrical current and is an estimation of the total ions dissolved. It is often used as a measure of water salinity.
Flow testing	A gas and water appraisal program (generally carried out over several months) to determine the dewatering profile required to flow gas from one or several test production wells completed for exploration purposes.
Fracture	Breakage in a rock or mineral along a direction or directions that are not cleavage or fissility directions.
Fractured rock aquifer	These occur in sedimentary, igneous and metamorphosed rocks which have been subjected to disturbance, deformation, or weathering, and which allow water to move through joints, bedding planes, fractures and faults. Although fractured rock aquifers are found over a wide area, they generally contain much less groundwater than alluvial and porous sedimentary rock aquifers.
Groundwater	The water contained in interconnected pores or fractures located below the water table in the saturated zone.
Groundwater level	The water level measured in a bore; this may be at or close to the water table in unconfined aquifers, or represent the average piezometric level across the screened interval in confined aquifers.

Hydraulic conductivity	The rate at which water of a specified density and kinematic viscosity can move through a permeable medium (notionally equivalent to the permeability of an aquifer to fresh water).
Hydraulic gradient	The change in total hydraulic head with a change in distance in a given direction.
Hydraulic head	A specific measurement of water pressure above a datum. It is usually measured as a water surface elevation, expressed in units of length. In an aquifer, it can be calculated from the depth to water in a monitoring bore. The hydraulic head can be used to determine a hydraulic gradient between two or more points.
Hydrochemistry	Chemical characterisation of water (both surface water and groundwater).
Hydrogeology	The study of the interrelationships of geologic materials and processes with water, especially groundwater.
Hydrology	The study of the occurrence, distribution, and chemistry of all surface waters.
Lithology	The study of rocks and their depositional or formational environment on a large specimen or outcrop scale.
Monitoring bore	A non-pumping bore, is generally of small diameter that is used to measure the elevation of the water table and/or water quality. Bores generally have a short well screen against a single aquifer through which water can enter.
Permeable material	Material that permits water to move through it at perceptible rates under the hydraulic gradients normally present.
Permian	The last period of the Palaeozoic era that finished approximately 252 million years before present.
pH	Potential of Hydrogen; the logarithm of the reciprocal of hydrogen-ion concentration in gram atoms per litre; provides a measure on a scale from 0 to 14 of the acidity or alkalinity of a solution (where 7 is neutral, greater than 7 is alkaline and less than 7 is acidic) (Hounslow 1995).
Piezometric pressure	See hydraulic head.
Porosity	The proportion of open space within an aquifer, comprised of intergranular space, pores, vesicles and fractures.
Porosity, primary	The porosity that represents the original pore openings when a rock or sediment formed.
Porosity, secondary	The porosity caused by fractures or weathering in a rock or sediment after it has been formed.
Quaternary	The most recent geological period extending from approximately 2.6 million years ago to the present day.
Recharge	The process which replenishes groundwater, usually by rainfall infiltrating from the ground surface to the water table and by river water reaching the water table or exposed aquifers. The addition of water to an aquifer.

Recharge area	A geographic area that directly receives infiltrated water from surface and in which there are downward components of hydraulic head in the aquifer. Recharge generally moves downward from the water table into the deeper parts of an aquifer then moves laterally and vertically to recharge other parts of the aquifer or deeper aquifer zones.
Recovery	The difference between the observed water level during the recovery period after cessation of pumping and the water level measured immediately before pumping stopped.
Salinity	The concentration of dissolved salts in water, usually expressed in EC units or milligrams of total dissolved solids per litre (mg/L TDS).
Salinity classification	Fresh water quality – water with a salinity <800 µS/cm. Marginal water quality – water that is more saline than freshwater and generally waters between 800 and 1,600 µS/cm. Brackish quality – water that is more saline than freshwater and generally waters between 1,600 and 4,800 µS/cm. Slightly saline quality – water that is more saline than brackish water and generally waters with a salinity between 4,800 and 10,000 µS/cm. Moderately saline quality – water that is more saline than slightly saline water and generally waters between 10,000 and 20,000 µS/cm. Saline quality – water that is almost as saline as seawater and generally waters with a salinity greater than 20,000 µS/cm. Seawater quality – water that is generally around 55,000 µS/cm. (Australian Water Resources Council 1998)
Sandstone	Sandstone is a sedimentary rock composed mainly of sand-sized minerals or rock grains (predominantly quartz).
Screen	A type of bore lining or casing of special construction, with apertures designed to permit the flow of water into a bore while preventing the entry of aquifer or filter pack material.
Sedimentary rock aquifer	These occur in consolidated sediments such as porous sandstones and conglomerates, in which water is stored in the intergranular pores, and limestone, in which water is stored in solution cavities and joints. These aquifers are generally located in sedimentary basins that are continuous over large areas and may be tens or hundreds of metres thick. In terms of quantity, they contain the largest volumes of groundwater.
Shale	A laminated sedimentary rock in which the constituent particles are predominantly of clay size.
Siltstone	A fine-grained rock of sedimentary origin composed mainly of silt-sized particles (0.004 to 0.06 mm).
Stratigraphy	The depositional order of sedimentary rocks in layers.
Surface water-groundwater interaction	This occurs in two ways: (1) streams gain water from groundwater through the streambed when the elevation of the water table adjacent to the streambed is greater than the water level in the stream; and (2) streams lose water to

	groundwater through streambeds when the elevation of the water table is lower than the water level in the stream.
Tertiary	Geologic time at the beginning of the Cainozoic era, 65 to 2.6 million years ago, after the Cretaceous and before the Quaternary.
Tuff	Tuff is a type of volcanic rock consisting of consolidated explosive ash ejected from vents during a volcanic eruption.
Vibrating wire piezometer	An instrument consisting of a vibrating wire element connected to a sensitive diaphragm; designed to measure pore pressures in fully and partially saturated soils and rock in boreholes.
Water bearing zone	Geological strata that are saturated with groundwater but not of sufficient permeability to be called an aquifer.
Water quality	Term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.
Water quality data	Chemical, biological, and physical measurements or observations of the characteristics of surface and ground waters, atmospheric deposition, potable water, treated effluents, and waste water and of the immediate environment in which the water exists.
Water table	The top of an unconfined aquifer. It is at atmospheric pressure and indicates the level below which soil and rock are saturated with water.
Well	Pertaining to a gas exploration well or gas production well.

Abbreviations

AGL	AGL Upstream Investments Pty Ltd
BoM	Bureau of Meteorology
CDFM	Cumulative deviation from mean
CSG	Coal seam gas
EC	Electrical Conductivity
GFDA	Gas Field Development Area
GGP	Gloucester Gas project
LTA	Long term average
MGA	Map Grid of Australia
PEL	Petroleum Exploration Licence
PPL	Petroleum Production Lease
VWP	Vibrating wire piezometer

Units

m	metres
m^3/s	cubic metres per second
mAHD	metres Australian Height Datum
mbgl	metres below ground level
mg/L	Milligrams per litre
m/d	metres per day
µS/cm	microSiemens per centimetre
mm	millimetres

Executive summary

AGL Upstream Investments Pty Ltd (AGL) is proposing to build the Gloucester Gas Project (GGP) which comprises several stages of development facilitating the extraction of coal seam gas from the Gloucester Basin. Part 3A Approval and EPBC Approval has been granted for the Stage 1 Gas Field Development Area (GFDA).

A comprehensive surface water and groundwater monitoring network comprising nested monitoring bores and stream gauges has been established for the GGP. Ongoing site investigations and regional water level and water quality monitoring have continued since monitoring began in January 2011. There was a biannual water sampling event in 2014/15. Additional water quality monitoring programs have been completed for exploration programs including the Waukivory Pilot Program, the Tiedman Irrigation Program and constructed monitoring bores at Wards River.

Rainfall

Total rainfall for the period July 2014 to June 2015 at the AGL weather station was 978 mm, which is comparable to the long term average annual rainfall (979 mm) at Gloucester Post Office. Below average rainfall was observed between September and December 2014. Rainfall events resulting in significantly greater than the long term monthly average occurred in August 2014, December 2014 and May 2015.

Groundwater

Groundwater level trends in monitoring bores vary depending on the lithology and depth of the screened interval:

- **Alluvium:** Groundwater levels in monitoring bores screened in the alluvial deposits show a rapid response to significant rainfall events. This is a threshold response, with rainfall events of a certain magnitude required to trigger a response in groundwater levels. This is variable between sites. Most alluvial monitoring bores show a decrease in groundwater levels within the first few months of the monitoring period, before increasing after December 2014 in response to increased rainfall over the remainder of the year.
- **Shallow fractured rock**: Groundwater levels in shallow rock monitoring bores have decreased slightly over the monitoring period in response to the below average rainfall in recent years. There are no strong responses to individual rainfall events in the shallow rock bores during this monitoring period.
- **Interburden units**: Monitoring bores screened within the interburden units show no significant change over the monitoring period, and groundwater levels do not respond to individual rainfall events.
- **Deep coal seams:** Groundwater levels in monitoring bores that are screened within the coal seams show varied but typically small changes in groundwater level over the monitoring period. There are no strong responses to individual rainfall events.

Vertical gradients are noted at nine of the eleven nested bore installations:

- Downward hydraulic gradients were noted at the TCMB, TTMB, FKMB and BWMB nested bore sites.
- Upward hydraulic gradients were noted at the S4MB, RMB, WKMB and WRMB nested bore sites.
- An upward vertical gradient is noted at WKMB06 during periods of low rainfall which trends to a downward gradient following high rainfall and flood events.

No vertical head gradients were noted at the BMB and WMB nested bore sites. Due to the very low permeability of the interburden units, vertical groundwater flow is likely to be extremely slow and negligible,

despite the vertical gradients. Lateral flow within each of the geological units is concluded to be the dominant groundwater flow mechanism when there are no stresses on the shallow or deep groundwater systems.

Groundwater quality is variable across the hydrogeological units. Similarities in water quality variables can be seen between deeper hydrogeological units of the interburden and coal seams. Water quality within the deeper hydrogeological units is distinctly different compared to the shallower alluvium. This is indicated by the ionic composition and salinity of the different groundwater systems.

Surface water

Low rainfall between September and December 2014 resulted in declining water levels at the surface water monitoring locations. Higher rainfall from December 2014 onwards, shows an increase in surface water levels that remain relatively stable (despite responses to rainfall) for the remainder of the monitoring period.

All stream gauges on the Avon River and Dog Trap Creek show rapid responses to large rainfall events and runoff, and relatively steep recession curves, such as associated with the December 2014, April and May 2015 rain events.

Surface water quality is generally characteristic of a slightly to moderately disturbed agricultural catchment. Water quality parameters are generally within the recommended ANZECC (2000) guidelines. Some similarities can be seen between the surface water and shallow alluvium, however generally surface water quality characteristics appear distinctly different from shallow groundwater due to the dominance of rainfall runoff over groundwater baseflow accessions.

1. Introduction

This report is the annual groundwater and surface water monitoring status report for AGL Upstream Investments Pty Ltd (AGL) water monitoring network for the Gloucester Gas Project (GGP) in the Gloucester Basin. This report is for the 2014/15 monitoring period between 1 July 2014 and 30 June 2015 (the monitoring period).

1.1 Background

AGL is proposing to build the GGP which comprises several stages of development facilitating the extraction of coal seam gas (CSG) from the Gloucester Basin. Concept Plan and Project Approval (Part 3A Approval) for the Stage 1 Gas Field Development Area (GFDA) was granted on 22 February 2011 under Part 3A of the *Environmental Planning and Assessment Act (1979)* (EP&A Act). In addition the project received approval under the *Environment Protection and Biodiversity Conservation Act (1999)* (EPBC Act) (EPBC Approval) on 11 February 2013.

AGL holds Petroleum Exploration Licence (PEL) 285, under the *Petroleum (Onshore) Act 1991*, covering the whole of the Gloucester Basin, approximately 100 km north of Newcastle, NSW. AGL has applied for several Petroleum Production Leases (PPL) for the Stage 1 GFDA. The Stage 1 GFDA in relation to the PEL 285 boundary is shown in Figure 1.1. The Stage 1 GFDA with AGL owned properties and the water monitoring network is shown in Figure 1.2.

The GGP will involve the depressurisation of deep groundwater and the extraction of gas from multiple coal seams within the Gloucester Coal Measures. Target coal seam depths will vary from site to site with an expected range of 250 to 1,000 metres below ground level (mbgl). The Stage 1 GFDA includes the construction, operation, and decommissioning of 110 CSG wells and associated infrastructure, including gas and water gathering lines.

Groundwater and surface water studies are required to define baseline conditions (pre-development) and to assess impacts (if any) on water resources and local ecosystems as the GGP is constructed and operated. A dedicated water monitoring network is in place which has enabled the collection of baseline water level, water quality and hydraulic conductivity data for the different groundwater systems and surface water receptors. There are now more than 60 dedicated water monitoring locations and more than four years of baseline monitoring (water levels and water quality) at 54% of sites across the Gloucester Basin. There are 53 locations within the Stage 1 GFDA and 10 locations across the broader area of the Basin.

CSG exploration activities (fracture stimulation and flow testing) were carried out as part of the Waukivory Pilot Project during the monitoring year. AGL received approval from the NSW Office of Coal Seam Gas (OCSG) on 6 August 2014 to fracture stimulate and flow test four existing pilot wells located within the Stage 1 GFDA of the GGP (Parsons Brinckerhoff 2015a, 2015b and 2015c).

1.2 Objectives

The objectives of the continuing groundwater and surface water monitoring program are to:

- Provide baseline information on groundwater levels and groundwater quality and the seasonal trends in levels and quality at monitoring sites across the Gloucester Basin (with a primary focus on the Stage 1 GFDA).
- Provide baseline information on stream levels, flow and water quality in surface water systems across the Gloucester Basin (with a primary focus on the Stage 1 GFDA).

1.3 Scope of works

This report presents groundwater and surface water monitoring data for the GGP monitoring network, with an emphasis on data obtained during the past 12 months.

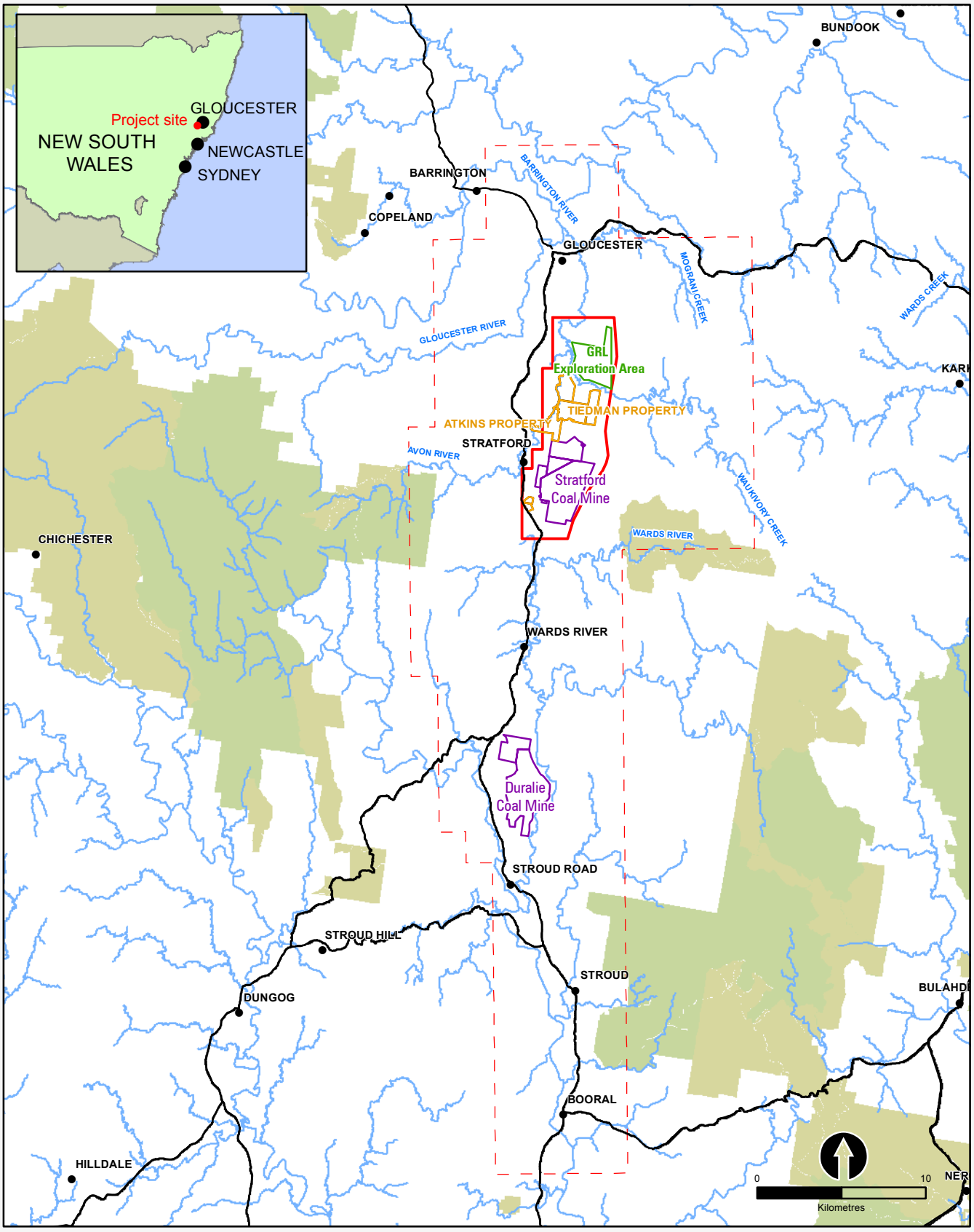
The scope of works for the monitoring year period includes:

- Quarterly groundwater and surface water level monitoring, including data logger downloads and field measurements for verification.
- Maintenance of the water monitoring network and data loggers.
- Groundwater and surface water quality sampling across the entire monitoring network (completed in June 2015).
- Analysis and interpretation of water levels and water quality results with reference to the hydrogeological conceptual model (Parsons Brinckerhoff 2015f).
- Quarterly updates and compilation of an interpreted annual report (this report) on water level and quality trends during the year.

In addition to the water quality sampling undertaken in June 2015, water sampling was carried out in relation to the following exploration programs during the monitoring period across the GGP monitoring network:

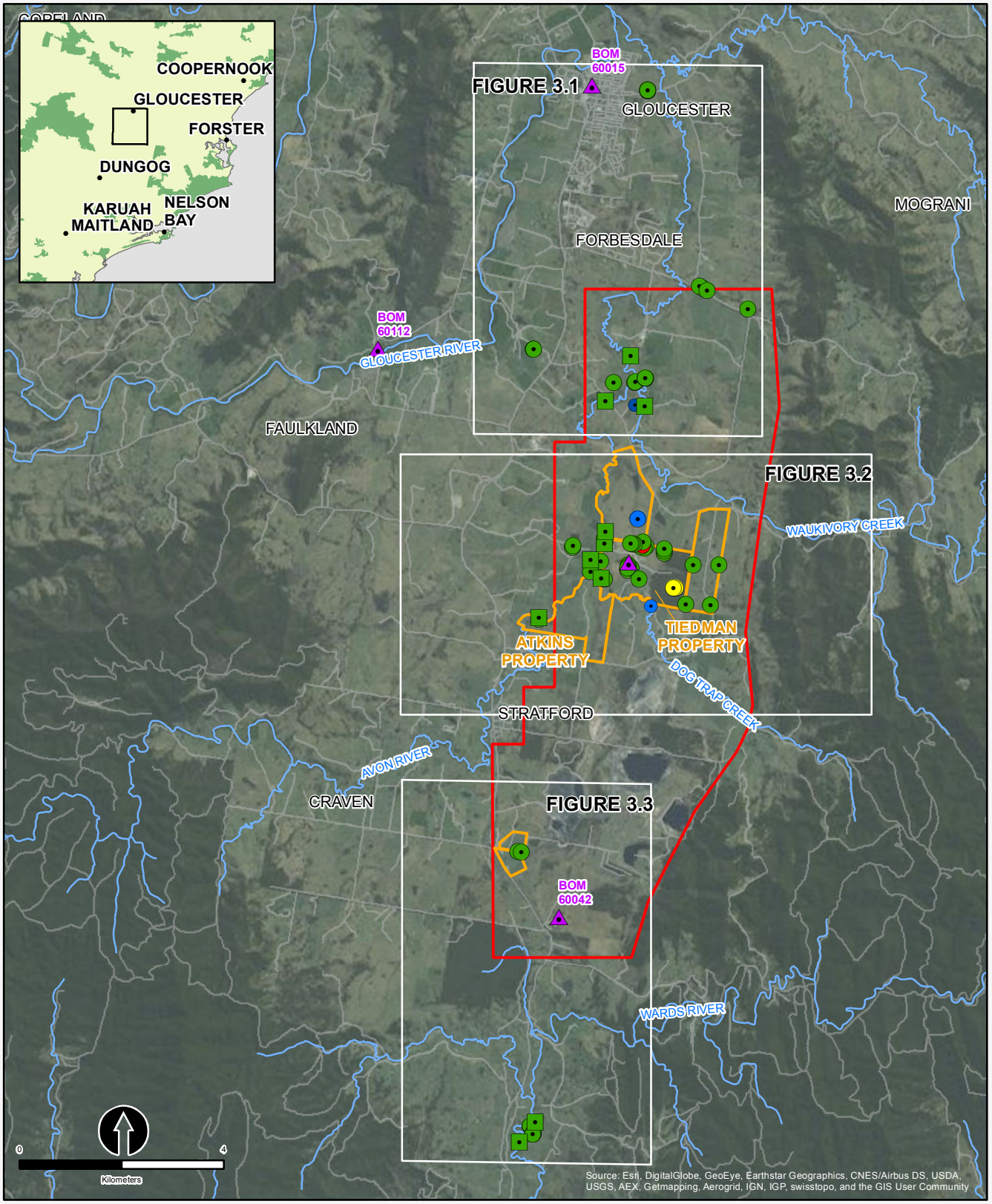
- The Waukivory Pilot Project (Parsons Brinckerhoff 2015a, 2015b and 2015c).
- The Tiedman Irrigation Program (Parsons Brinckerhoff 2015d and 2015e).
- Newly constructed monitoring bores (Parsons Brinckerhoff 2015g).

Data obtained from these programs are not included in the scope of works for this annual status report.



Stage 1 GFDA boundary
PEL 285 boundary
AGL owned properties
Mining Lease Boundary
GRL exploration area boundary
Towns
Rivers and streams
Major roads
NSW State Forest
National Park, Nature Reserve or State Conservation Area

Figure 1.1
Regional location



- Weather station
- Multizone monitoring well
- Shallow gas monitoring bore
- Groundwater monitoring bore
- Test production bore
- VWP Monitoring Piezometers
- Stream gauge
- AGL owned properties
- Stage 1 GFDA boundary
- Rivers and streams
- Roads

Figure 1.2
Groundwater and surface water monitoring network
Gloucester Gas Project

2. Site characterisation

2.1 Rainfall

The Bureau of Meteorology (BoM) operates four weather stations within the Gloucester Basin and AGL operates one weather station on the Tiedman property (Figure 1.2). Average rainfall and the period of monitoring for the BoM stations are presented in Table 2.1.

Table 2.1 BoM stations in the Gloucester Basin (BoM 2015)

BoM station number	Location name	Monitoring period	Long term average annual rainfall (mm)[a]
60015	Gloucester Post Office	1888 to present	979
60112	Gloucester Hiawatha	1976 to present	1014
60042	Craven (Longview)	1961 to present	1057
61071	Stroud Post Office	1889 to present	1144

(a) Long-term average (LTA) annual rainfall (mm) over the stated monitoring period.

The long-term, annual cumulative deviation from mean (CDFM) rainfall for Gloucester Post Office is plotted in Figure 2.1. The long-term cumulative rainfall residual plots are formulated by subtracting the average annual rainfall for the recorded period from the actual annual rainfall and then accumulating these residuals over the assessment period. Periods of below average rainfall are represented as downward trending slopes while periods of above average rainfall are represented as upward trending slopes.

The cumulative deviation plot for Gloucester Post Office (Figure 2.1) shows that over the last 60 years, short (2 to 3 year) drought periods have occurred about every 10 to 15 years, however there have been no long-term deviations from mean conditions such as the prolonged drought periods that characterised the first half of last century. Historically, the period between July and September records the lowest monthly rainfall, while the period between January and March typically has the highest monthly rainfall.

Rainfall for the AGL weather station for the period July 2011 (installation) to June 2015 are presented in Figure 2.2. For this monitoring period (July 2014 – June 2015) rainfall remained mostly consistent with the long term average. Rainfall events resulting in significantly greater than the long term monthly average occurred in August 2014, December 2014 and May 2015.

Total rainfall for the period July 2014 to June 2015 at the AGL weather station was 978 mm, which is comparable to the long term average annual rainfall (979 mm) at Gloucester Post Office.

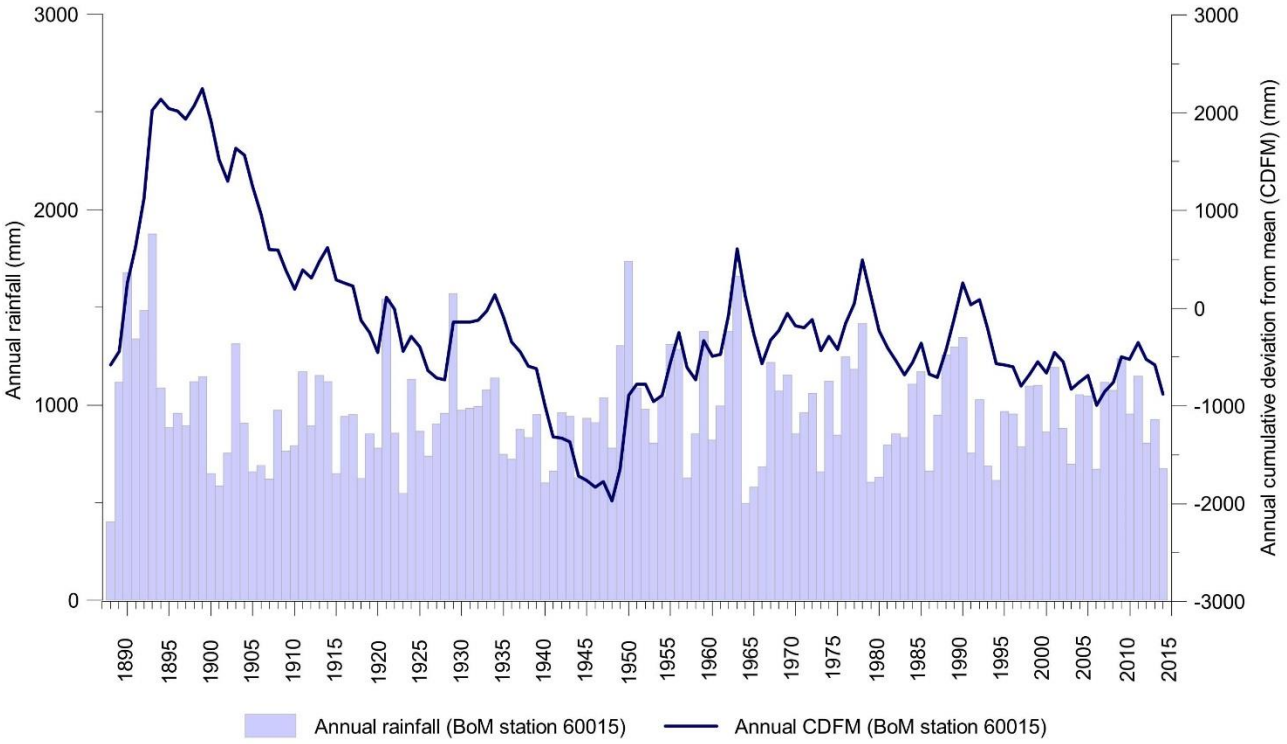


Figure 2.1 **Long term annual rainfall and cumulative deviation from annual mean (CDFM) rainfall at Gloucester Post Office BoM station 060015 (BoM 2015)**

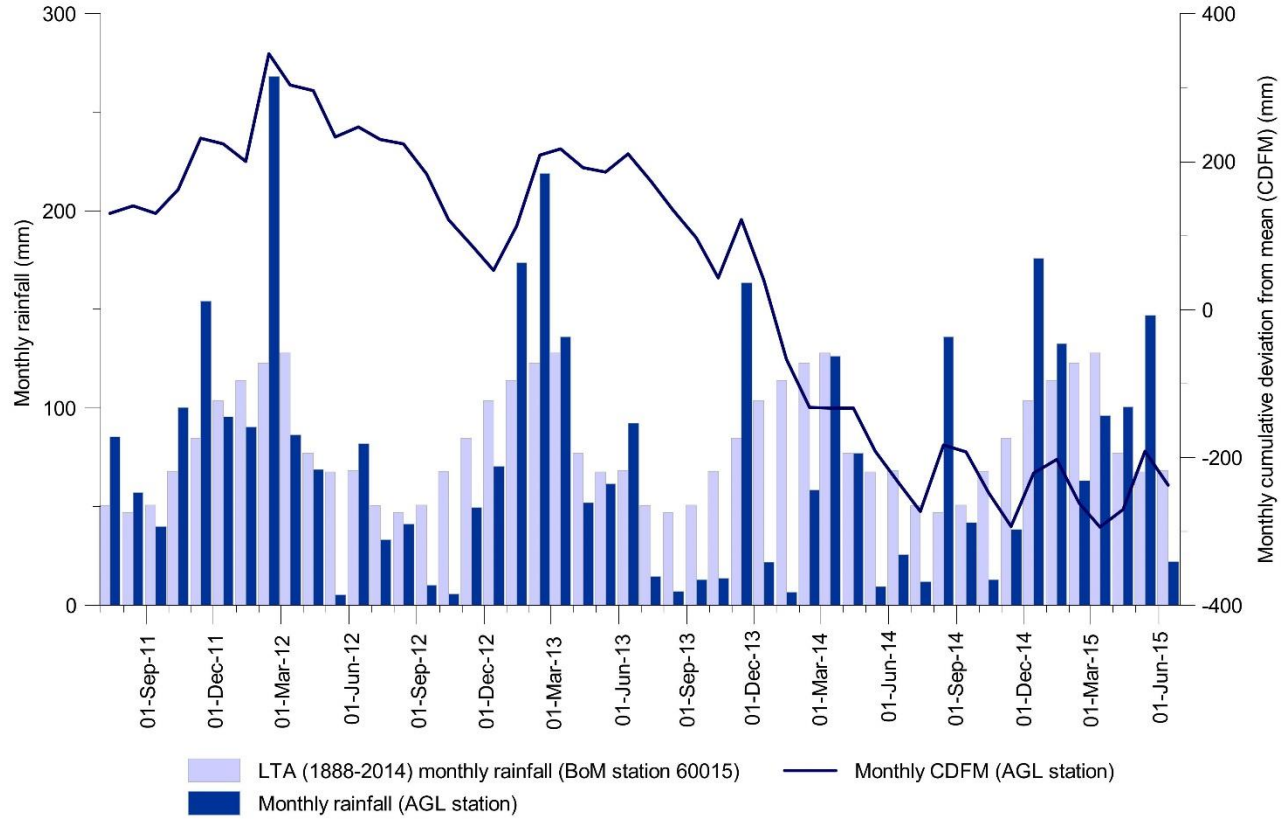


Figure 2.2 **Monitoring period monthly rainfall, and cumulative deviation from the monthly mean (CDFM) rainfall at the AGL Gloucester station (AGL 2015)**

2.2 Surface hydrology

The Gloucester Basin is a narrow, north-south trending, elongated basin approximately 40 km long and 10 km wide, extending from Gloucester in the north to Stroud in the south. The Gloucester Basin is located in the upper reaches of the Manning River and Karuah River coastal catchments. The area occupied by the Permian Coal Measures (about 217 km^2) is small in comparison to the size of these catchments.

Surface water flow in the Gloucester Basin is divided between the Wards River catchment (a sub-catchment of the Karuah River catchment) and the Avon River catchment (a sub-catchment of the Manning River catchment). In the north of the basin, within the Manning River catchment, the surface water flow direction is to the north. In the south of the basin, within the Karuah River catchment, the surface water flow direction is to the south.

Predominantly, surface water flow in the Stage 1 GFDA is within the Avon River catchment, and includes the tributaries of Dog Trap Creek and Waukivory Creek (Figure 1.2). The Gloucester River joins the Avon River in the north of the Gloucester Basin at Gloucester.

2.3 Geological setting

The Gloucester Basin comprises a thick succession of Permian sedimentary rocks representing deposition in both terrestrial and marine environments during a complex period of subsidence, uplift and relative sea level change (marine transgression and regression).

The Basin is a synclinal intermontane structure formed in part of the New England Fold Belt between a major Permian plate margin and the Sydney-Gunnedah Basin (Lennox 2009). The north-south trending synclinal nature of the Gloucester Basin resulted from the collision between the East Australian and Pacific Plates.

Following a period of extension during the Early Permian the Gloucester Basin has undergone periods of normal and reverse faulting, with large scale tilting associated with late stage compressional movements occurring towards the end of the Permian (Hughes 1984). Reverse faults dominate present day structure. A comparison with the contemporary horizontal stress field map (Hillis *et al* 1998) indicates the Basin is likely to be under compression in an east-west orientation.

The stratigraphy dips steeply (up to 90°) on the flanks of the Basin, dipping towards the north-south trending synclinal basin axis and flattening toward the centre of the Basin. Early Permian and Carboniferous hard resistive volcanics form the ridgelines of the Basin; the Mograni Range to the east, and the Gloucester and Barrington Tops to the west.

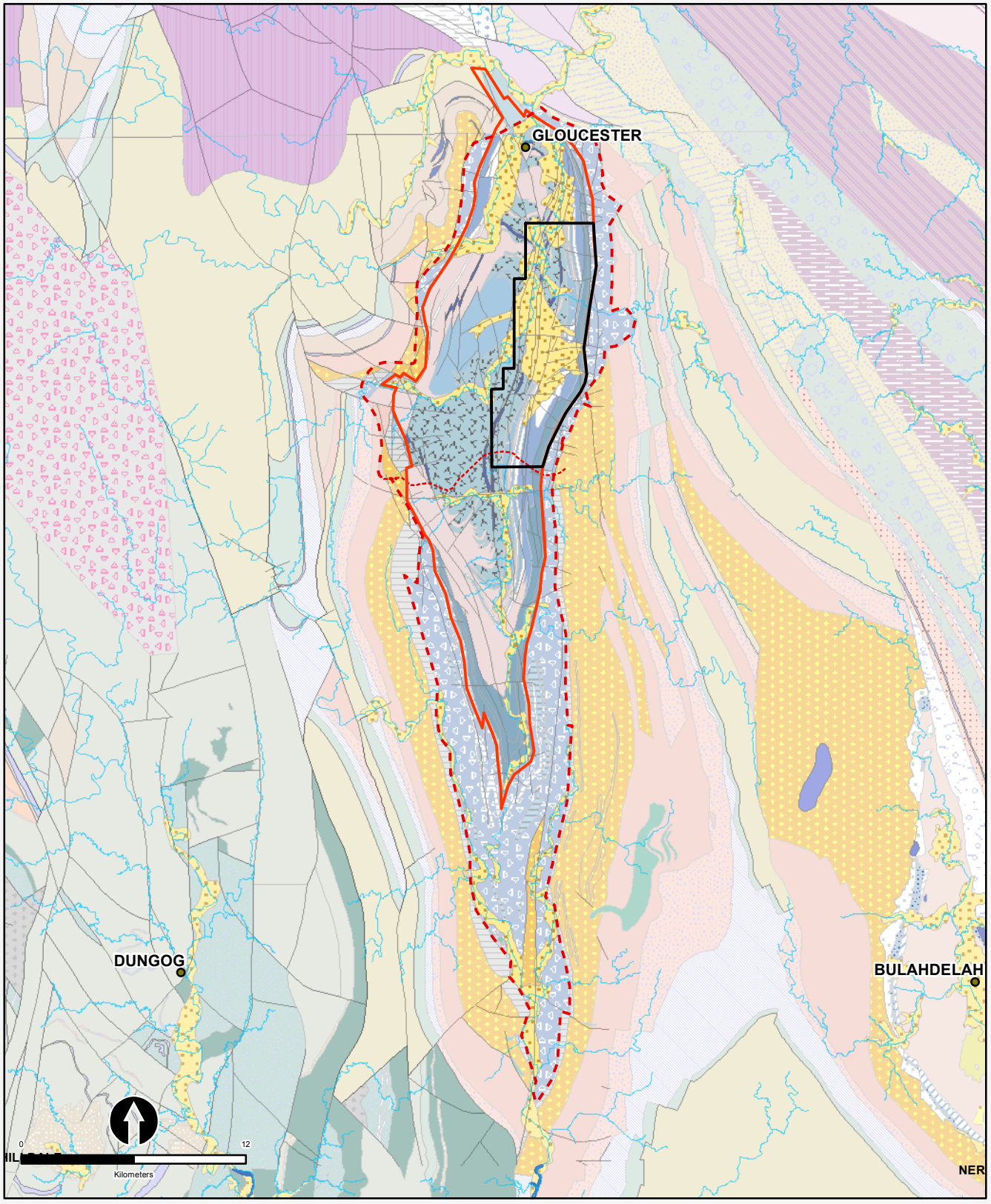
Overlying the Permian stratigraphy is a thin sequence of surficial Quaternary sedimentary deposits and regolith. The Quaternary sediments are variable in thickness, and comprise unconsolidated alluvial sediments (sand, gravel, silt and clay) along the drainage channels and colluvial deposits across the rest of the plain sourced from the surrounding outcropping Permian deposits.

The Gloucester Basin is divided into three major Permian stratigraphic units each representing a distinct depositional setting: the Gloucester Coal Measures, the Dewrang Group, and the Alum Mountain Volcanics. The generalised stratigraphy of the basin is summarised in Table 2.2. A geological map of the basin is shown in Figure 2.3. The CSG development in the Stage 1 GFDA is targeting the intermediate and deep coal seams in the Gloucester Coal Measures generally below depths of 250 m to approximately 1,000 m.

Table 2.2 Stratigraphy of the Gloucester Basin

Period	Group	Sub-group	Formation	Approx. thickness (m)	Coal seam	Depositional environment	Tectonic events
Upper Permian	Gloucester Coal Measures	Craven	Crowthers Road Conglomerate	350		Marine regression, pro-gradation of alluvial fans	Uplift to west of Gloucester Basin
			Leloma	585	Linden		
					JD		
					Bindaboo		
					Deards		
			Jilleon	175	Cloverdale		
					Roseville		
					Tereel/Fairbairns		
			Wards River Conglomerate	Variable			
			Wenham	23.9	Bowens Road		
					Bowens Road Lower		
		Speldon Formation				Marine transgression but also some progradation of alluvial fans in the west related to uplift	Extension (normal fault development) and regional subsidence. Uplift to west of Basin
		Avon	Dog Trap Creek	126	Glenview		
			Waukivory Creek	326	Avon		
					Triple		
					Rombo		
					Glen Road		
					Valley View		
					Parkers Road		
	Dewrang	Mammy Johnsons		300	Mammy Johnsons	Marine transgression, regression and further marine transgression	Extension (normal fault development) and regional subsidence
		Weismantel		20	Weismantel		
		Duralie Road		250			
Lower Permian	Alum Mountain Volcanics				Clareval	Arc-related rift	Rift
					Basal		

Modified from AECOM (2009) and SRK (2005).



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Stage 1 GFDA boundary
Alum Mountain Volcanics boundary
Permian Coal Measures boundary
Rivers and streams
Surface water divide

Gloucester Basin Geology

Qa	Quaternary Alluvium	Plij	Jo Doth Tuff Member	Plt	Dog Trap Creek Formation	Peat	Unnamed Welded Tuff Member
		Plo	Jilleon Formation	Pli	Waukivory Creek Formation	Peac	Unnamed Basal Sequence
		Plw	Wards River Conglomerate	Pldy	Mammy Johnsons Formation	Carboniferous geology	
G	Unnamed microgranite	Pla	Wards River Conglomerate	Plde	Weismantels Formation	Clo1	Johnsons Creek Conglomerate
Permian Geology		Plgx	Gloucester Coal Measures	Pldd	Duralie Road Formation	Clkm	McInnes Formation
Plc	Crowthers Rd Conglomerate	Plh	Wenham Formation	Pea	Alum Mountain Volcanics	Clr	Booral Formation
Pll	Leloma Formation	Plp	Speldon Formation	Pear	Unnamed Rhyolite Member		Fault

Figure 2.3
Geology

2.4 Hydrogeological setting

Four broad hydrogeological units have been identified within the Gloucester Basin (Table 2.3).
The permeability and groundwater flow characteristics within the Gloucester Basin are controlled by several factors including lithology, depth and the degree of fracturing and faulting. In this sense hydrogeological units and flow systems do not always correspond with defined geological boundaries.

Table 2.3 Four hydrogeological units – Gloucester Basin

Unit	Aquifer type	Formation name	General lithology	Hydraulic characteristics
Alluvial aquifers	Semi-confined, clay capped, porous, granular	Quaternary alluvium	Clay/mixed gravels	Heterogeneous, highly variable permeability associated with varying lithology
Shallow fractured rock aquifers (<150m)	Semi-confined, fractured rock	Upper Permian Coal Measures, Alum Mountain Volcanics	Interbedded sandstone/siltstone with bedding plane fractures	Heterogeneous, high and low permeability domains associated with fault zones and fracturing
Deep coal measure Interburden confining unit	Confined, fractured rock	Upper Permian Coal Measures	Interbedded indurated sandstone/siltstone and claystone	Low permeability associated with sparse fractures, permeability decreases with depth
Deep coal seam water bearing zones	Confined, fractured rock	Upper Permian Coal Measures	Coal/shale	Low permeability associated with cleating and fractures in coal seams, permeability decreases with depth

The four hydrogeological units are summarised as follows:

1. **Alluvial deposits –** adjacent to major creeks and rivers comprising unconsolidated sand, gravel and clay. The deposits are typically 12 – 15 m thick. These systems are heterogeneous but generally permeable with rapid recharge, through-flow and discharge associated with interactions with streams, and to a lesser extent with the underlying less permeable shallow rock. Hydraulic conductivity measurements range from 0.3 to 300 metres per day (m/d), averaging around 10 m/d.
2. **Shallow fractured rock –** comprising variably weathered and fractured Permian rocks extending to approximately 150 m below the surface, across all sub-cropping Permian units. The shallow rock zone is heterogeneous with relatively impermeable domains separated by more permeable domains, but on the whole it is more permeable than the deeper coal measures. The domains of higher permeability are due to a higher density of fracturing associated with an irregular weathering profile and the near-surface expression of faulting. Shallow aquifers observed during drilling occur within 75 m of surface. Groundwater flow within this zone is more strongly controlled by weathering and fracturing than the attitude of geological strata. Hydraulic conductivity of the shallow rock ranges from 10 m/d to $1x10^{-6}$ m/d at a depth of 150 m, but is typically in the order of 10^{-3} to 10^{-4} m/d.
3. **Deep Coal Measures interburden –** predominantly sandstone and siltstone units form the interburden to coal seams and are typically of very low permeability, forming aquitards and confining layers. The permeability of the interburden decreases with depth such that, at the maximum depth of CSG production, it is likely to be in the order of 10^{-5} to 10^{-7} m/d, or less.
4. **Deep coal seams –** coal seams tend to be slightly more permeable than interburden and commonly form weak water bearing zones. Permeability and storage are provided by small fractures and cleats in the coal. As with the interburden, drill-stem tests clearly show that the permeability of coal seams generally decreases with depth. At the maximum depth of CSG production, the permeability of coal seams is very low (10^{-4}–10^{-6} m/d), but may be an order of magnitude higher than the interburden.

The Alum Mountain Volcanics underlie the Permian Coal Measures, and form the impermeable base of the Gloucester Basin. The Alum Mountain Volcanics outcrop in the eastern and western boundaries of the basin, forming the elevated topography of the Gloucester and Barrington Tops to the west, and the Mograni Range to the east.

3. Monitoring program

3.1 Monitoring network

AGL's groundwater and surface water monitoring locations are shown in Figure 3.1 (Bucketts Way, Waukivory and Faulklands locations), Figure 3.2 (Atkins, Bignell, Merridong, Pontilands and Tiedman locations), and Figure 3.3 (Rombo and Wards River locations).

The monitoring network was expanded in 2014/15 to include the following groundwater monitoring locations:

- WKMB06A (alluvium) and WKMB06B (Leloma Formation – shallow rock) nested site established at the site of the Waukivory Pilot Program to assess the influence of the thrust fault zone on vertical connectivity.
- A multizone monitoring well (WKMB05) established at the site of the Waukivory Pilot Program with six sensors installed between 340 and 714 mbgl.
- Gas exploration well LMG01 was plugged and abandoned and converted to a vibrating wire piezometer (VWP) installation to provide additional baseline monitoring of the Avon Coal Seam and the overburden.
- Four shallow inclined coal exploration bores (drilled by Yancoal in early 2015) were converted to groundwater monitoring bores screened within the shallow rock on AGL's Merridong property.

Groundwater quality data collected in June 2015 from the four inclined groundwater monitoring bores on AGL's Merridong property have been included in this report. There is no groundwater level data presented in this report for the new LMG01 VWP and Merridong monitoring bores as instrumentation was completed late in 2015. These data will be included in subsequent monitoring reports.

3.1.1 Groundwater

The monitoring network comprises three types of groundwater monitoring installations:

1. Conventional monitoring bores targeting:
    a) The shallow alluvial sediments of the Avon River and its tributaries, and Wards River.
    b) The shallow fractured rock.
    c) The interburden and coal seams of the Gloucester Coal Measures.
2. VWP arrays installed to monitor piezometric pressure (pore pressure) in the deep interburden and a deep coal seam of the Gloucester Coal Measures (PL03 and LMG01).
3. A multizone monitoring well installed to monitor piezometric pressure in the deep interburden and deep coal seams of the Gloucester Coal Measures (WKMB05).

Monitoring bores are often installed in "nested" sites which comprise several bores targeting different depths and hydrogeological units at the one location. The construction details for the GGP groundwater monitoring bores are presented in Table 3.1, the details for the VWP array is presented in Table 3.2 and the details of the multizone monitoring well are presented in Table 3.3.

There are 46 locations within the Stage 1 GFDA, and 10 locations across the broader area of the Basin.

Perched groundwater/seepage monitoring bores (TMB04 and TMB05) exist in the Stage 1 GFDA. However, these sites do not monitor regional groundwater and the monitoring results are not discussed in this report. Shallow gas monitoring bores (TGMB01 and TGMB02) also

Table 3.1 AGL Gloucester groundwater monitoring bores

Monitoring bore	Location	Total depth (mbgl)	Screened interval (mbgl)	Lithology	Formation	Hydrogeological unit
S4MB01	Tiedman	66.0	58.0 – 64.0	Sandstone	Leloma Formation	Shallow fractured rock
S4MB02	Tiedman	97.0	89.0 – 95.0	Sandstone/ siltstone	Leloma Formation	Shallow fractured rock
S4MB03	Tiedman	170.0	162.0 – 168.0	Coal	Jilleon Formation – Cloverdale Coal Seam	Deep Coal Seam
S5MB01	Tiedman	60.0	52.0 – 58.0	Sandstone/ siltstone	Jilleon Formation	Shallow fractured rock
S5MB02	Tiedman	114.0	100.0 – 112.0	Siltstone	Jilleon Formation	Shallow fractured rock
S5MB03	Tiedman	166.0	158.0 – 164.0	Coal/shale	Jilleon Formation – Roseville Coal Seam	Deep Coal Seam
TMB01	Tiedman	12.0	7.0 – 10.0	Clay	Avon River Alluvium	Alluvial
TMB02	Tiedman	15.5	9.0 – 12.0	Mixed gravels	Avon River Alluvium	Alluvial
TMB03	Tiedman	12.5	5.0 – 11.0	Mixed gravels and sand	Avon River Alluvium	Alluvial
TCMB01	Tiedman	90.0	87.0 – 93.0	Sandstone	Leloma Formation	Shallow fractured rock
TCMB02	Tiedman	183.0	175.0 – 181.0	Sandstone	Leloma Formation	Interburden
TCMB03	Tiedman	268.0	260.0 – 266.0	Coal and sandstone	Jilleon Formation – Cloverdale Coal Seam	Deep Coal Seam
TCMB04 (core hole)	Tiedman	334.7	327.3 – 333.3	Coal	Jilleon Formation – Roseville Coal Seam	Deep Coal Seam
AMB01	Atkins	12.6	8.0 – 10.0	Mixed gravels	Avon River Alluvium	Alluvial
AMB02	Atkins	11.5	6.5 – 11.0	Mixed gravels	Avon River Alluvium	Alluvial
BMB01	Bignell	30.0	15.0 – 29.0	Sandstone/ siltstone	Leloma Formation	Shallow fractured rock

Monitoring bore	Location	Total depth (mbgl)	Screened interval (mbgl)	Lithology	Formation	Hydrogeological unit
BMB02	Bignell	138.0	124.0 – 136.0	Sandstone	Leloma Formation	Shallow fractured rock
WMB01	GRL – Waukivory	8.5	5.0 – 8.0	Mixed gravel/ sand	Avon River Alluvium	Alluvial
WMB02	GRL – Waukivory	23.0	15.0 – 21.0	Sandstone	Wenham Formation	Shallow fractured rock
WMB03	GRL – Waukivory	36.0	32.0 – 34.0	Coal	Wenham Formation – Bowens Road Coal Seam	Shallow fractured rock
WMB04	GRL – Waukivory	80.5	67.0 – 79.0	Sandstone	Wenham Formation	Shallow fractured rock
RMB01	Rombo	51.0	42.0 – 48.0	Sandstone	Leloma Formation	Shallow fractured rock
RMB02	Rombo	93.0	85.0 – 91.0	Sandstone	Leloma Formation	Shallow fractured rock
WKMB01	Waukivory Pilot	54.0	47.0 – 53.0	Sandstone	Leloma Formation	Shallow fractured rock
WKMB02	Waukivory Pilot	61.0	51.0 – 60.0	Sandstone/ siltstone	Leloma Formation	Shallow fractured rock
WKMB03	Waukivory Pilot	210.0	200.0 – 209.0	Sandstone	Leloma Formation	Interburden
WKMB06A	Waukivory Pilot	13.4	6.4 – 12.4	Alluvium	Avon River Alluvium	Alluvial
WKMB06B	Waukivory Pilot	63.0	52.0 – 61.0	Sandstone	Leloma Formation	Shallow fractured rock
Farley[a]	Pontilands	N/A	N/A	N/A	N/A	N/A
TTPB	Tiedman	90.0	76.0 – 88.0	Sandstone/ siltstone	Leloma Formation	Shallow fractured rock
TTMB01	Tiedman	90.0	76.0 – 88.0	Sandstone/ siltstone	Leloma Formation	Shallow fractured rock
TTMB02	Tiedman	90.0	76.0 – 88.0	Sandstone/ siltstone	Leloma Formation	Shallow fractured rock
TTMB03	Tiedman	198.0	186.0 – 199.0	Sandstone/ siltstone	Leloma Formation	Interburden
NS725R	Merridong	50[b]	14.0 - 32.0[b]	n/a	Avon sub-group	Shallow fractured rock
NS726R	Merridong	50 [b]	8.0 – 32.0 [b]	n/a	Avon sub-group	Shallow fractured rock
NS735R	Merridong	50 [b]	8.0 – 32.0 [b]	n/a	Jilleon Formation	Shallow fractured rock
NS746R	Merridong	50 [b]	14.0 – 32.0 [b]	n/a	Jilleon Formation	Shallow fractured rock

Monitoring bore	Location	Total depth (mbgl)	Screened interval (mbgl)	Lithology	Formation	Hydrogeological unit
FKMB01A	Faulklands	54.0	44.0 – 53.0	Sandstone	Leloma Formation	Shallow fractured rock
FKMB01B	Faulklands	150.2	140.2 – 149.2	Sandstone	Leloma Formation	Shallow fractured rock
BWMB01A	Bucketts Way	11.6	6.5 – 9.5	Mixed gravels	Avon River Alluvium	Alluvial
BWMB01B	Bucketts Way	21.0	14.0 – 20.0	Sandstone/ gravel	Jilleon Formation	Shallow fractured rock
BWMB01C	Bucketts Way	81.4	67.4 – 79.4	Sandstone	Jilleon Formation	Shallow fractured rock
BWMB01D	Bucketts Way	162.6	149.6 – 161.6	Sandstone/ siltstone	Jilleon Formation	Interburden
WRMB01A	Wards River	8.1	4.5 – 7.0	Mixed gravels	Wards River Alluvium	Alluvial
WRMB01B	Wards River	56.4	48.4 – 54.4	Sandstone	Jilleon Formation	Shallow fractured rock
WRMB01C	Wards River	126.5	111.5 – 123.5	Sandstone	Jilleon Formation	Shallow fractured rock
WRMB01D	Wards River	199.0	178.0 – 184.0	Sandstone	Jilleon Formation	Interburden

(a) Although water levels are monitored in this bore, no trends are discussed in this report (the hydrograph trace is provided in Appendix A) as there are few details known about the construction of this old water (test) bore.

(b) Merridong monitoring bores are inclined by 60 degrees, total depth and screened interval is down hole depth and not true depth (mbgl).

mbgl – metres below ground level.

Table 3.2 Summary of AGL Gloucester vibrating wire piezometer construction details

VWP	Total depth (mbgl)	Sensor ID	Sensor depth (mbgl)	Lithology	Formation	Hydrogeological unit
PL03	966.3	2	496	Coal	Wenham Formation – Bowens Road Coal Seam	Deep coal seam
		3	463	Pebble conglomerate	Wards River Conglomerate	Interburden
LMG01		01	465	Interbedded indurated sandstone/siltstone and claystone	Waukivory Creek formation	Interburden
		02	485	Coal	Waukivory Creek - Avon Coal Seam	Deep coal seam

mbgl – metres below ground level.

PL03 Sensor ID #1 installed at a depth of 681 m is not operable.

LMG01 target sensor depths and formations shown, however confirmation of data is required to assess if targets were reached.

Table 3.3 Summary of AGL multizone monitoring well construction details

	Total depth (mbgl)	Sensor ID	Sensor depth (mbgl)	Lithology	Formation	Hydrogeological unit
WKMB05	1,100	1	340.0 – 343.0	Siltstone/ sandstone	Leloma Formation	Interburden (aquitard)
		2	426.0 – 429.0	Coal	Jilleon Formation – Cloverdale Coal Seam	Deep coal seam
		3	584.0 – 587.0	Siltstone/ sandstone	Jilleon Formation	Interburden (aquitard)
		4	595.4 – 598.4	Coal	Jilleon Formation – Fairbairns Coal Seam	Deep coal seam
		5	698.5 – 701.5	Siltstone/ sandstone	Jilleon Formation	Interburden (aquitard)
		6	711.0 – 714.0	Siltstone/ sandstone	Jilleon Formation	Interburden (fault zone)

mbgl – metres below ground level.
Each horizon is installed with a pressure transducer to measure the piezometric level.

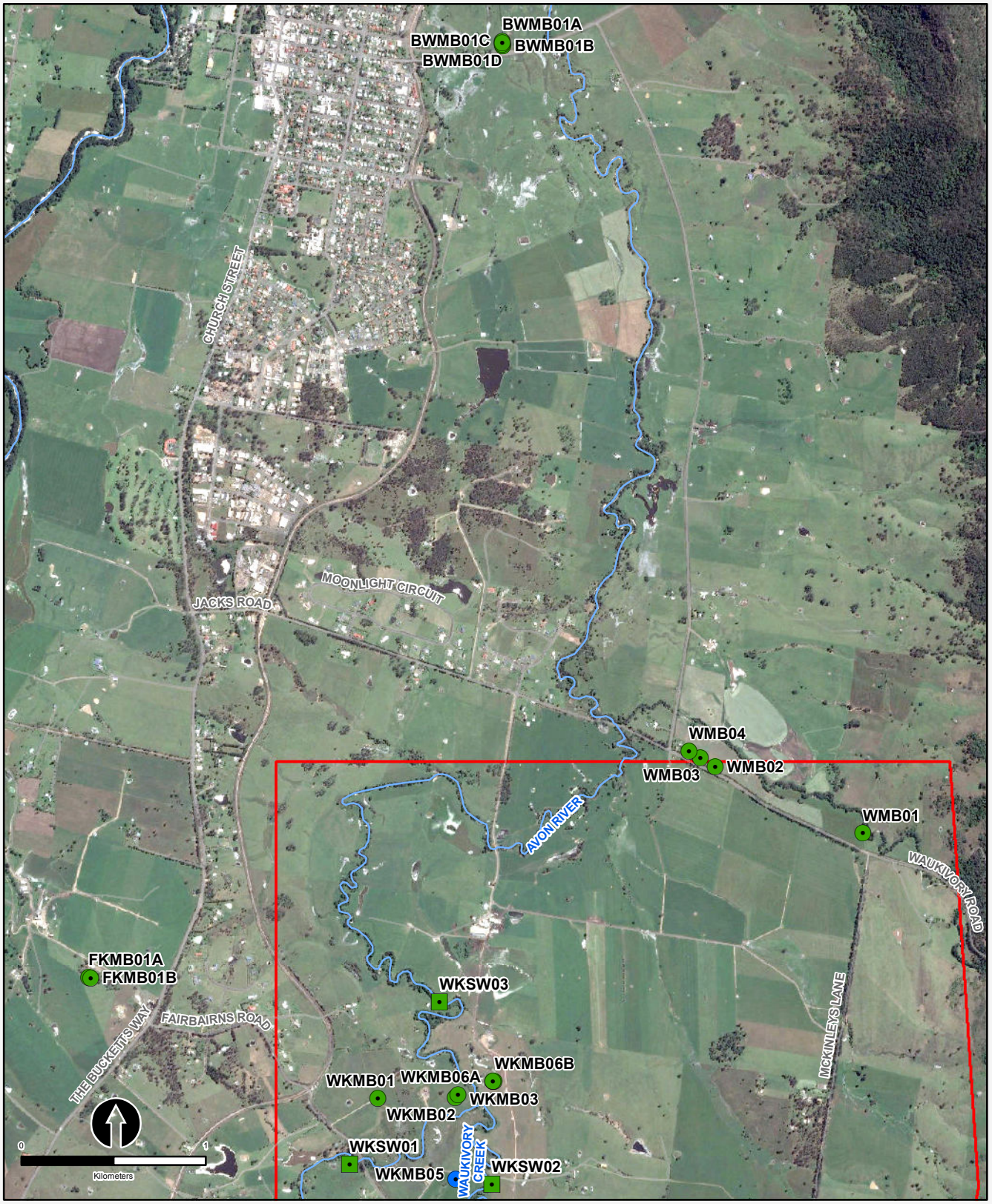
3.1.2 Surface water

There are currently seven AGL stream gauges in the Gloucester Basin; five on the Avon River, one on Dog Trap Creek, and one on Waukivory Creek (Table 3.4). These are all located within the Stage 1 GFDA. Surface water quality samples during the monitoring period were also collected from Wards River (WRSW01 and WRSW02) and an additional location downstream of TSW01 (FSW01). The locations of the surface water monitoring sites are presented in Figures 3.1 to Figure 3.3.

Table 3.4 AGL Gloucester stream gauges

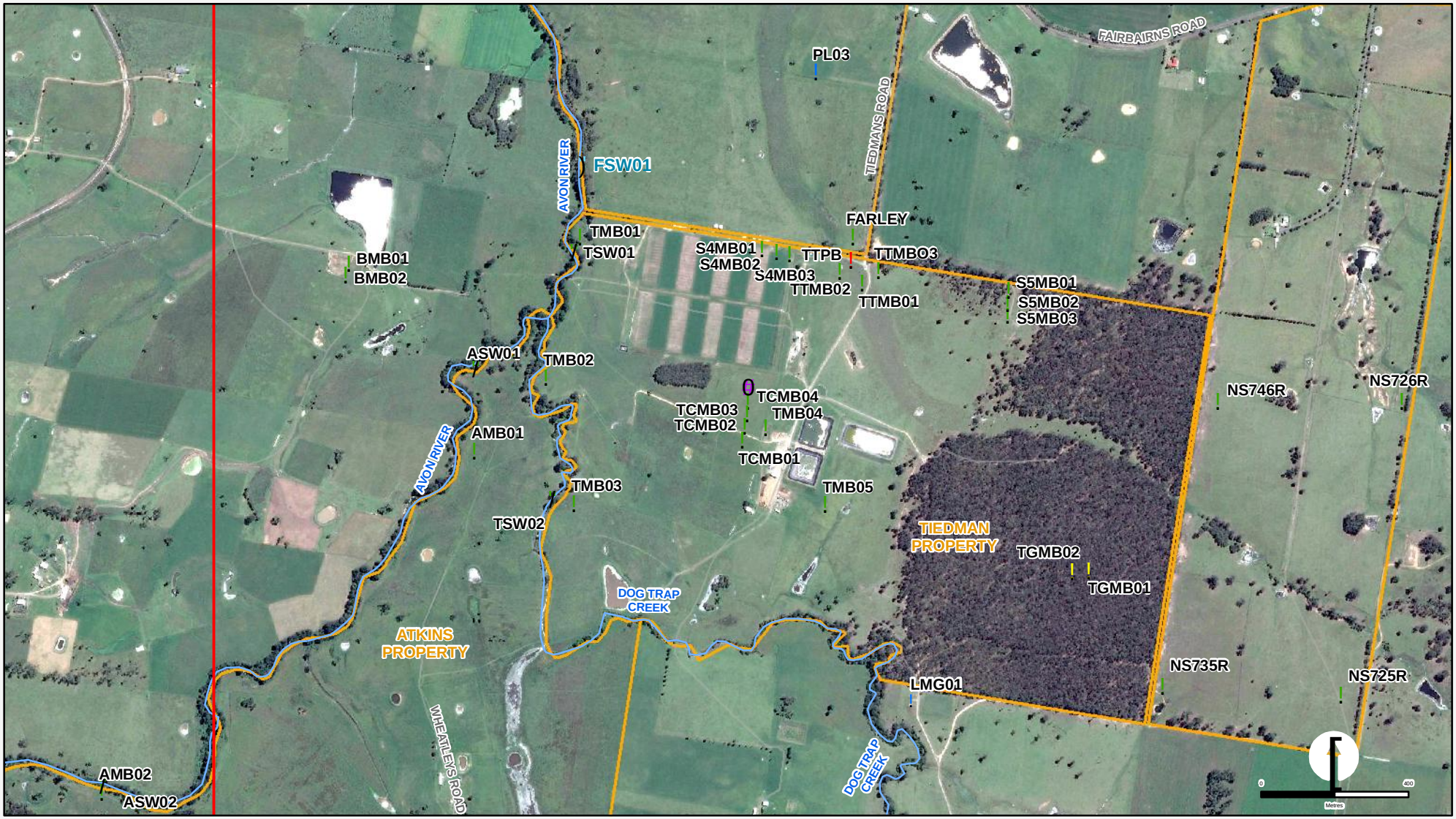
Stream gauge	Easting (MGA, m)	Northing (MGA, m)	Location	Stream
TSW01	401994	6449417	Tiedman (downstream)	Avon River
TSW02	401922	6448741	Tiedman (tributary)	Dog Trap Creek
ASW01	401711	6449092	Atkins (downstream)	Avon River
ASW02	400698	6447963	Atkins (upstream)	Avon River
WKSW01	402002	6452208	Waukivory Pilot (upstream)	Avon River
WKSW02	402772	6452099	Waukivory Pilot (tributary)	Waukivory Creek
WKSW03	402488	6453088	Waukivory Pilot (downstream)	Avon River

MGA - Map Grid of Australia.



Groundwater monitoring bore
Multizone monitoring well
Stream gauge
AGL owned properties
Stage 1 GFDA boundary
Rivers and streams
Roads

Figure 3.1
Groundwater and surface water monitoring locations northern area



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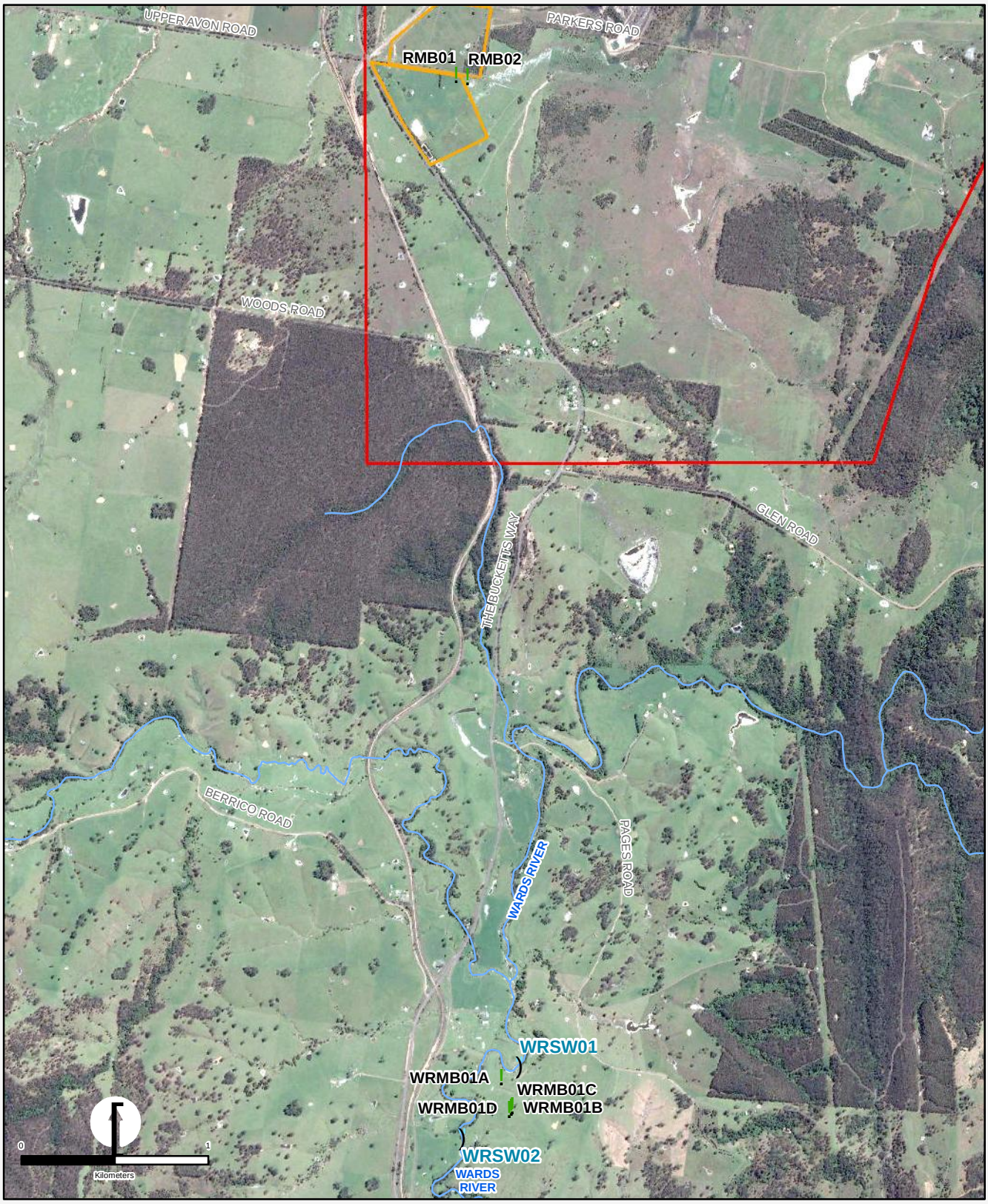
- Shallow gas monitoring bore
- Groundwater monitoring bore
- Test production bore
- VWP Monitoring Piezometers
- Stream gauge
- Surface water monitoring location
- AGL weather station
- AGL owned properties
- Stage 1 GFDA boundary
- Rivers and streams
- Roads

Figure 3.2
Groundwater and surface water monitoring locations central area



! Groundwater monitoring bore
Stream gauge
Surface water monitoring location
AGL owned properties
Stage 1 GFDA boundary
Rivers and streams
Roads

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Figure 3.3
Groundwater and surface water monitoring locations southern area

3.2 Water level monitoring

Groundwater level monitoring commenced in January 2011 (Figure 3.4) and surface water level monitoring commenced in March 2011 (Figure 3.5). The majority of the monitoring network has been in place since January 2011 (Parsons Brinckerhoff 2012).

Data loggers are installed in each of the groundwater monitoring bores to monitor groundwater levels every six hours. To calibrate the level recorded by the data loggers, manual groundwater level measurements are recorded every three months using an electronic dip meter. Data loggers installed at the VWP sites and at the multizone monitoring well monitor piezometric pressure every six hours.

A barometric data logger installed at WKMB02 above the water table records changes in atmospheric pressure. Data from this logger are used to correct the effects of changing barometric pressure on groundwater levels. At the stream gauges, data loggers are installed to monitor water levels and salinity every 15 minutes. Water levels are verified by manual gauge board readings recorded every three months. Salinity (recorded as Electrical Conductivity (EC)) measurements are checked every three months using a hand-held water quality meter.

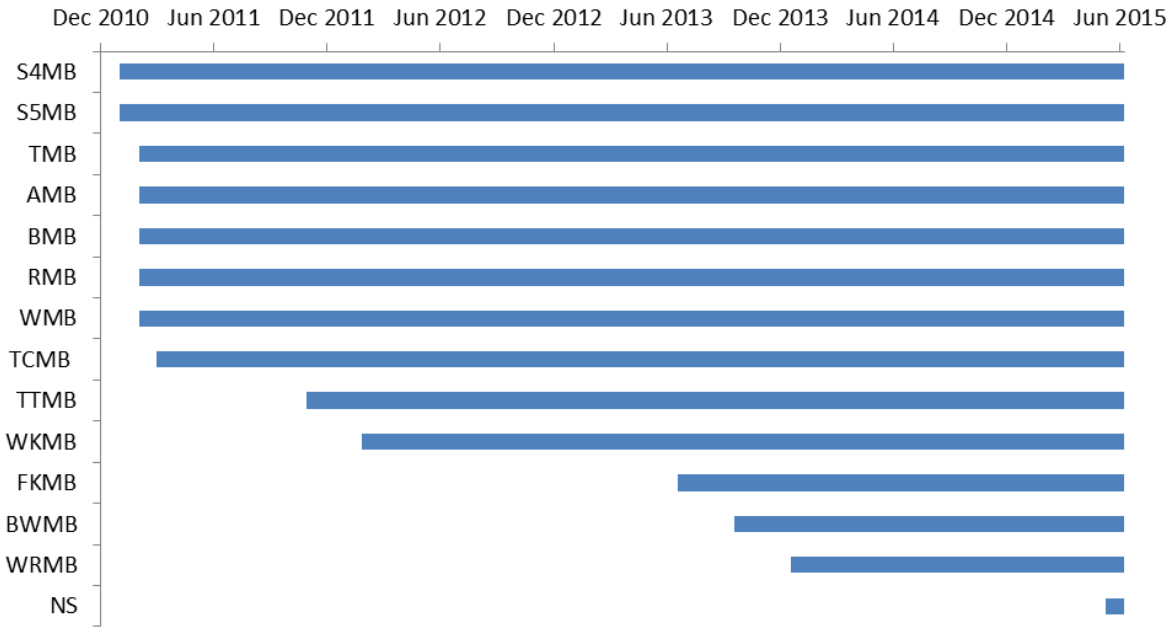


Figure 3.4 Groundwater level data collection periods for each nested groundwater bore location

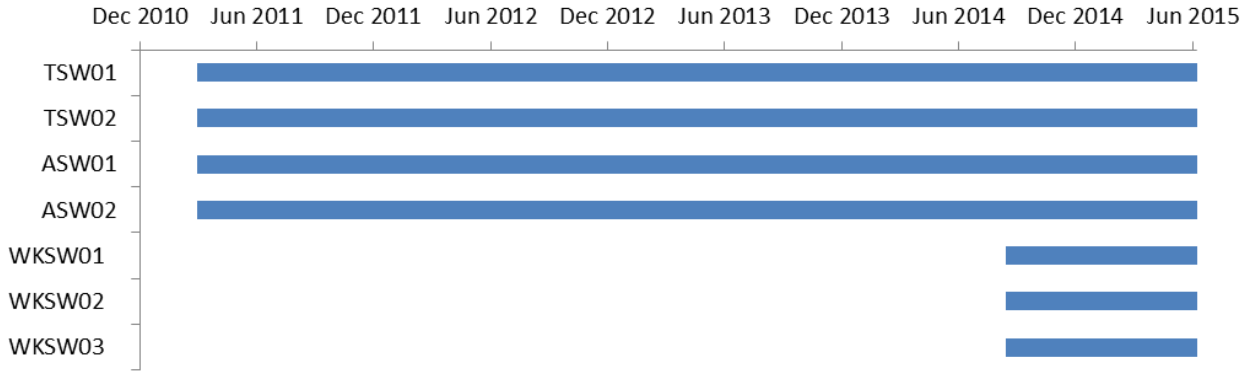


Figure 3.5 Surface water level data collection periods for each monitoring location

3.3 Water quality monitoring

3.3.1 Overview

A summary of sampling frequency for groundwater and surface water quality since monitoring commenced in January 2011 is provided in Table 3.5. Comprehensive groundwater and surface water quality sampling was undertaken across the GGP monitoring network in June 2015.

Table 3.5 Water quality sampling frequency – all water monitoring locations

Monitoring site	April 2011	July – August 2012	June – July 2013	October 2013	September / November 2014	June 2015
S4MB, S5MB, TMB, AMB, BMB, RMB, WMB	✓[a]		✓			✓
TCMB	✓[a,b]		✓[c]			✓[c]
Surface water (TSW01-02, ASW01-02, FSW01 and WKSW01-03)	✓[d,g]		✓[g]			✓
TTMB			✓			✓
WKMB		✓[a,e]	✓[e]	✓[a,f]	see Table 3.7	✓
WKMB06					✓[a] see Table 3.7	✓
FKMB, BWMB				✓[a]		✓
WRMB					✓[a, h]	✓[h]
NS						✓
Reference report	Parsons Brinckerhoff (2012)	Parsons Brinckerhoff (2014a)	Parsons Brinckerhoff (2013b)	Parsons Brinckerhoff (2014a) Parsons Brinckerhoff (2014b)	Parsons Brinckerhoff (2015h) Parsons Brinckerhoff (2015g)	This report

(a) Sampling included isotope analysis.
(b) Excluding TCMB01.
(c) Excluding TCMB03 – bore blocked at depth and unable to be sampled.
(d) Excluding TSW02.
(e) WKMB01, WKMB02, WKMB03 only.
(f) WKMB04 only – bore plugged and abandoned November 2013 (Parsons Brinckerhoff 2014a).
(g) Excluding FSW01 and WKSW01-03.
(h) Excluding WRMB01D.

A summary of water quality monitoring undertaken as part of the Tiedman Irrigation Program is provided in Table 3.6; sampling locations are shown in Figure 3.6. Quarterly groundwater and surface water quality results from the S4MB and TMB bores, and selected surface water sites are presented in the Tiedman Irrigation Program 6-monthly reports (Parsons Brinckerhoff 2013c, 2013d, 2014c, 2014d, 2015d and 2015e).

Table 3.6 Water quality sampling frequency – Tiedman irrigation program

Monitoring site	October and December 2011	February, June and September 2012	May, August and November 2013	February and May 2014	August and November 2014	February and May 2015
TMB01, TMB02, TMB03, TMB04, TMB05, S4MB01	✓[b]	✓	✓	✓	✓	✓
Tiedman Dams (TND, TSD, TED)	✓[c]	✓[c]	✓	✓	✓	✓
Catch dams (CDE, CDW)			✓[e]	✓[f]	✓	✓
Surface water (TSW01, TSW02, ASW01, FSW01)	✓[d]	✓	✓[d,e]	✓[d,f]	✓[g]	✓[h]
Perched water (soil piezometers) SP1A/B to SP10A/B[a]			✓	✓	✓	✓
TCMB01					✓	✓
TTMB02					✓	✓
Reference report	Parsons Brinckerhoff (2013c)		Parsons Brinckerhoff (2013d and 2014c)	Parsons Brinckerhoff (2014d)	Parsons Brinckerhoff (2015d)	Parsons Brinckerhoff (2015e)

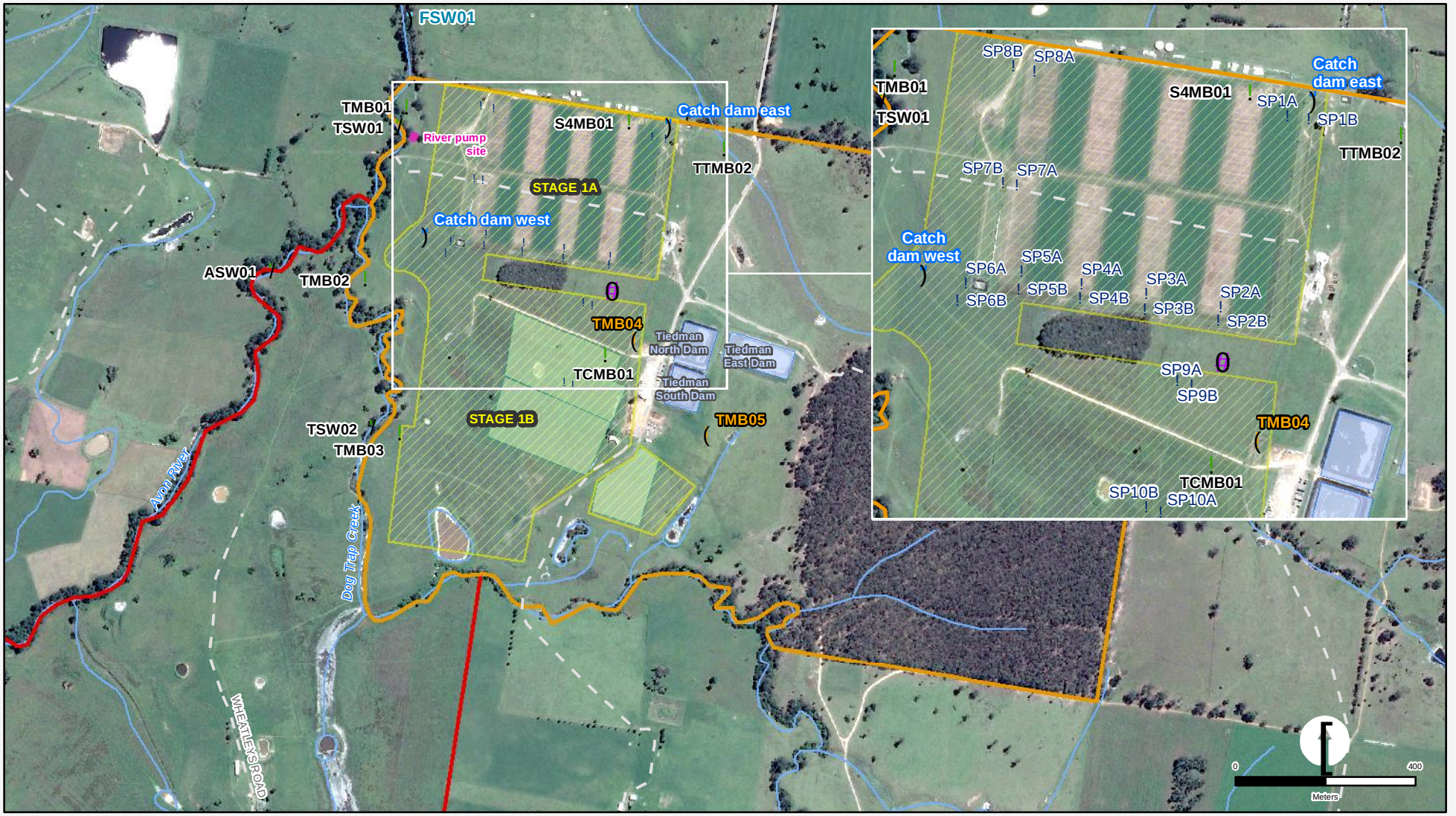
(a) Sampled only piezometer where sufficient water had accumulated to allow for a representative sample to be collected.
(b) Excluding TMB04 and TMB05.
(c) Excluding TED (dam not constructed until January 2013).
(d) Excluding FSW01.
(e) Including additional high rainfall sampling at the end of November 2013 (CDE, CDW, ASW01 and FSW01).
(f) Including additional high rainfall sampling at the beginning of March 2014 (CDE, CDW, ASW01 and FSW01).
(g) Including additional high rainfall sampling at the end of August 2014 and in December 2014 (CDE, CDW, ASW01 and FSW01).
(h) Including additional high rainfall sampling in January, March, April and May 2015 (CDE, CDW, ASW01 and FSW01).

A summary of the water quality monitoring undertaken as part of the Waukivory Pilot Project sampling is given in Table 3.7; sampling locations are shown in Figure 3.1. Groundwater and surface water quality results are presented in the Waukivory Pilot Project water monitoring report (Parsons Brinckerhoff 2015a, 2015b and 2015c).

Table 3.7 Water quality sampling program – Waukivory Pilot Project sampling

Monitoring site	March and June 2014	September and October 2014	November and December 2014	January 2015	April, May and June 2015
WKMB	✓[a]	✓	✓	✓	✓
WKMB06			✓[a]	✓	✓
WKSW	✓[a]	✓	✓	✓	✓
Reference report	Parsons Brinckerhoff (2015a)			Parsons Brinckerhoff (2015b)	Parsons Brinckerhoff (2015c)

(a) Sampling included isotope analysis.



! Groundwater monitoring bore
/ Stream gauge
(Seepage monitoring bore
) Surface water monitoring location
! Perched shallow piezometer
! River pump site
) Catch dam
Water storage dam
Stage 1 irrigation area
Atkins Property
Tiedman Property
Roads
Tracks

Figure 3.6 Tiedman irrigation program monitoring network

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3.3.2 Sampling techniques

3.3.2.1 Groundwater sampling

Three methods were used to obtain groundwater quality samples from the conventional monitoring bores. Methods were selected based on the permeability of the screened formation of each bore determined from the hydraulic testing. Higher yielding monitoring bores were purged and sampled using a submersible pump. Lower yielding bores and selected deeper bores with high purge volumes were sampled using a low flow pump. In summary:

- A submersible 12V pump was used in monitoring bores: AMB01, AMB02, BMB01, RMB01 TMB01, TMB02, TMB03, WKMB06A, WMB01, WMB02, WMB03,WRMB01A, NS725, NS726, NS735 and NS746,
- A micro-purge™ low flow sampling pump was used in monitoring bores: S4MB01, TCMB01, TTMB02, TTMB03, WKMB01, WKMB02, WKMB03, WKMB06B and WRMB01B.
- A discrete depth double-valve bailer was used in monitoring bores: BMB02, FKMB01A, FKMB01B, RMB02, S4MB02, S4MB03, S5MB01, S5MB02, S5MB03, TCMB02, TCMB04, TTMB01, TTPB, WMB04 and WRMB01C.

Where a submersible pump was used, a minimum of three well volumes was purged (where practical) from the monitoring bore prior to sampling to allow a representative groundwater sample to be collected. Water quality parameters were measured during and immediately after purging to monitor water quality changes and to indicate representative groundwater suitable for sampling and analysis.

The micro-purge™ system allows groundwater to be drawn into the pump intake directly from the screened portion of the aquifer, eliminating the need to purge relatively large volumes of groundwater from these bores. Water quality parameters were monitored during the micro-purge™ pumping to ensure that a representative groundwater sample was collected.

Water quality parameters (pH, EC, temperature, total dissolved solids (TDS), dissolved oxygen (DO) and oxidation reduction potential (ORP)) were measured during and immediately after purging using a calibrated hand-held water quality meter.

3.3.2.2 Surface water sampling

Surface water samples for water quality analysis were taken from the river bank using a telescopic sampler. Samples were collected as close as practicable to the centre of the channel in order to be representative of water quality conditions at the time of sampling and avoid compromised samples from river bank effects. Water quality parameters (pH, EC, TDS, DO and ORP) were measured at the time of sampling.

3.3.3 Chemical analysis of water

Surface water and groundwater samples collected in the field were analysed for a broad chemical suite designed specifically to assess the chemical characteristics of the different surface water and groundwater systems at each of the monitoring sites. Table 3.8 details the analytical suite for the regional water sampling events.

Table 3.8 Surface water and groundwater analytical suite

Category	Parameters	
Water quality parameters (measured in the field)	EC Temperature (°C) DO (mg/L and % saturation) Free and total residual chlorine[a]	pH ORP TDS
General parameters	EC TDS	pH
Major ions	Calcium Magnesium Sodium Potassium	Chloride Bicarbonate Sulphate Fluoride[a] Silica
Metals and minor/trace elements	Aluminium Antimony[b] Arsenic Barium Boron Bromine Beryllium Cadmium Chromium[b] Cobalt Copper	Iron Lead Manganese Molybdenum Mercury[b] Nickel Selenium Strontium Zinc Uranium Vanadium
Nutrients	Ammonia Nitrite Nitrate	Total organic carbon (TOC) Phosphorus (total) Phosphorus (reactive)
Hydrocarbons	Phenol compounds Polycyclic aromatic hydrocarbons (PAH)	Total petroleum hydrocarbons (TPH) Benzene, toluene, ethyl benzene and xylenes (BTEX)
Dissolved gases	Methane Ethene[b] Ethane[b] Propene[b]	Propane[b] Butene[b] Butane[b]

(a) For samples collected after the 2011 sampling event.
(b) For samples collected in June 2015.

3.3.4 Quality assurance

3.3.4.1 Field QA/QC

The field sampling procedures conformed to Parsons Brinckerhoff's quality assurance/quality control (QA/QC) protocols (Parsons Brinckerhoff 2015i) to prevent cross-contamination and preserve sample integrity. The following QA/QC procedures were applied:

- Unstable parameters were analysed in the field (physical and chemical water quality parameters).
- Nitrile gloves were worn while collecting samples.
- The hand-held water quality meter was calibrated each day for EC and pH.
- Samples were collected in clearly labelled bottles (sample ID, date, time and samplers initials) with appropriate preservation solutions, as specified by a NATA accredited laboratory.
- All bottles for volatile analysis were filled as far as practicable to avoid any head space and loss of volatiles.

- Samples undergoing dissolved metal analysis were filtered through 0.45 µm filters in the field prior to collection.
- Samples were placed in eskies containing ice immediately upon collection.
- A chain-of-custody form was completed for each batch of samples.
- Samples were delivered to the laboratories within the specified holding times, with the exception of pH and free chlorine, which were also analysed in the field.
- Duplicate sampling was undertaken to assess the reproducibility of laboratory analysis.

3.3.4.2 Laboratory QA/QC

The laboratories conduct their own internal QA/QC program to assess the repeatability of the analytical procedures and instrument accuracy. These programs include analysis of laboratory sample duplicates, spike samples, certified reference standards, surrogate standards/spikes and laboratory blanks. In addition, a duplicate sample is collected in the field for every ten samples collected to assess sampling and laboratory analysis accuracy.

3.3.5 Assessment criteria

The surface water monitoring data is compared against default ANZECC (2000) guideline values for the 95% protection level of freshwater aquatic ecosystems. The 95% protection level is most commonly applied to ecosystems classified as slightly to moderately disturbed (ANZECC 2000). This assessment level is appropriate for the GGP as other land uses in the area, (such as agriculture) or natural background conditions (e.g. geological or evaporative hydrological processes) have the potential to influence surface water quality.

4. Groundwater monitoring

4.1 Groundwater levels

4.1.1 Temporal trends

Groundwater level trends in monitoring bores vary depending on the lithology and depth of the screened interval. Temporal trends are described for each hydrogeological unit in this section. Alluvial hydrographs are presented in Section 4.1.1.1. Trends for the shallow rock, coal seam and interburden hydrogeological units are presented in the nested monitoring bore hydrographs in Sections 4.1.1.2, 4.1.1.3 and 4.1.1.4 respectively. Individual hydrographs for each monitoring bore are shown in Appendix A. All monitoring bores are located in the Avon River catchment with the exception of the WRMB sites which are located in the Wards River catchment.

4.1.1.1 Alluvium

Most alluvial monitoring bores show a slight decrease in groundwater levels over the first months of the monitoring period, corresponding to the overall below average rainfall over this period, followed by an overall increase in groundwater levels over the remaining months of the year.

Groundwater levels in monitoring bores screened in the alluvial deposits show a sharp response to significant rainfall events (Figure 4.1, Figure 4.2, Figure 4.3, Figure 4.12, Figure 4.14 and Figure 4.15). This is a threshold response, with rainfall events of a certain magnitude required to trigger a response in groundwater levels. This response is variable between sites.

Over the course of the year, groundwater levels at the TMB and WMB alluvial monitoring bores (Figure 4.1 and Figure 4.3) show an increase in response to the higher than average rainfall events in August 2014, December 2014, January 2015, April 2015 and May 2015. This increase is ~ 0.7 m at TMB01, and ~ 0.2 m at TMB02, TMB03 and WMB01. Since installation, groundwater levels at WKMB06A (Figure 4.12) and WRMB01A (Figure 4.15) show an increase (~1.0 m) in response to the large rainfall events in April and May 2015. The hydrographs at these sites show a relatively steep recession curve, with a return to antecedent groundwater levels over a period of one to two months. During dry periods when there are very low stream levels, accelerated drainage of alluvial groundwater (from storage) is observed at the TMB01 site in late 2012/early 2013, in late 2013/2014 and again in late 2014 and early 2015 (Figure 4.1).

During the year, groundwater levels at the AMB alluvial monitoring bores (Figure 4.2) typically show a smaller response (< 0.1 m) to rainfall events. However, the groundwater level at AMB02 shows an increase of ~ 0.6 m in April and May 2015 in response to the large rainfall events. The hydrographs at these two sites show a flatter recession curve, with groundwater levels continuing to decrease between the large rainfall event in February 2013 and the large rainfall event in April 2015.

BWMB01A (Figure 4.14) has shown no individual responses to rainfall events, although there is a very slight increase over the year which may be a delayed response to regional recharge.

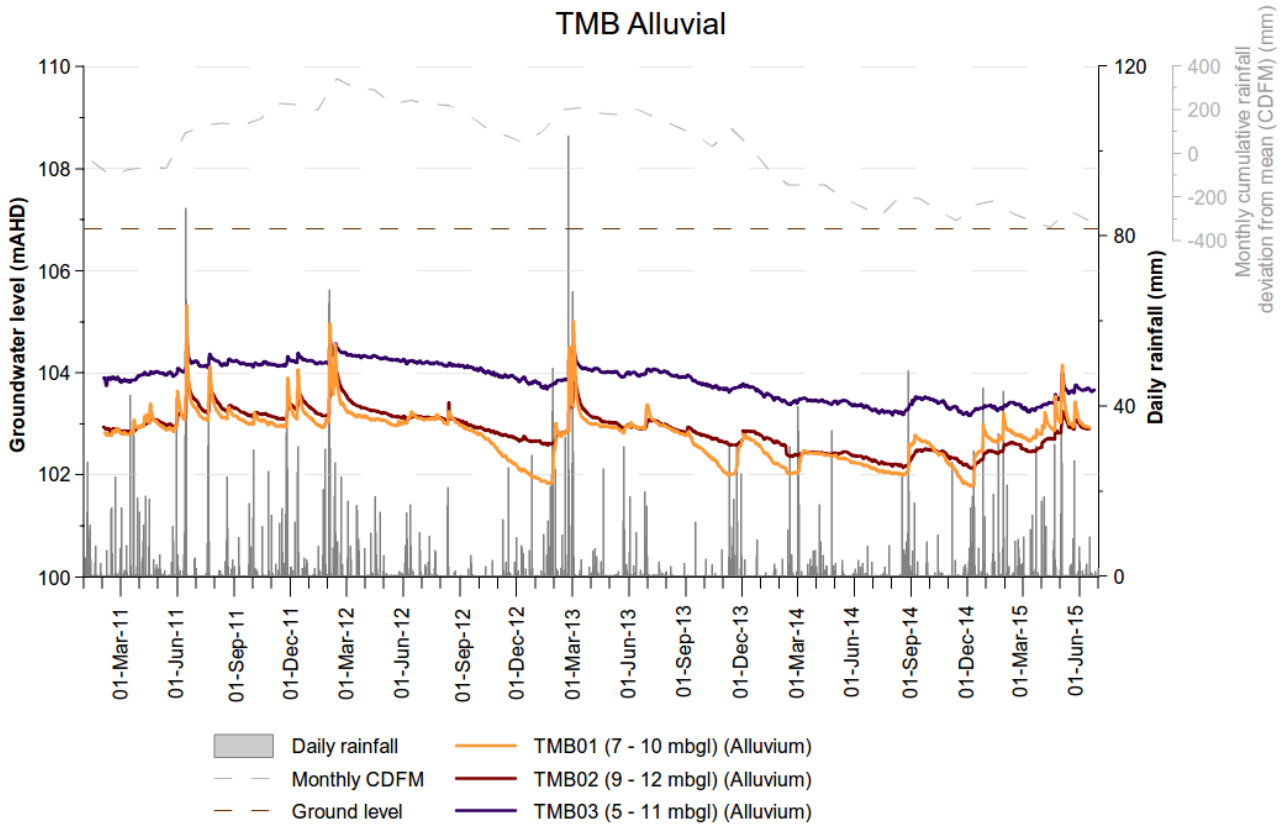


Figure 4.1 Groundwater levels and rainfall in the TMB alluvial monitoring bores

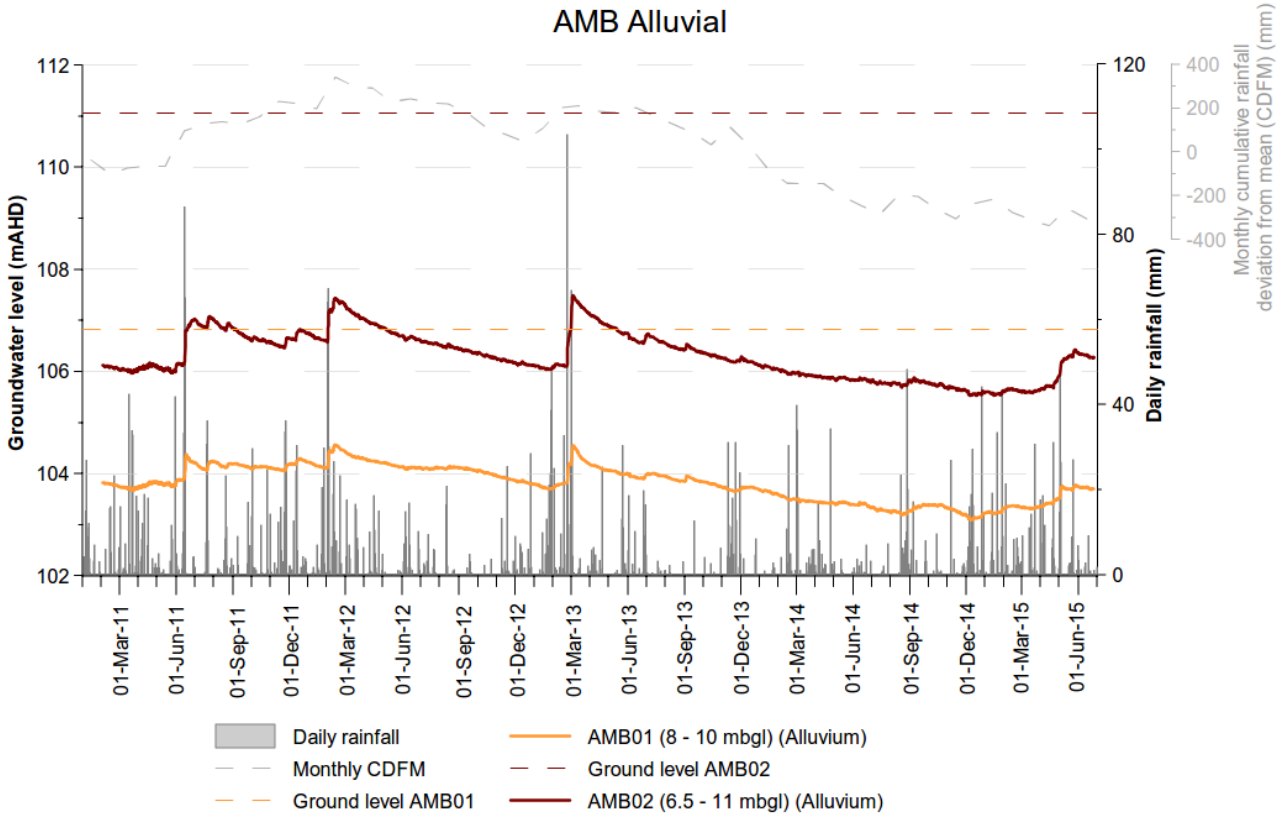


Figure 4.2 Groundwater levels and rainfall at the AMB alluvial monitoring bores

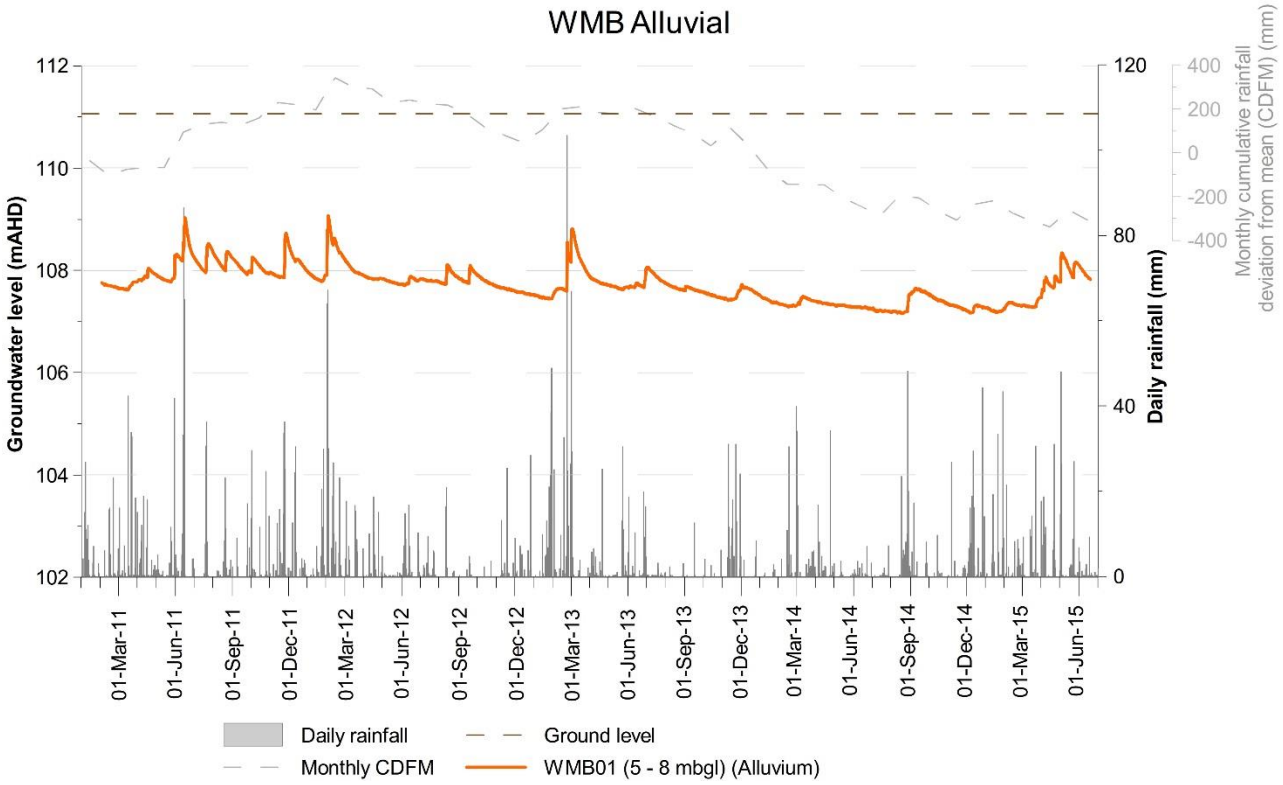


Figure 4.3 Groundwater levels and rainfall at the WMB alluvial monitoring bore

4.1.1.2 Shallow fractured rock

Monitoring bores screened within the shallow rock are present at all of the nested monitoring sites. Groundwater levels in the shallow rock typically show a delayed response to periods of higher than average rainfall (as indicated on the cumulative deviation from mean monthly rainfall plot), indicating that groundwater levels are responding slowly to rainfall recharge over a broad area, assumed to be up-gradient of the monitoring locations. The groundwater level response is typically delayed approximately 1 to 2 months after periods of higher than average rainfall.

There are no strong responses to individual rainfall events in the shallow rock monitoring bores, with the exception of WKMB02 in February 2013, and WKMB02 and WKMB06B in May 2015 (Figure 4.11 and Figure 4.12). At these sites the groundwater levels are responding to local rainfall recharge.

The data loggers at WKMB01 and WKMB02 failed in March 2014 and were replaced in September 2014 and August 2014 respectively. Groundwater levels in monitoring bores WKMB01 and WKMB02 (Figure 4.11) show a slow recovery response to the frequent sampling events associated with the Waukivory Pilot Project (Parsons Brinckerhoff 2015c), indicative of the low conductivity of the shallow rock unit at this location. Monitoring bores in the shallow rock at the WKMB (Figure 4.11) and WKMB06 (Figure 4.12) sites show an overall increase in groundwater levels in response to rainfall events over the year. The increase is ~0.3 m at WKMB01 and WKMB02 and ~0.9 m at WKMB06B (since installation in November 2014).

The shallow rock hydrographs at the S4MB (Figure 4.4), TCMB (Figure 4.6) and TTMB (Figure 4.7) sites show an overall decrease in groundwater levels of ~ 0.2 m between July 2014 and June 2015, as a delayed response to the below average rainfall conditions (December 2013 to July 2014) prior to the start of the monitoring period.

At the BMB (Figure 4.8), RMB (Figure 4.9) and WMB (Figure 4.10) sites, groundwater levels in the shallow rock show a slightly greater response to long term rainfall recharge trends (cumulative deviation from the

mean monthly rainfall plot). The greatest response is visible at the RMB site, which shows an increase in groundwater levels following the rainfall events in late August 2014.

S5MB01 (Figure 4.5) shows a very slow recovery in response to the June 2013 sampling event and shows erratic groundwater level data since March 2014 and therefore does not provide useful information on baseline trends. S5MB02 screened in the shallow rock shows no overall change in groundwater level over the year. The cause of the anomalous sharp increase in groundwater levels of ~ 2m at S5MB02 associated with the June 2013 water sampling event is not clear, although it may be associated with improved hydraulic connection after the water sampling event.

The shallow rock hydrographs at the FKMB (Figure 4.13) and BWMB (Figure 4.14) sites show no significant changes in groundwater levels within the shallow rock the since monitoring commenced.

The shallow rock hydrographs at the WRMB (Figure 4.15) site show minimal response to rainfall recharge over the monitoring year. WRMB01B shows a delayed recovery following the September 2014 sampling event, which is indicative of very low hydraulic conductivity of the shallow rock at this monitoring location.

4.1.1.3 Interburden

The interburden monitoring bores TCMB02 (Figure 4.6), TTMB03 (Figure 4.7) and BWMB01D (Figure 4.14) show no overall change in groundwater levels over the monitoring year with the exception of a minimal response to the rainfall events in late August 2014.

Groundwater levels at WKMB03 (Figure 4.11) show a distinctive delayed recovery response to sampling events, which is indicative of very low hydraulic conductivity within the interburden/fault zone. Increasing groundwater levels at WKMB03 from December 2014 to July 2015 are due to a delayed recovery response after the high frequency groundwater sampling events carried out as part of the Waukivory Pilot Project (Parsons Brinckerhoff 2015c) in late 2014.

4.1.1.4 Coal seams

The coal seam monitoring bore S4MB03 (Figure 4.4) shows a decrease in groundwater level of ~ 0.2 m between July 2014 and June 2015, however later in monitoring period (April – June 2015) the water level appears to be slightly increasing.

Coal seam monitoring bores S5MB03 (Figure 4.5) TCMB03 and TCMB04 (Figure 4.6) do not show an overall change in groundwater levels over the monitoring year with the exception of a minimal response to the rainfall events in late August 2014.

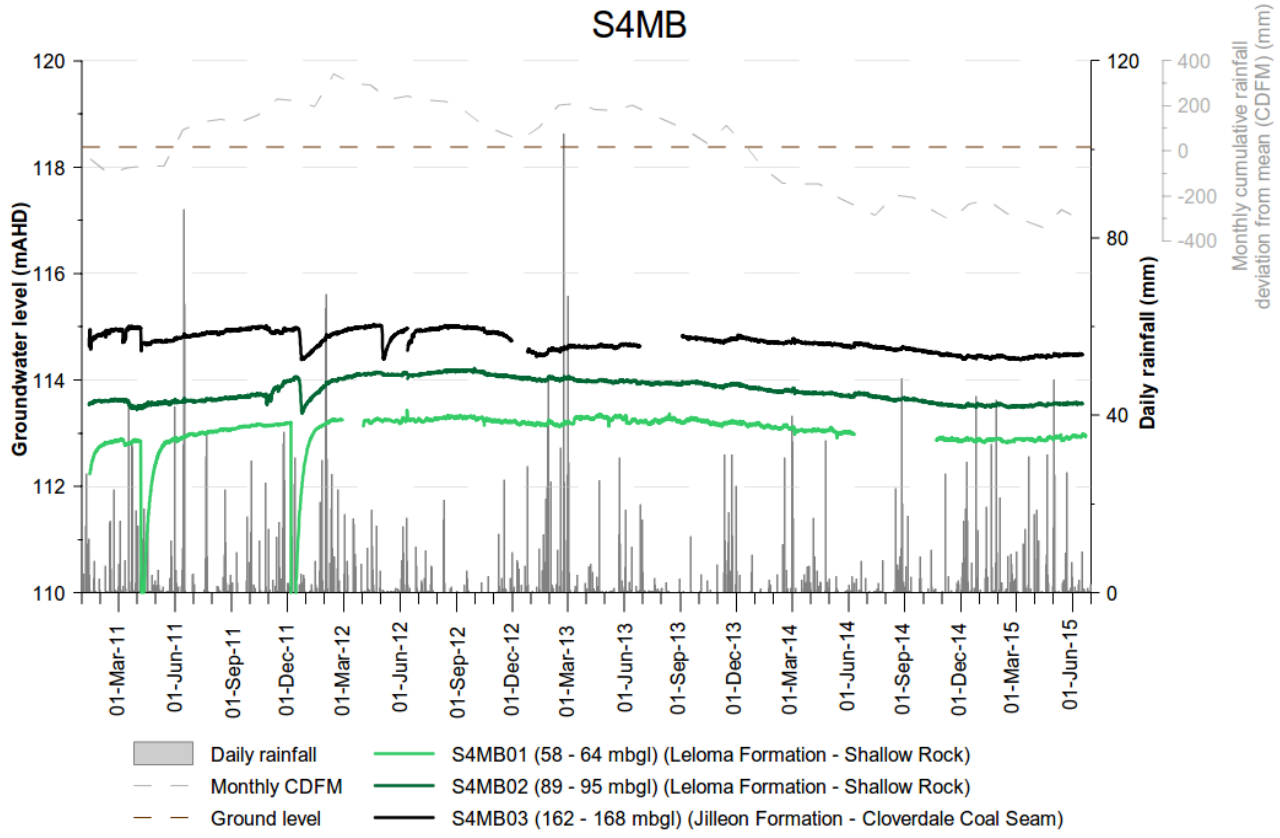


Figure 4.4 Groundwater levels and rainfall at the S4MB site

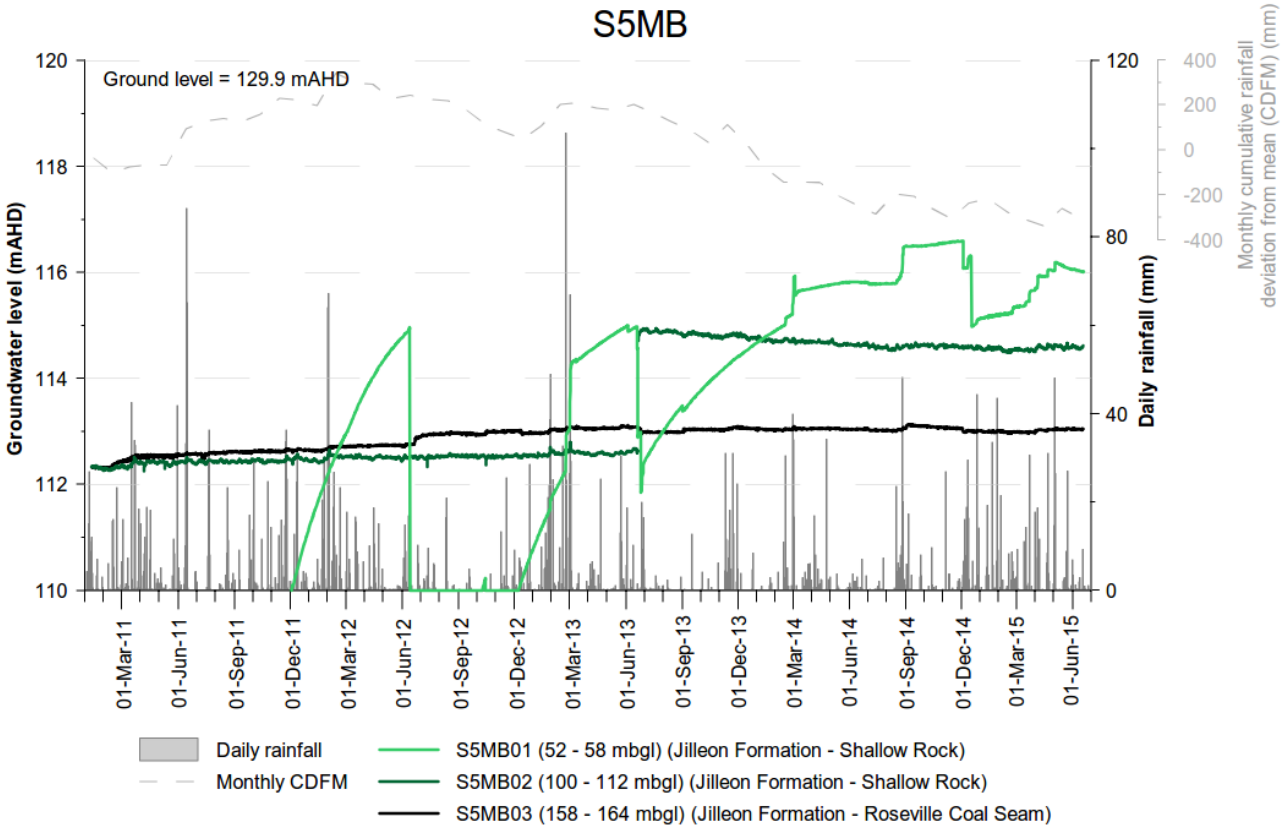


Figure 4.5 Groundwater levels and rainfall at the S5MB site

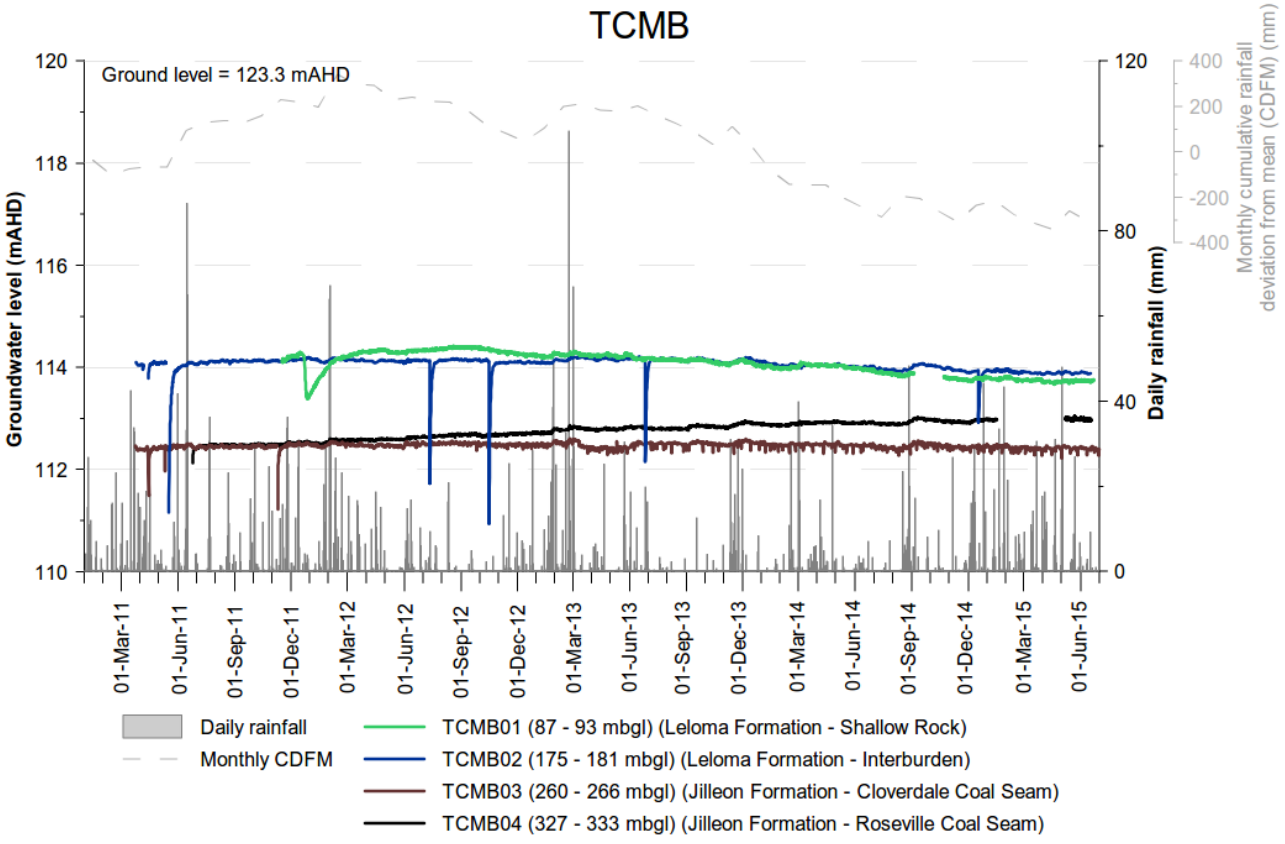


Figure 4.6 Groundwater levels and rainfall at the TCMB site

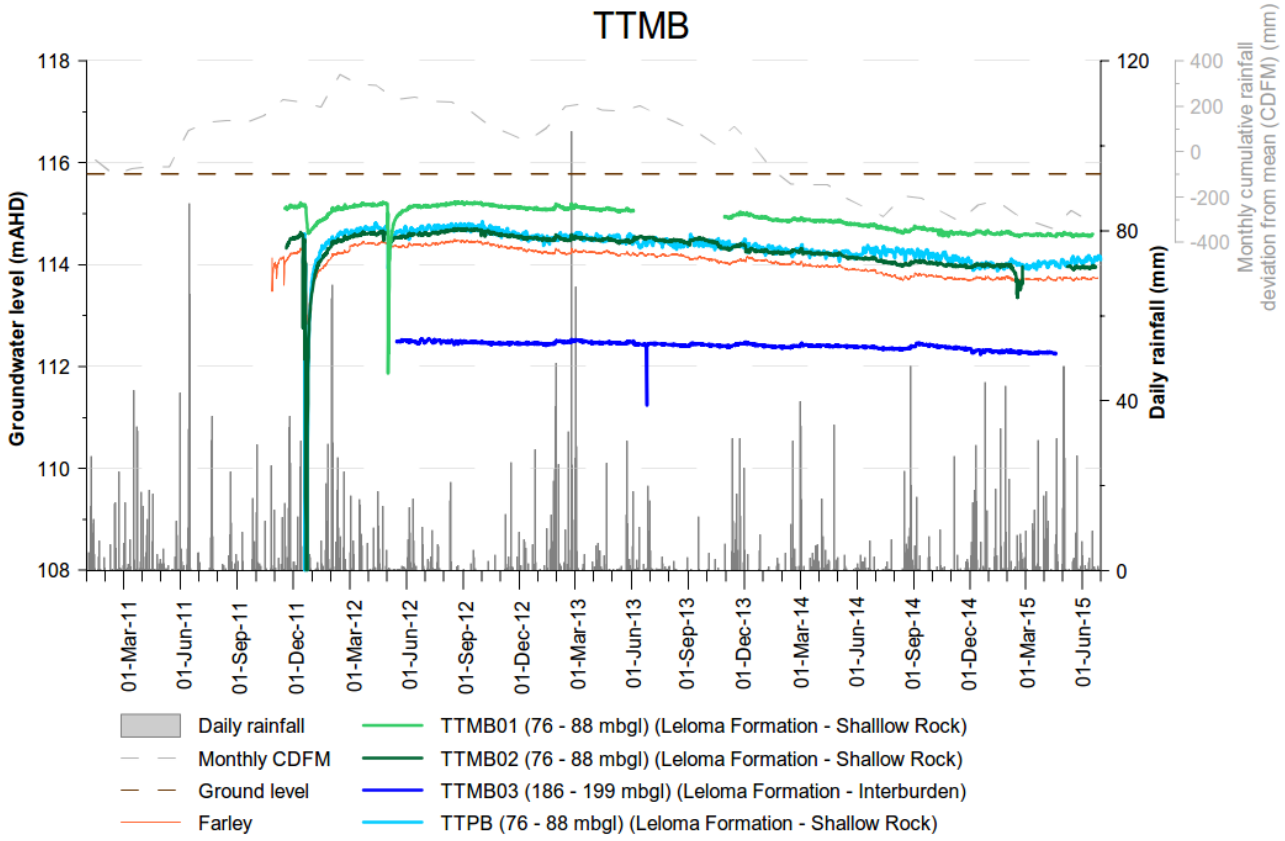


Figure 4.7 Groundwater levels and rainfall at the TTMB site

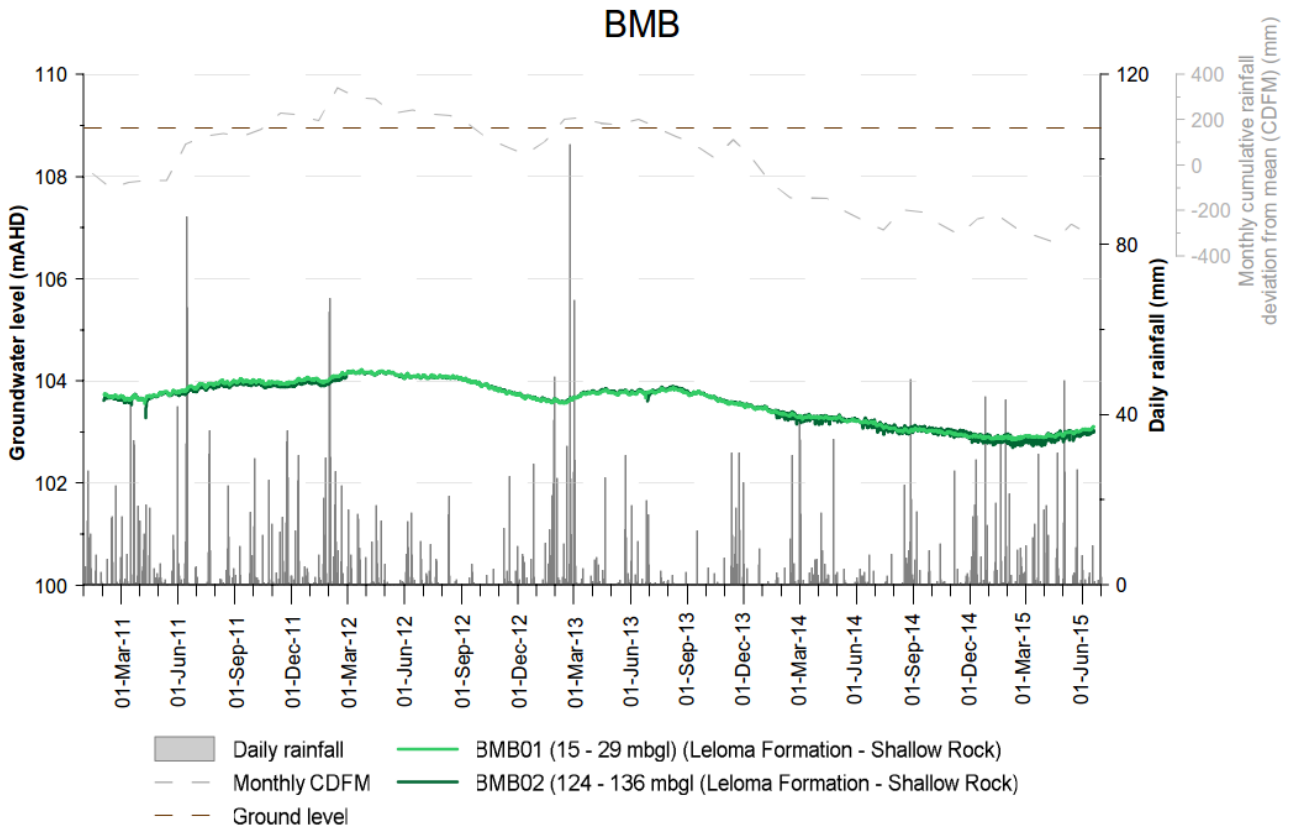


Figure 4.8 Groundwater levels and rainfall at the BMB site

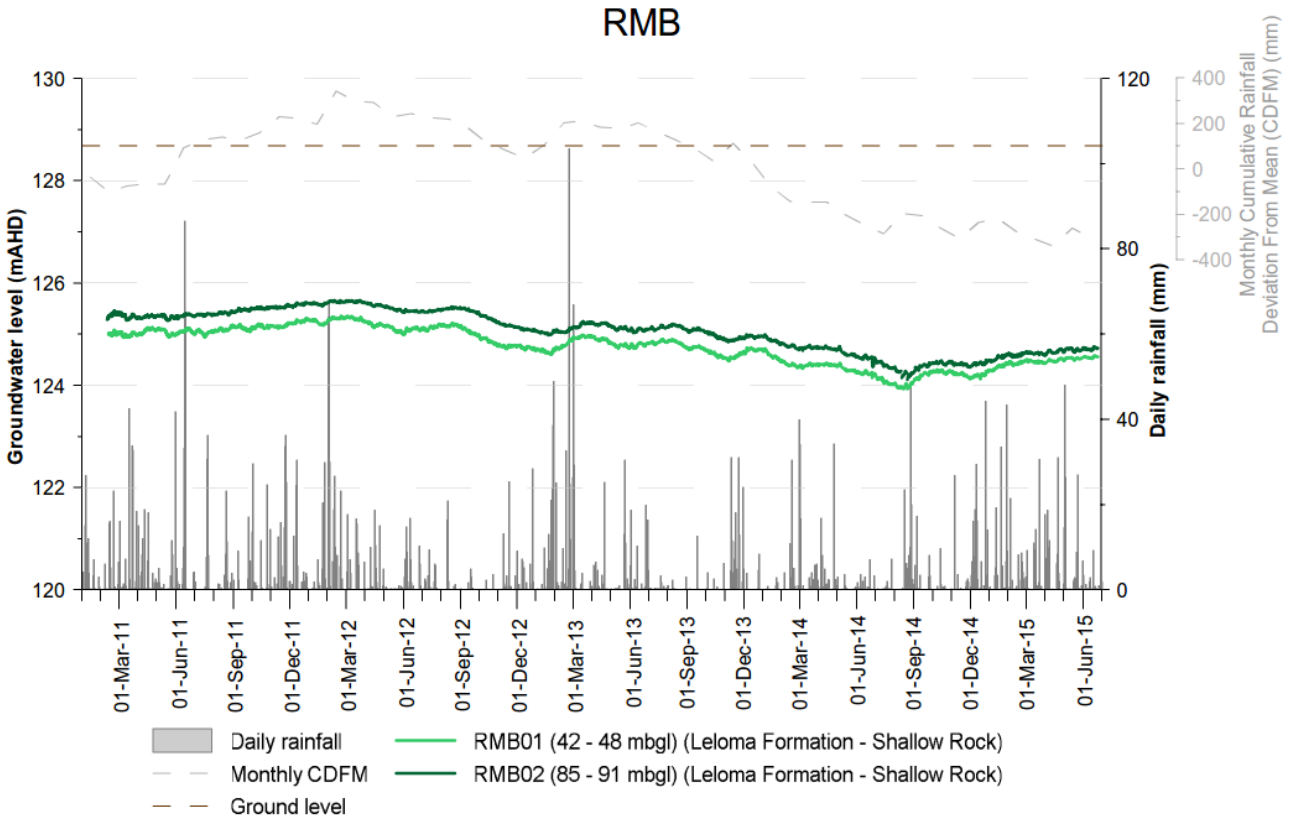


Figure 4.9 Groundwater levels and rainfall at the RMB site

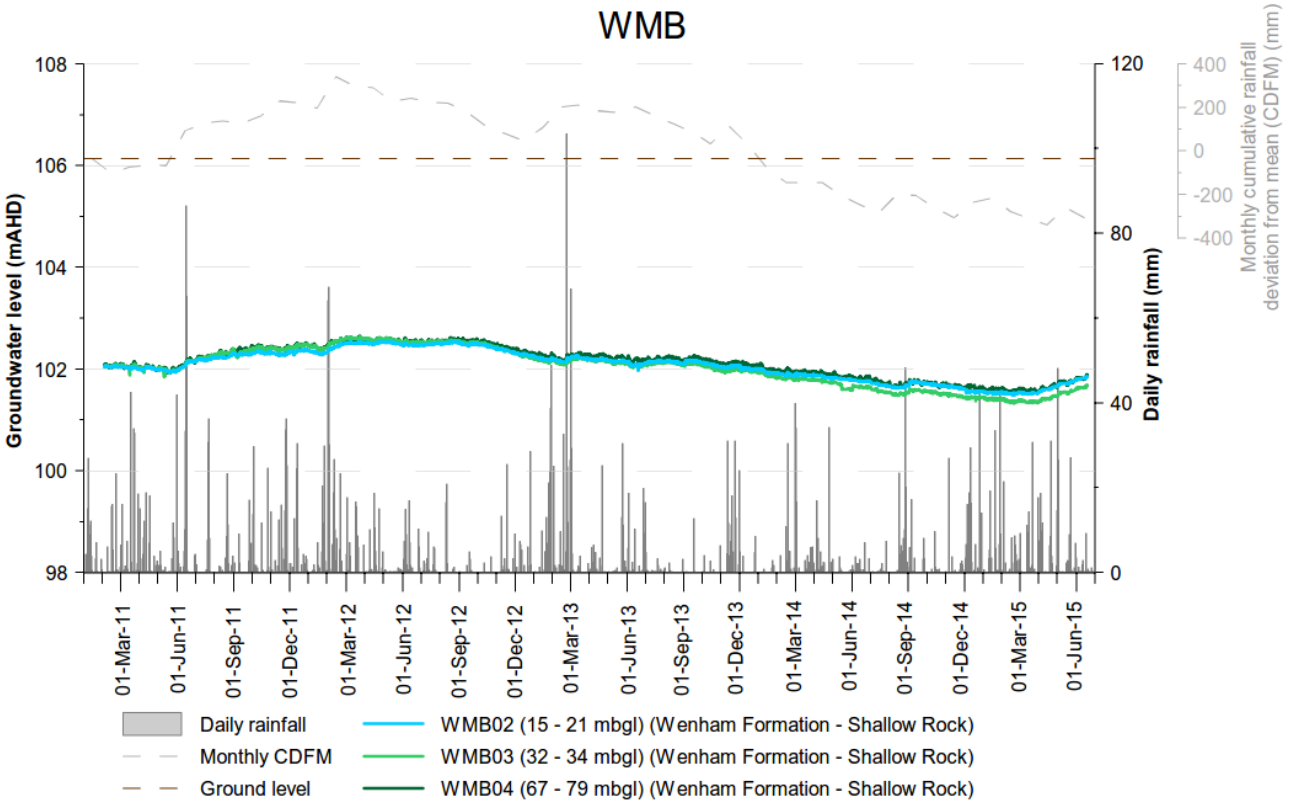


Figure 4.10 Groundwater levels and rainfall at the WMB site

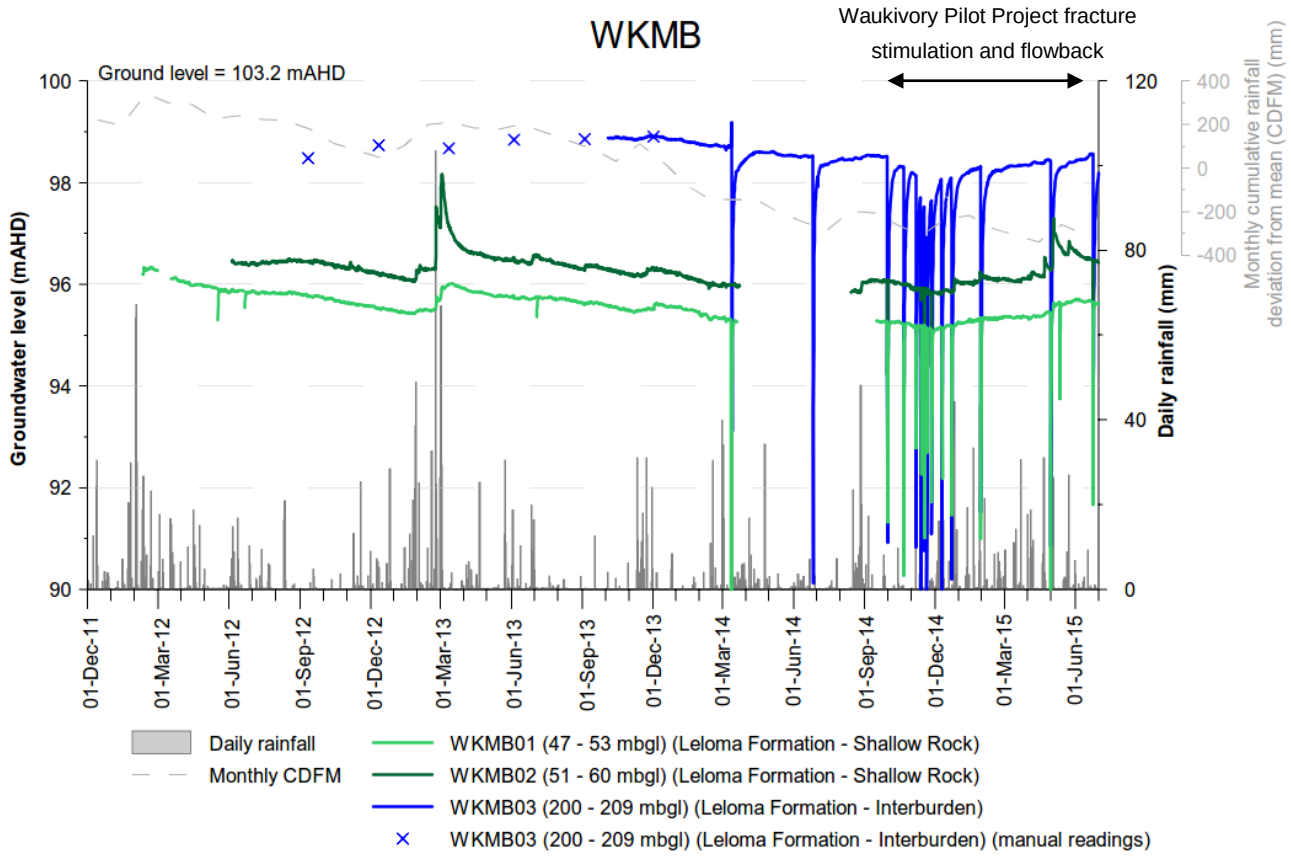


Figure 4.11 Groundwater levels and rainfall at the WKMB site

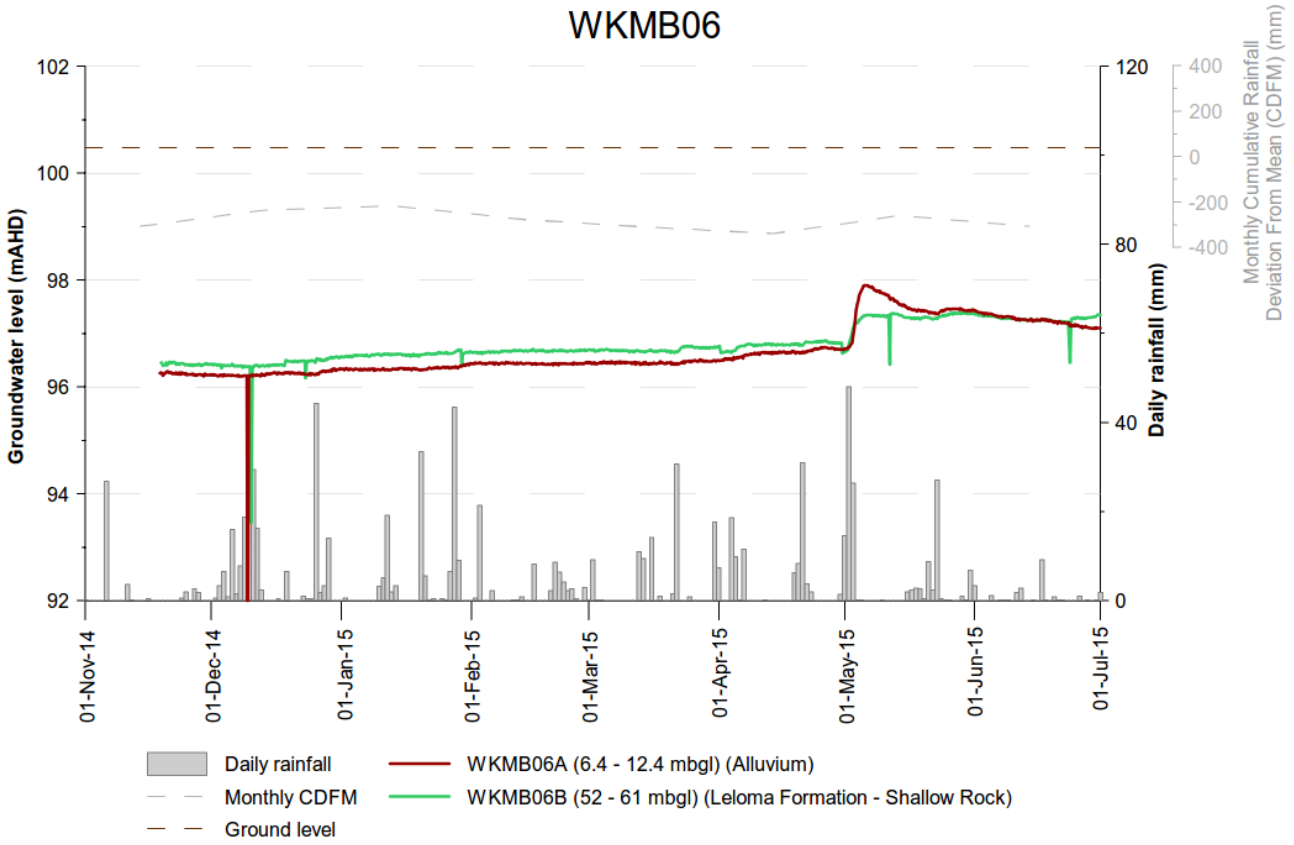


Figure 4.12 Groundwater levels and rainfall at the WRMB06 site

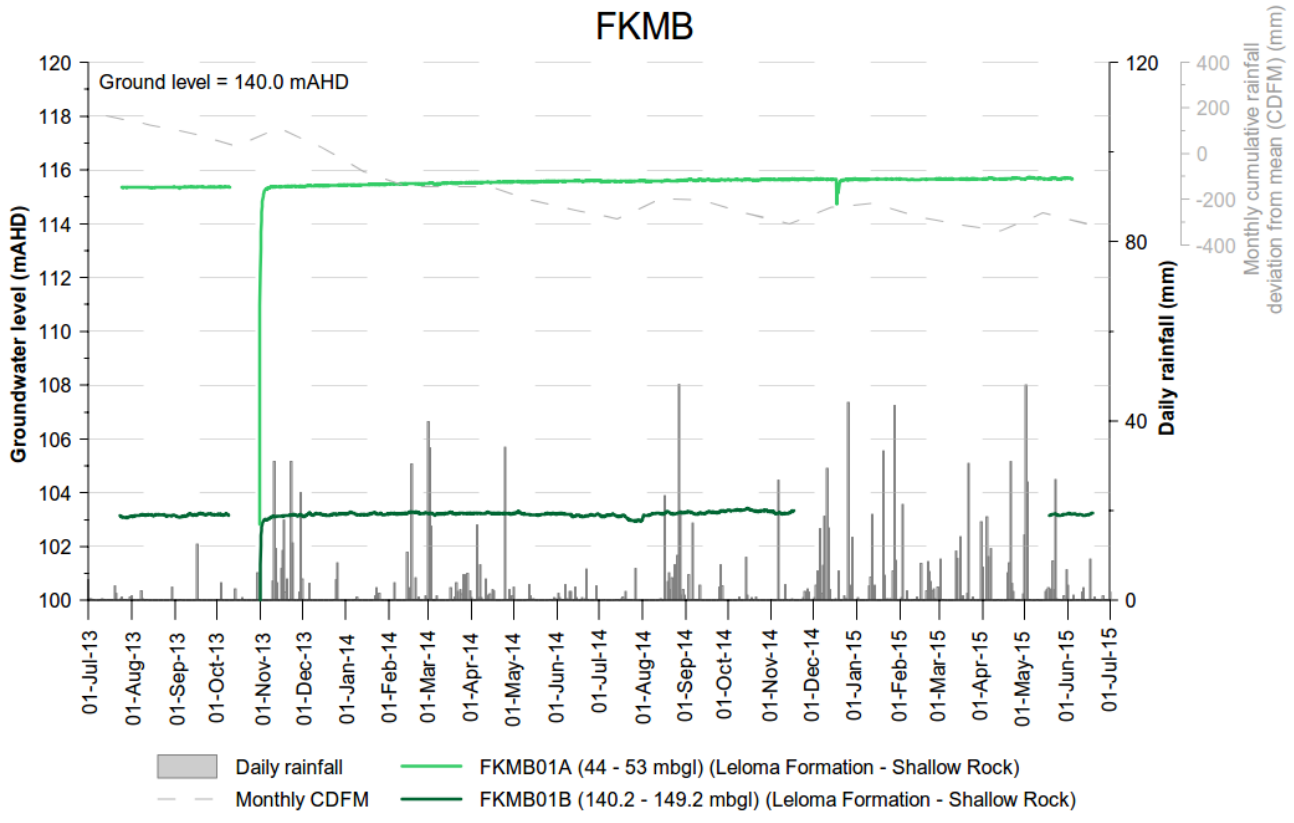


Figure 4.13 Groundwater levels and rainfall at the FKMB site

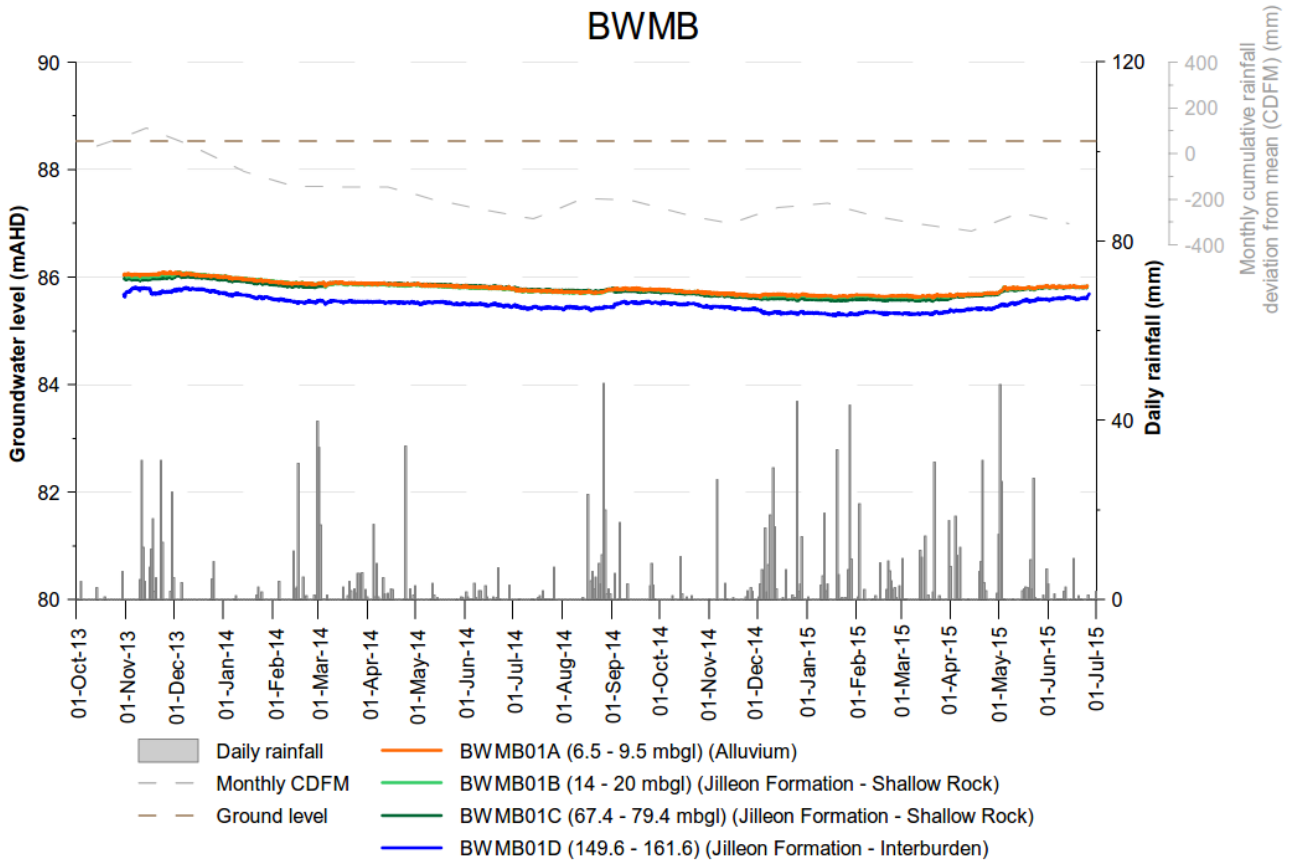


Figure 4.14 Groundwater levels and rainfall at the BWMB site

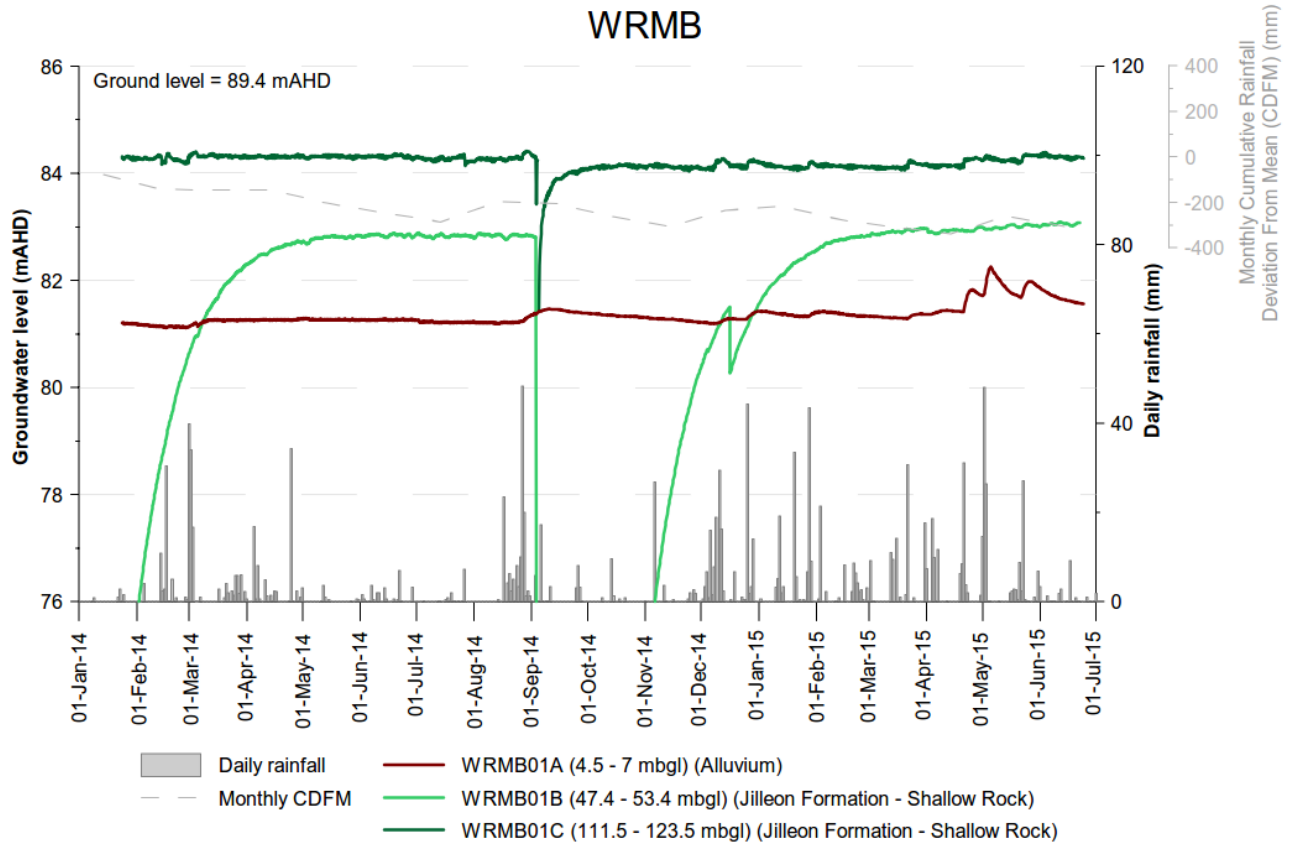


Figure 4.15 Groundwater levels and rainfall at the WRMB site

4.1.1.5 Deep groundwater

Deep groundwater (>300 mbgl) is monitored by PL03 (VWP) (Figure 4.16), LMG01 (VWP) (no data available for this report) and by WKMB05 (multizone monitoring well) (Figure 4.17).

VWP PL03 was installed in September 2013. Interburden sensor 3 (463 mbgl) shows a decrease in piezometric pressure of about 60 m since installation. However, since February 2015, the rate of decline in sensor 3 has decreased and there was a slight increase in piezometric pressure in March – April 2015 before a slight decline to the end of June 2015. Coal seam sensor 2 (496 mbgl) shows a decrease in piezometric pressure of about 20 m since installation with generally a steady declining trend.

The declines in piezometric level reflect the long term readjustment of pore pressure in the surrounding rock since installation and do not represent natural trends. However, sensor 3 may possibly have equilibrated in the last four months and this may be confirmed in the following reporting period. The long recovery period is due to the very low permeability of the interburden and coal seams at the depth of the sensors. This phenomenon is widely observed in VWP installations and has been observed at VWPs installed at the AGL Hunter Gas Project. At that location, groundwater levels took over one year to equilibrate following installation (Parsons Brinckerhoff 2014e). These trends reflect pore pressures near the sensor adjusting and recovering towards hydrostatic pressures following the local disturbance associated with installation.

During the monitoring year, piezometric levels at PL03 sensor 2 have decreased by about 15 m and at PL03 sensor 3 has decreased by about 35 m (Figure 4.16). There is no useful trend information available from VWPs at this time.

Piezometric levels in WKMB05 for the period November 2014 (installation) to 30 June 2015 are shown in Figure 4.17. The rapid changes in the piezometric levels measured at all sensors on 25 November 2014 occurred during the commissioning of the packer system. Most WKMB05 sensors show a relatively constant trend in piezometric levels during the monitoring period, with the exception of sensor 2 which shows a downward trend (~ 5 m) and sensors 5 and 6 which show a slight decline. There is uncertainty as to whether the piezometric levels for sensors 5 and 6 have reached equilibration following installation, this will be reviewed as additional monitoring data becomes available.

It is not yet clear how, or if, these slight declining trends relate to the Waukivory Pilot Project flowback activities, it is possible they represent delayed pressure responses, from either fracture stimulation or the commencement of flowback, due to the low permeability of the interburden. The decrease observed at Sensor 2 within the Cloverdale Coal Seam since early January 2015 is the most prominent response and could be related to the pumping and flowback activities at Waukivory pilot gas well WK13, located 164 m west of WKMB05 (Parsons Brinckerhoff, 2015c).

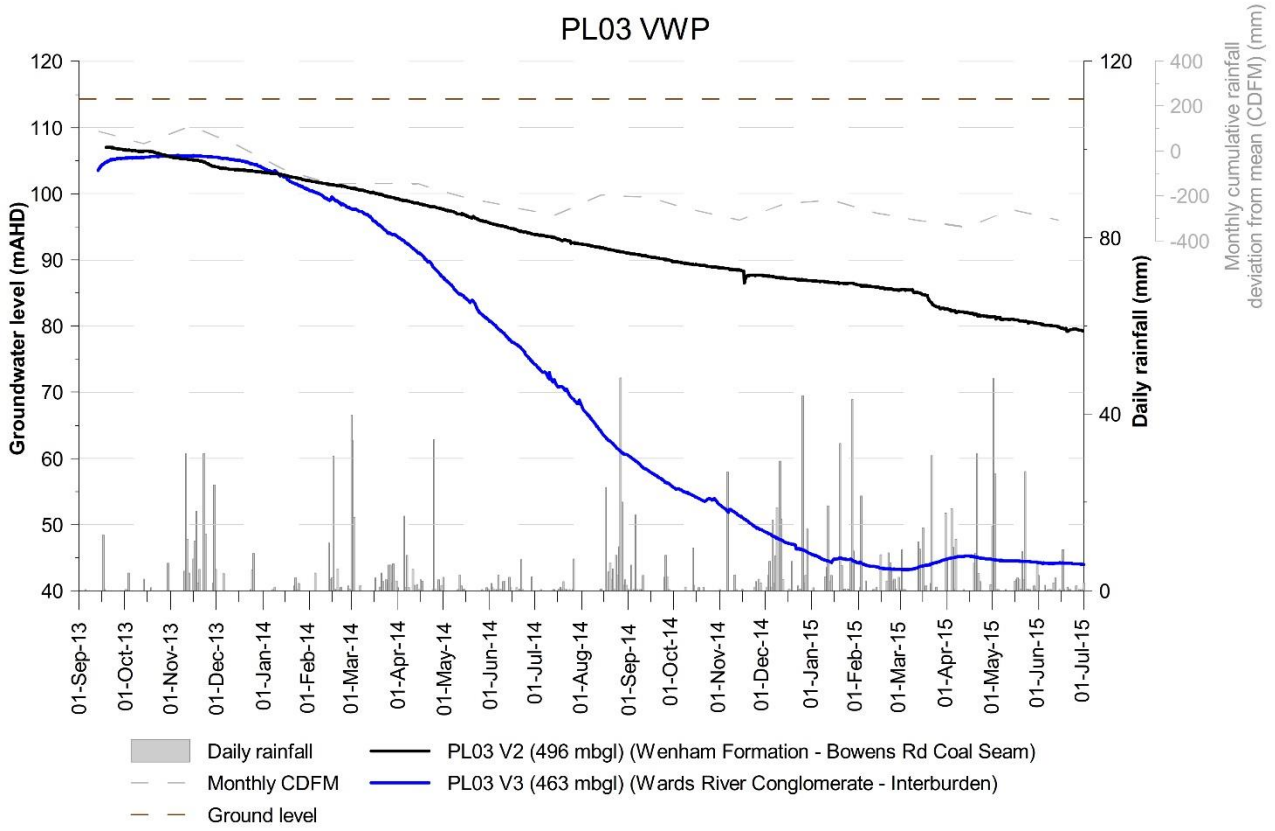


Figure 4.16 Groundwater levels and rainfall at the PL03 VWP

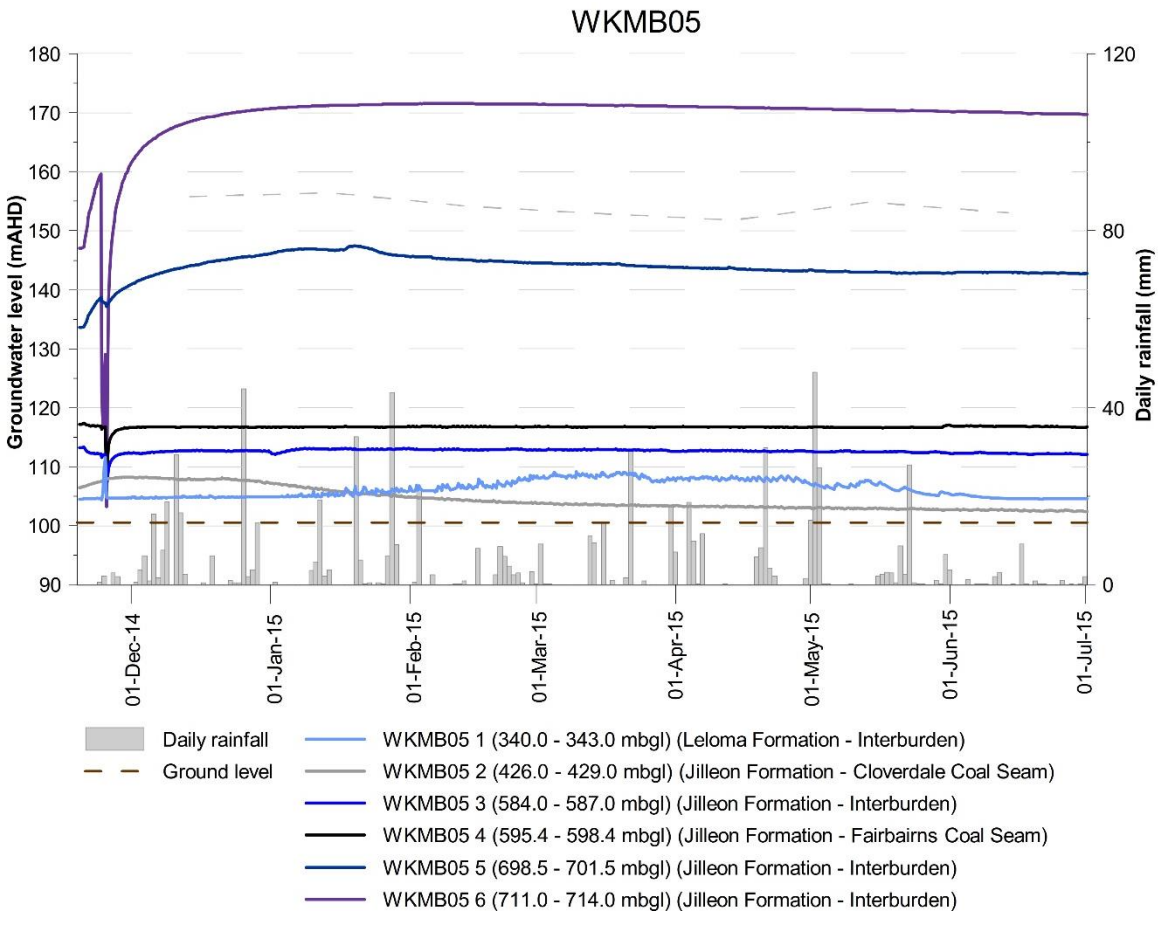


Figure 4.17 Groundwater levels and rainfall at the WKMB05 multizone monitoring well

4.1.2 Vertical gradients

Vertical gradients were noted at nine of the eleven nested bore installations as shown in Table 4.1. Due to the very low permeability of the interburden units, vertical groundwater flow is likely to be slow and negligible, despite the vertical gradients. Lateral flow within each of the geological units is concluded to be the primary groundwater flow mechanism when there are no stresses on the shallow or deep groundwater systems (Parsons Brinckerhoff 2015f).

The complexity in groundwater elevations and apparent gradients, and the variability between some relatively close sites requires further assessment. Levels will be further assessed and calibrated as part of the current local-scale and basin-wide numerical modelling projects.

Table 4.1 Vertical gradients at the nested monitoring bore installations

Monitoring site	Gradient	Comments
TCMB	Downward Slight upward	~ 1 m to ~ 1.5 m between the shallow rock and deeper coal seams. ~ 0.5 m from the interburden to shallow rock.
TTMB	Downward	~ 2 m to ~ 2.5 m between the shallow rock and the deeper rock.
FKMB	Downward	~ 12.5 m between the shallower and the deeper monitoring bore in the shallow rock; this is the most significant gradient across the monitoring sites, however it is also the most elevated site.
BWMB	Slight Downward	~ 0.5 m between the alluvium/shallow rock and the deep interburden.
S4MB	Upward	~ 1 m to ~ 2 m between the deeper coal seam and the shallow rock.
S5MB	Downward	~ 2 m between the deeper coal seam at S5MB03 and the shallow rock at S5MB02 since July 2013 (a slightly upward gradient prior to July 2013). The shallow rock monitoring bore at S5MB01 shows a very slow response to sampling and therefore may not be representative of water table trends.
RMB	Slight Upward	~ 0.5 m between the deeper and the shallower monitoring bore in the shallow rock
WKMB	Upward	~ 2.5 m to ~ 3 m between the interburden and the shallow rock
WKMB05	Upward	Apparent and pronounced upward gradient between the deepest zones and the shallowest zones
WKMB06	Upward Downward	~ 0.3 m between the shallow rock and alluvium Reversal of vertical gradient during/following flood events
WRMB	Upward	~ 1.5 m between the deeper and shallow monitoring bore in the shallow rock ~3 m between the shallow monitoring bore and the alluvium
BMB	No gradient	No perceptible gradient.
WMB	No gradient	Slight (<0.5 m) downward between the shallow and deeper monitoring bores in the shallow rock.

4.2 Groundwater quality

A total of 46 groundwater quality samples were collected from the monitoring network during the 2015 monitoring event (conventional monitoring bores and surface water sites). Water quality data from the monitoring event (regional sampling in June 2015) are discussed in this chapter, and compared to water quality data since monitoring commenced for the GGP, as shown in Table 4.2.

Table 4.2 Gloucester water quality sampling

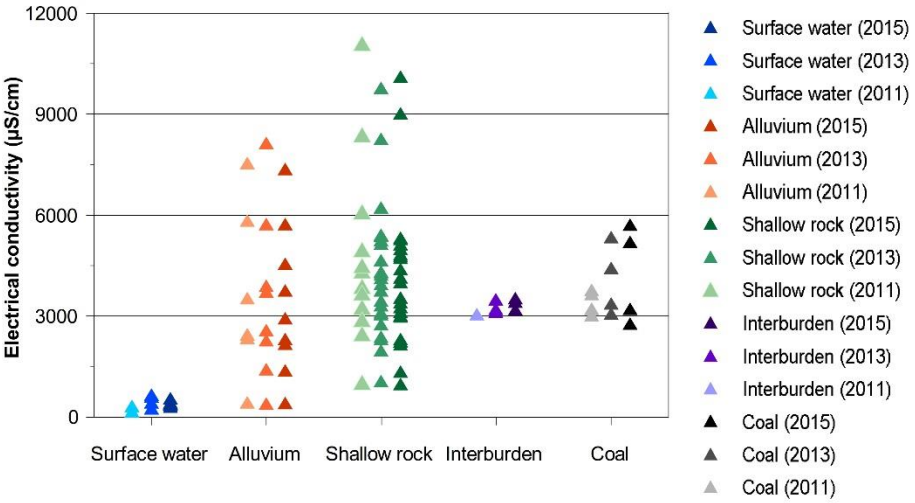
Data period	Monitoring program
2011 water quality results	April 2011 regional groundwater and surface water quality sampling
2013 water quality results	June – July 2013 regional groundwater and surface water sampling
	July – August 2013 WKMB drilling completion sampling
	October 2013 FKMB and BWMB drilling completion sampling
	September 2014 WRMB drilling completion sampling
	November 2014 WKMB06 drilling completion sampling
2015 water quality results	June 2015 regional groundwater and surface water sampling

A summary of the water quality results for the June 2015 monitoring event are presented in Appendix B and laboratory results in Appendix C.

Water quality results collected during the Waukivory Pilot Project and the Tiedman Irrigation Project are included in respective technical reports (section 3.1) and have not been included in the water quality assessment in this report for this monitoring period.

4.2.1 Field parameters

Plots of laboratory salinity (EC) and field pH for the GGP monitoring bores are presented in Figure 4.18 and Figure 4.19 respectively.



Note: the lowest concentration levels reported above are below the laboratory detection limit. For the purpose of analysis, these concentrations are shown as one-half of the detection limit.

Figure 4.18 Laboratory EC concentrations in surface water and groundwater

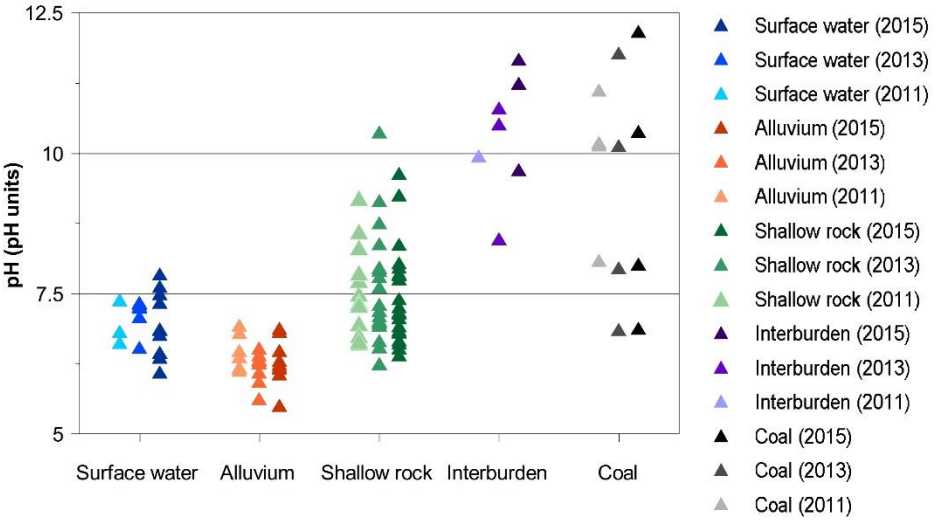


Figure 4.19 Field pH concentrations in surface water and groundwater

Groundwater salinity (EC) in the alluvium recorded during the monitoring period is fresh to slightly saline (ranging between 402 – 7,360 µS/cm). The highest EC concentrations recorded in the alluvium were detected at TMB01 (7,360 µS/cm) and TMB03 (5,730 µS/cm). Since monitoring began, TMB01 and TMB03 have consistently recorded the highest EC concentrations in the alluvium.

Groundwater salinity (EC) in the shallow fractured rock recorded during the monitoring period is marginally brackish to moderately saline (ranging between 974 – 10,100 µS/cm). The highest EC concentrations recorded in the shallow rock were detected at RMB01 (10,100 µS/cm) and RMB02 (9,010 µS/cm). Since monitoring began, RMB01 and RMB02 have consistently recorded the highest EC concentrations in the shallow rock.

Groundwater salinity (EC) in the interburden has remained consistently brackish since monitoring began (ranging between 3,050 – 3,520 µS/cm). Groundwater in the coal seams is brackish to slightly saline (ranging between 2,770 – 5,700 µS/cm).

Groundwater pH generally increases with depth, with slightly acidic to near neutral water in the alluvium and more alkaline groundwater measured in the deeper hydrogeological units. The concentrations of EC and pH levels recorded during the 2015 monitoring event are consistent with water quality results since monitoring began.

4.2.2 Major ions

The major ion characteristics of groundwater samples for all monitoring events are shown in a piper diagram in Figure 4.20 and representative bivariate plots in Figure 4.21. A piper diagram is a graphical representation of the relative concentrations of major ions (Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, Cl^{-}, HCO_3^{-}, CO_3^{2-} and SO_4^{2-}). The ratios of sodium/chloride and magnesium/chloride versus chloride concentrations are also presented in two bivariate plots. Chloride is typically assumed to be a conservative (non-reactive) ion in groundwater systems. Evapotranspiration of the initial water with low chloride concentration would therefore be expected to result in a horizontal trend in a major ion/chloride versus chloride plot.

Groundwater in the alluvium is dominated by sodium and chloride, together with bicarbonate in groundwater within the shallow rock, interburden and coal. The sodium-chloride-bicarbonate water type is typical for groundwater within coal seams, which is typically depleted in calcium and magnesium ions (Figure 4.21) and exhibit highly reduced sulphate concentrations (Owen *et al.* 2014).

No apparent change in ion composition was observed in the 2015 monitoring event compared to the biannual events in previous years.

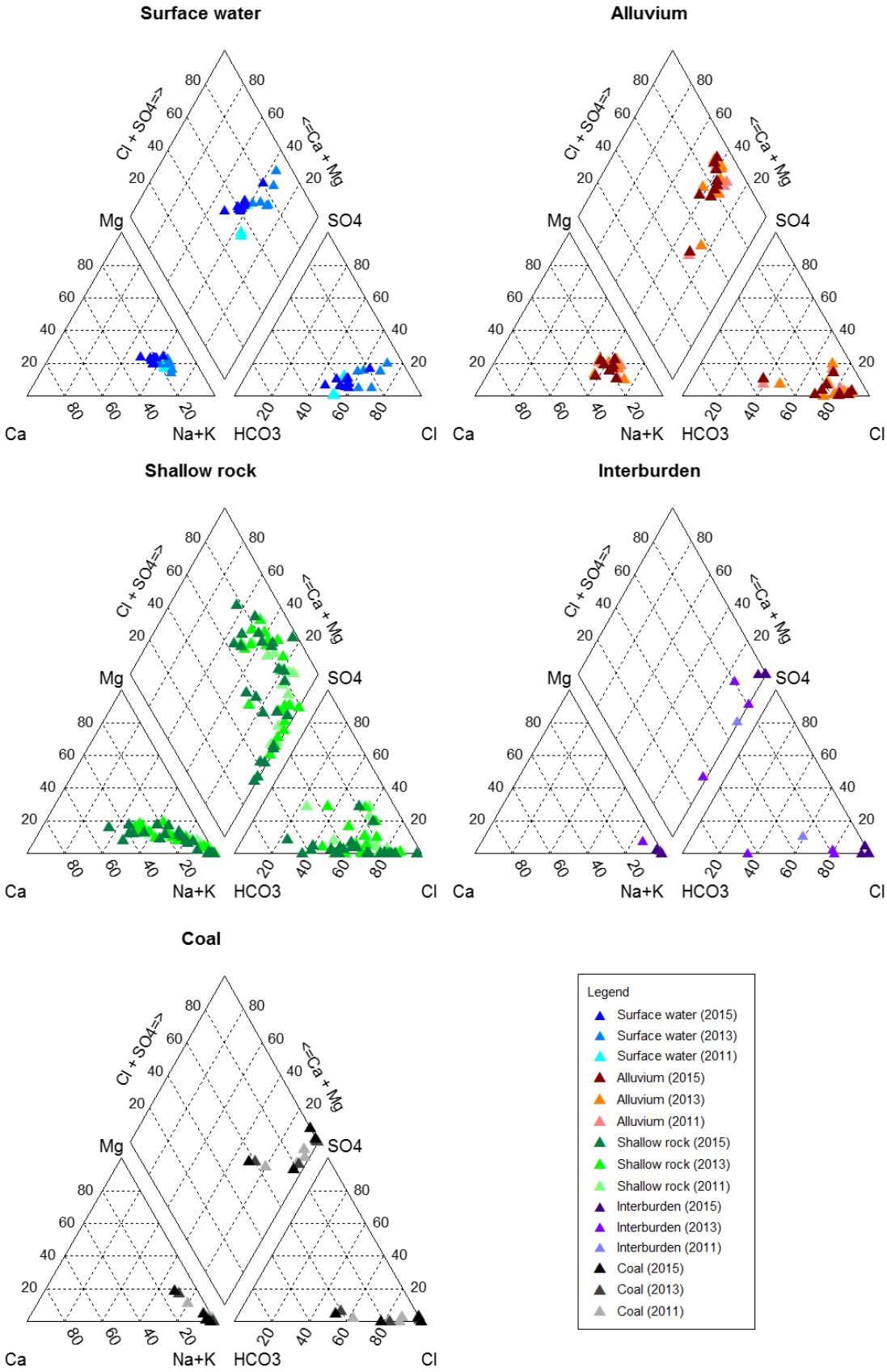


Figure 4.20 Major ion chemistry of surface water and groundwater

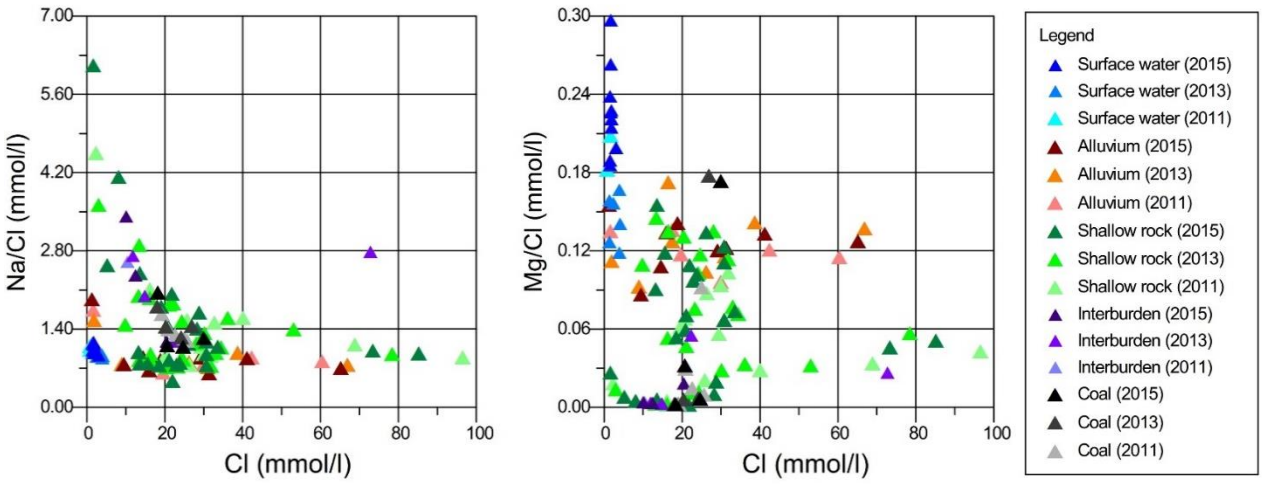


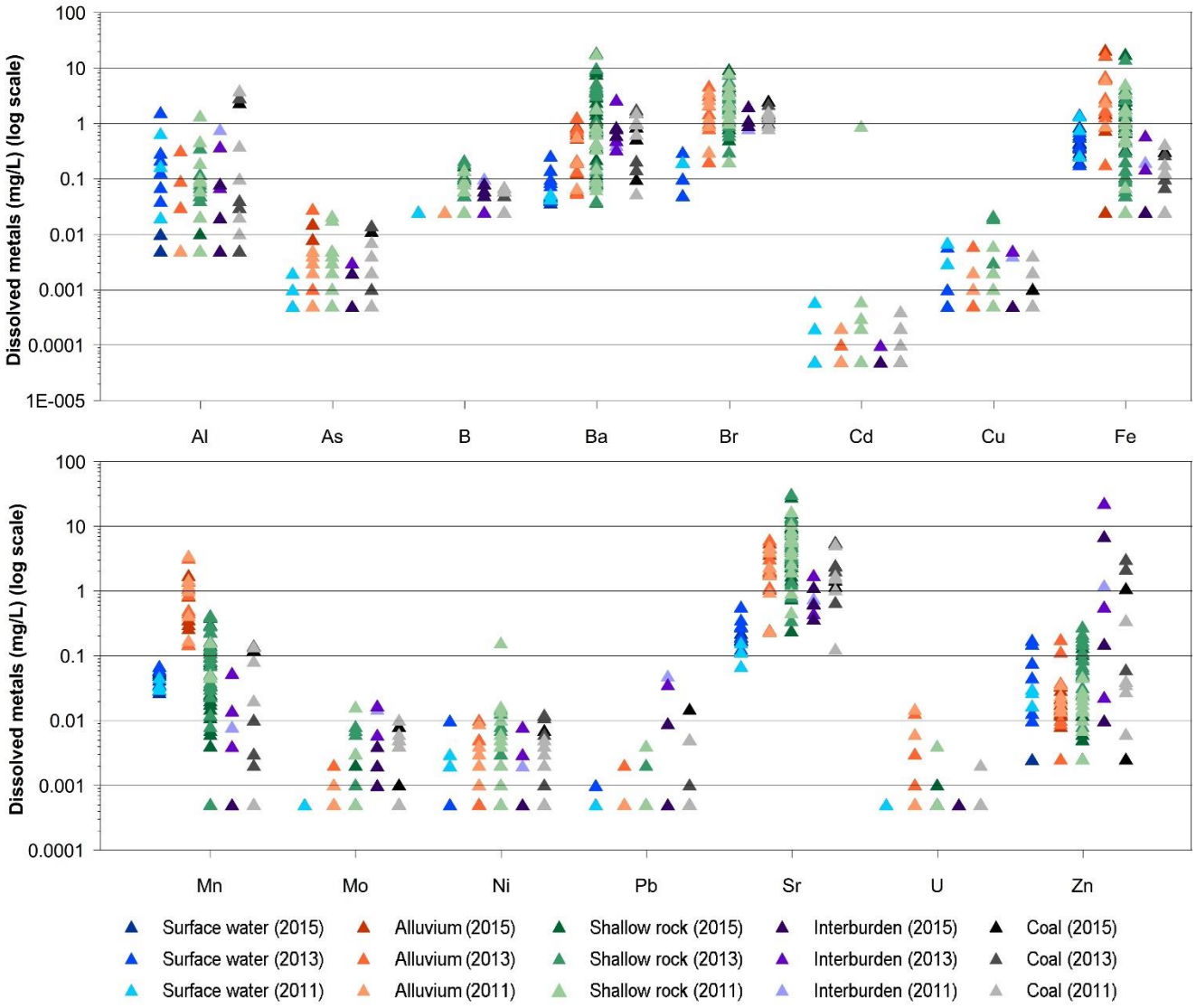
Figure 4.21 Major ion chemistry of surface water and groundwater

4.2.3 Dissolved metals

Concentrations of dissolved metals in groundwater are presented in Figure 4.22. The major findings for dissolved metals for the 2015 monitoring event are as follows:

- Dominant metals found in groundwater samples include Aluminium (<0.01 – 2.35 mg/L), Barium (0.037 – 18.3 mg/L), Bromine (<0.1 – 9.2 mg/L), Iron (<0.05 – 20.6 mg/L), Manganese (<0.001 – 19.6 mg/L) and Strontium (0.172 – 28.6 mg/L).
- Generally, metal concentrations do not differ greatly between hydrogeological units within the GGP. Notable exceptions include:
  - Barium concentrations are greatest in the shallow rock with the maximum concentration detected at RMB01 (18.3 mg/L).
  - Iron concentrations are greatest in the alluvium and shallow rock, with the maximum detected at WKMB06A (20.6 mg/L), and WMB02 (3.57 mg/L) respectively. Iron was not detected in the interburden for the monitoring period.
  - Manganese concentrations are greatest in the alluvium, with the maximum detected at AMB01 (3.19 mg/L). Manganese concentrations generally exceed those found within the shallow rock, interburden and coal.
  - Lead concentrations typically increase with depth with the maximum concentration detected within the coal at TCMB04 (0.015 mg/L).
  - Strontium concentrations are greatest within the shallow rock, with the maximum detected at S4MB01 (28.6 mg/L).
  - Zinc concentrations typically increase with depth with the maximum detected in the interburden at WKMB03 (6.94 mg/L).
- Mercury, selenium and vanadium were below the laboratory limit of reporting (LOR) in all groundwater samples. Cobalt was generally below detection limit in all hydrogeological units with the exception of some detections in the alluvium. These metals have been excluded from Figure 4.22.
- Dissolved metal concentrations detected during the 2015 monitoring event were low and were generally comparable to previous monitoring events.

The dissolved metal concentrations are not unexpected and are considered natural given the brackish salinities and clayey nature of the Avon River alluvium and the estuarine and shallow marine origin of most sedimentary rocks across the catchment.



Note: the lowest concentration levels reported above are below the laboratory detection limit. For the purpose of analysis, these concentrations are shown as one-half of the detection limit.

Figure 4.22 Dissolved metal concentrations in surface water and groundwater

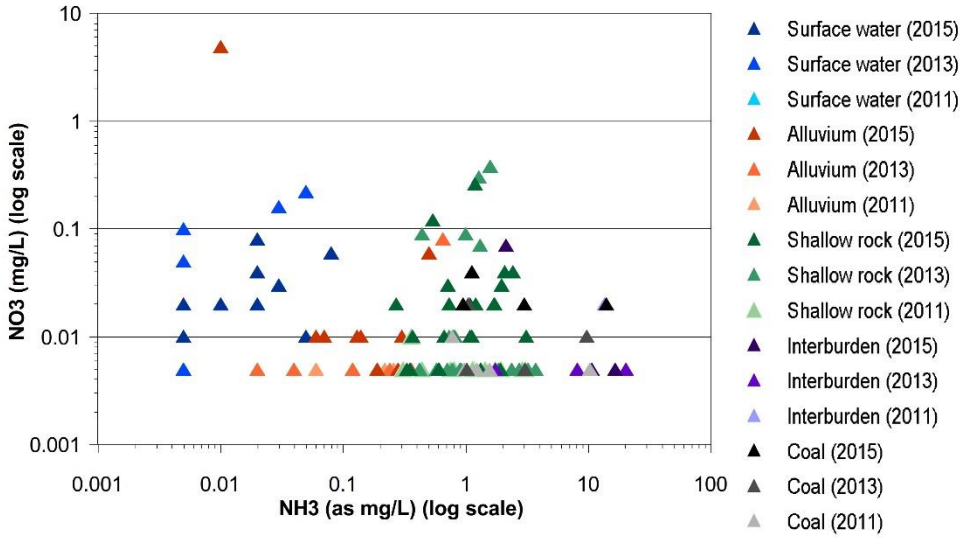
4.2.4 Nutrients

The major findings for nutrient concentrations detected in the groundwater samples are as follows:

- Ammonia (NH_3) concentrations in groundwater increase with depth; higher ammonia concentrations are found in the coal seams and interburden than the alluvium.
- Nitrate (NO_3) concentrations in groundwater were low at all GGP monitoring bores (<0.2 mg/L as N).
- The maximum concentration of NO_3 was detected in the alluvium at WMB01 (4.91 mg/L).
- Nitrite (NO_2) concentrations were below the laboratory LOR at all monitoring bores with the exception of minor detections in the alluvium, shallow rock and interburden.
- Phosphorus concentrations are greatest in the shallow rock with the maximum detected at WKMB06B (0.58 mg/L).
- Total organic carbon (TOC) concentrations differ between hydrogeological units, with concentrations generally increasing with depth.

- Concentrations detected during the 2015 monitoring event are comparable to previous monitoring events.

A plot showing ammonia versus nitrate in surface water and groundwater is presented in Figure 4.23.



Note: the lowest concentration levels reported above are below the laboratory detection limit. For the purpose of analysis, these concentrations are shown as one-half of the detection limit.

Figure 4.23 Ammonia versus nitrate concentrations in surface water and groundwater

4.2.5 Dissolved gases

A plot showing dissolved methane concentrations in surface water and groundwater is presented in Figure 4.24.

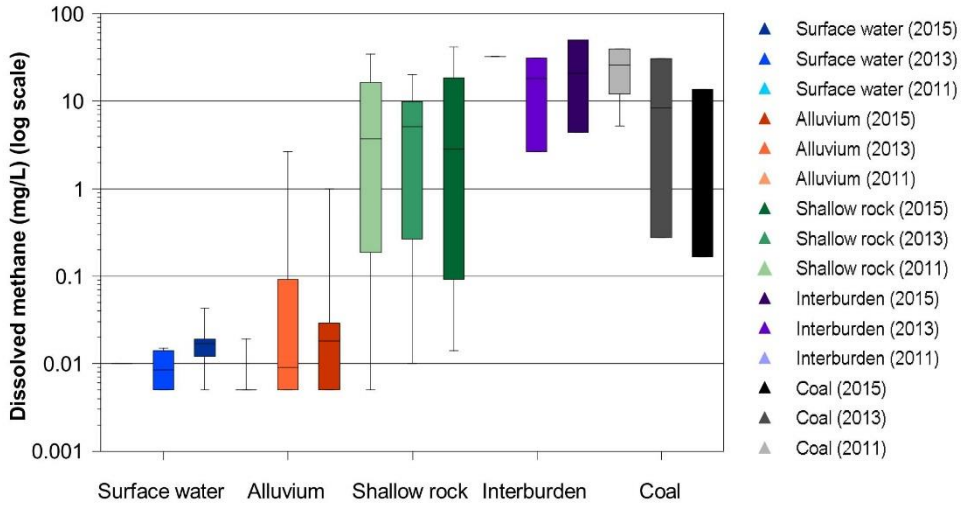


Figure 4.24 Dissolved methane (CH_4) in surface water and groundwater

The major findings for dissolved gases are as follows:

- Dissolved methane was detected in all hydrogeological units, generally increasing with depth with the highest average concentrations detected within the interburden and coal seams.
- Dissolved methane concentrations are lower in the alluvium and typically comparable to surface water concentrations.

- No other dissolved gases were detected, with the exception of propane which was detected on one occasion in the shallow rock (0.02 mg/L at S5MB02 in June 2013).
- Concentrations detected during the 2015 monitoring event are comparable to previous monitoring events.

Gas samples were collected using Isotech Isotubes® from the two shallow gas monitoring wells, TGMB01 and TGMB02 on the Tiedman property (Figure 3.2). These are dry monitoring wells, above the water table. The results from the sampling event on 4 April 2015 are presented in Table 4.3.

Table 4.3 Gas sampling composition

Analyte	TGMB01 (screened 3 – 4 mbgl)		TGMB02 (screened 12 – 15 mbgl)	
	2011	2015	2011	2015
O_2 + Ar (ppm)	217,700	211,000	216,600	211,400
CO_2 (ppm)	560	400	1200	490
N_2 (ppm)	781,700	788,600	782,100	788,100
CH_4 (ppm)	16	4	138	4

Concentrations of oxygen (O_2), Argon (Ar) Carbon Dioxide (CO_2) and Nitrogen (N_2) are typical of air. Methane concentrations were negligible and were too low to perform any isotopic analysis of C or H isotopes. These results are comparable to gas sampling that was completed in May 2011 as part of the Phase 2 Groundwater Investigations (Parsons Brinckerhoff 2013a), however methane and carbon dioxide concentrations were slightly lower than the 2011 results. Laboratory results from the gas sampling are included in Appendix C.

4.2.6 Dissolved hydrocarbons

The major findings for dissolved hydrocarbons detected during the monitoring period are as follows:

- Phenolic compounds were generally below the laboratory LOR for the monitoring event, with five detections occurring across the monitoring network recorded within the shallow rock; BWMB01C (3.2 µg/L), S4MB01 (1.1 µg/L) and, FKMB01B (2.1 µg/L) and the interburden; TCMB02 (3.4 µg/L) and BWMB01D (1.6 µg/L).
- Toluene was the only BTEX constituent found during the monitoring event with 7 detections occurring across the monitoring network. Detected toluene concentrations range from 2 - 59 µg/L with the greatest concentration found in the shallow rock unit at TCMB01. Detection of hydrocarbons in groundwater in the sedimentary rocks of the Gloucester Basin represents natural background conditions (Volk *et al.* 2011) and are expected for sedimentary rocks based on early exploration studies in the Gloucester Basin by Thornton (1982) and Hunt *et al.* (1983).
- Polyaromatic hydrocarbons (PAHs) were predominately below the laboratory LOR for the monitoring event. No volatile organic compounds (VOCs) were detected during the monitoring event.

5. Surface water monitoring

5.1 Surface water levels

The stream gauge monitoring network is located on the Avon River, Dog Trap Creek and Waukivory Creek (section 3.1.2). All stream gauges across the monitoring network show rapid responses to rainfall events (Figures 5.1 and 5.2) with peak discharge occurring within hours of the rainfall event. The hydrographs also show relatively steep recession curves, with stream levels declining close to pre-existing levels within 2 weeks following rainfall events. This is representative of runoff high in the catchment, with limited storage capacity and baseflow contributions upstream of the GGP site. During the monitoring period, high rainfall events correlating with increased water levels occurred in August 2014, December 2014, January 2015, April 2015 and May 2015.

A period of below average rainfall occurred from September 2014 to December 2014. This corresponds to periods of very low water levels in the Avon River, Dog Trap Creek and Waukivory Creek. During this time, the water levels fell below the zero gauge height at TSW01 (Avon River), ASW01 (Avon River), and TSW02 (Dog Trap Creek). Periods of very low rainfall and low water levels result in 'no flow' or 'very low flow', and typically the rivers are characterised by a series of disconnected pools.

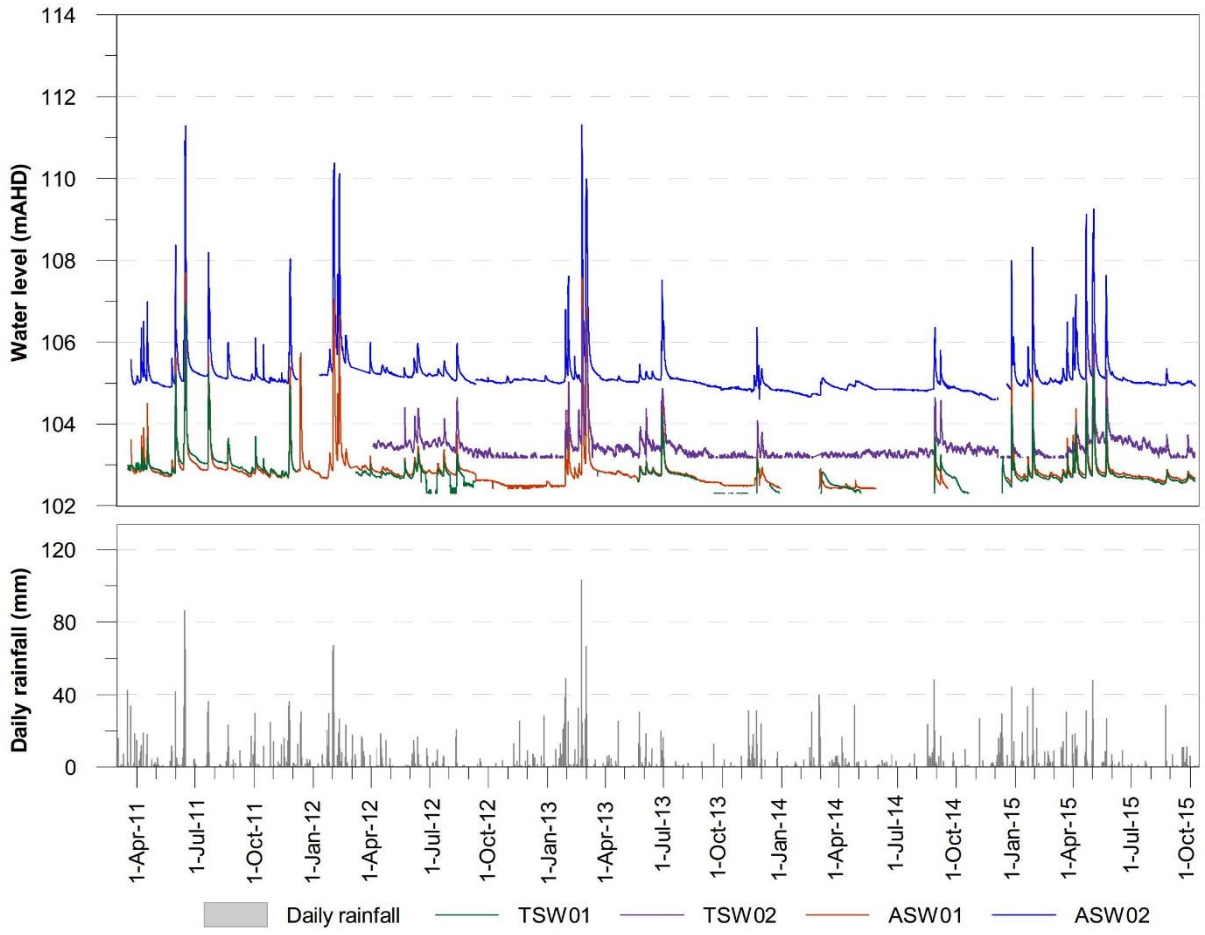


Figure 5.1 Avon River (ASW01, ASW02 and TSW01) and Dog Trap Creek (TSW02) stream level and rainfall

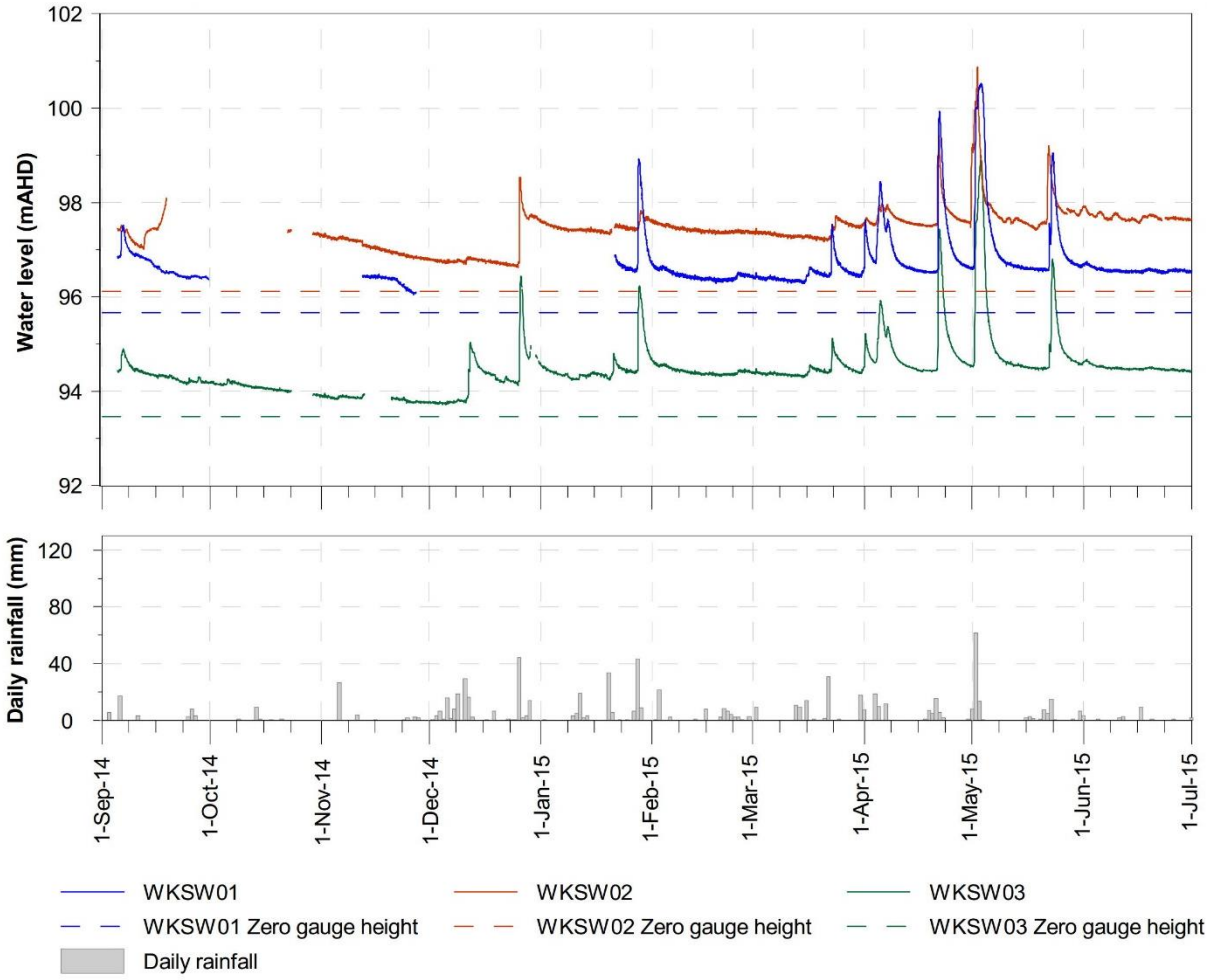


Figure 5.2 **Avon River (WKSW01 and WKSW03) and Waukivory Creek (WKSW02) stream level and rainfall**

5.1.1 Groundwater-surface water interaction

Groundwater levels in the alluvium are typically higher than adjacent stream levels (by between one and two metres), indicating that the streams are discharge features for shallow groundwater in the Stage 1 GFDA (Figure 5.3). It is only during relatively short periods of high stream levels and flow, associated with rainfall events and floods, that the shallow alluvial groundwater is recharged from the streams.

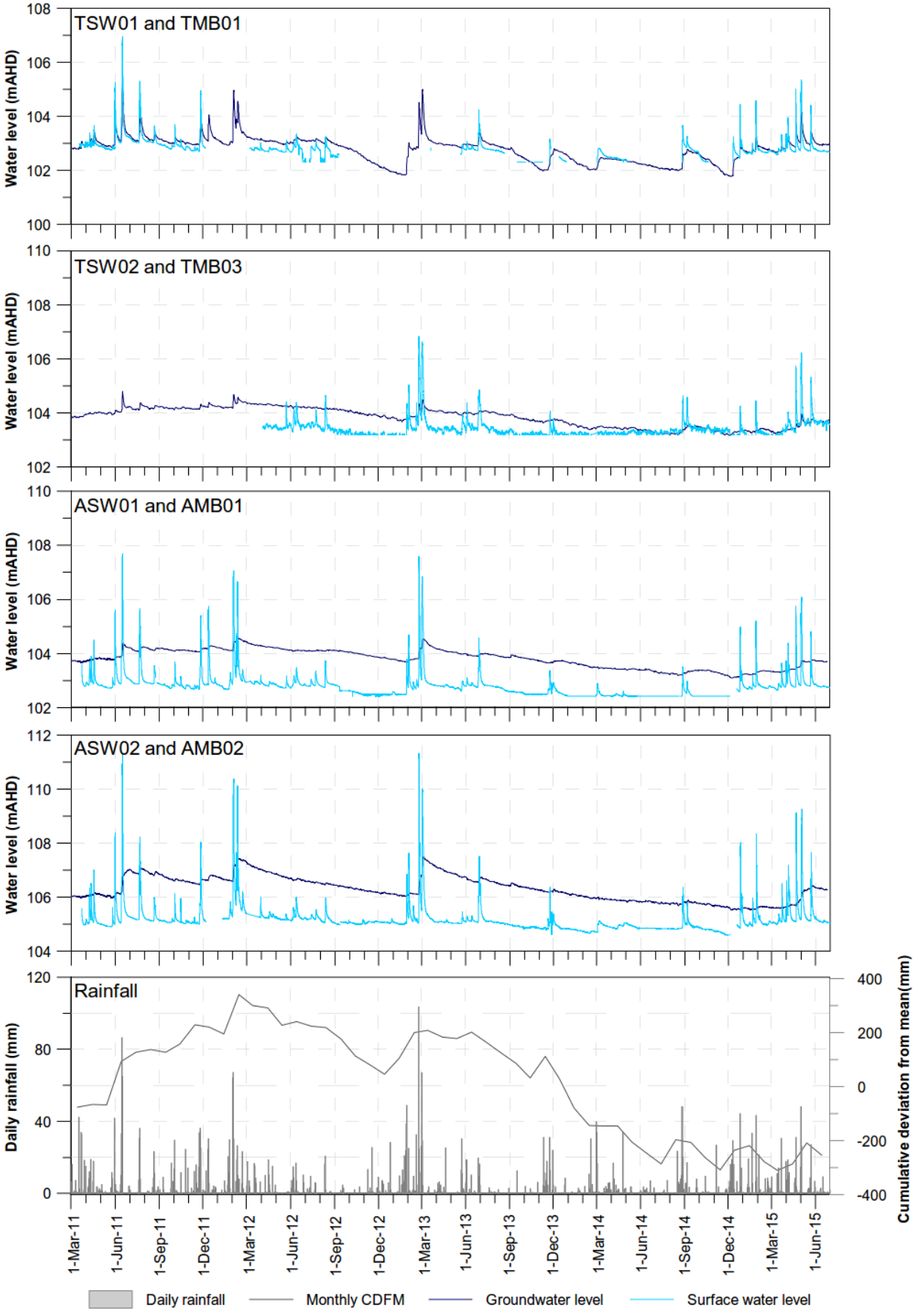


Figure 5.3 **Surface water hydrographs and groundwater levels in the adjacent alluvium for the Avon River and Dog Trap Creek**

5.2 Surface water flows

No calibrated rating curves are available for any of the stream gauge sites at this time due to persistent low flows and very short periods of higher flows. Stream water levels have been converted to estimated stream flows using theoretical rating curves prepared for the 2014 Monitoring Status Report (Parsons Brinckerhoff 2014f). Estimated stream flows are provided in Figure 5.4.

The Avon River at ASW01 and Dog Trap Creek at TSW02 have no flow for 94% and 98% of the time respectively (Parsons Brinckerhoff 2014f). Absence of flow does not reflect no water at a stream gauge. During periods of low rainfall, the Avon River and Dog Trap Creek are characterised by multiple disconnected pools. The Avon River at TSW01 has no flow for 30% of the time, and at ASW02 has no flow for 3% of the time.

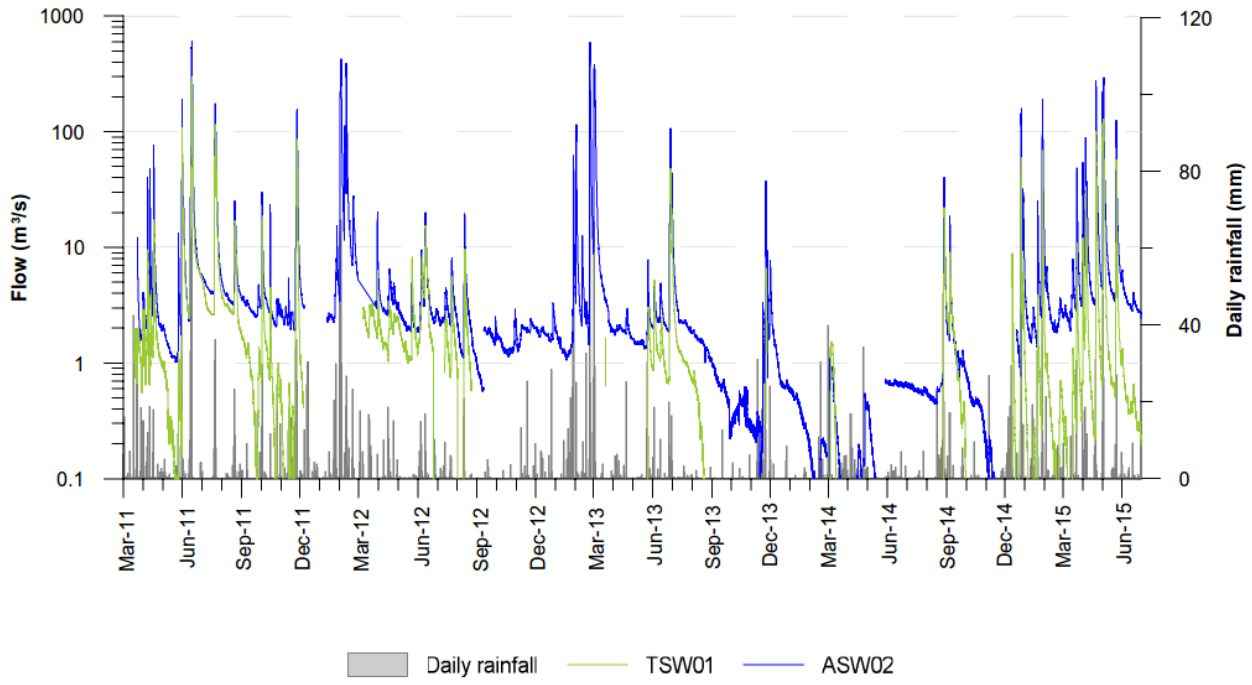


Figure 5.4 Avon River and Dog Trap Creek estimated flows and rainfall

5.3 Surface water quality

Surface water quality samples were collected from 10 monitoring locations across the monitoring network during the 2015 water sampling event. Surface water results are compared to the groundwater results in the figures in section 4.2.

A summary of the water quality results for the June 2015 sampling event are presented in Appendix B and laboratory results in Appendix C.

5.3.1 Surface water salinity monitoring

Stream gauge installations for the GGP are provided in section 3.1.2 and Figure 3.1 and Figure 3.2. Continuous water level and salinity (as EC) data are recorded at 15 minute intervals at selected surface water monitoring locations.

The complete time series of water levels and EC since monitoring began at TSW01, TSW02, ASW01 and ASW02 are provided in Appendix A. The following figures present hydrographs and EC concentrations

during the 2015 monitoring period at ASW01 and ASW02 (Figure 5.5), TSW01 and TSW02 (Figure 5.5), and WKSW01, WKSW02 and WKSW03 (Figure 5.6).

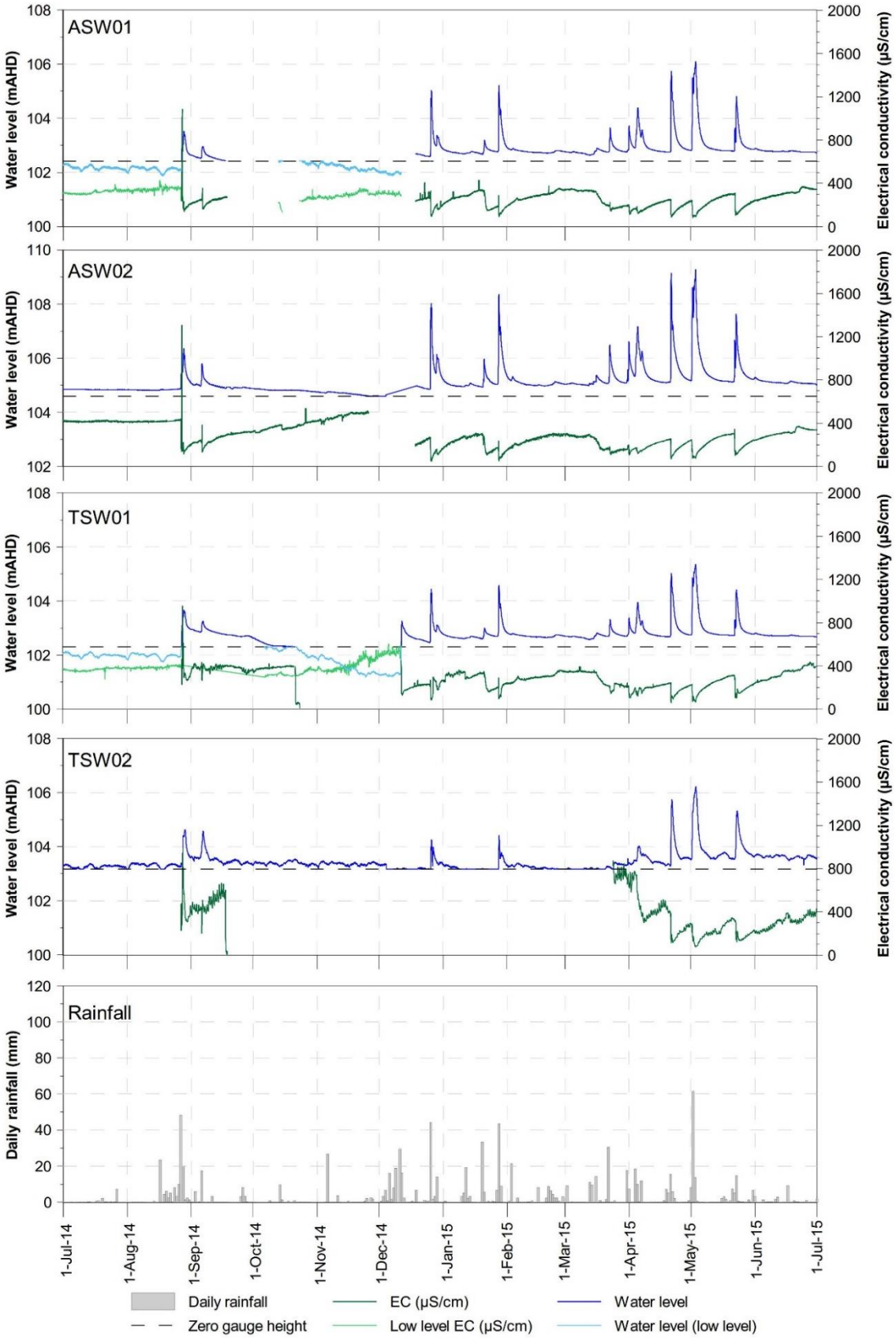


Figure 5.5 **Water levels and EC (µS/cm) on the Avon River (ASW01, ASW02 and TSW01) and Dog Trap Creek (TSW02) during the 2015 monitoring period**

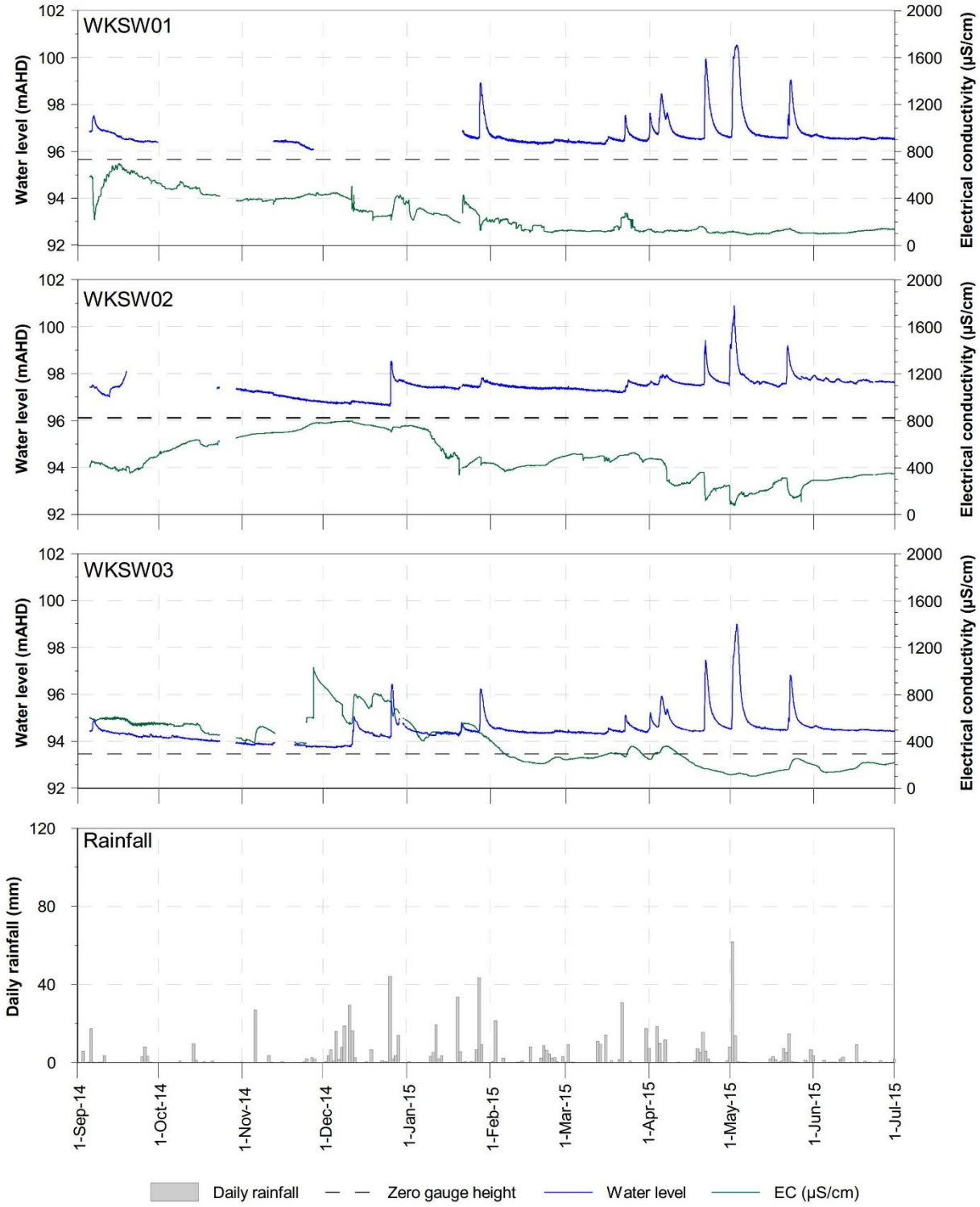


Figure 5.6 Water levels and EC (µS/cm) on the Avon River (WKSW01 and WKSW03) and Waukivory Creek (WKSW02) since September 2014

Surface water levels show a direct and immediate response to rainfall and runoff across all monitoring locations. Surface water salinity (measured as EC) is inversely related to levels and flow. Salinity decreases following rainfall events as relatively fresh runoff is routed into streams (Figures 5.2 to 5.4). An initial increase in EC is often seen in the initial runoff phase as readily dissolvable salts are flushed from the ground surface and shallow soils. During the monitoring period, an increase in EC associated with high rainfall events and the initial runoff phase is observed in September 2014 following an extended dry period.

After the initial salinity spike and subsequent reduction in EC levels, EC then gradually increases as flow decreases, and as groundwater discharge from the alluvium starts to become a more dominant component of the baseflow. During the monitoring period, a gradual increase in EC is observed during low rainfall periods from November 2014 to December 2014. Low water levels are observed in the Avon River and Dog Trap Creek during these periods and an increase in EC may also be attributed to evaporative concentration of salts likely to be taking place in disconnected pools within the streams.

A percentile is the value below which a given percentage of observations fall. For example, the 5th percentile is the value below which 5% of observations are found. The 5th and 95th percentiles presented in Table 5.1 are used as a method of discounting outlying values.

Generally, the tributaries of the Avon River (Dog Trap Creek (at TSW02) and Waukivory Creek (at WKSW02)) show median EC concentrations and higher EC concentrations in the 95th%ile. Table 5.1 shows the range of EC data measured by in-situ loggers during the 2015 monitoring period. The maximum concentration was found at TSW02 (2420 µS/cm) while the highest 95th percentile was found at WKSW02 (756 µS/cm). This is attributed to the ephemeral characteristics of these tributaries and generally lower surface water flows compared to the Avon River.

Table 5.1 EC observations during the 2015 monitoring period

EC (µS/cm)	Location	5th percentile	Median	95th percentile	Maximum
ASW01[a]	Avon River	138	249	345	1081
ASW02	Avon River	132	286	451	1307
TSW01[a]	Avon River	141	293	400	957
TSW02	Dog Trap Creek	30	368	705	2420
WKSW01	Avon River	101	150	491	699
WKSW02	Waukivory Creek	177	389	756	798
WKSW03	Avon River	126	260	653	1031

(a) ASW01 and TSW01 do not include low level logger data

5.3.2 Field parameters

Plots of laboratory EC and field pH for the GGP monitoring surface water locations are presented in Figure 4.18 and Figure 4.19. Continuous monitoring of EC is recorded at the surface water monitoring locations (section 5.3.1).

Surface water salinity is fresh to marginal. The salinity of the surface water is significantly fresher than groundwater salinity in the alluvium, shallow rock, interburden and coal seams (Figure 4.18).

Surface water is generally neutral to slightly acidic. Surface water pH is slightly more acidic than alluvial groundwater pH over all sampling events.

5.3.3 Major ions

Major ionic composition of surface water is shown in Figure 4.20 (and included in section 4.2.2). The composition of surface water is consistent with the alluvium (Figure 4.20). Surface water is predominately sodium chloride water, consistent with the alluvium. The ionic composition of water has remained consistent since monitoring began for the GGP.

5.3.4 Dissolved metals

Concentrations of dissolved metals (mg/L) in groundwater are presented in Figure 4.22 and Appendix B. Metal concentrations were compared to ANZECC (2000) guidelines for the protection of 95% of species. No exceedances were noted for the 2015 monitoring event.

Metals detected within the surface water are typically lower in concentration than those detected in the groundwater with the exception of aluminium, cadmium, copper and nickel where concentrations in surface water are comparable to the concentrations detected within the groundwater.

5.3.5 Nutrients

A plot showing ammonia versus nitrate in surface water is presented in Figure 4.23. Surface water samples are generally low in NH_3 and NO_3 concentrations however, NO_3 is the dominating species due to aerobic conditions.

5.3.6 Dissolved gases

A plot showing dissolved methane concentrations in surface water is presented in Figure 4.24. Methane was detected in 8 surface water monitoring locations in low concentrations ranging between 0.012 – 0.043 mg/L. The greatest concentration was detected at WKSW02. Methane concentrations are considerably lower than concentrations found within the groundwater of the shallow rock, interburden and coal seam units. The range of methane concentrations detected during the 2015 monitoring event are consistent with previous monitoring events.

5.3.7 Dissolved hydrocarbons

No phenolic compounds, VOCs, PAHs, TPHs or BTEX compounds were detected in the surface water quality samples taken during the 2015 monitoring event.

6. Conclusions and recommendations

6.1 Conclusions

A comprehensive surface water and groundwater monitoring network comprising nested monitoring bores and stream gauges has been established for the GGP. Ongoing site investigations and regional water level and water quality monitoring have continued since monitoring began in January 2011. There was a biannual water sampling event in 2014/15. Additional water quality monitoring programs have been completed for exploration programs related to the GGP (section 1.3) including the Waukivory Pilot Program, the Tiedman Irrigation Program and constructed monitoring bores at Wards River.

The following conclusions are drawn from a review of the groundwater and surface water monitoring data for the 2015 monitoring period.

Rainfall

Total rainfall for the period July 2014 to June 2015 at the AGL weather station was 978 mm, which is comparable to the long term average annual rainfall (979 mm) at Gloucester Post Office. Below average rainfall was observed between September and December 2014. Rainfall events resulting in significantly greater than the long term monthly average occurred in August 2014, December 2014 and May 2015.

Groundwater

Groundwater level trends in monitoring bores vary depending on the lithology and depth of the screened interval:

- **Alluvium:** Groundwater levels in monitoring bores screened in the alluvial deposits show a rapid response to significant rainfall events. This is a threshold response, with rainfall events of a certain magnitude required to trigger a response in groundwater levels. This is variable between sites. Most alluvial monitoring bores show a decrease in groundwater levels within the first few months of the monitoring period, before increasing after December 2014 in response to increased rainfall over the remainder of the year.
- **Shallow fractured rock**: Groundwater levels in shallow rock monitoring bores have decreased slightly over the monitoring period in response to the below average rainfall in recent years. There are no strong responses to individual rainfall events in the shallow rock bores during this monitoring period.
- **Interburden units**: Monitoring bores screened within the interburden units show no significant change over the monitoring period, and groundwater levels do not respond to individual rainfall events.
- **Deep coal seams:** Groundwater levels in monitoring bores that are screened within the coal seams show varied but typically small changes in groundwater level over the monitoring period. There are no strong responses to individual rainfall events.

Vertical gradients are noted at nine of the eleven nested bore installations:

- Downward hydraulic gradients were noted at the TCMB, TTMB, FKMB and BWMB nested bore sites.
- Upward hydraulic gradients were noted at the S4MB, RMB, WKMB and WRMB nested bore sites.
- An upward vertical gradient is noted at WKMB06 during periods of low rainfall which trends to a downward gradient following high rainfall and flood events.

No vertical head gradients were noted at the BMB and WMB nested bore sites. Due to the very low permeability of the interburden units, vertical groundwater flow is likely to be extremely slow and negligible, despite the vertical gradients. Lateral flow within each of the geological units is concluded to be the dominant groundwater flow mechanism when there are no stresses on the shallow or deep groundwater systems.

Groundwater quality is variable across the hydrogeological units. Similarities in water quality variables can be seen between deeper hydrogeological units of the interburden and coal seams. Water quality within the deeper hydrogeological units is distinctly different compared to the shallower alluvium. This is indicated by the ionic composition and salinity of the different groundwater systems.

The conclusions of this report are consistent with the hydrogeological conceptual model of the Gloucester Basin (Parsons Brinckerhoff 2015f).

Surface water

Low rainfall between September and December 2014 resulted in declining water levels. More consistent rainfall from December 2014 onwards, shows an increase in surface water levels that remain relatively stable (despite responses to rainfall) for the remainder of the monitoring period.

All stream gauges on the Avon River and Dog Trap Creek show rapid responses to large rainfall events and runoff, and relatively steep recession curves, such as associated with the December 2014, April and May 2015 rain events.

Surface water quality is generally characteristic of a slightly to moderately disturbed agricultural catchment. Water quality parameters are generally within the recommended ANZECC (2000) guidelines. Some similarities can be seen between the surface water and shallow alluvium, however generally surface water quality characteristics appear distinctly different from shallow groundwater due to the dominance of rainfall runoff over groundwater baseflow accessions.

6.2 Recommendations

The following recommendations are made regarding the ongoing groundwater and surface water monitoring in the Gloucester Basin:

- Monitoring should continue at dedicated monitoring sites in accordance with the existing program, as outlined below:
  - Continuous water level and EC monitoring at the surface water monitoring sites.
  - Continuous water level monitoring at the groundwater monitoring sites.
  - Comprehensive water quality sampling at dedicated sites on a two-yearly cycle (i.e. next sampling event to be scheduled for mid-2017, and reported in the 2016/2017 annual status report).
- Four-monthly datalogger downloads should continue for all monitoring locations and four-monthly update reports should continue to be issued presenting updated hydrographs and salinity traces (where applicable).
- Improved flow gauging should be completed to verify theoretical flow duration curves to understand the flow characteristics of the Avon River across the Stage 1 GFDA.

7. Statement of limitations

7.1 Scope of services

This report has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and Parsons Brinckerhoff (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

7.2 Reliance on data

In preparing the report, Parsons Brinckerhoff has relied upon data, surveys, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, Parsons Brinckerhoff has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Parsons Brinckerhoff will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Parsons Brinckerhoff.

7.3 Environmental conclusions

In accordance with the scope of services, Parsons Brinckerhoff has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

7.4 Report for benefit of client

assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Parsons Brinckerhoff or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Parties other than the client should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

7.5 Other limitations

Parsons Brinckerhoff will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

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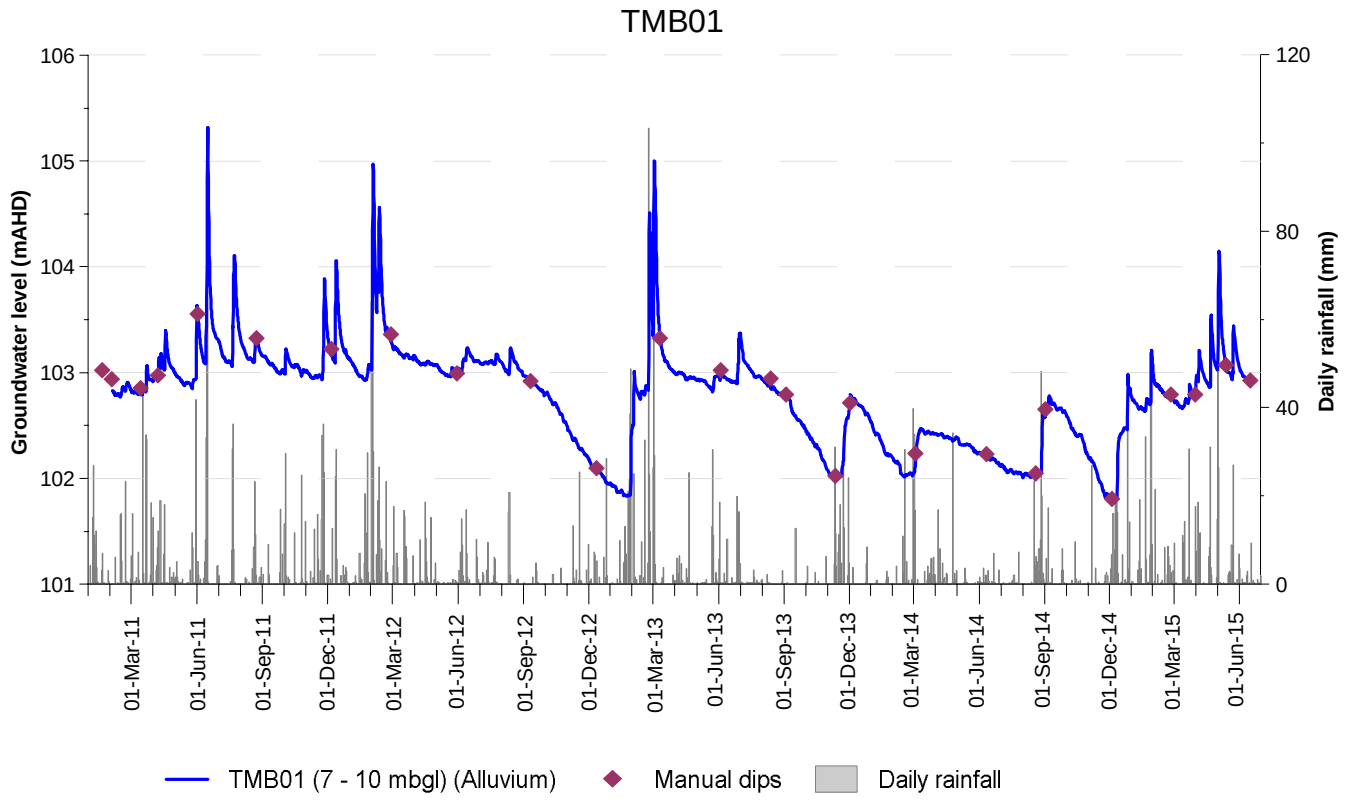
Appendix A

Hydrographs



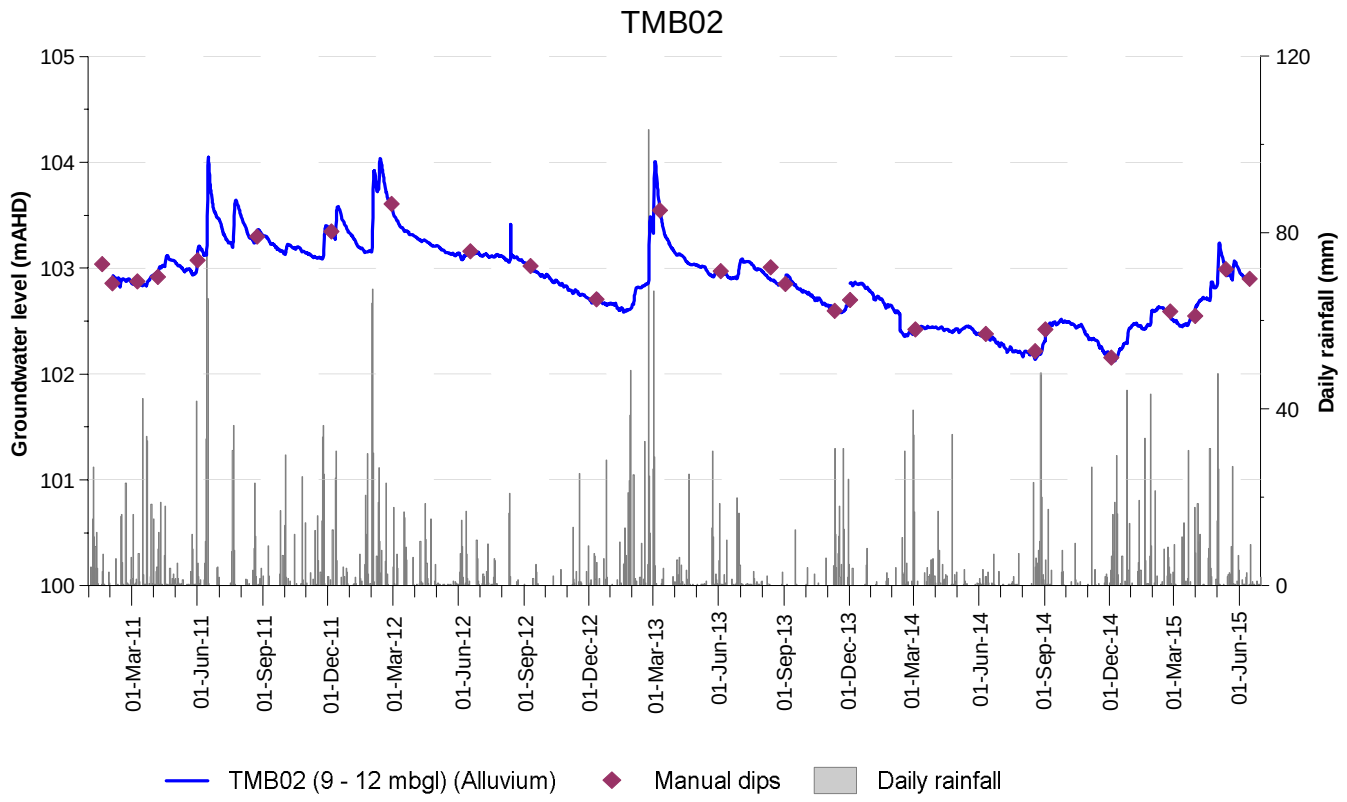


Figure A.1: TMB01 and TMB02 monitoring bores

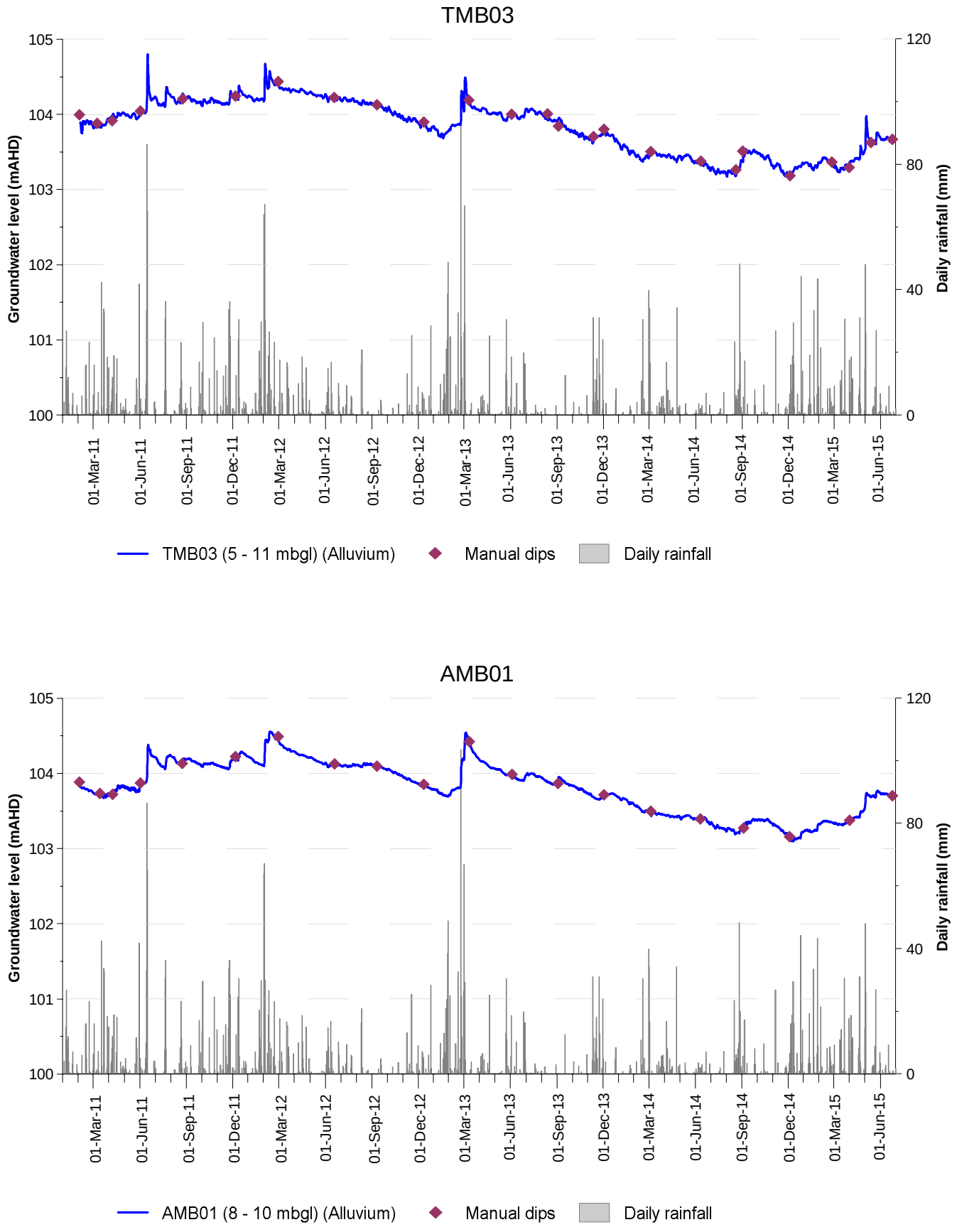


Figure A.2: TMB03 and AMB01 monitoring bores

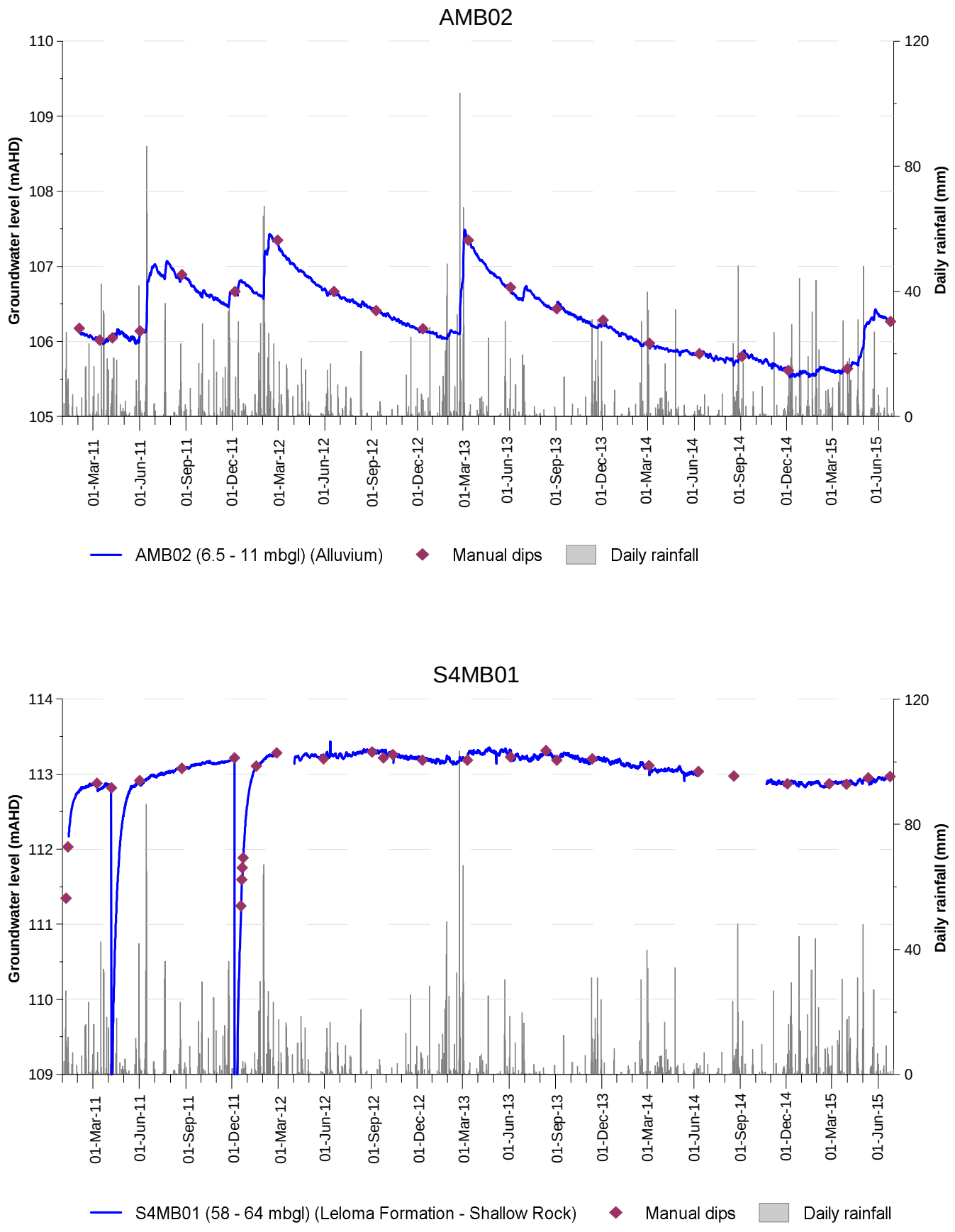
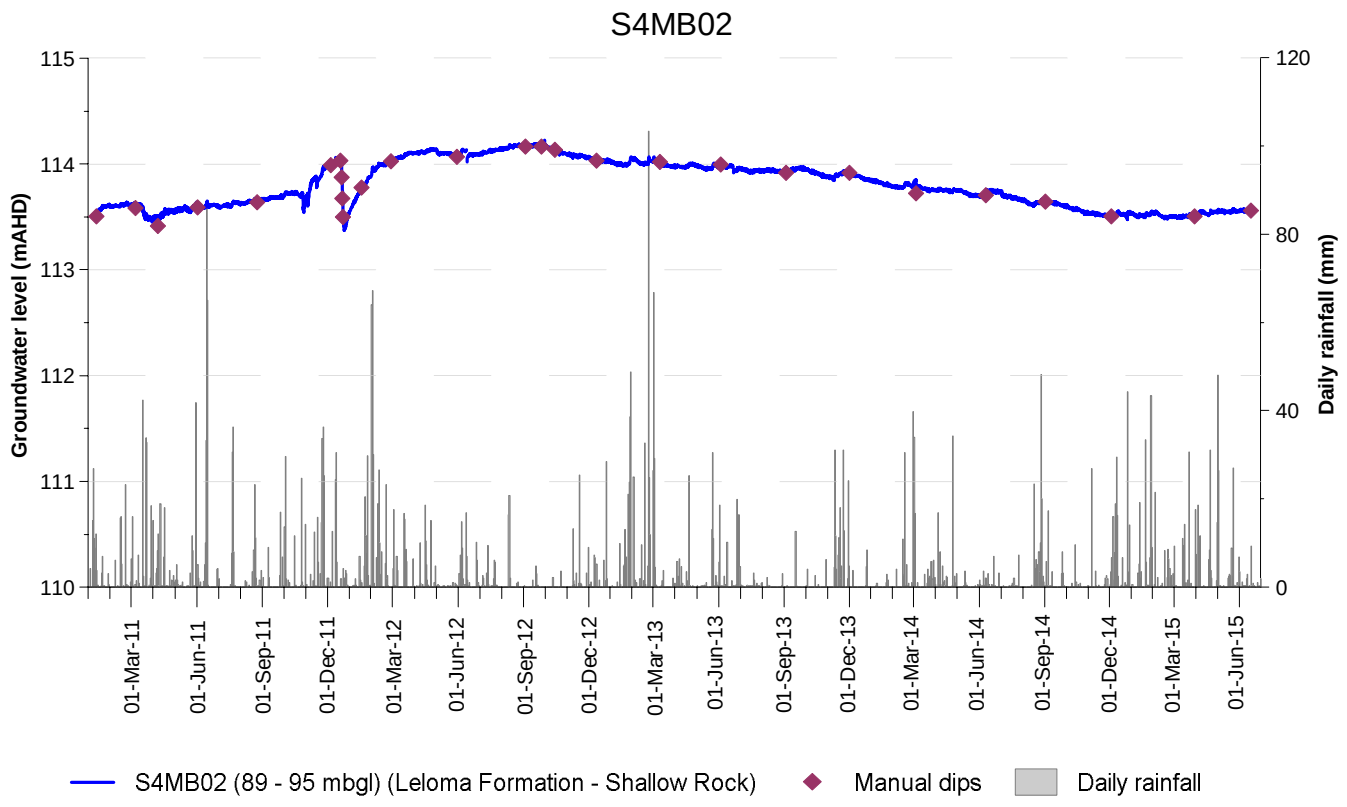


Figure A.3: AMB02 and S4MB01 monitoring bores



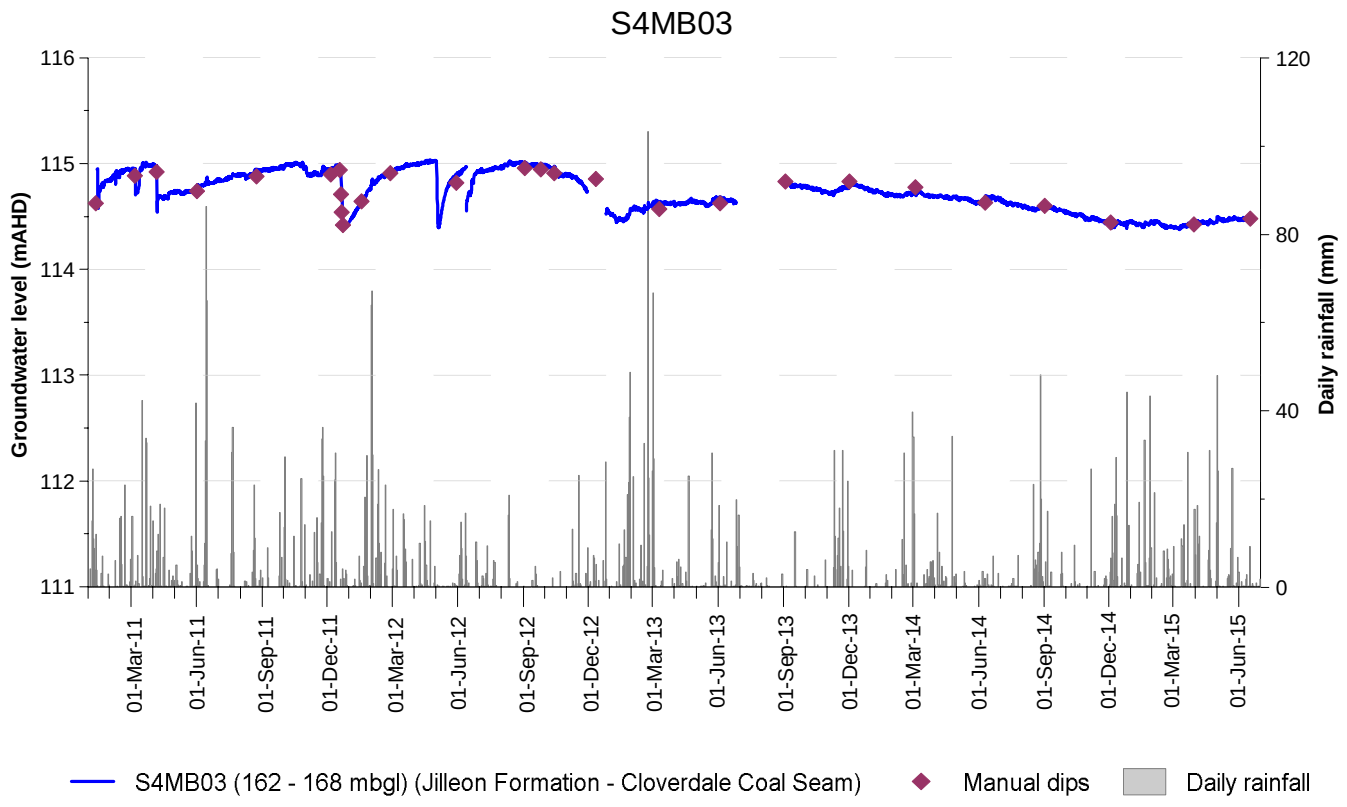


Figure A.4: S4MB02 and S4MB03 monitoring bores

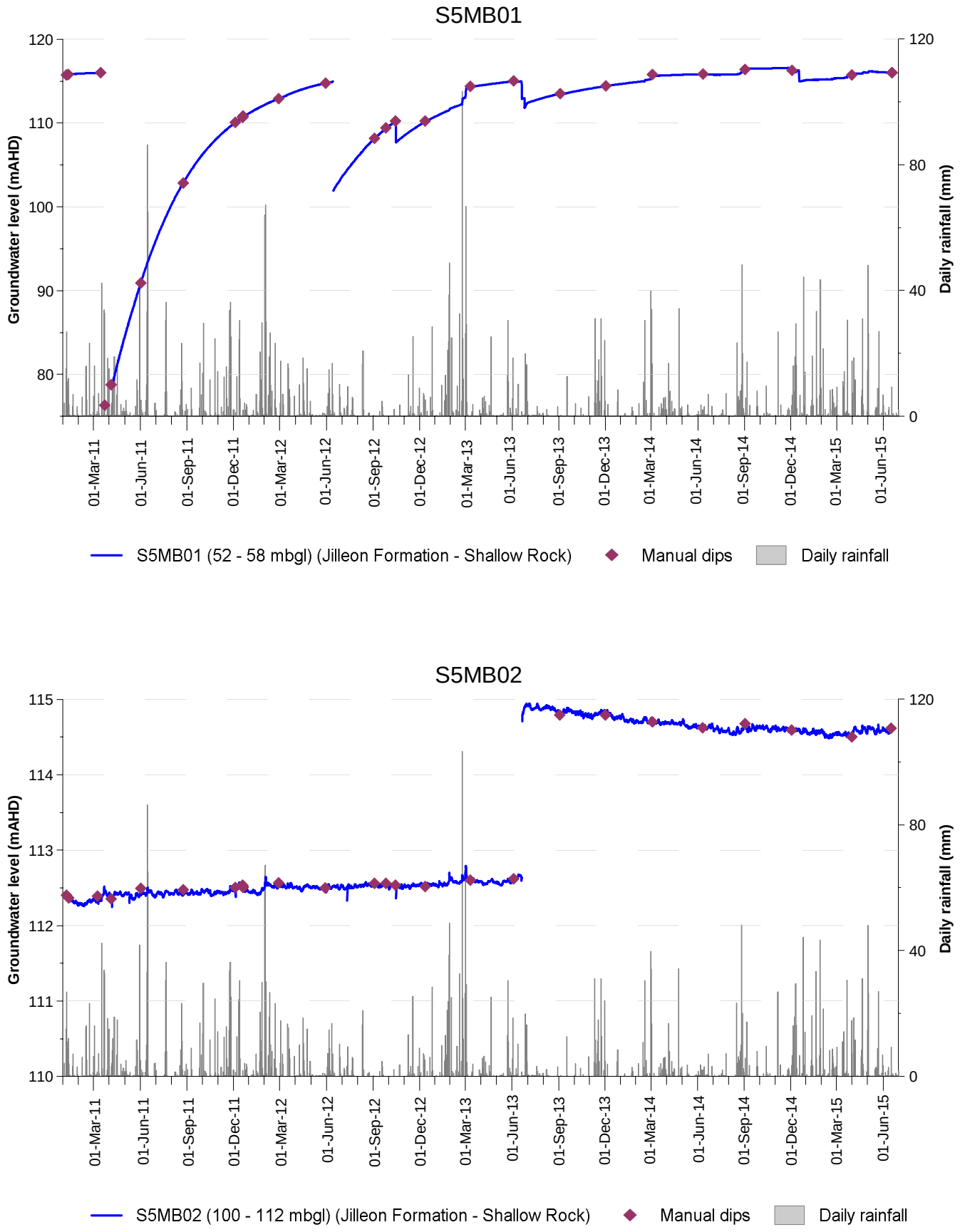
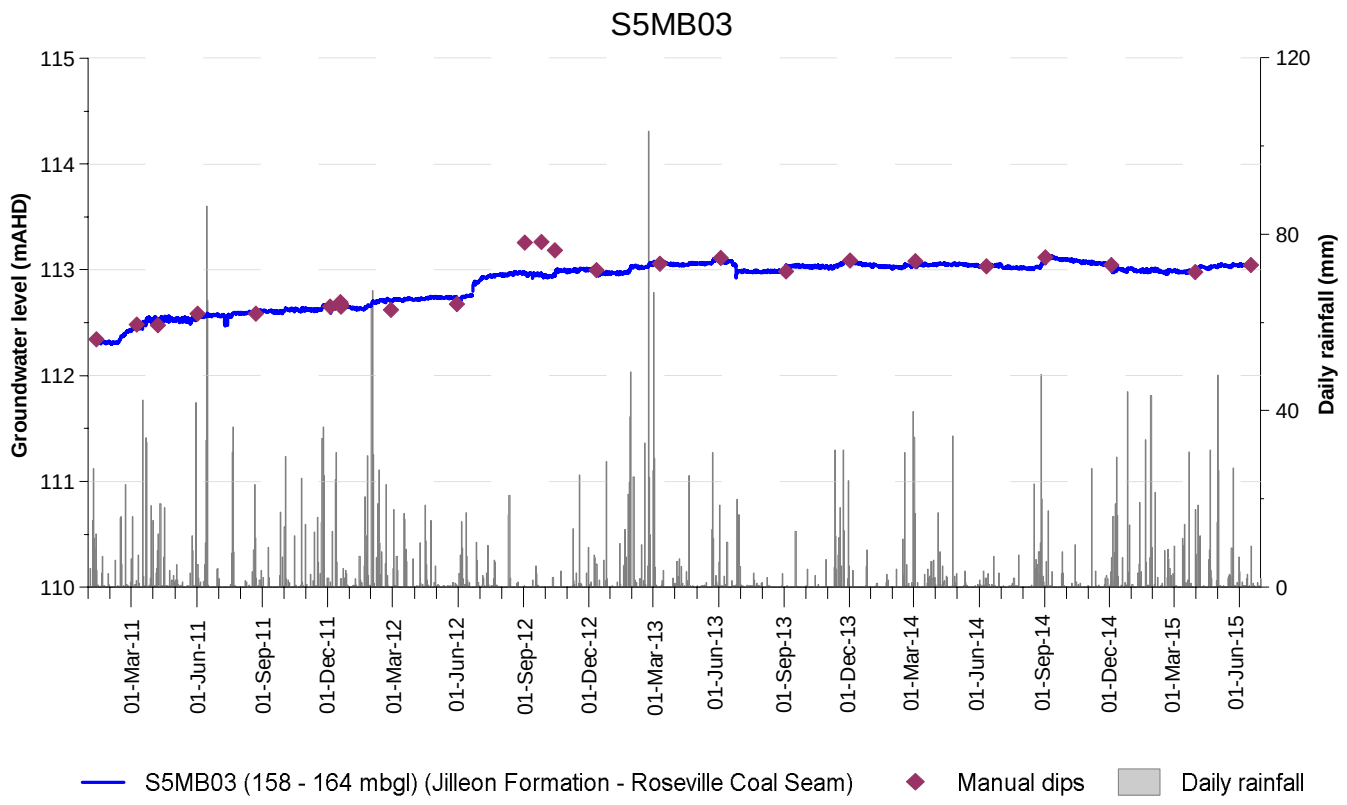


Figure A.5: S5MB01 and S5MB02 monitoring bores



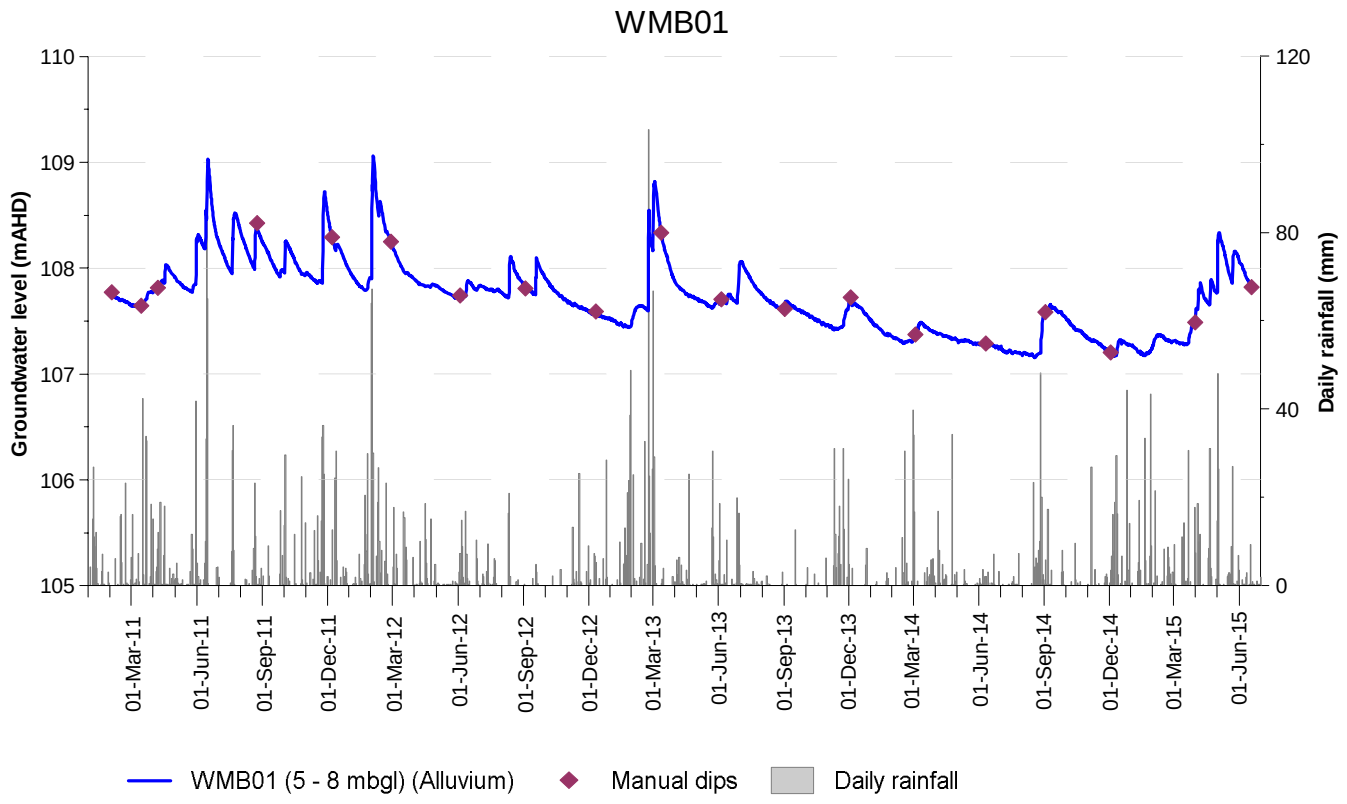


Figure A.6: S5MB03 and WMB01 monitoring bores

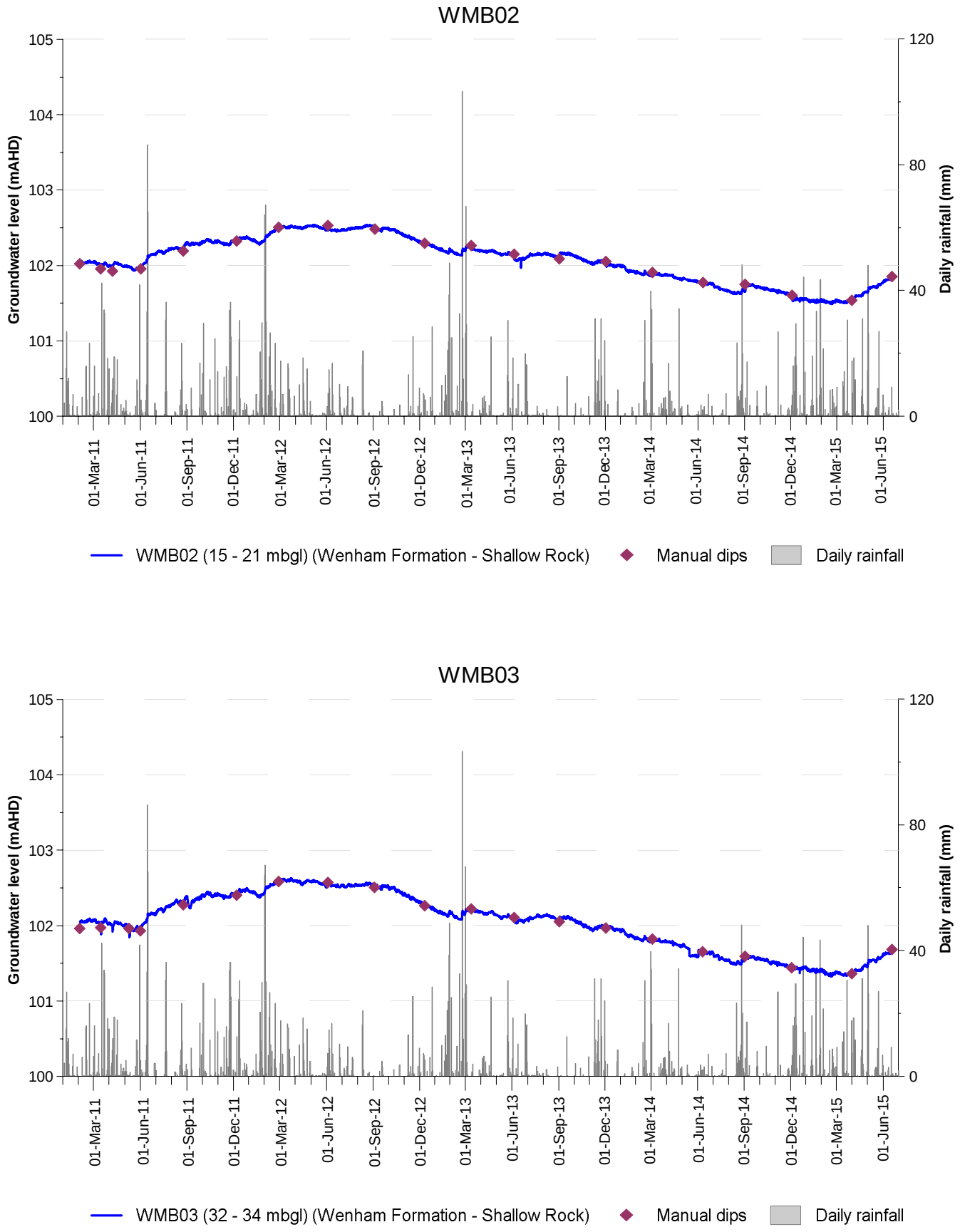
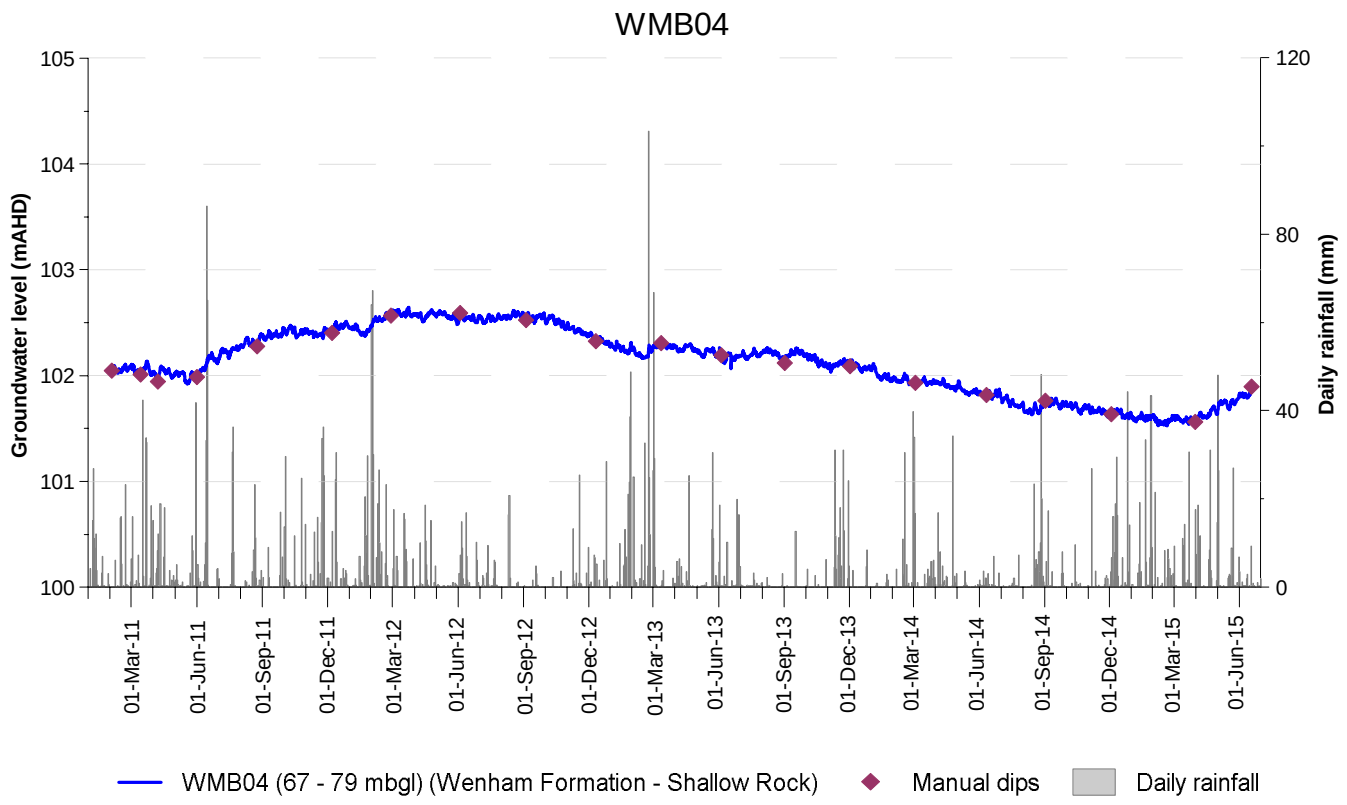


Figure A.7: WMB02 and WMB03 monitoring bores



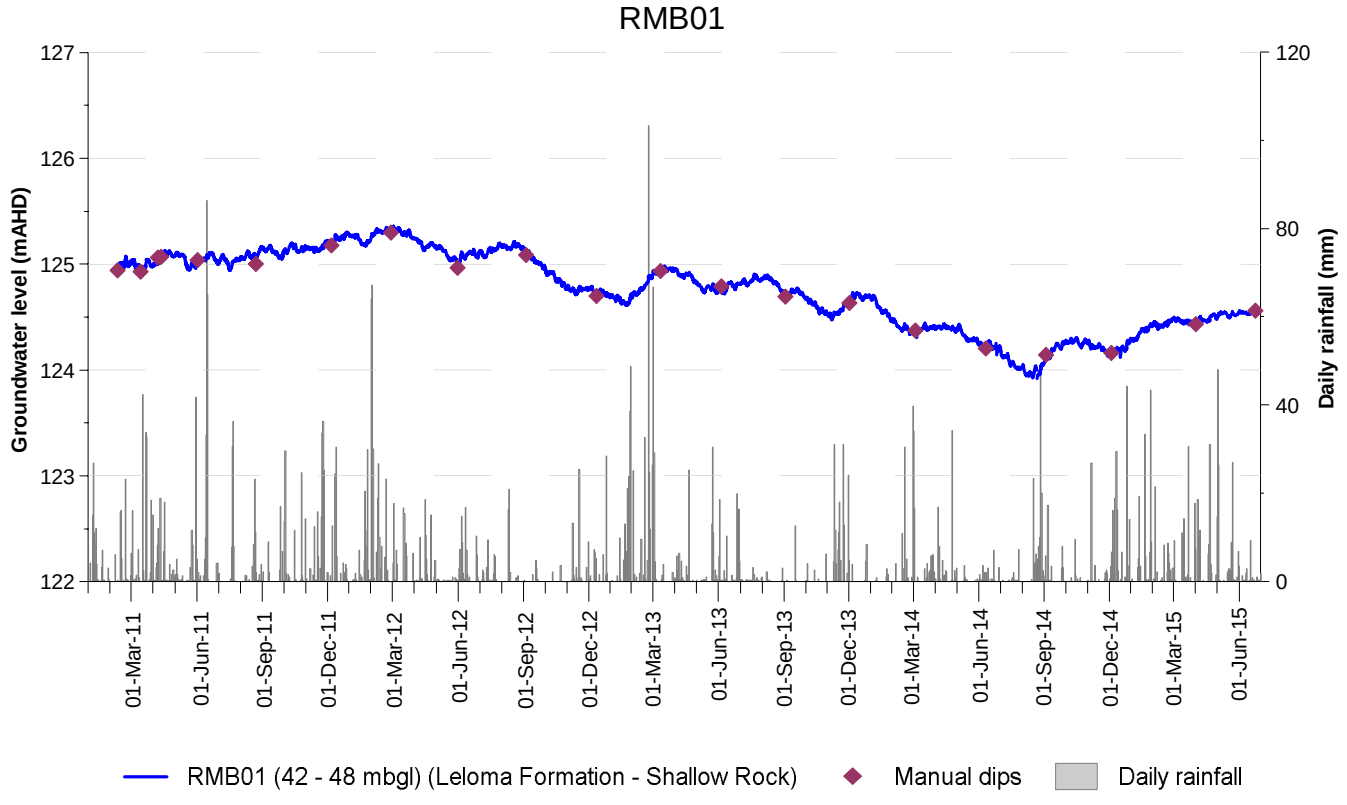
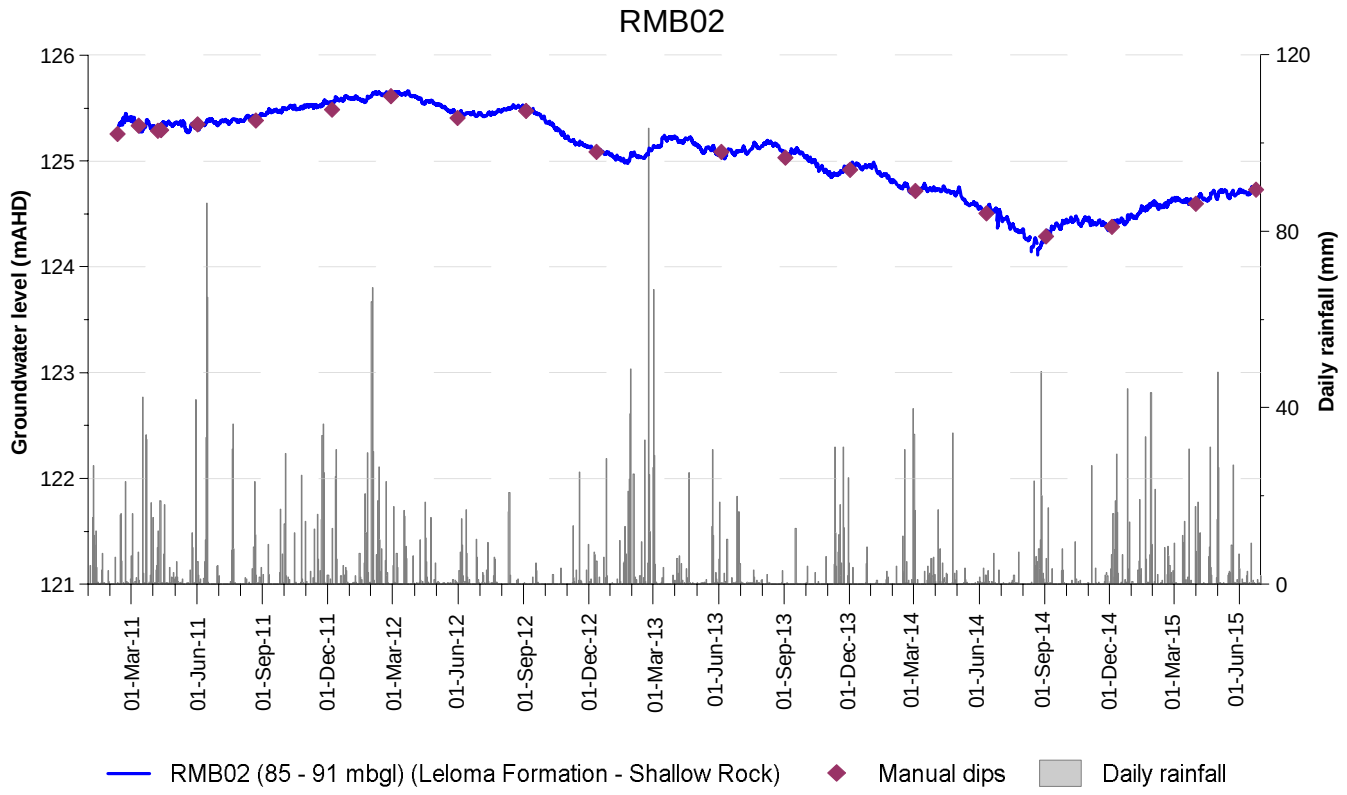


Figure A.8: WMB04 and RMB01 monitoring bores



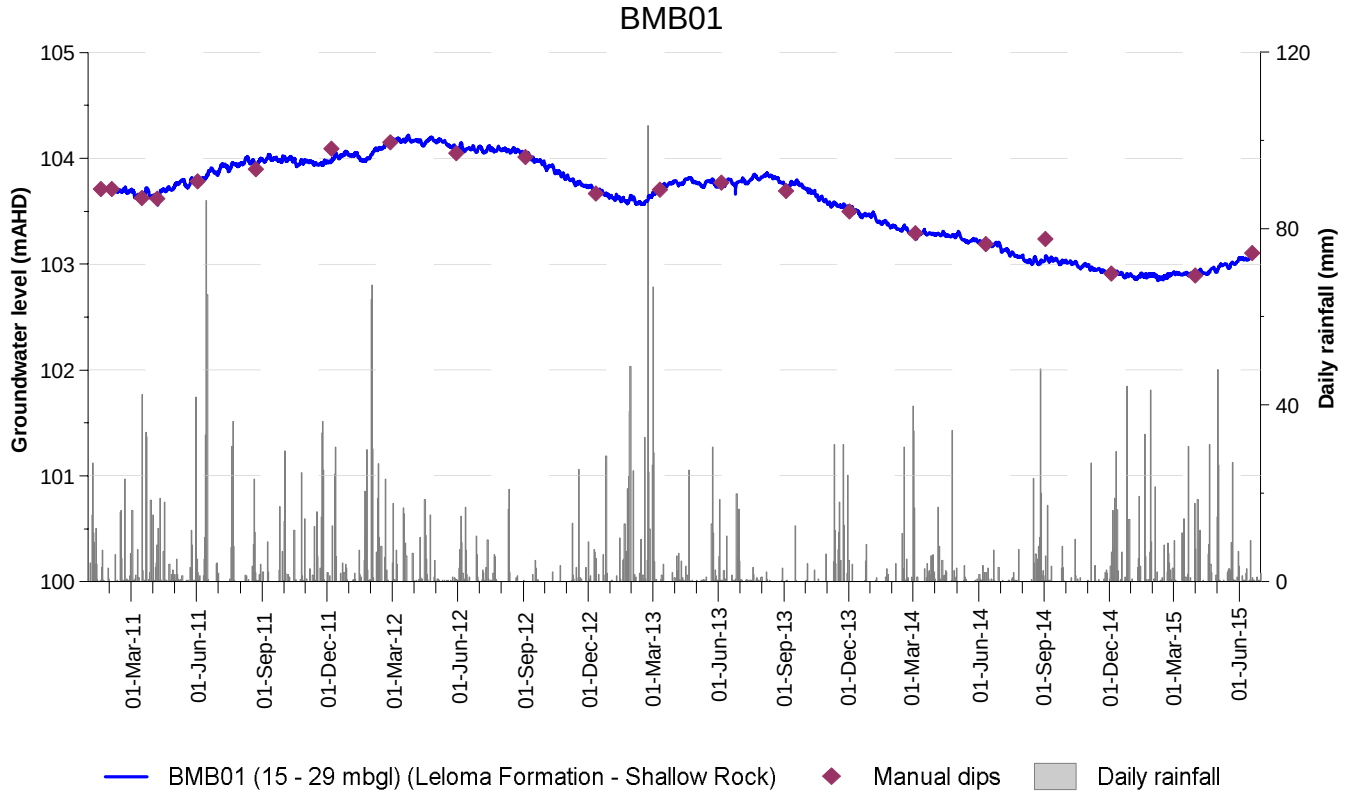


Figure A.9: RMB02 and BMB01 monitoring bores

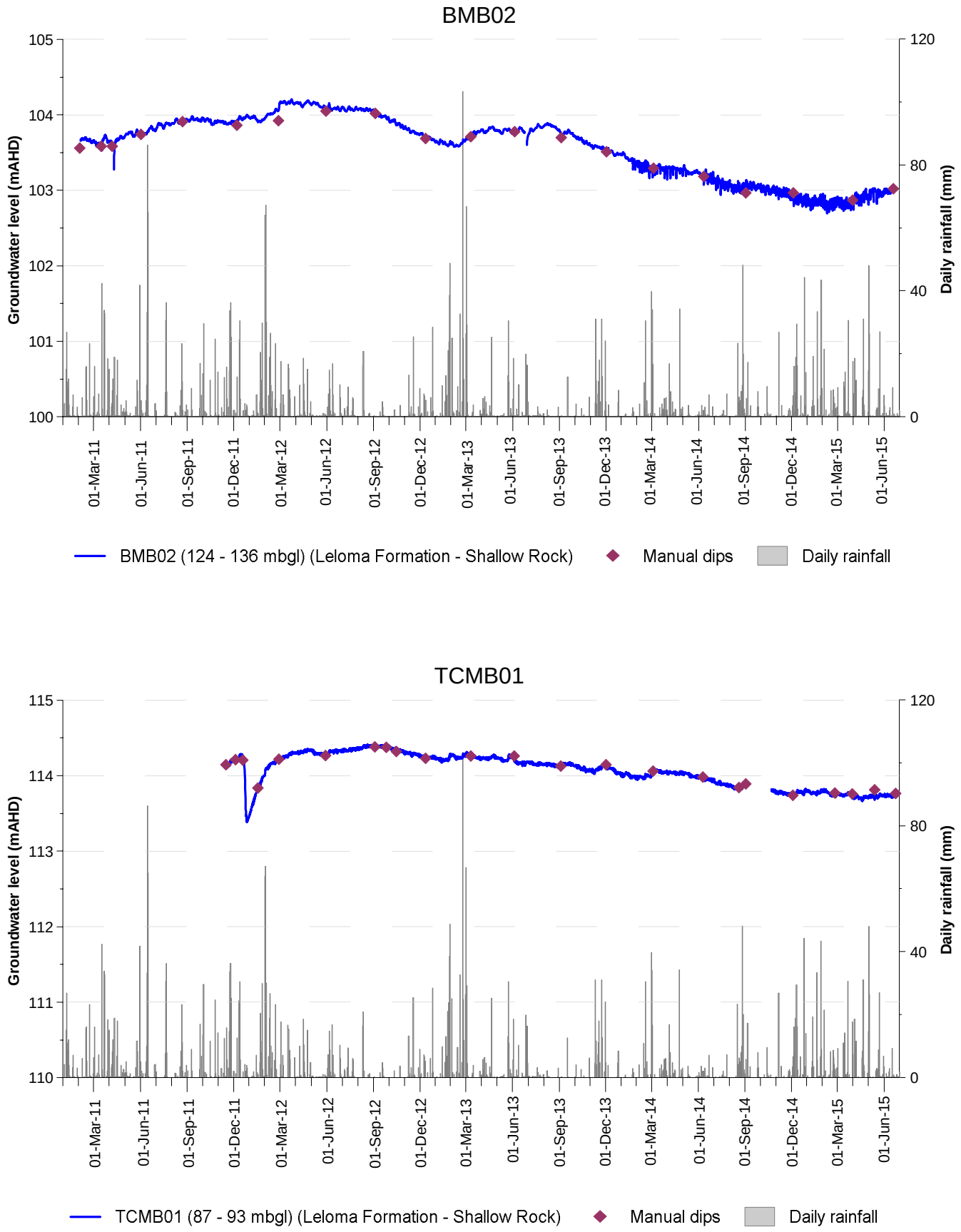
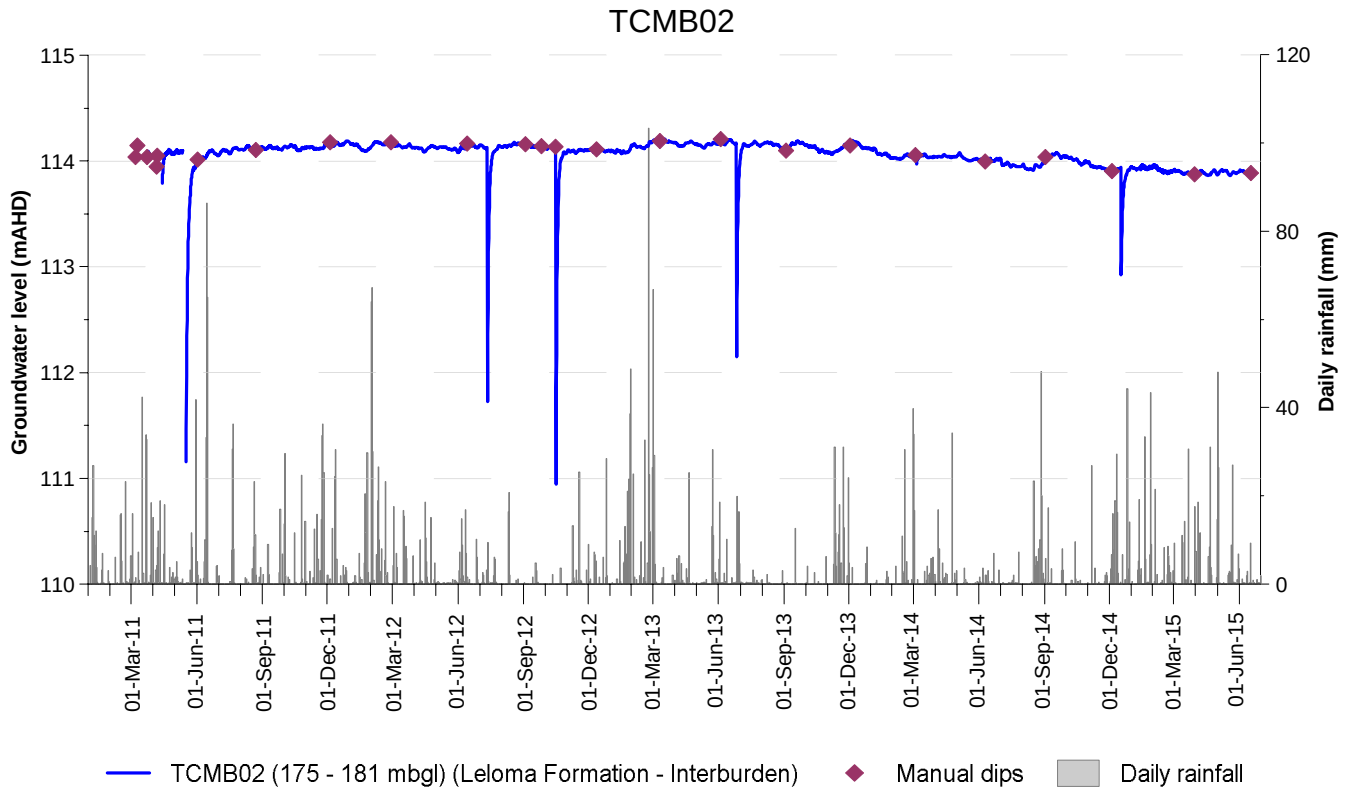


Figure A.10: BMB02 and TCMB01 monitoring bores



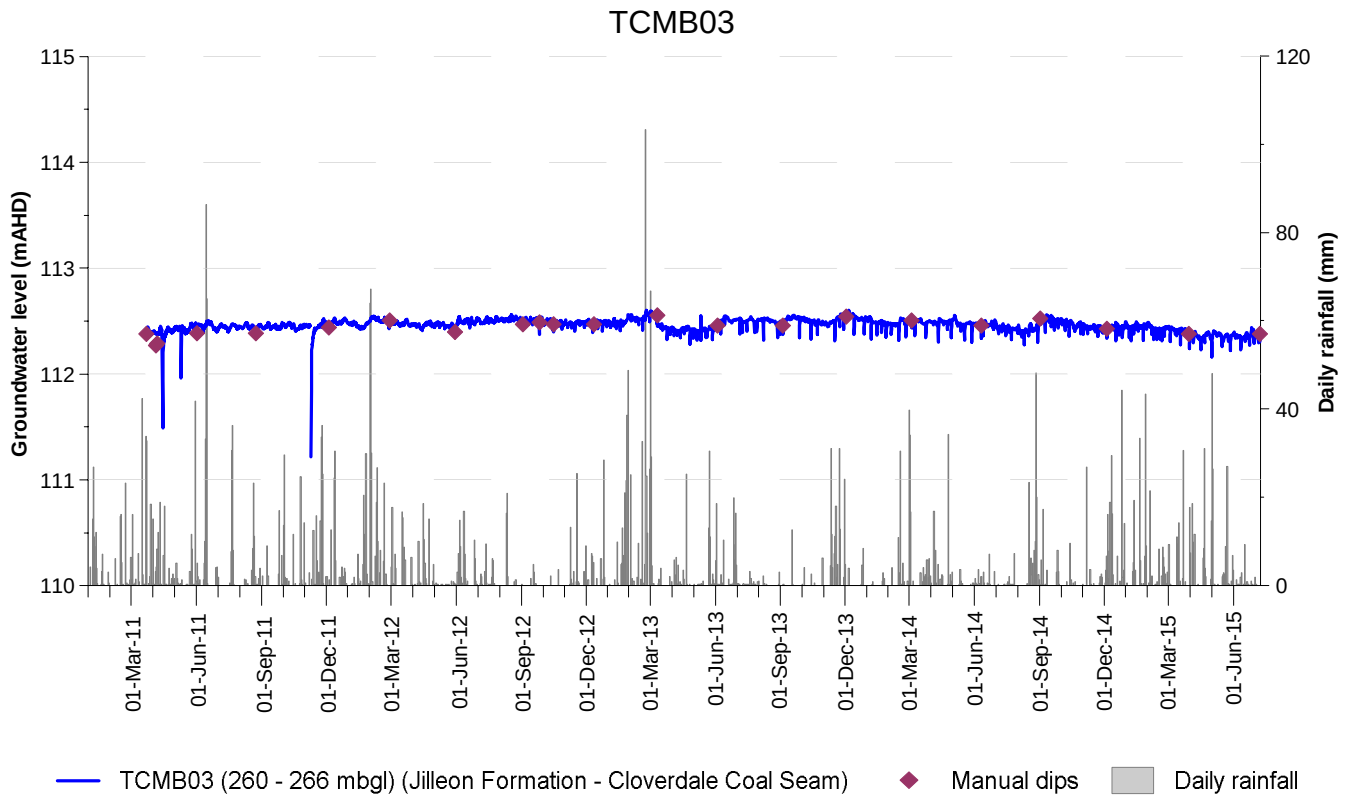
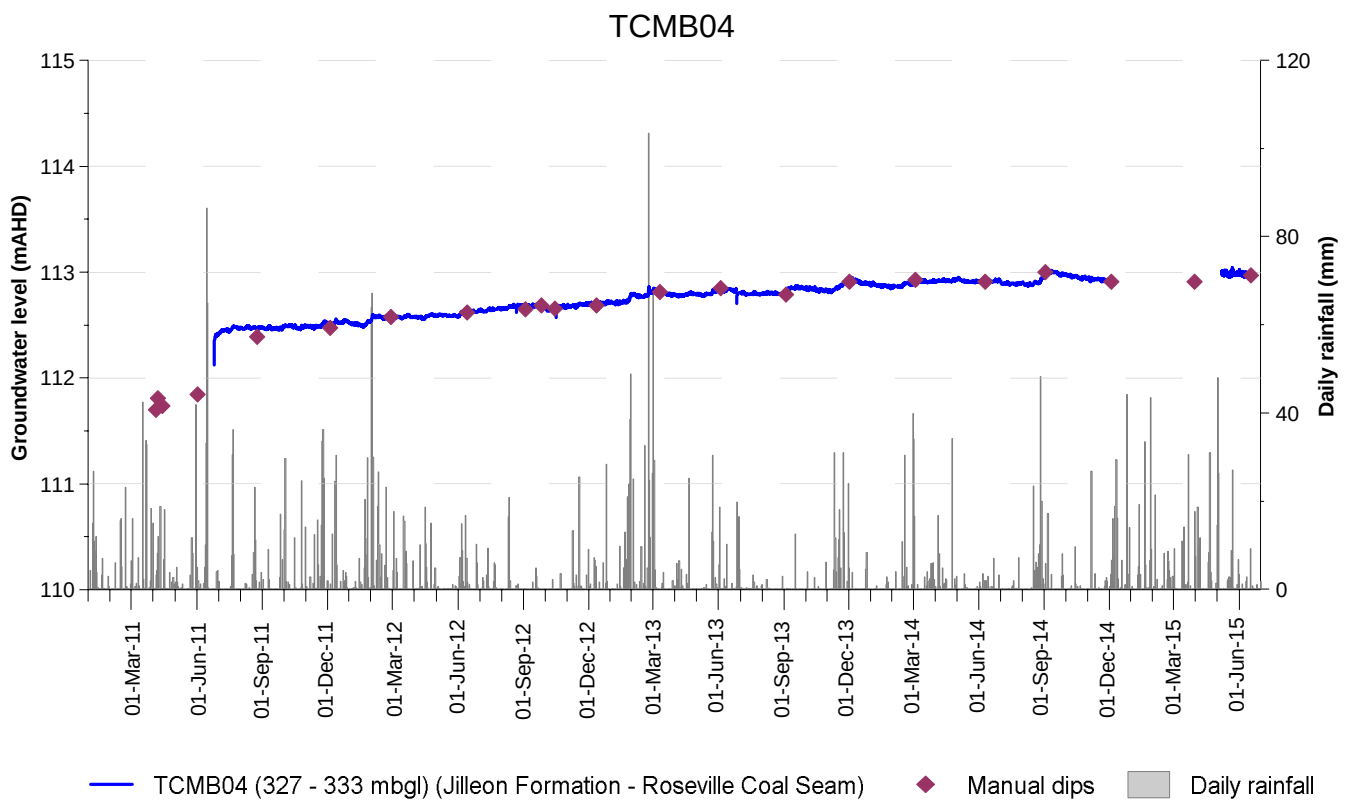


Figure A.11: TCMB02 and TCMB03 monitoring bores



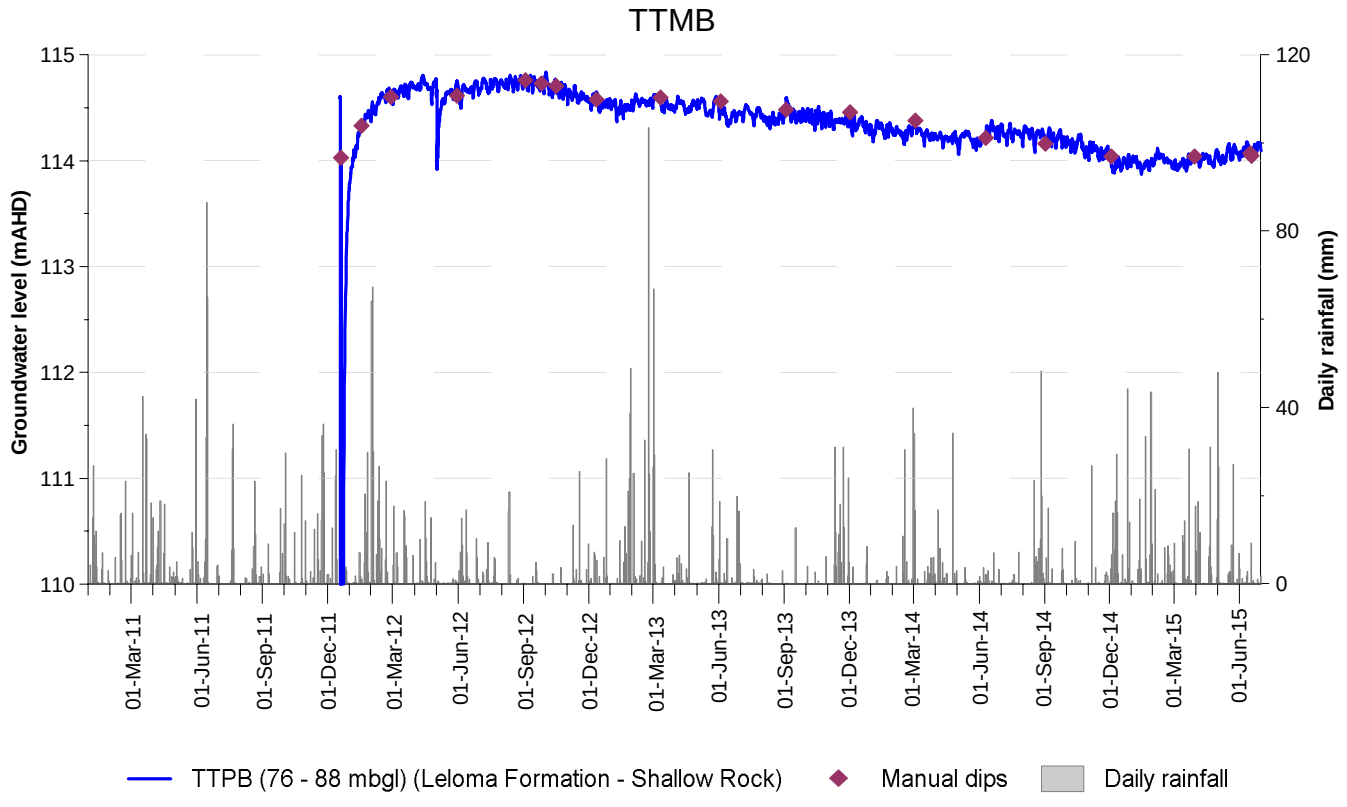


Figure A.12: TCMB04 and TTMB monitoring bores

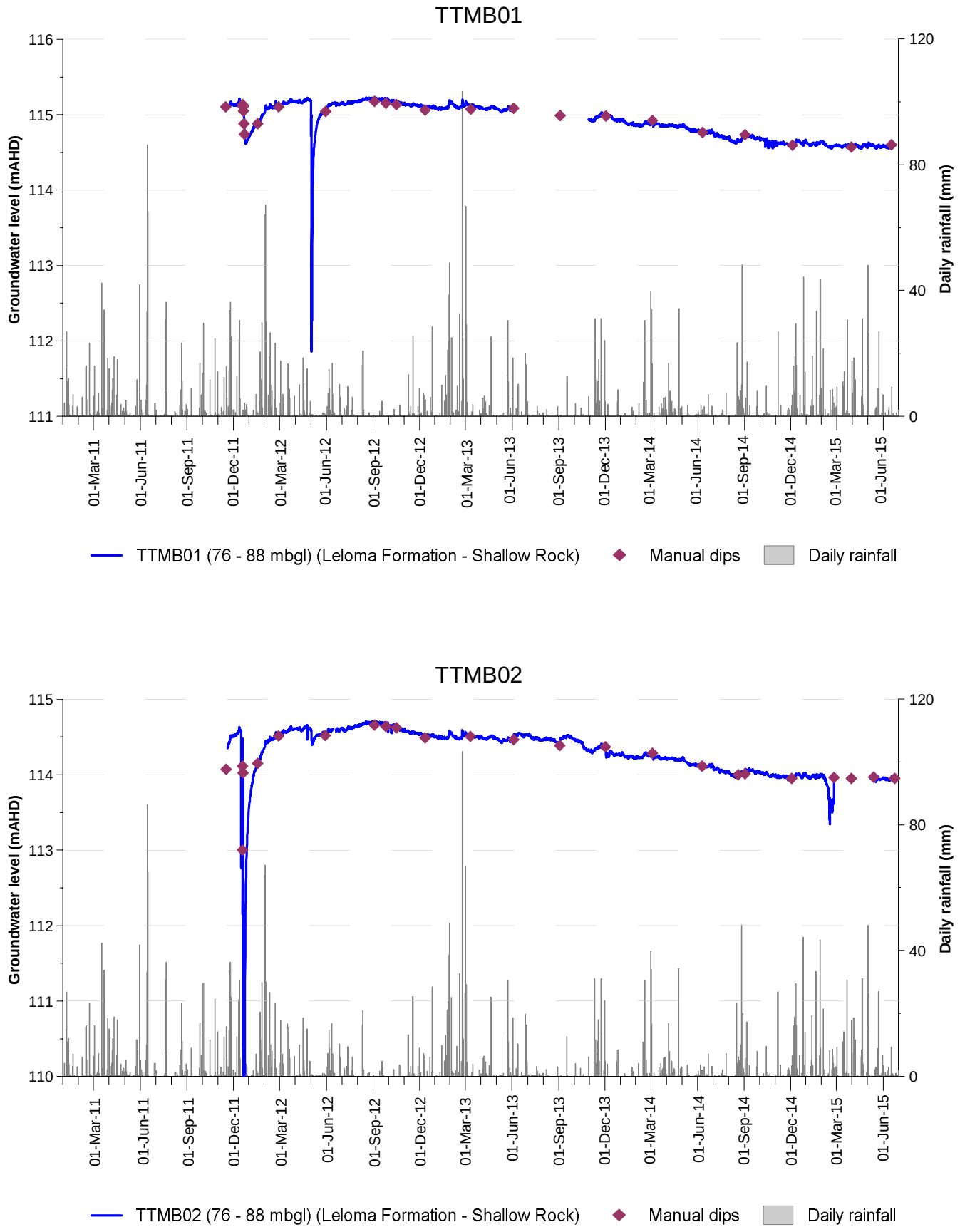
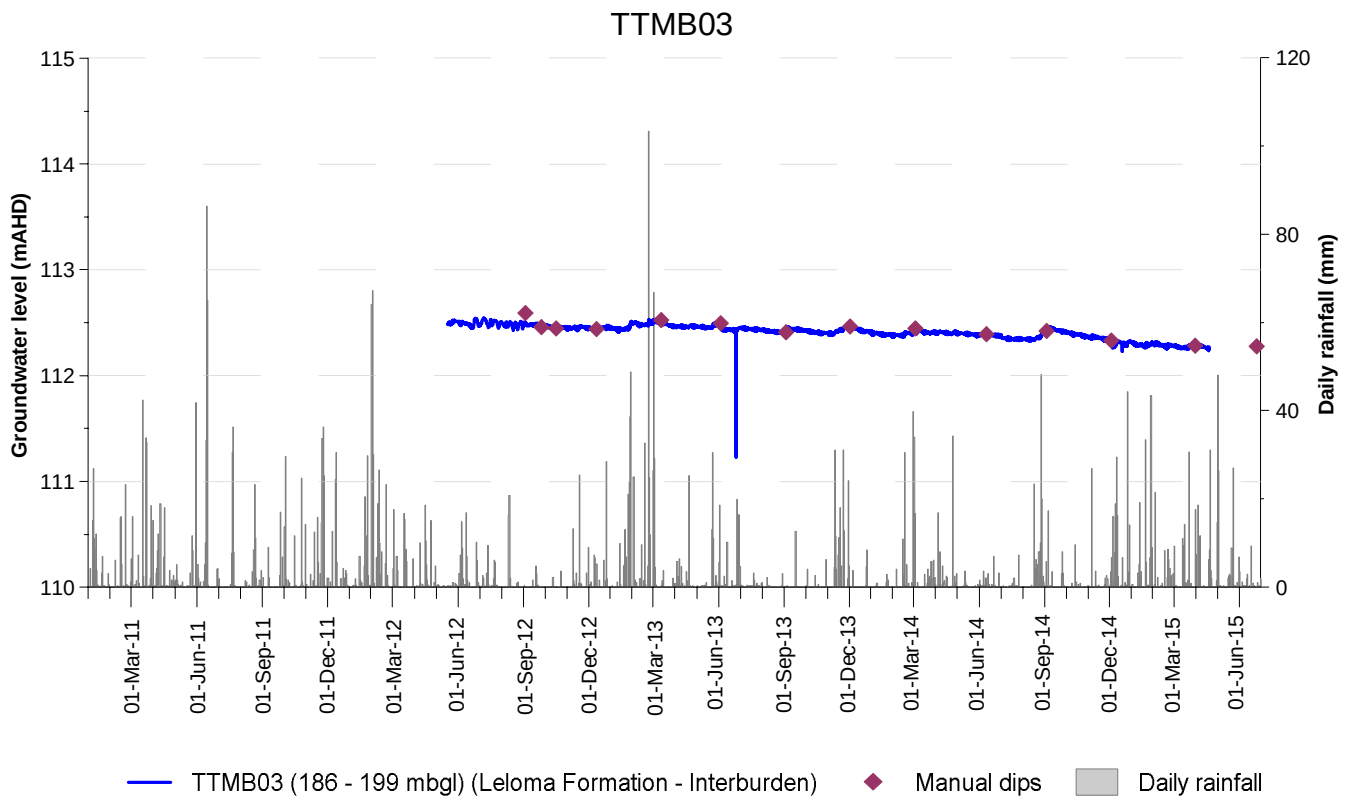


Figure A.13: TTMB01 and TTMB02 monitoring bores



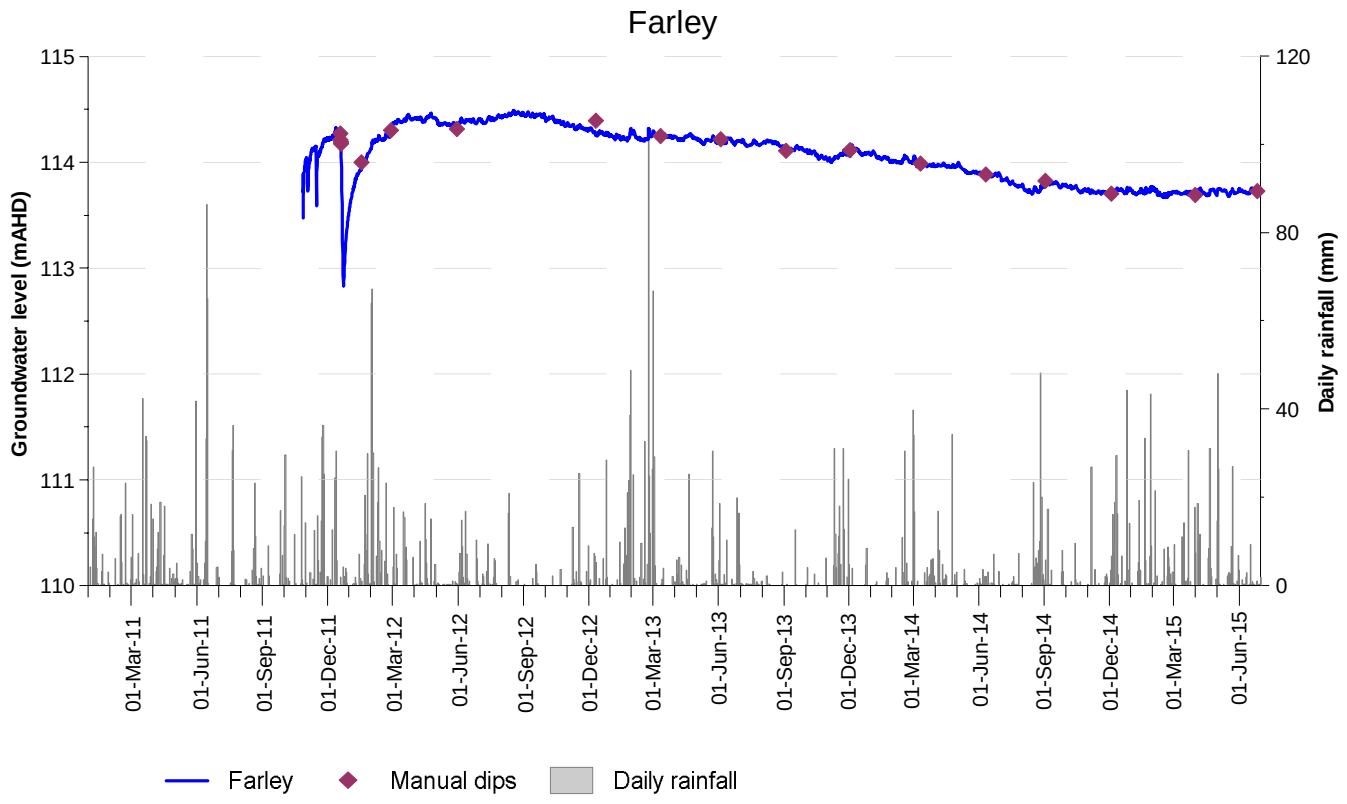
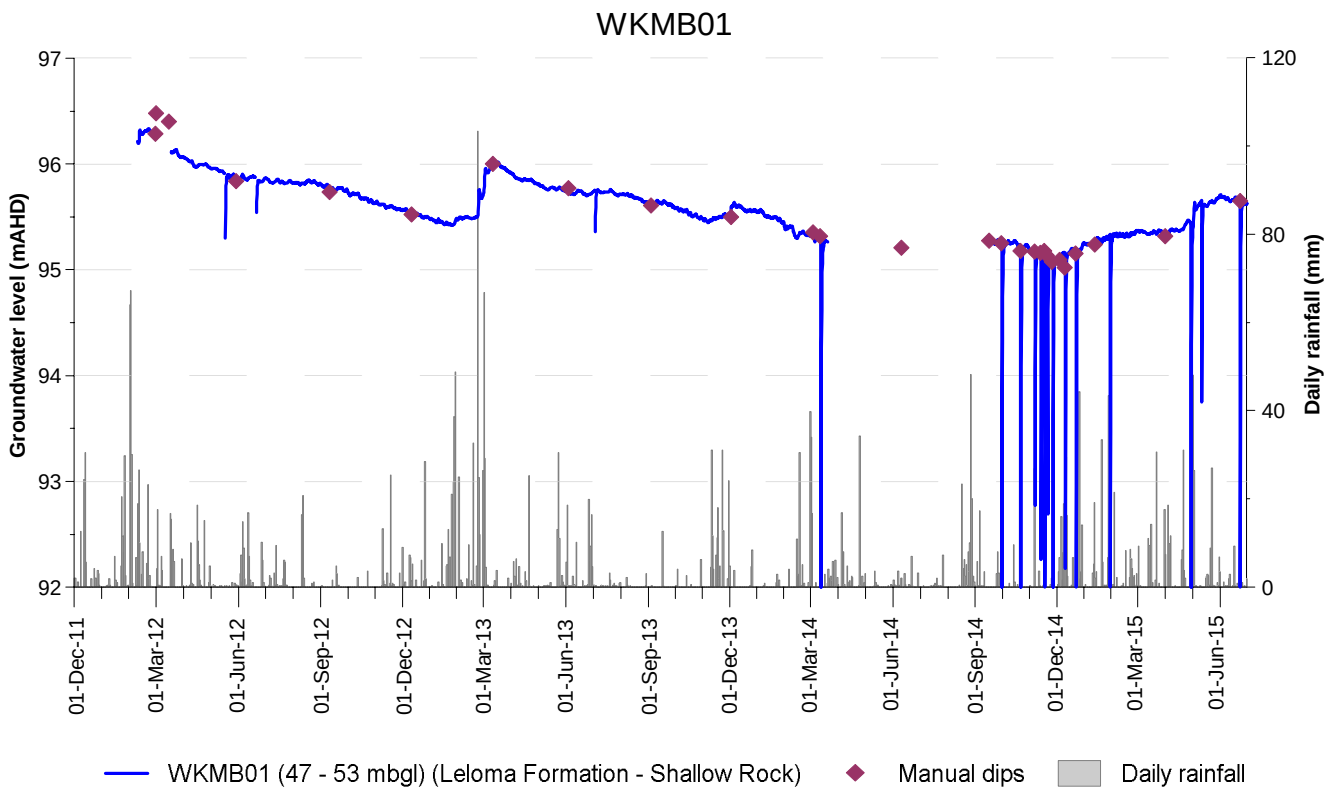


Figure A.14: TTMB03 and Farley monitoring bores



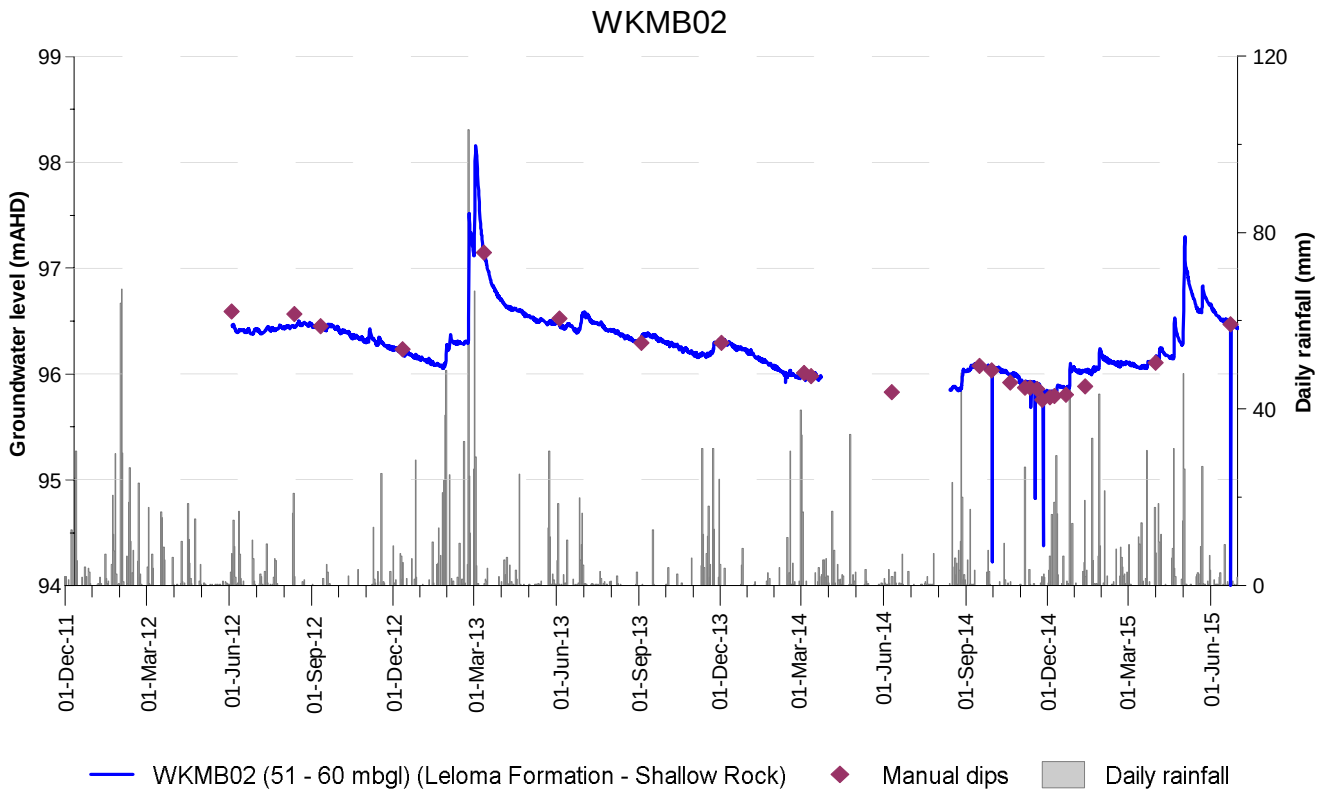


Figure A.15: WKMB01 and WKMB02 monitoring bores

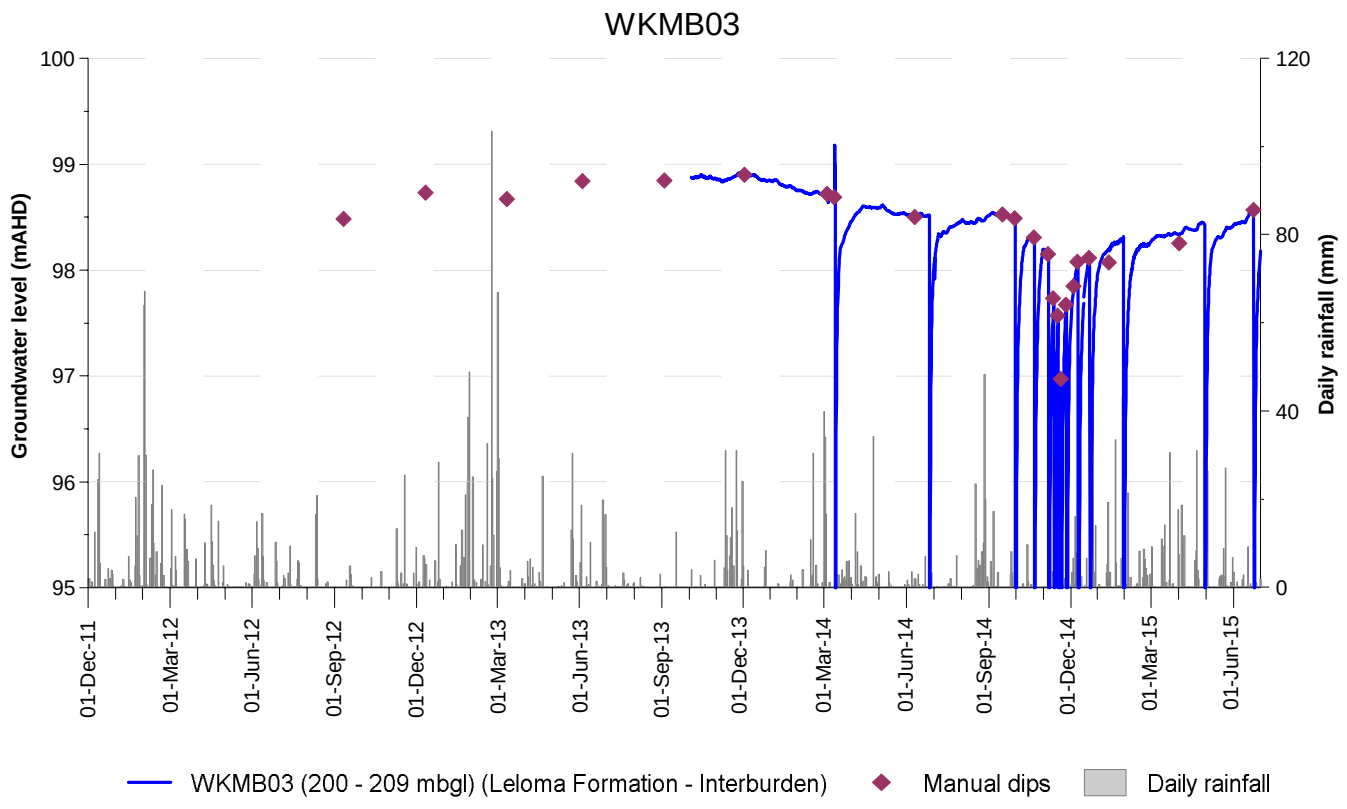
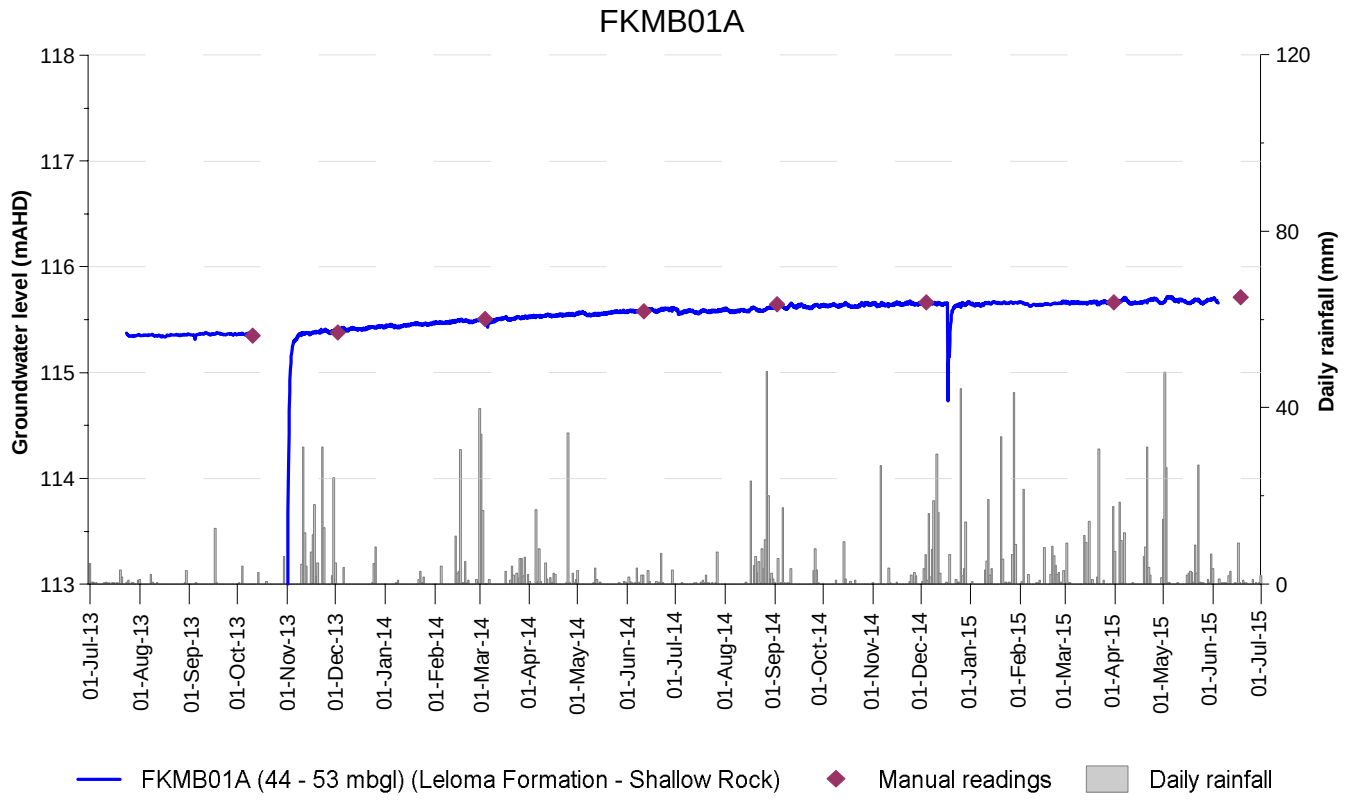


Figure A.16: WKMB03 monitoring bore



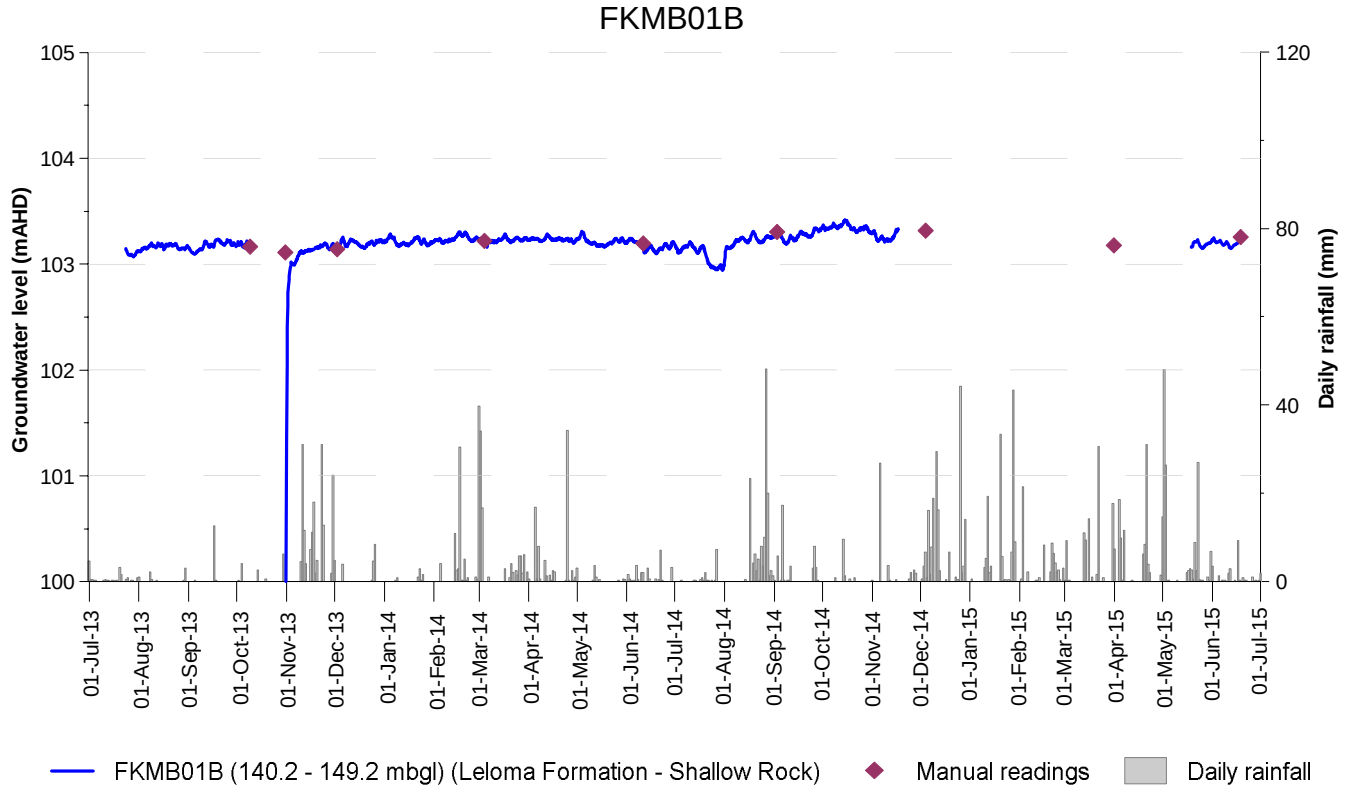
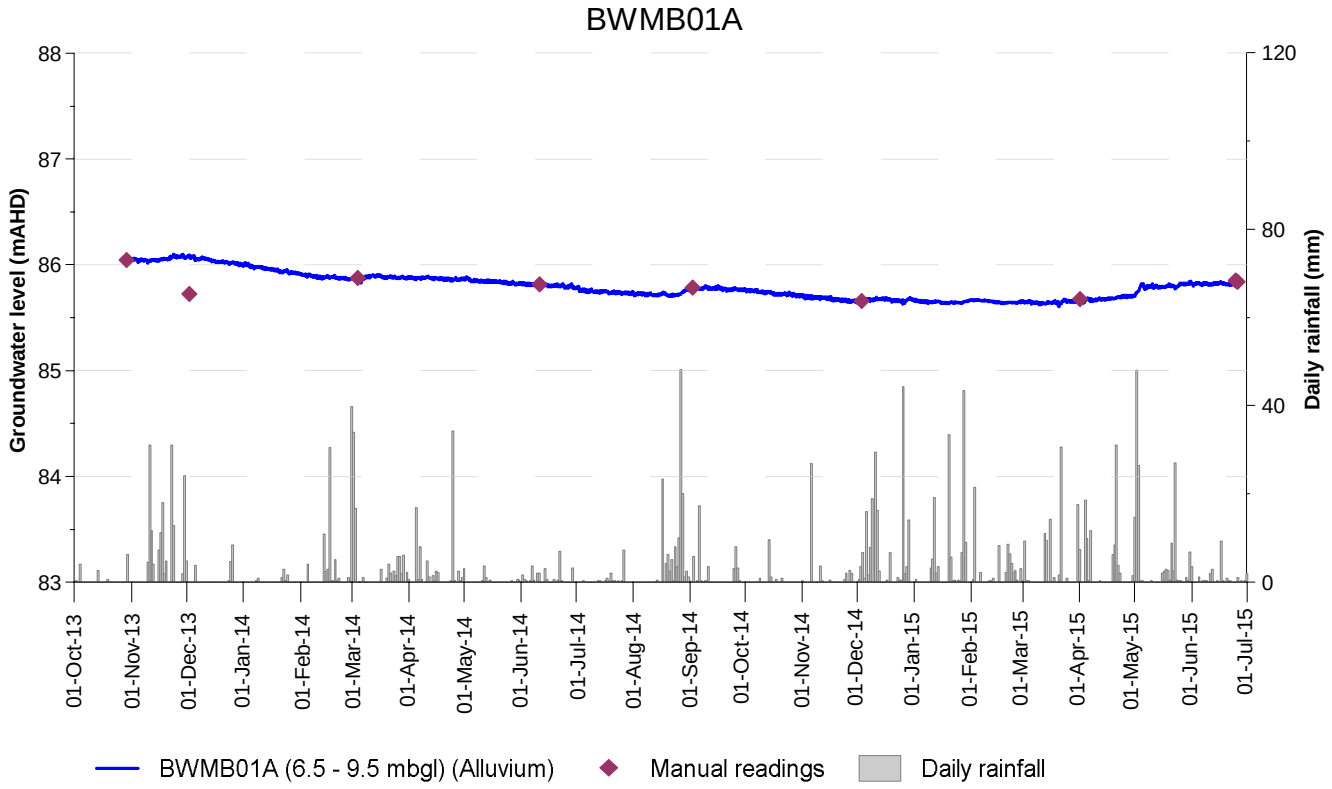


Figure A.17: FKMB01A and FKMB01B monitoring bores



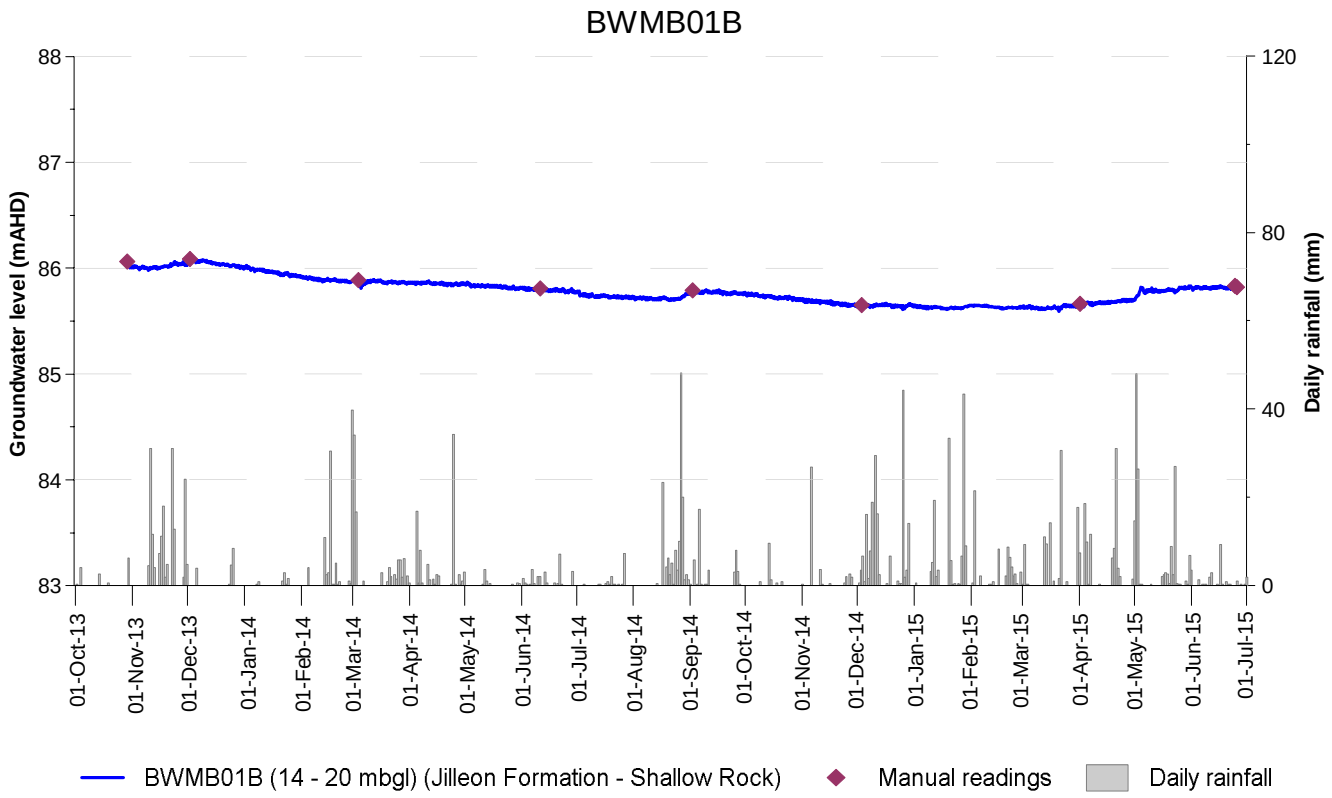
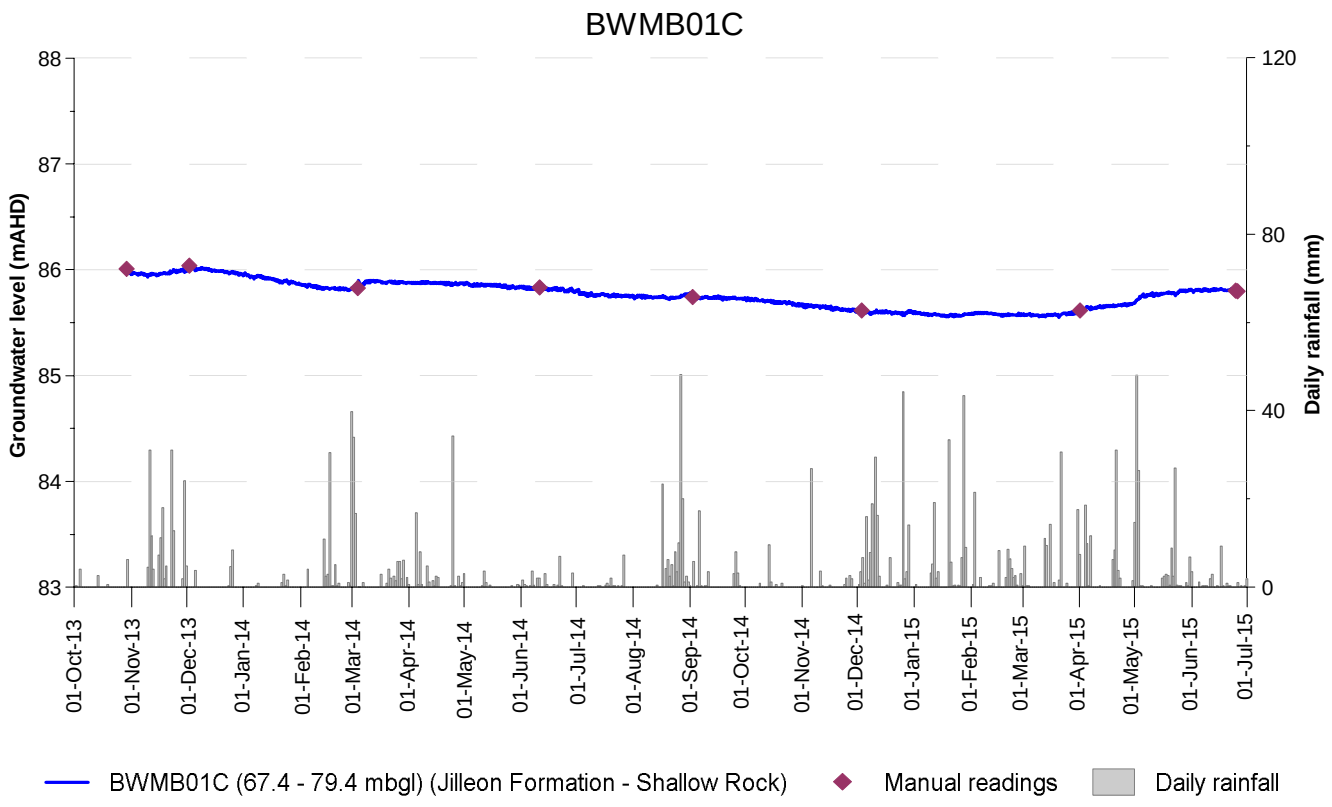


Figure A.18: BWMB01A and BWMB01B monitoring bores



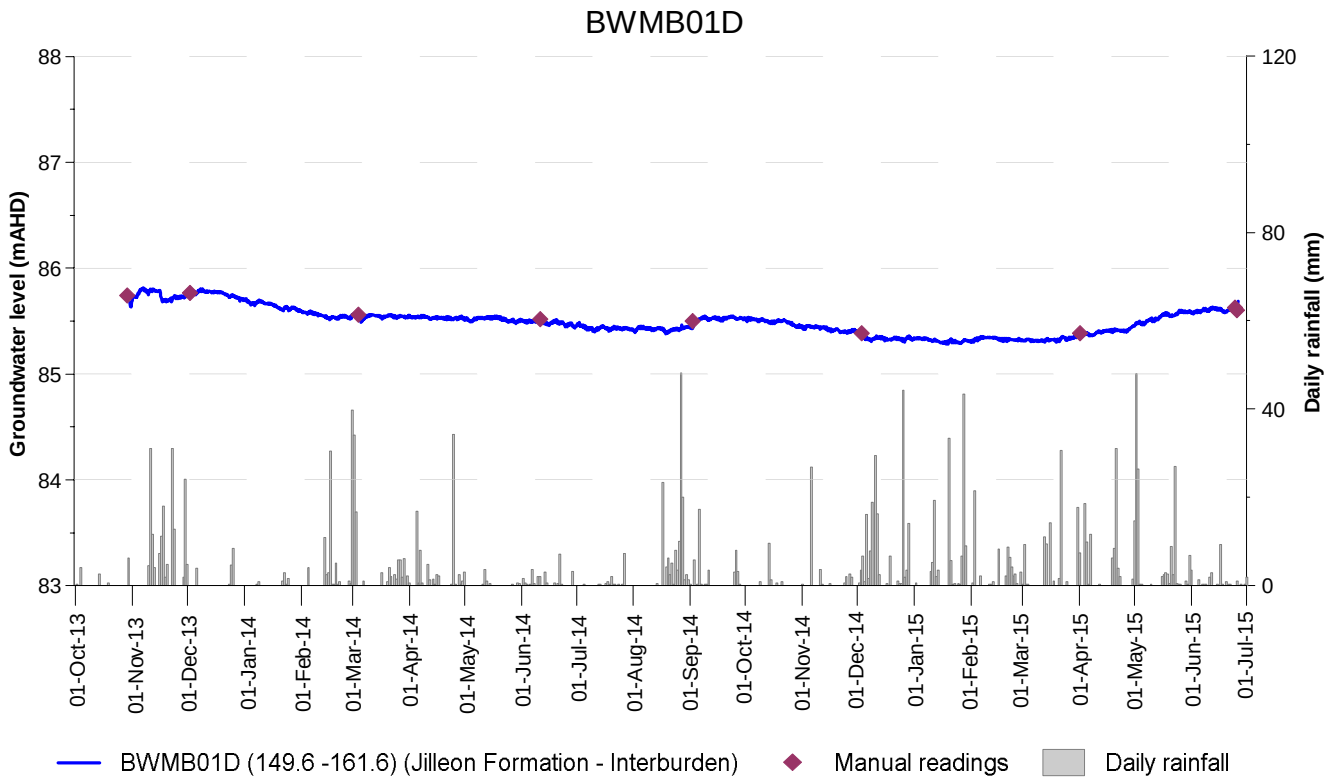
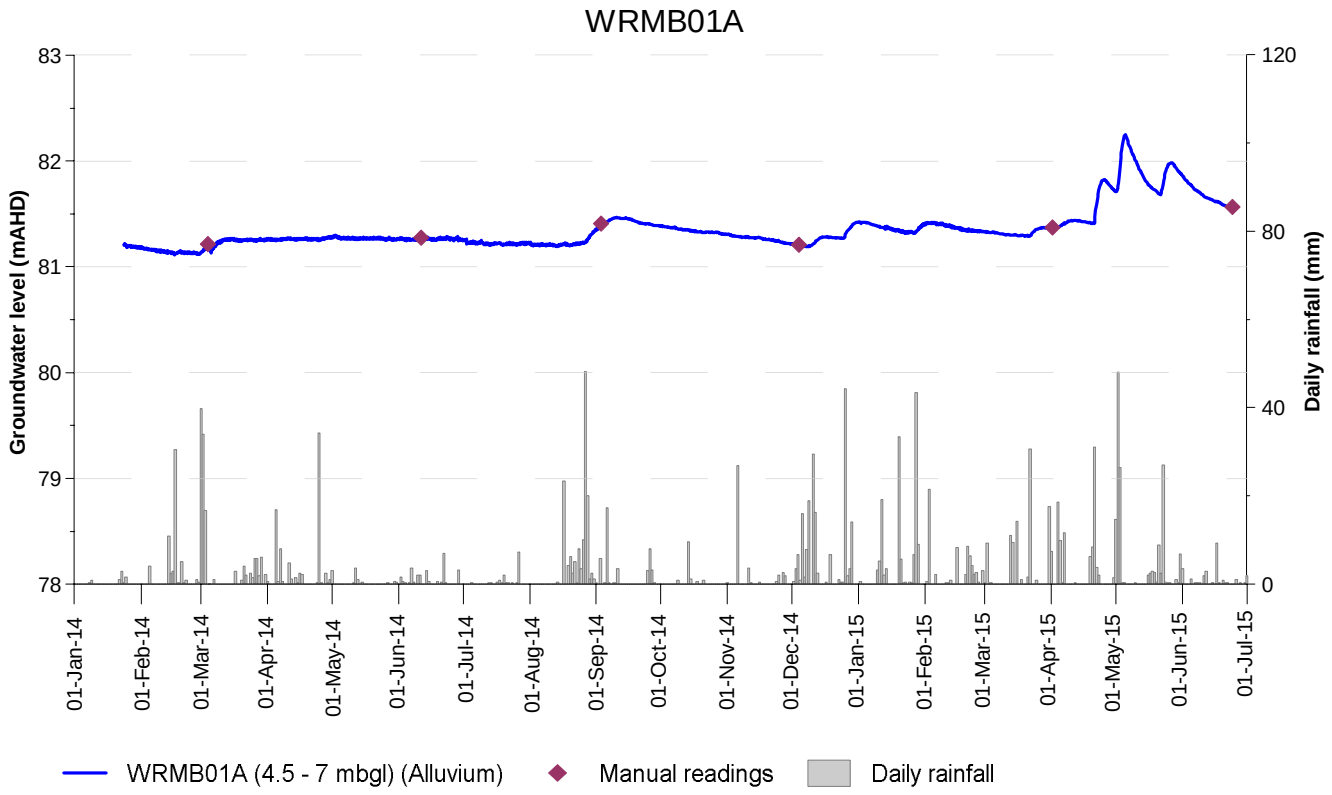


Figure A.19: BWMB01C and BWMB01D monitoring bores



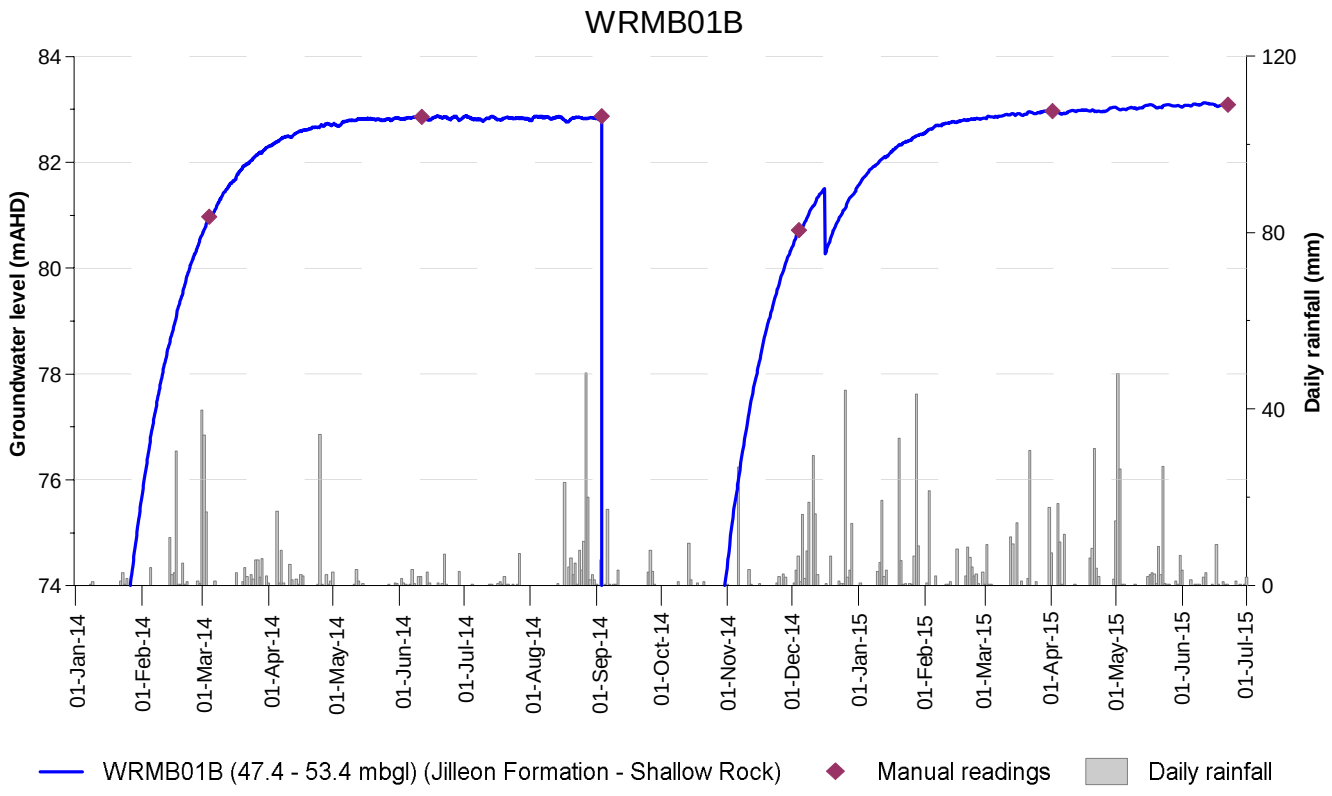


Figure A.20: WRMB01A and WRMB01B monitoring bores

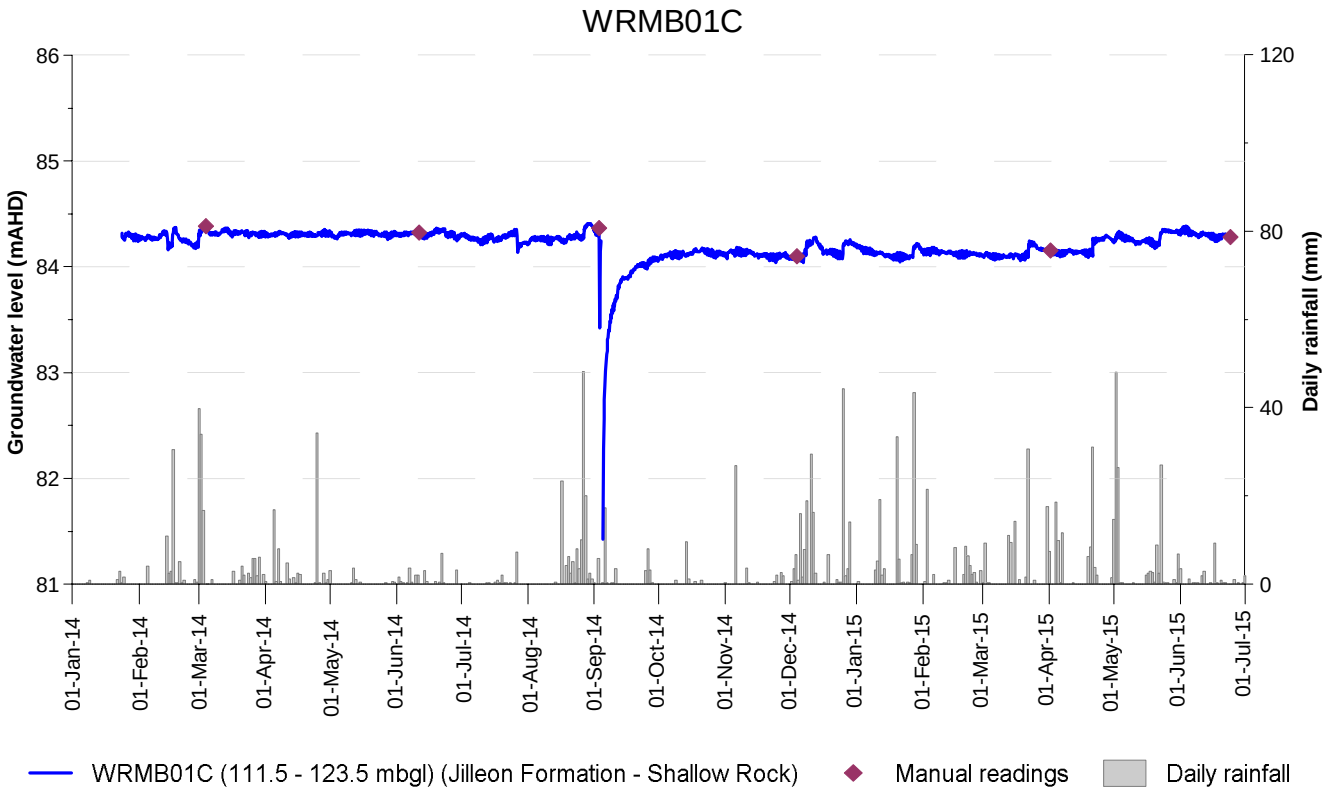
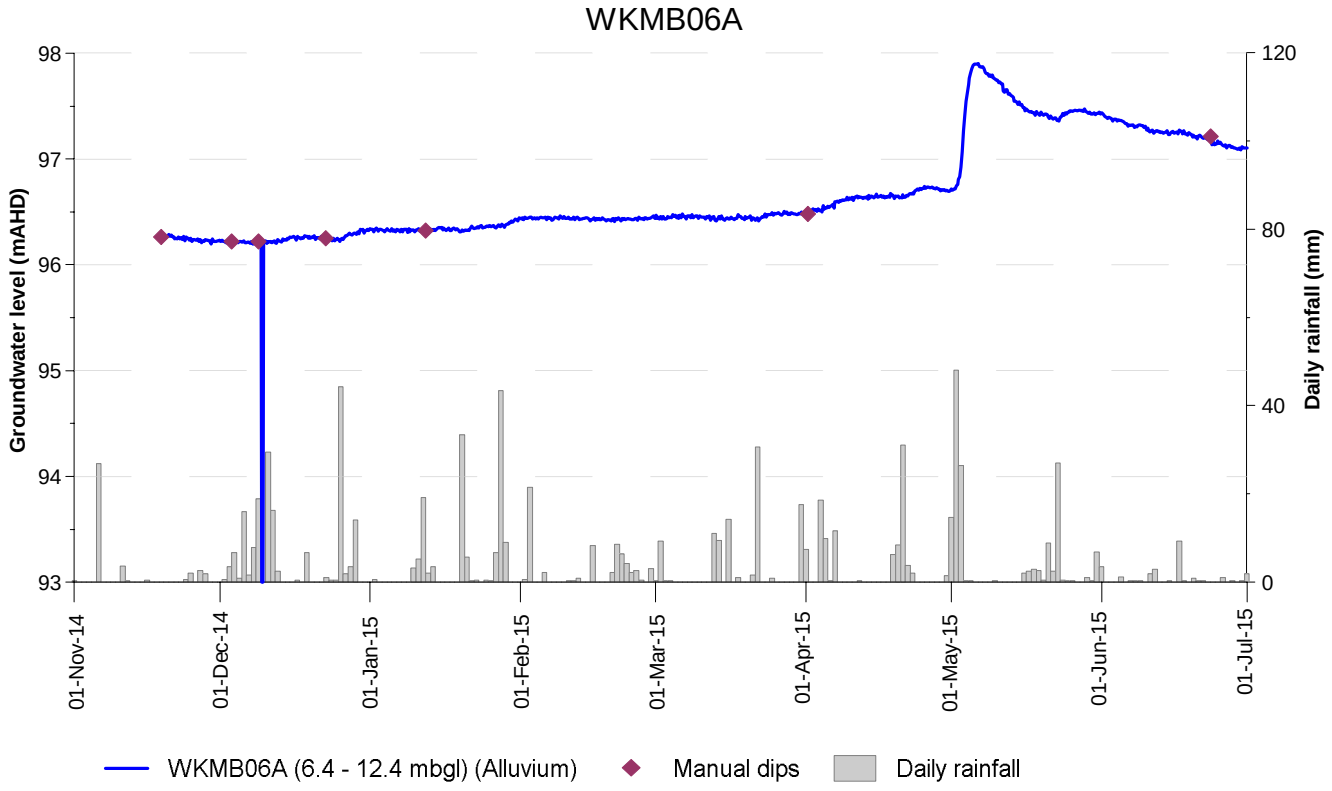


Figure A.21: WRMB01C monitoring bore



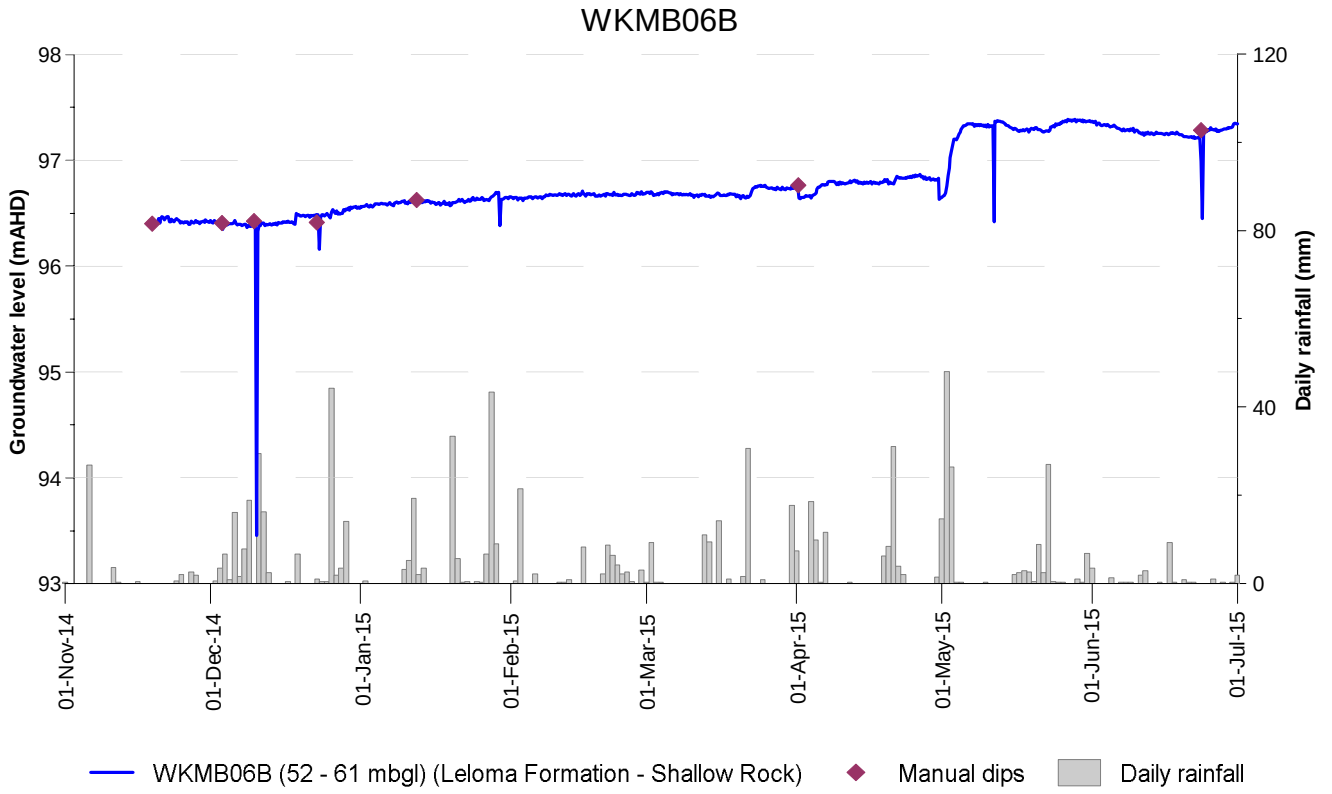


Figure A.22: WKMB06A and WKMB06B monitoring bores

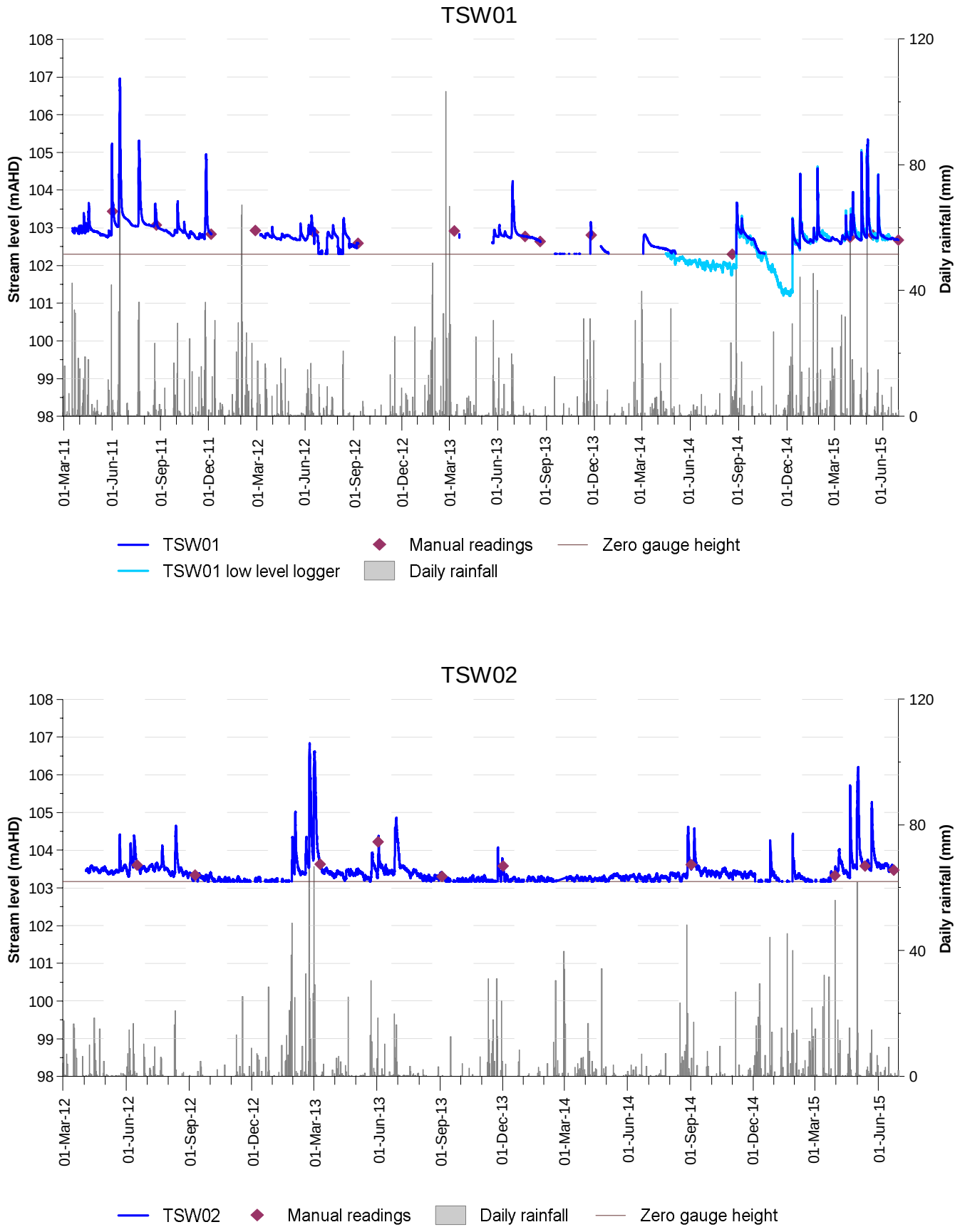
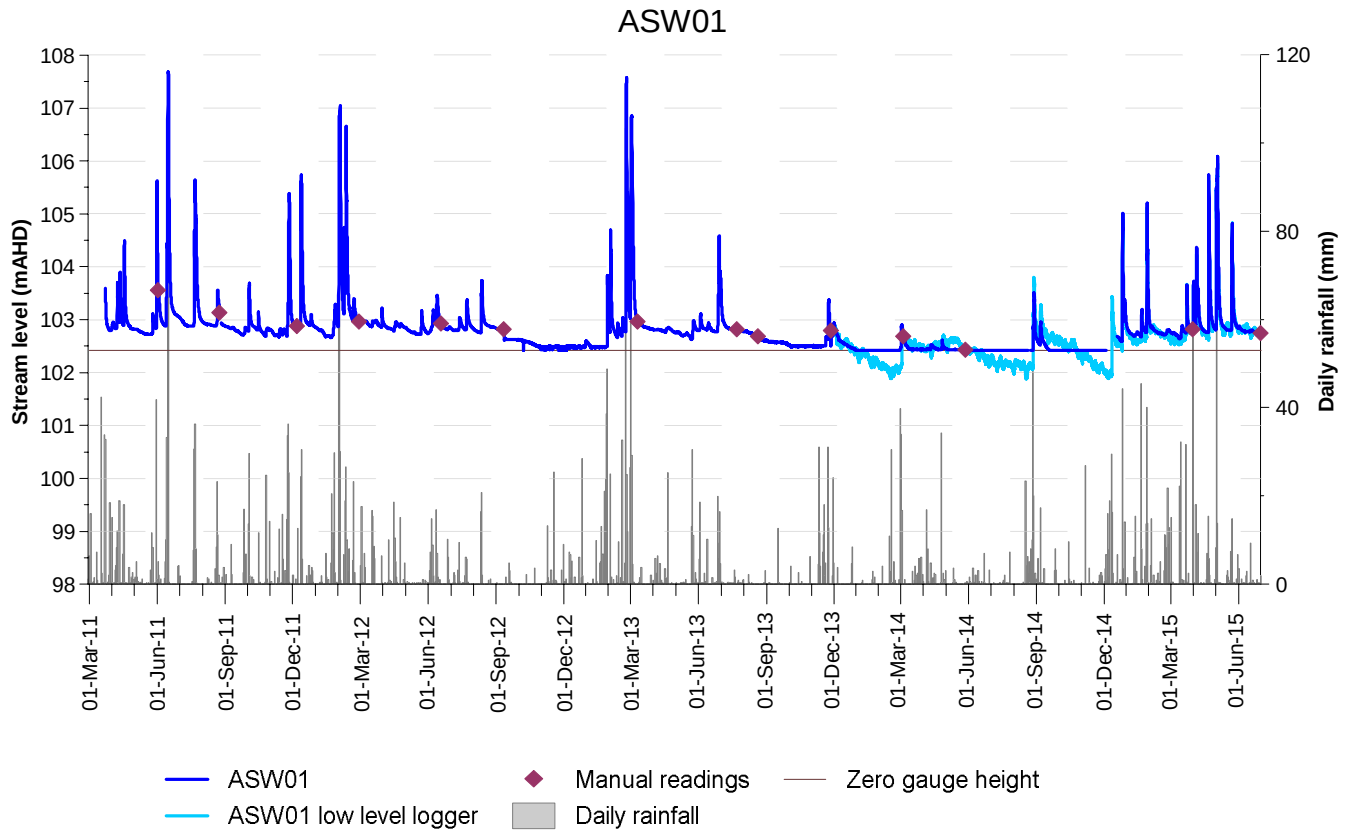


Figure A.23: TSW01 and TSW02 stream levels



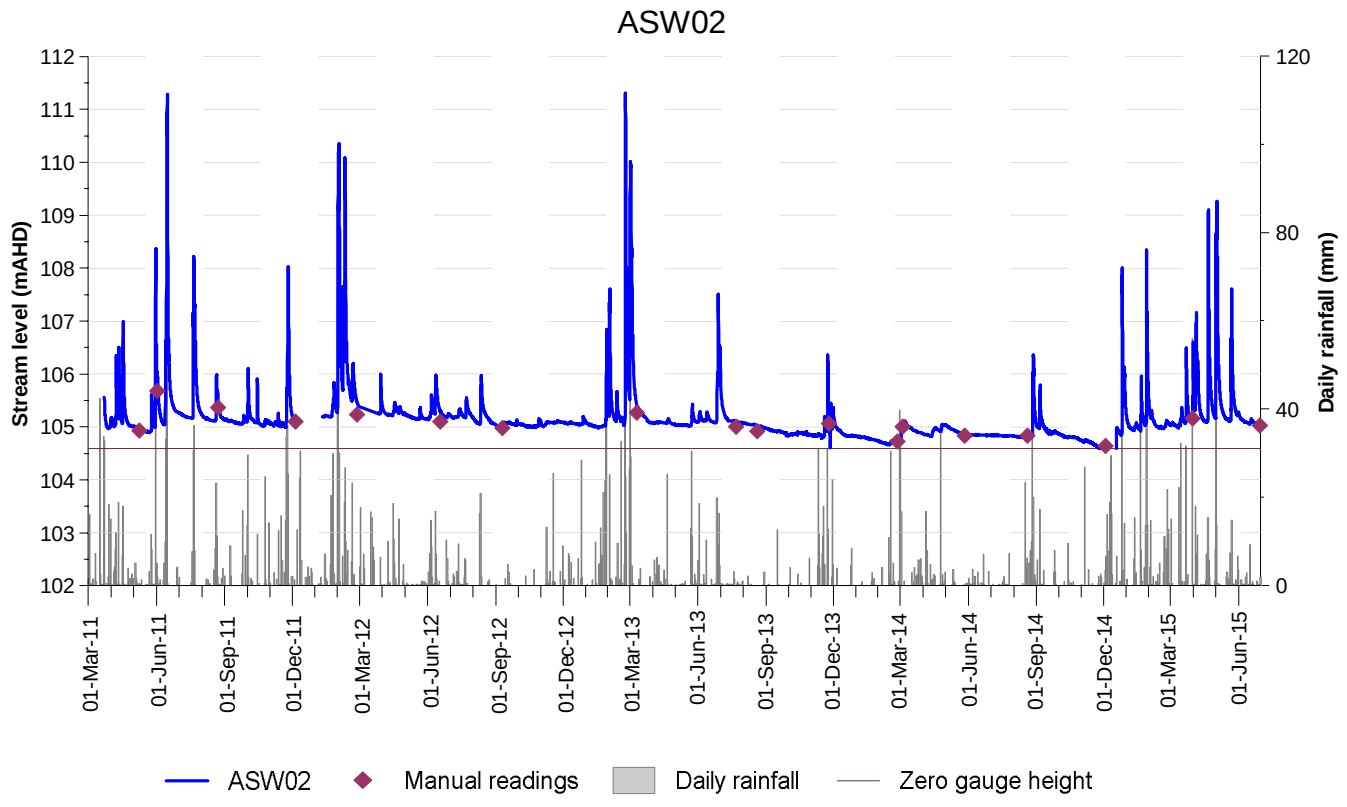
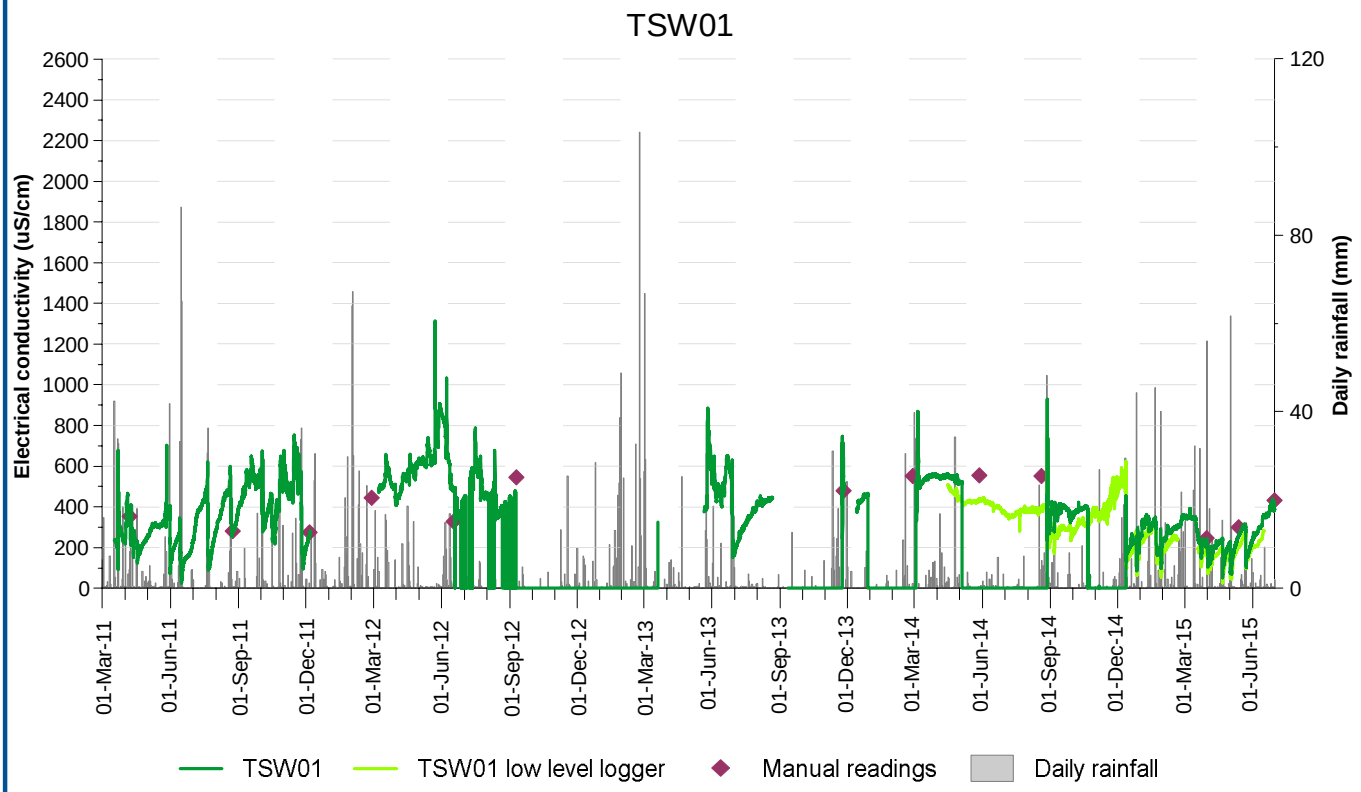


Figure A.24: ASW01 and ASW02 stream levels



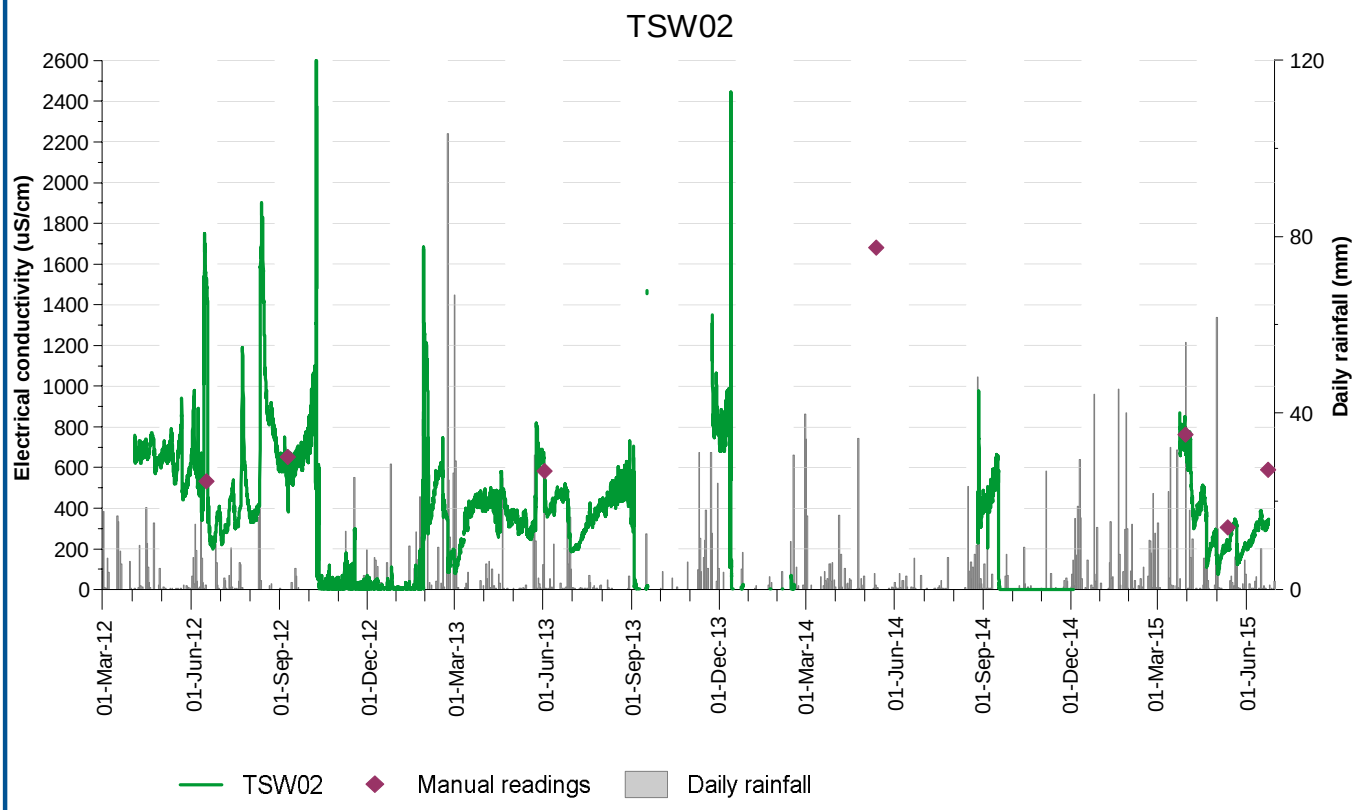
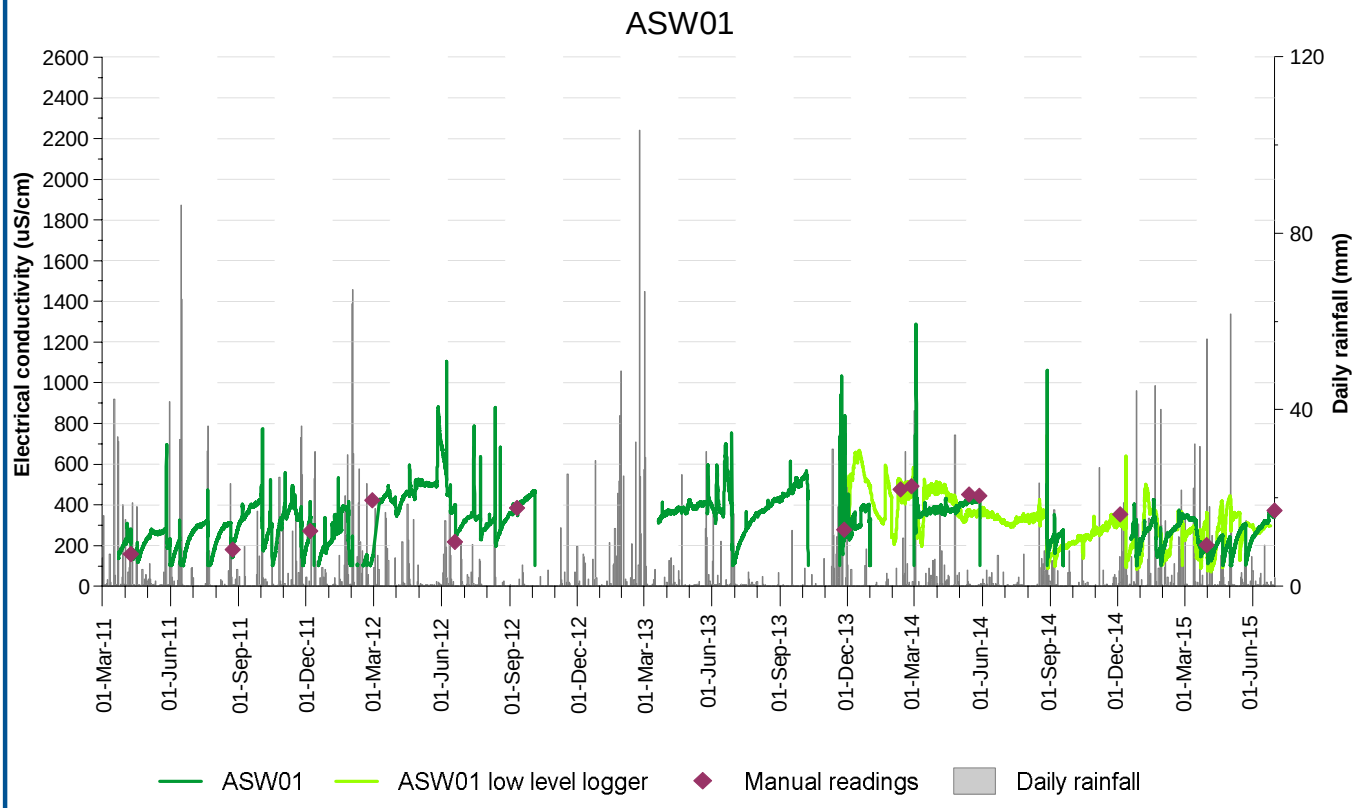


Figure A.25: TSW01 and TSW02 electrical conductivity



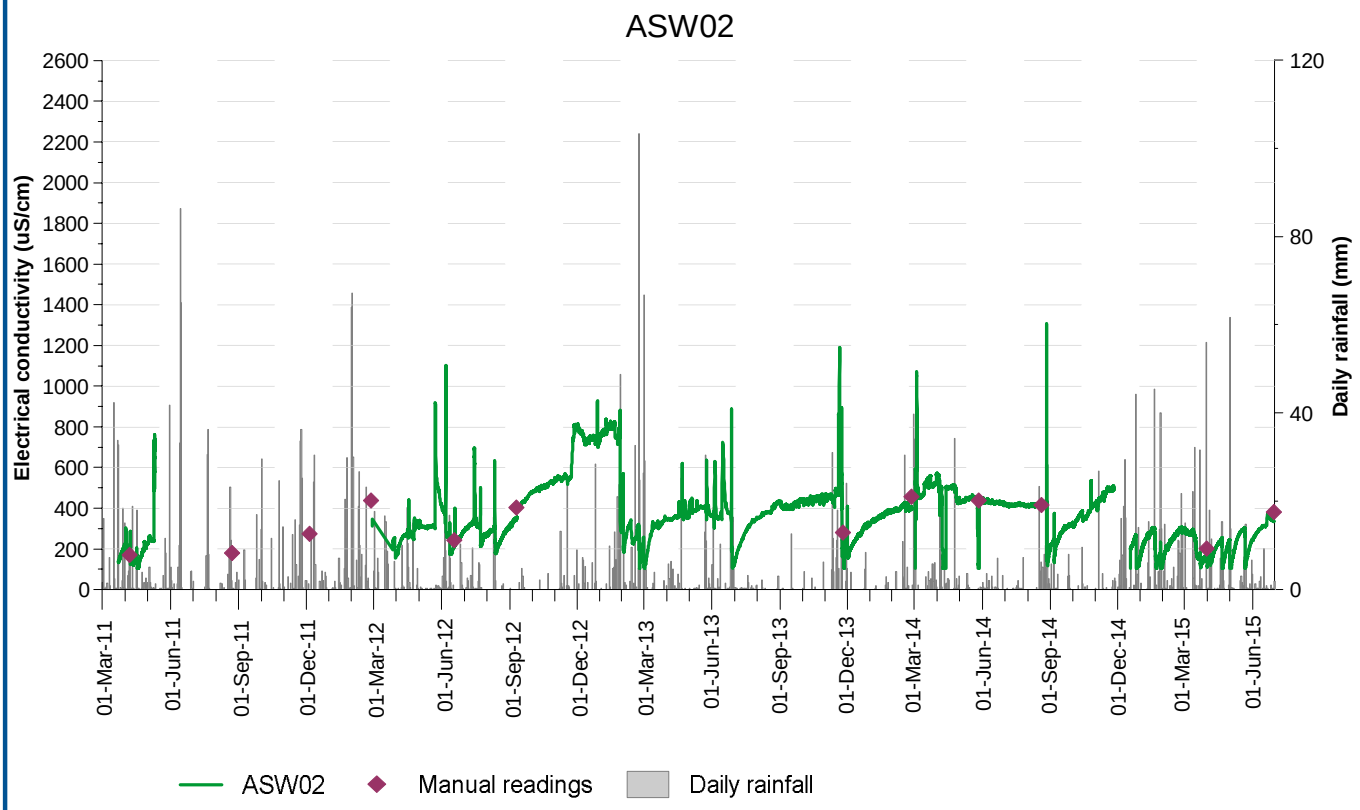


Figure A.26: ASW01 and ASW02 electrical conductivity

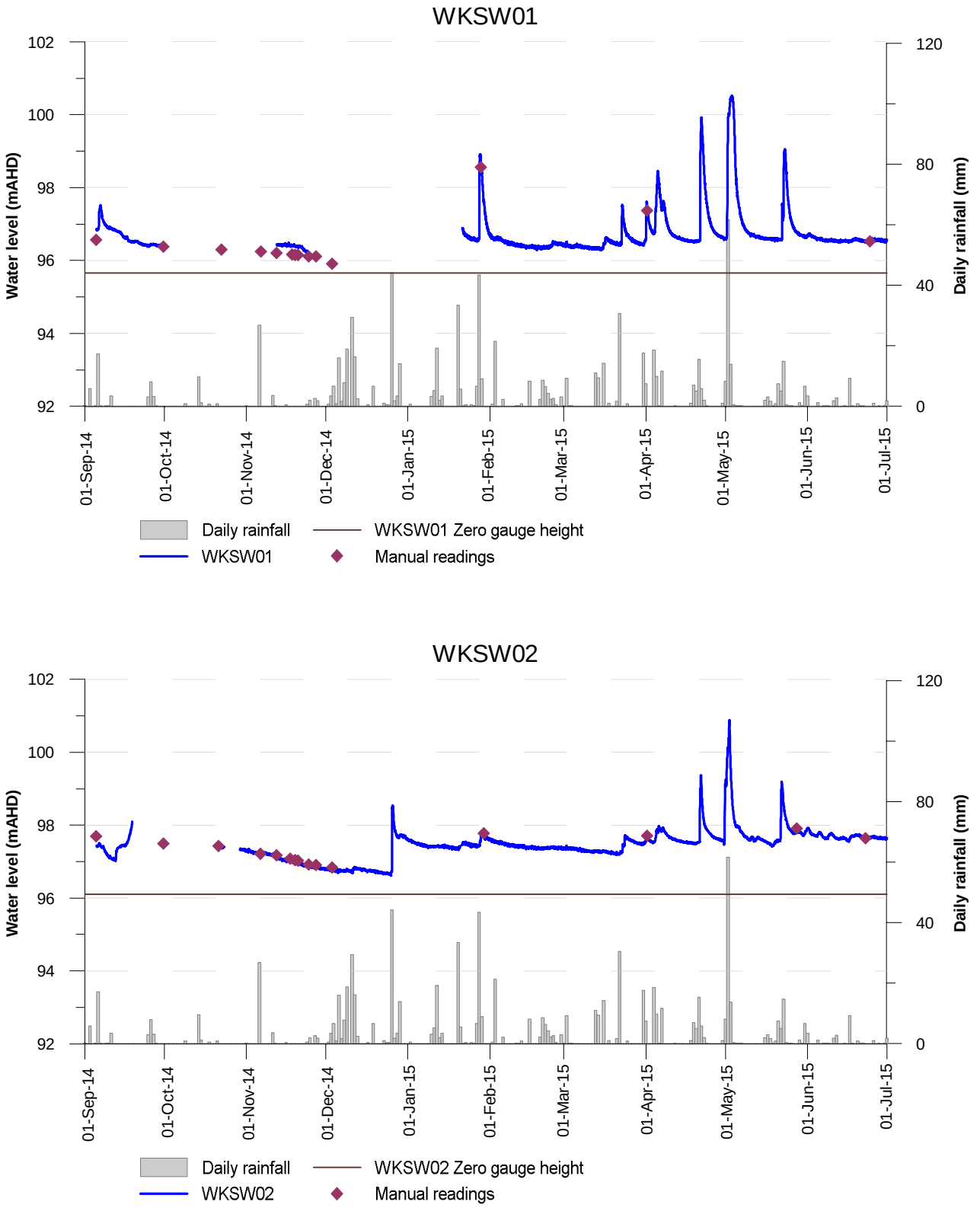


Figure A.27: WKSW01 and WKSW02 stream levels

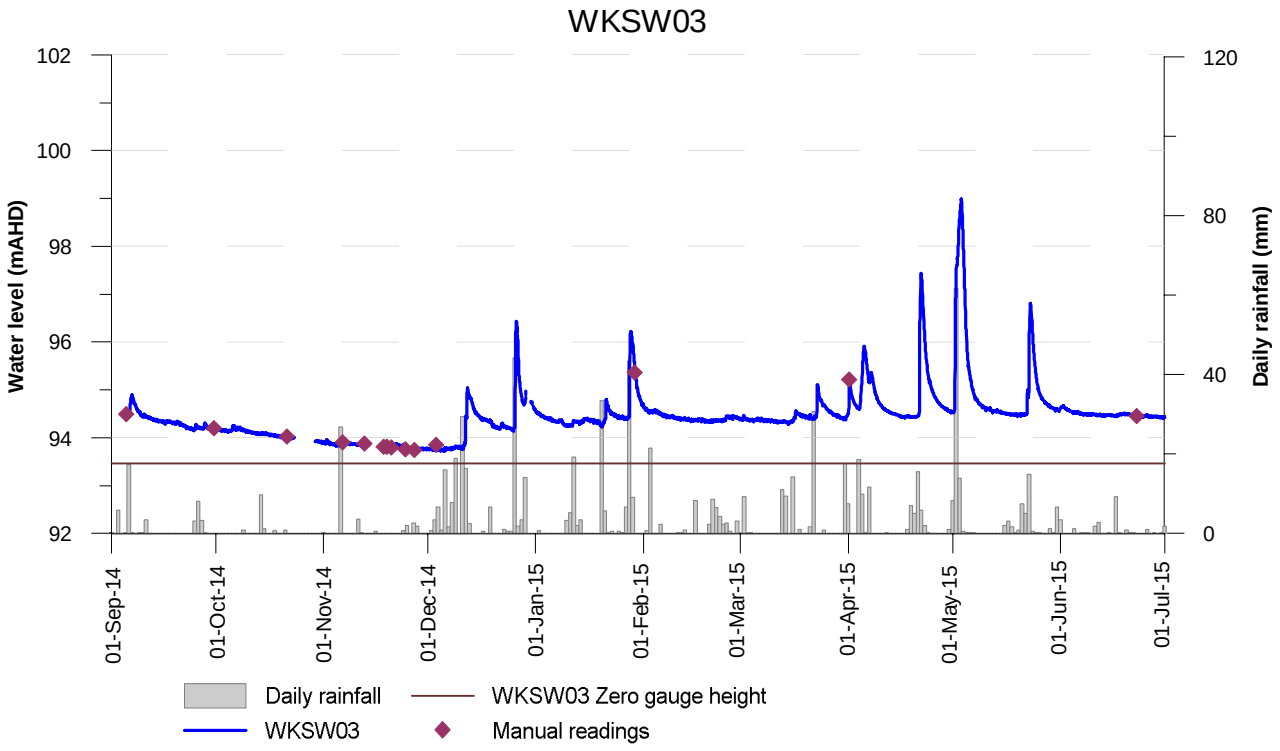


Figure A.28: WKSW03 stream levels

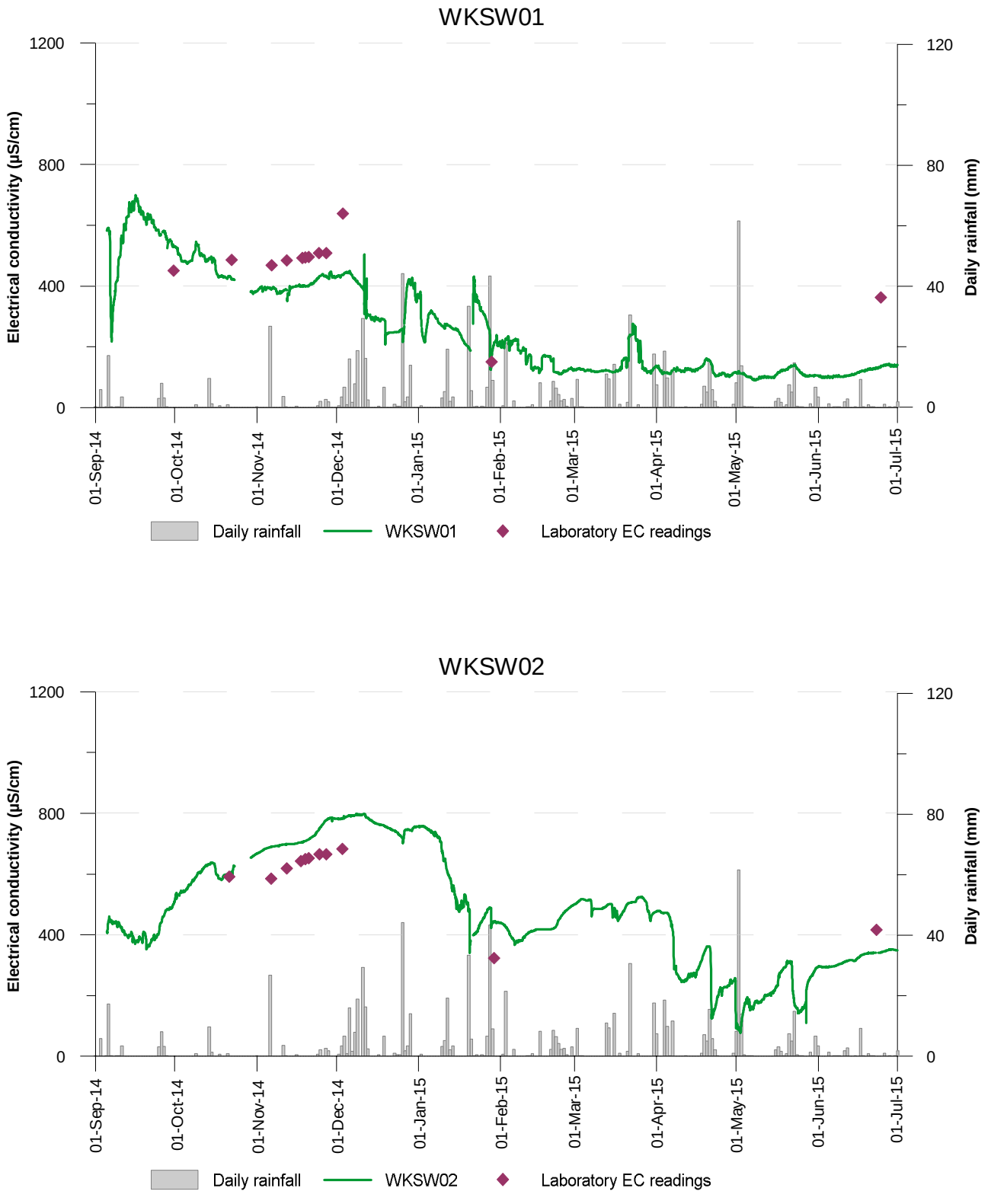


Figure A.29: WKSW01 and WKSW02 electrical conductivity

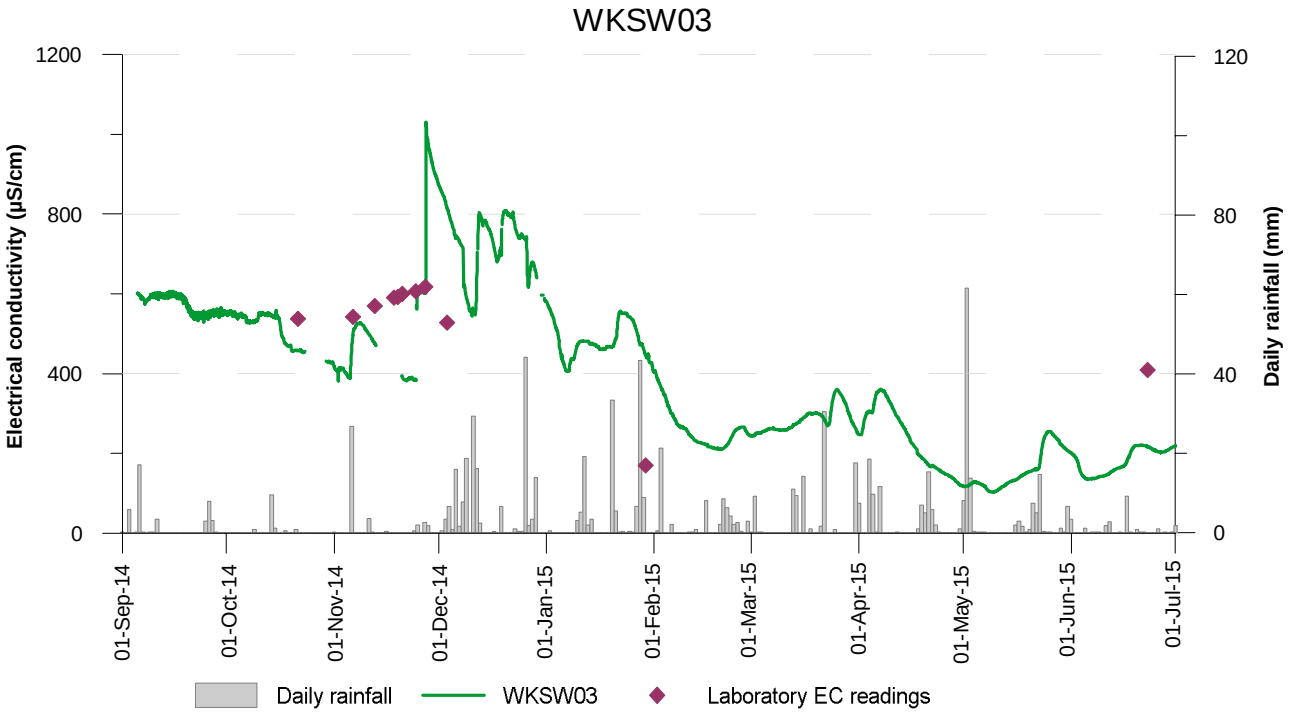
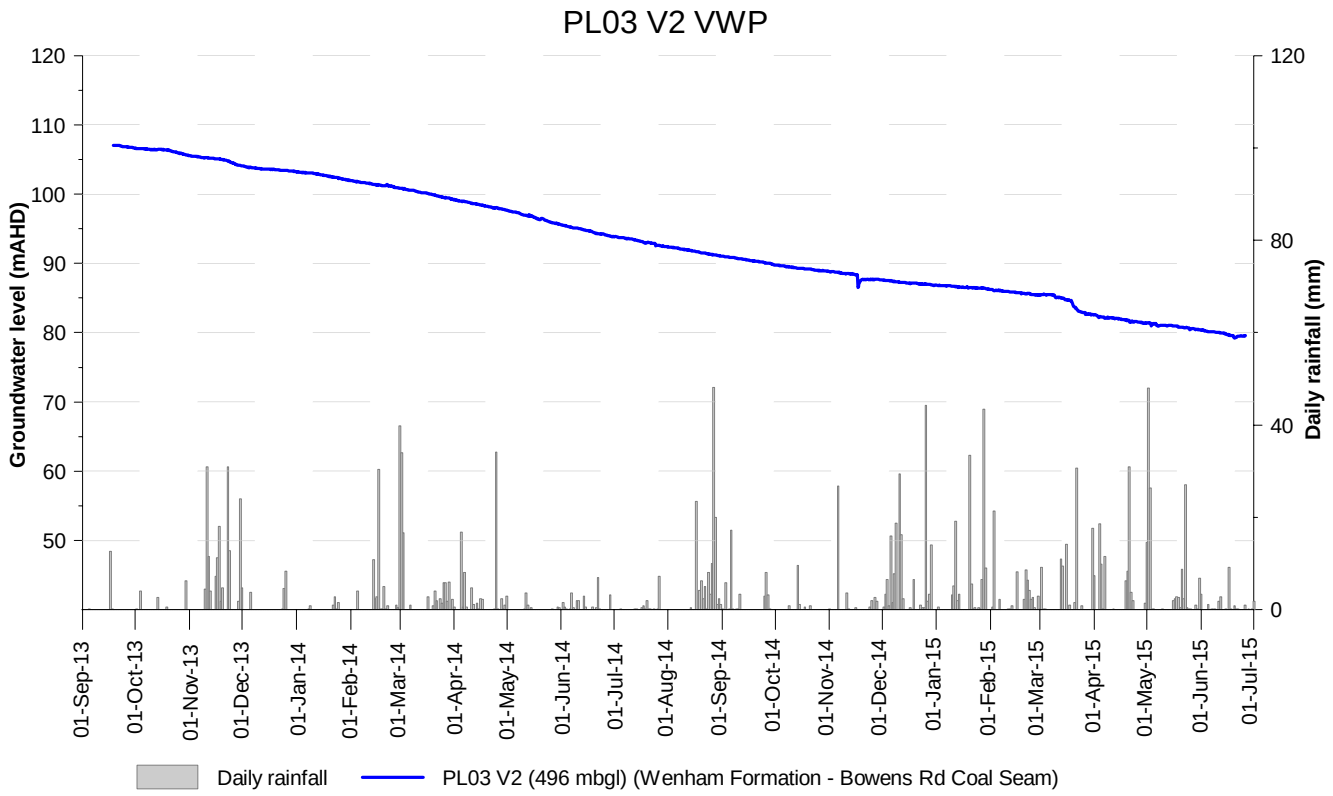


Figure A.30: WKSW03 electrical conductivity



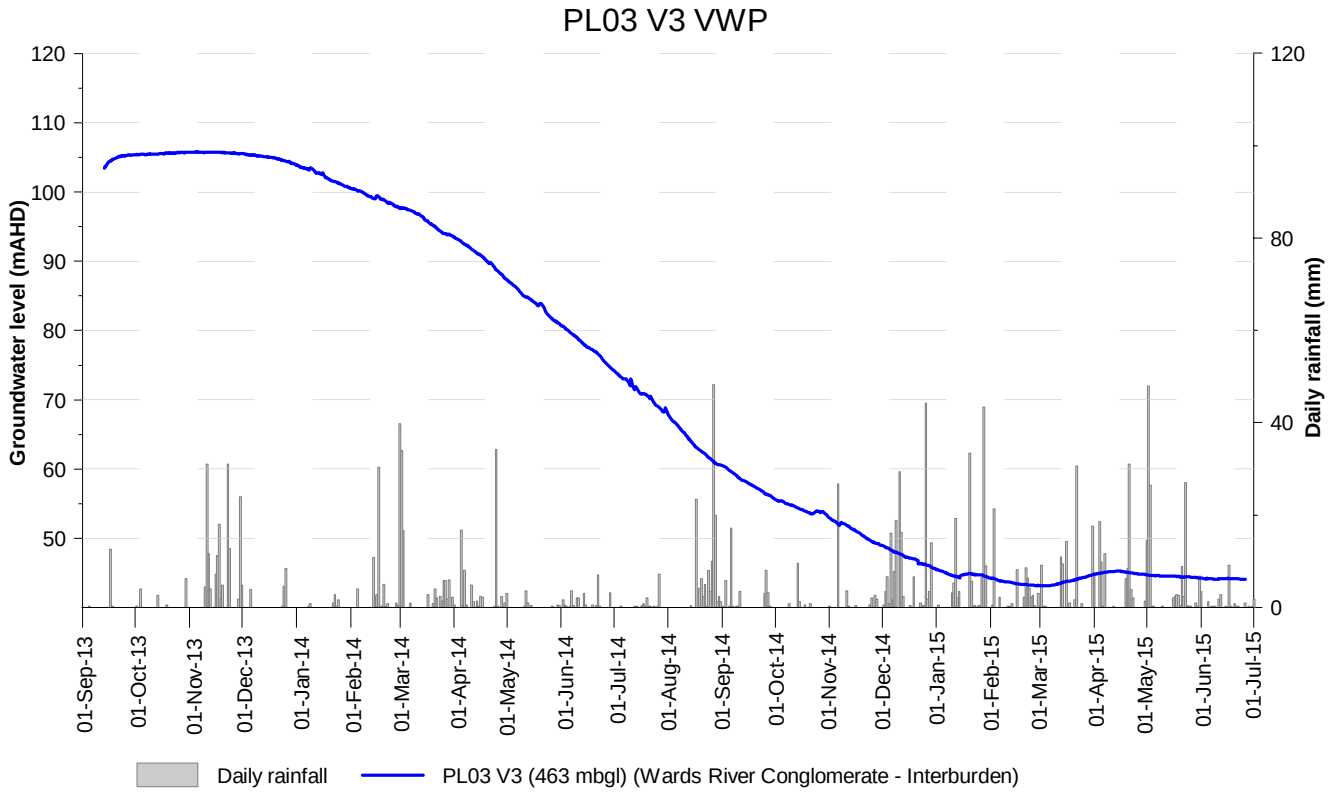
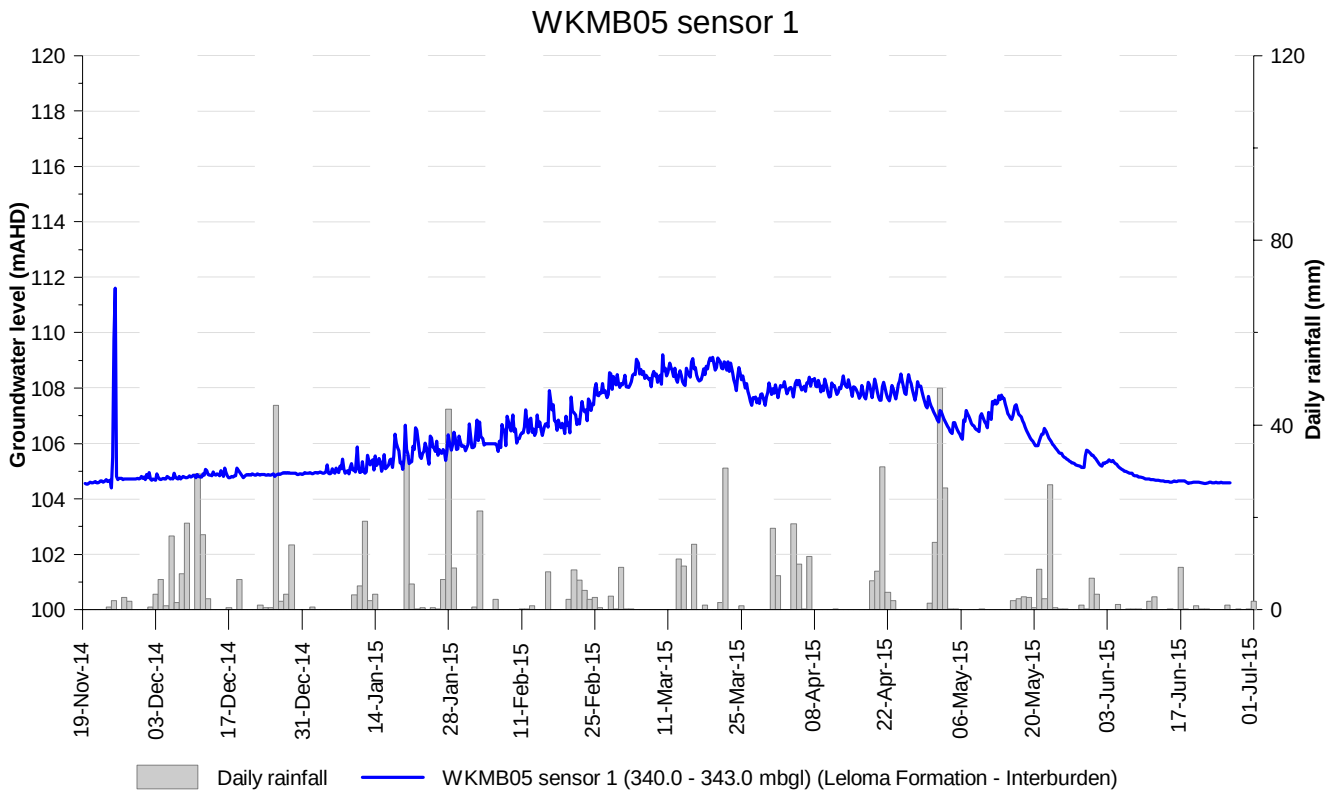


Figure A.31: PL03 VWP



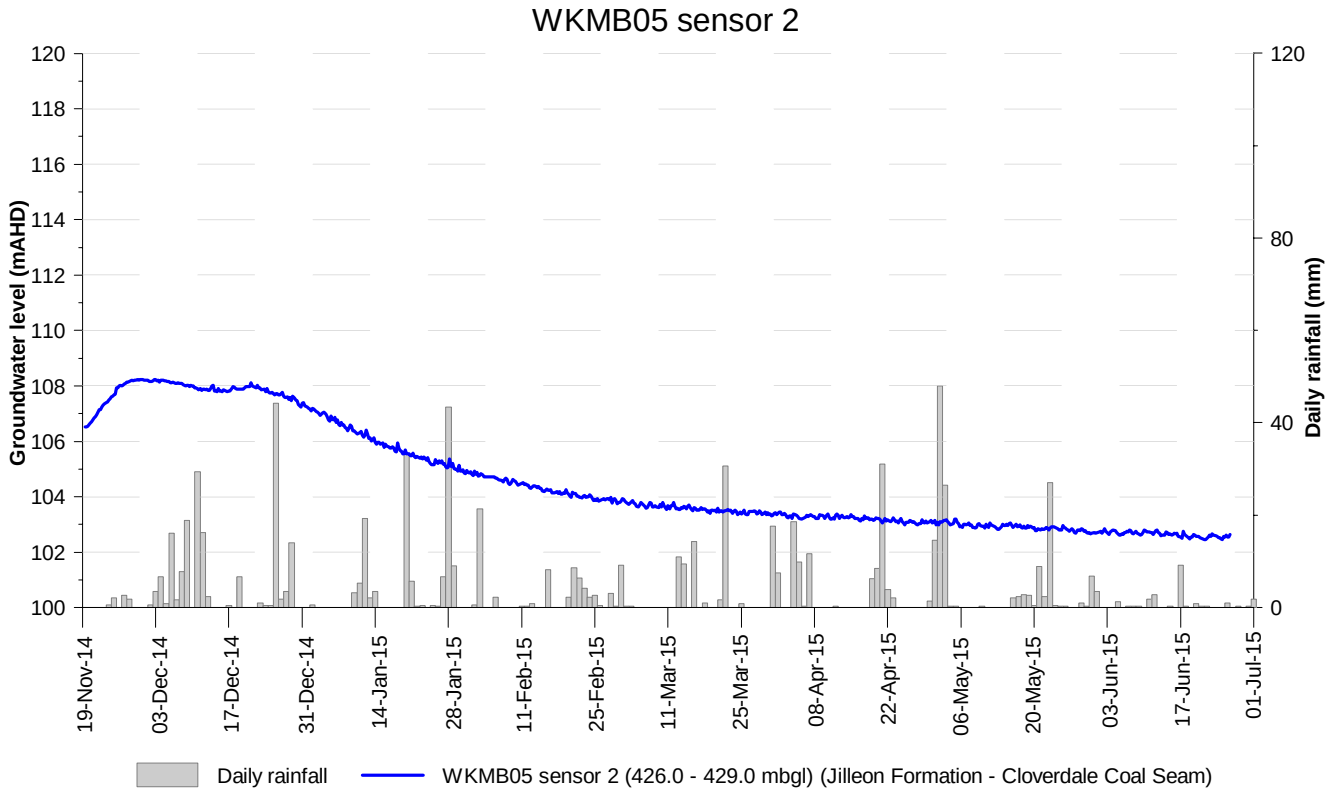
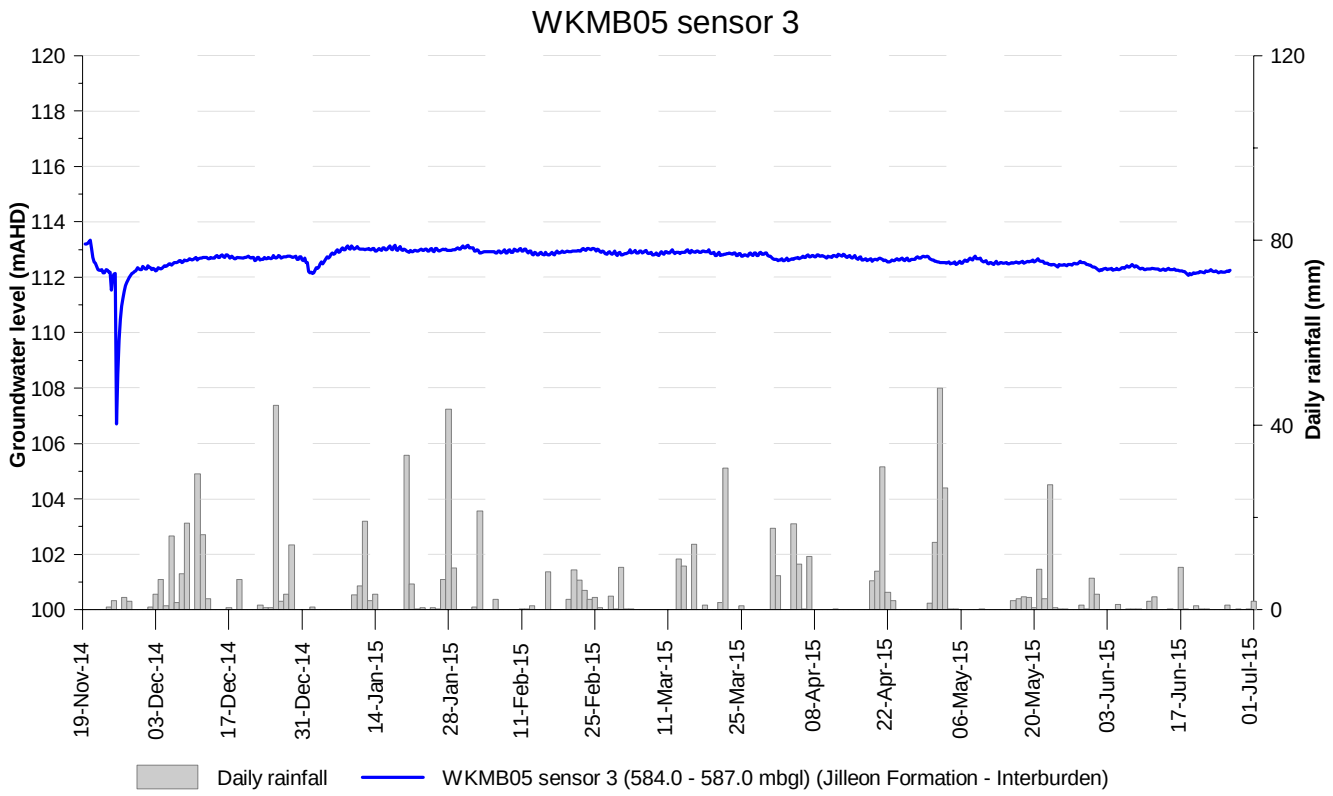


Figure A.32: WKMB05 sensors 1 and 2



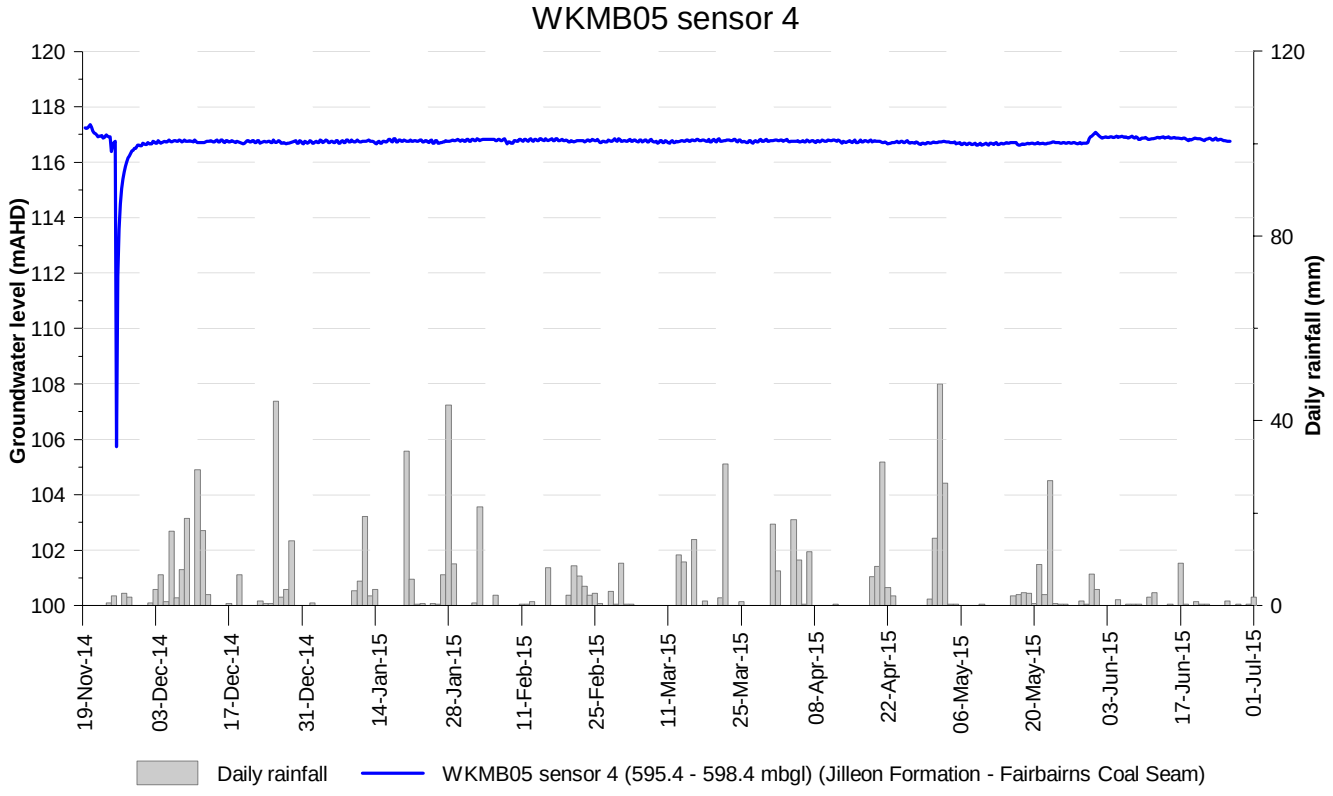
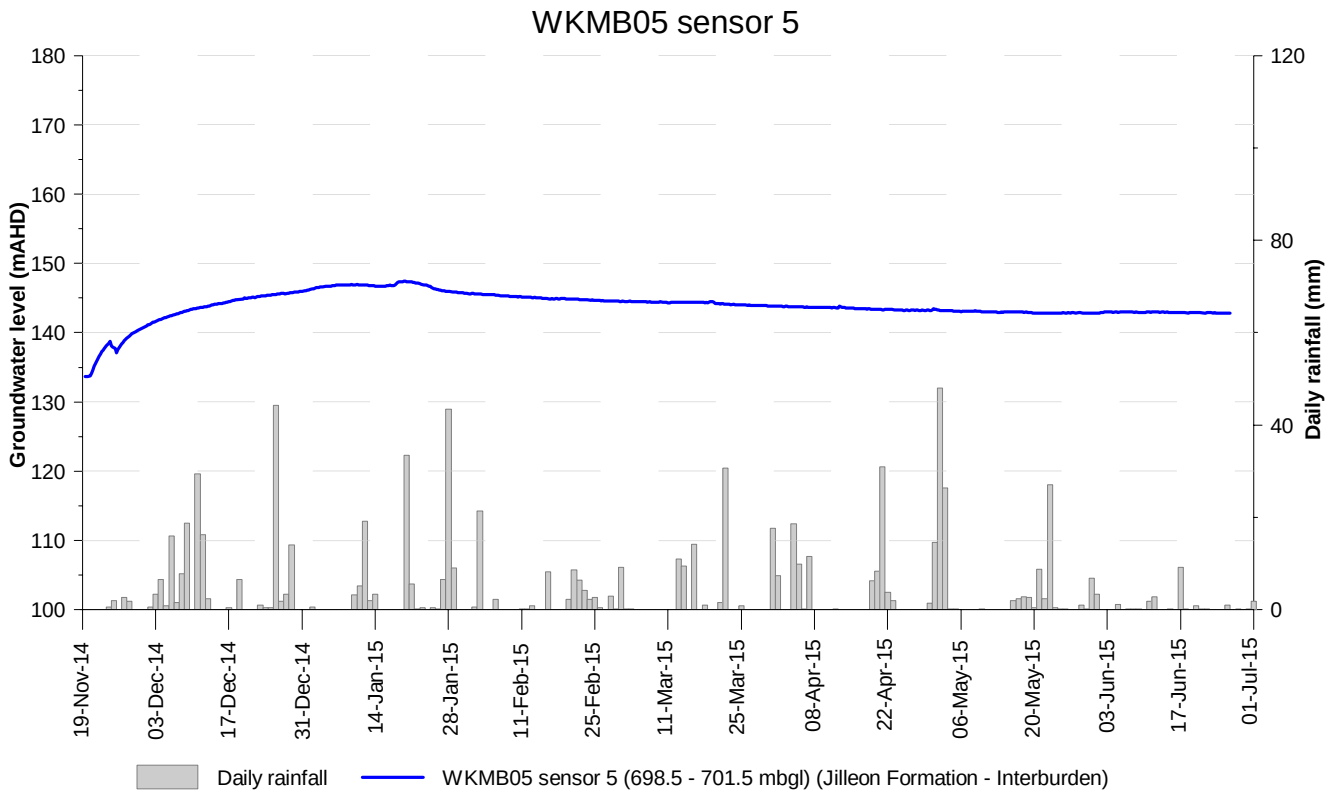


Figure A.33: WKMB05 sensors 3 and 4



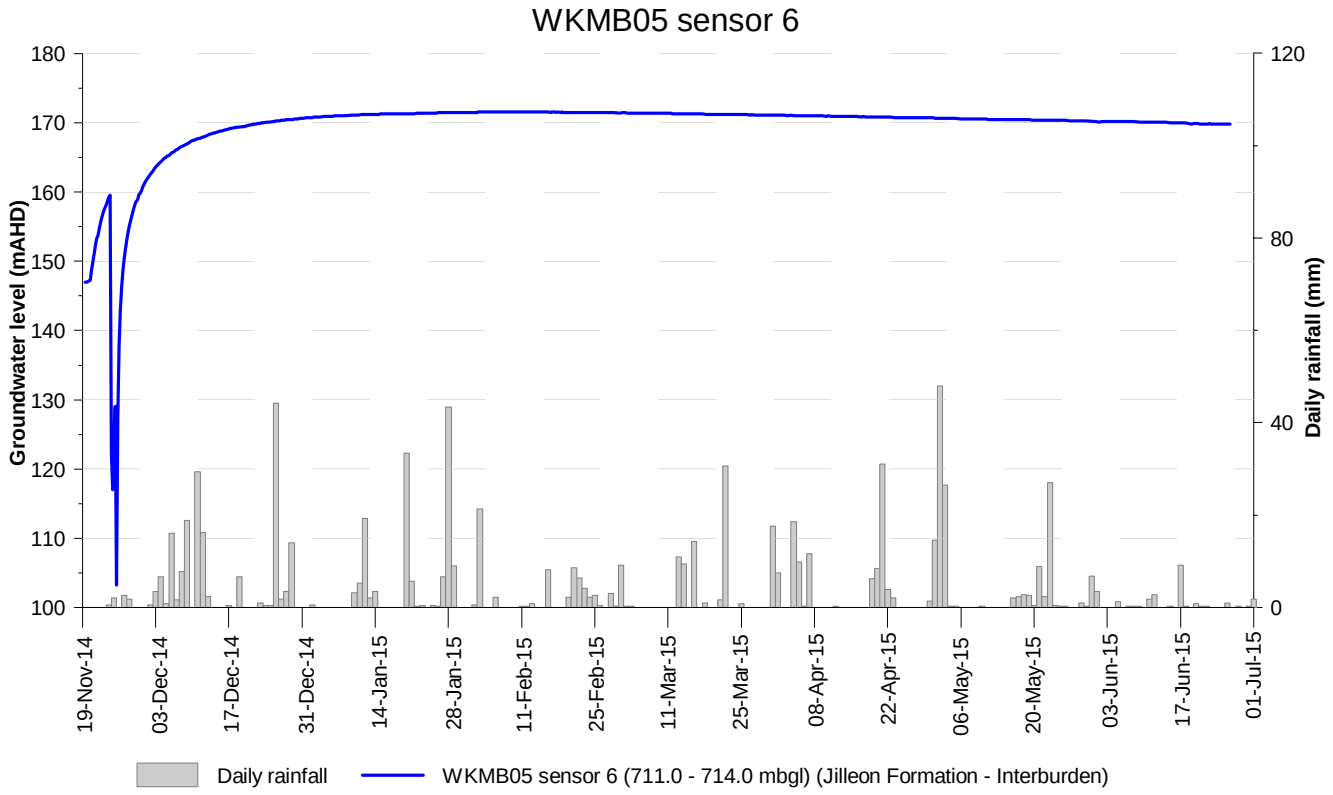


Figure A.34: WKMB05 sensors 5 and 6

Appendix B

Water quality tables

				Field_ID	AMB01	AMB02	BMB01	BMB02	BWMB01A	BWMB01B	BWMB01C	BWMB01D	FKMB01A	FKMB01B
				Sampled Date	25/06/2015	25/06/2015	19/06/2015	19/06/2015	25/06/2015	25/06/2015	25/06/2015	25/06/2015	18/06/2015	18/06/2015
Chem_Group	Analyte	Units	EQL											
Field	Conductivity (Field)	uS/cm			2199	403	5215	4467	4410	4636	3156	3197	5424	3287
	pH (Field)	-			5.5	6.88	7.06	7.97	6.24	6.81	6.81	9.71	7.26	9.64
	TDS (Field)	mg/L			1430	262	3390	2907	2866	3014	2052	2078	3526	2136
	DO % (Field)	%			16	23.5	21.5	31.3	23.4	18.8	35.8	38.3	24.3	24.5
	DO mg/L (Field)	mg/L			1.5	2.25	1.97	3.05	2.15	1.73	3.41	3.79	2.32	2.28
	Redox (Field)	mV			56.2	-17.5	-118.3	-156.8	2.8	-103.1	-115.4	-253.8	-110.4	-142.5
	Temperature (Field)	°C			18.2	17.42	18.67	16.09	18.63	18.72	16.67	15.02	16.89	18.44
	Chlorine Free (Field)	mg/L			0.06	-	0	0.12	0	0.04	0.03	0	0.17	0.06
	Total Chlorine (Field)	mg/L			-	-	0	0.08	-	0	0.05	0	0.05	0.1
Key analytes	Ethanolamine	µg/L	1		<1	<1	2	1	2	<1	<1	1	<1	1
	Diethanolamine	µg/L	1		<1	<1	<1	3	<1	<1	2	66	<1	20
	Boron (Filtered)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.09	0.1
	Chloride	mg/L	1		566	47	1190	1000	1030	1090	747	726	1020	285
	Chlorine - Free	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Chlorine - Total Residual	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nitrogen (Total)	mg/L	0.1		0.2	<0.1	0.4	1.5	0.3	0.4	3.1	3	1	1.4
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		32	18	17	11	11	2	2	2	171	<1
	Phosphorus	mg/L	0.01		<0.01	0.02	0.04	0.43	0.03	0.01	<0.01	<0.01	0.05	0.04
Lab physical parameters	Conductivity @ 25 C	µS/cm	1		2300	402	5320	4780	4540	4720	2970	3180	5290	3260
	pH (Lab)	pH_Units	0.01		6.42	6.63	7.68	8.11	7.13	7.3	8.98	9.95	7.49	9.64
	TDS	mg/L	10		1260	208	2730	2380	2450	2400	1450	1480	2880	1820
	TSS	mg/L	5		9	<5	<5	80	77	41	<5	34	45	71
Major/minor ions	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		70	89	402	574	283	292	25	43	818	699
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	<1	<1	<1	<1	<1	18	158	<1	744
	Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Alkalinity (total) as CaCO3	mg/L	1		70	89	402	574	283	292	43	202	818	1440
	Calcium (Filtered)	mg/L	1		85	14	114	20	147	141	68	8	92	4
	Magnesium (Filtered)	mg/L	1		52	5	60	7	85	92	36	9	14	<1
	Potassium (Filtered)	mg/L	1		2	<1	5	4	2	2	50	5	7	5
	Sodium (Filtered)	mg/L	1		245	59	839	913	592	675	408	553	1120	761
	Fluoride	mg/L	0.1		0.1	0.2	0.4	0.8	0.2	0.2	<0.1	0.4	0.3	1.5
	Reactive Silica	mg/L	0.05		51.6	43.5	18.2	17.4	33	33.1	7.48	0.96	21.6	5.11
	Bromine (Filtered)	mg/L	0.1		1	0.2	4.9	3.7	3.3	3.9	2.1	2	4.5	1
	Ionic Balance	%	0.01		3.22	2.74	5.92	1.79	6.92	9.16	7.2	1.51	-	-
Nutrients	Ammonia as N	mg/L	0.01		0.19	0.06	0.35	0.79	0.13	0.27	3.13	2.14	0.72	1.08
	Ammonium as N	mg/L	0.01		0.19	0.06	0.35	0.77	0.13	0.27	3.12	0.89	0.72	0.42
	Nitrate (as N)	mg/L	0.01		<0.01	0.01	<0.01	0.01	0.01	0.02	0.01	0.07	0.03	0.01
	Nitrite (as N)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrite + Nitrate as N	mg/L	0.01		<0.01	0.01	<0.01	0.01	0.01	0.02	0.01	0.07	0.03	0.01
	Kjeldahl Nitrogen Total	mg/L	0.1		0.2	<0.1	0.4	1.5	0.3	0.4	3.1	2.9	1	1.4
	Reactive Phosphorus as P	mg/L	0.01		<0.01	0.02	<0.01	0.1	<0.01	<0.01	0.04	<0.01	0.02	<0.01
	Total Organic Carbon	mg/L	1		2	<1	2	22	<1	<1	2	8	2	34
Dissolved gas	Methane	mg/L	0.01		<0.01	<0.01	0.025	41.8	0.029	1.91	4.87	4.38	1.89	25
Dissolved metals	Aluminium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	Antimony (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Arsenic (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	0.001	0.015	<0.001	<0.001	<0.001	0.002	<0.001
	Barium (Filtered)	mg/L	0.001		0.531	0.059	0.712	0.981	1.25	1.46	2.97	0.845	0.369	0.12
	Berryllium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt (Filtered)	mg/L	0.001		0.035	0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Iron (Filtered)	mg/L	0.05		7.04	0.74	0.7	<0.05	1.53	17.5	0.06	<0.05	0.76	<0.05
	Lead (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
	Vanadium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005		0.034	0.012	0.006	0.018	0.015	0.007	<0.005	0.152	<0.005	0.104
	Manganese (Filtered)	mg/L	0.001		3.19	0.152	-	-	0.363	0.304	0.006	<0.001	0.121	<0.001
	Mercury (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	0.002	0.001	<0.001	0.006	0.002	0.002	0.002
	Nickel (Filtered)	mg/L	0.001		0.009	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
	Selenium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Strontium (Filtered)	mg/L	0.001		1.8	0.238	4.86	2.03	2.36	2.36	2.62	0.632	9.98	0.756
	Uranium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenols	2,4,5-trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2.4.6-Trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	1		<1	<1	<1	<1	<1	<1	3.2	1.6	<1	2.1
PAH	Acenaphthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a)pyrene TEQ (zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1		<1	<1	1.5	<1	<1	<1	<1	<1	<1	<1
	Pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5		<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH	TPH C6-C10	µg/L	20		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C16 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C16 - C34 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34 - C40 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C10 - C40 Fraction (Sum)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH	C6 - C9 Fraction	µg/L	20		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C29-C36 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	+C10 - C36 (Sum of total)	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
BTEX	Benzene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

			Field_ID	S4MB01	S4MB02	S4MB03	S5MB01	S5MB02	S5MB03	TCMB01	TCMB02	TCMB04
			Sampled Date	22/06/2015	17/06/2015	17/06/2015	18/06/2015	17/06/2015	17/06/2015	22/06/2015	17/06/2015	17/06/2015
Chem_Group	Analyte	Units	EQL									
Field	Conductivity (Field)	uS/cm		4749	2298	2898	3584	4326	5208	2991	2726	6055
	pH (Field)	-		7.15	7.83	8.02	7.76	7.15	6.88	7.06	10.39	12.17
	TDS (Field)	mg/L		3087	1494	1882	2329	2812	3385	1943	1772	3936
	DO % (Field)	%		8	23.3	30.6	31.1	33.8	38.1	8.6	19.7	36.4
	DO mg/L (Field)	mg/L		0.74	2.24	2.83	2.69	3.16	3.55	0.78	1.84	3.36
	Redox (Field)	mV		-181	-105.4	-108.9	-181.3	-131.8	-115.9	-151.8	-210.2	-175.6
	Temperature (Field)	°C		18.5	16.81	18.83	21.62	17.82	17.96	19.15	18.11	18.13
	Chlorine Free (Field)	mg/L		0	0.07	0.1	0.03	0.05	0.23	0.02	0.03	0.13
	Total Chlorine (Field)	mg/L		0.03	0	0.04	0	0.05	0.18	0	0	0
Key analytes	Ethanolamine	µg/L	1	<1	3	5	<1	<1	2	<1	<1	10
	Diethanolamine	µg/L	1	<1	<1	3	<1	3	<1	<1	8	29
	Boron (Filtered)	mg/L	0.05	0.14	<0.05	<0.05	0.17	0.08	0.06	<0.05	<0.05	0.07
	Chloride	mg/L	1	1090	654	872	740	1090	1060	776	732	647
	Chlorine - Free	mg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Chlorine - Total Residual	mg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nitrogen (Total)	mg/L	0.1	1.9	1.4	0.9	2.7	1.7	1	1.3	3	12
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1	<1	<1	<1	74	75	146	<1	3	27
	Phosphorus	mg/L	0.01	0.07	0.04	<0.01	0.08	0.07	0.02	<0.01	<0.01	0.08
Lab physical parameters	Conductivity @ 25 C	µS/cm	1	4820	2240	3200	4000	4980	5200	3020	2770	5700
	pH (Lab)	pH_Units	0.01	7.56	7.86	8.19	7.7	7.24	7.09	7.46	10.4	11.9
	TDS	mg/L	10	2850	1210	1680	2280	2500	2610	1860	1480	2540
	TSS	mg/L	5	6	6	9	24	24	33	<5	36	25
Major/minor ions	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1	598	154	334	789	1080	1240	314	<1	<1
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1	<1	<1	<1	<1	<1	<1	<1	298	422
	Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1	<1	<1	<1	<1	<1	<1	18	784
	Alkalinity (total) as CaCO3	mg/L	1	598	154	334	789	1080	1240	314	316	1200
	Calcium (Filtered)	mg/L	1	442	104	22	81	122	129	285	17	19
	Magnesium (Filtered)	mg/L	1	50	24	4	30	83	126	58	16	<1
	Potassium (Filtered)	mg/L	1	5	3	3	24	7	8	4	7	45
	Sodium (Filtered)	mg/L	1	529	319	615	684	836	852	237	525	861
	Fluoride	mg/L	0.1	0.5	0.1	<0.1	0.3	0.2	0.2	<0.1	0.4	0.8
	Reactive Silica	mg/L	0.05	28.9	14.7	13.6	22.2	18.6	17.9	20.7	30.6	55.2
	Bromine (Filtered)	mg/L	0.1	2.4	0.8	1.4	2.2	2.4	2.5	1.1	0.9	1.4
	Ionic Balance	%	0.01	7.21	0.95	5.1	-	4.31	3.28	2.19	3.56	3.98
Nutrients	Ammonia as N	mg/L	0.01	1.92	1.21	0.95	1.96	1.72	1.13	1.33	3	14.1
	Ammonium as N	mg/L	0.01	1.91	1.18	0.92	1.91	1.71	1.13	1.32	0.2	0.02
	Nitrate (as N)	mg/L	0.01	<0.01	0.02	0.02	0.03	0.02	0.04	<0.01	0.02	0.02
	Nitrite (as N)	mg/L	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrite + Nitrate as N	mg/L	0.01	<0.01	0.02	0.02	0.04	0.02	0.04	<0.01	0.02	0.02
	Kjeldahl Nitrogen Total	mg/L	0.1	1.9	1.4	0.9	2.7	1.7	1	1.3	3	12
	Reactive Phosphorus as P	mg/L	0.01	0.09	<0.01	0.01	0.07	<0.01	<0.01	0.07	<0.01	<0.01
	Total Organic Carbon	mg/L	1	47	2	2	94	4	<1	2	40	58
Dissolved gas	Methane	mg/L	0.01	8.88	4.58	13	3	2.86	0.165	0.415	4.48	13.7
Dissolved metals	Aluminium (Filtered)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.35
	Antimony (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.002
	Arsenic (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	0.002	0.002	0.011	<0.001	<0.001	0.002
	Barium (Filtered)	mg/L	0.001	9.45	3.83	1.56	1.68	1.14	0.097	8.62	0.87	0.523
	Berryllium (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
	Iron (Filtered)	mg/L	0.05	1.15	0.11	<0.05	<0.05	0.46	0.31	1.34	<0.05	<0.05
	Lead (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.015
	Vanadium (Filtered)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005	0.012	0.006	<0.005	<0.005	<0.005	<0.005	0.014	0.006	1.09
	Manganese (Filtered)	mg/L	0.001	0.147	0.015	0.01	0.011	0.074	0.123	0.024	<0.001	0.002
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.008
	Nickel (Filtered)	mg/L	0.001	0.002	<0.001	<0.001	0.003	<0.001	0.002	<0.001	<0.001	0.007
	Selenium (Filtered)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Strontium (Filtered)	mg/L	0.001	28.6	8.15	1.48	6.03	6.47	5.75	14.1	2.49	1.18
	Uranium (Filtered)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenols	2,4,5-trichlorophenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2.4.6-Trichlorophenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	1	1.1	<1	<1	<1	<1	<1	<1	3.4	<1
PAH	Acenaphthene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b&j)fluoranthene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a)pyrene TEQ (zero)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pyrene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	ug/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH	TPH C6-C10	µg/L	20	60	<20	<20	<20	<20	<20	90	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20	<20	<20	<20	<20	<20	<20	30	<20	<20
	C10 - C16 Fraction	µg/L	100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C16 - C34 Fraction	µg/L	100	<100	<100	<100	<100	<100	<100	<100	730	<100
	C34 - C40 Fraction	µg/L	100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C10 - C40 Fraction (Sum)	µg/L	100	<100	<100	<100	<100	<100	<100	<100	730	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH	C6 - C9 Fraction	µg/L	20	60	<20	<20	<20	<20	<20	90	<20	<20
	C10 - C14 Fraction	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100	<100	<100	<100	<100	<100	<100	<100	480	<100
	C29-C36 Fraction	µg/L	50	<50	<50	<50	<50	<50	<50	<50	220	<50
	+C10 - C36 (Sum of total)	µg/L	50	<50	<50	<50	<50	<50	<50	<50	700	<50
BTEX	Benzene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2	42	2	<2	<2	<2	<2	59	6	2
	Ethylbenzene	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1	42	2	<1	<1	<1	<1	59	6	2
	Naphthalene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1

				Field_ID	TMB01	TMB02	TMB03	TMB04	TMB05	TTMB01	TTMB02	TTMB03	TTPB
				Sampled Date	16/06/2015	16/06/2015	24/06/2015	16/06/2015	16/06/2015	17/06/2015	23/06/2015	25/06/2015	18/06/2015
Chem_Group	Analyte	Units	EQL										
Field	Conductivity (Field)	uS/cm			7318	3748	5679	7024	7367	1963	2285	3392	2283
	pH (Field)	-			6.48	6.3	6.82	5.82	5.01	6.84	6.61	11.68	7.17
	TDS (Field)	mg/L			4757	2436	3691	4566	4789	1276	1485	2205	1484
	DO % (Field)	%			25.2	23.1	47.6	32.7	48.9	28.4	11.2	13.2	28.8
	DO mg/L (Field)	mg/L			2.31	2.14	4.44	3.1	4.53	2.65	1.05	1.25	2.54
	Redox (Field)	mV			-75.7	-68.8	-74.1	-16.1	21.7	-81.2	-124.9	-324.7	-114
	Temperature (Field)	℃			18.28	18.03	18.56	16.72	17.52	18.38	18.26	17.04	18.68
	Chlorine Free (Field)	mg/L			0.02	0.02	0.05	0	0	0.16	0	0.05	0.04
	Total Chlorine (Field)	mg/L			0	0.08	0.17	-	0	0.18	0.08	0.14	0.08
Key analytes	Ethanolamine	µg/L	1		<1	3	<1	<1	<1	<1	2	2	<1
	Diethanolamine	µg/L	1		<1	<1	<1	<1	<1	<1	<1	31	<1
	Boron (Filtered)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05
	Chloride	mg/L	1		2310	1110	1460	1950	2420	468	480	444	552
	Chlorine - Free	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Chlorine - Total Residual	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nitrogen (Total)	mg/L	0.1		0.2	0.4	<0.1	0.3	0.8	0.7	0.6	10.6	0.7
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		71	19	188	562	216	<10	45	<10	<1
	Phosphorus	mg/L	0.01		0.06	0.07	<0.01	0.03	0.04	0.3	0.24	<0.01	0.01
Lab physical parameters	Conductivity @ 25 C	µS/cm	1		7360	3760	5730	7020	7270	2150	2300	3420	2240
	pH (Lab)	pH_Units	0.01		6.73	6.66	6.89	5.98	4.99	7.28	6.91	10.9	7.41
	TDS	mg/L	10		4090	2310	3210	4160	4420	1090	1300	1700	1120
	TSS	mg/L	5		18	<5	<5	21	50	108	<5	<5	24
Major/minor ions	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		592	197	541	158	9	519	399	<1	194
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	<1	<1	<1	<1	<1	<1	771	<1
	Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1	<1	<1	128	<1
	Alkalinity (total) as CaCO3	mg/L	1		592	197	541	158	9	519	399	899	194
	Calcium (Filtered)	mg/L	1		205	152	193	77	49	79	172	2	89
	Magnesium (Filtered)	mg/L	1		202	93	133	208	263	29	51	<1	45
	Potassium (Filtered)	mg/L	1		2	4	2	20	16	4	4	2	4
	Sodium (Filtered)	mg/L	1		1050	438	838	1010	1030	300	244	680	279
	Fluoride	mg/L	0.1		0.2	0.2	0.3	0.8	0.7	0.1	0.1	1.4	<0.1
	Reactive Silica	mg/L	0.05		37.8	34.5	32.9	52.9	68.5	27.4	33.1	69.4	6.69
	Bromine (Filtered)	mg/L	0.1		<0.1	<0.1	3.2	<0.1	<0.1	0.5	0.7	1.1	0.8
	Ionic Balance	%	0.01		3.91	1.78	1.03	3.31	2.57	9.52	2.29	1.31	-
Nutrients	Ammonia as N	mg/L	0.01		0.14	0.3	0.07	0.04	0.23	0.73	0.6	10.7	0.54
	Ammonium as N	mg/L	0.01		0.14	0.3	0.07	0.04	0.23	0.73	0.6	0.07	0.54
	Nitrate (as N)	mg/L	0.01		0.01	0.01	0.01	0.05	0.21	0.02	<0.01	<0.01	0.12
	Nitrite (as N)	mg/L	0.01		<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrite + Nitrate as N	mg/L	0.01		0.01	0.01	0.01	0.07	0.21	0.02	<0.01	<0.01	0.12
	Kjeldahl Nitrogen Total	mg/L	0.1		0.2	0.4	<0.1	0.2	0.6	0.7	0.6	10.6	0.6
	Reactive Phosphorus as P	mg/L	0.01		0.03	<0.01	<0.01	<0.01	<0.01	0.04	0.03	0.02	<0.01
	Total Organic Carbon	mg/L	1		<1	2	1	9	9	8	4	8	4
Dissolved gas	Methane	mg/L	0.01		0.021	0.01	0.018	<0.01	<0.01	2.67	0.014	49.9	2.19
Dissolved metals	Aluminium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	0.04	1.45	<0.01	<0.01	0.02	<0.01
	Antimony (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.063	<0.001
	Arsenic (Filtered)	mg/L	0.001		<0.001	0.003	0.003	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
	Barium (Filtered)	mg/L	0.001		0.192	0.859	0.204	0.044	0.064	3.56	0.755	0.604	2.42
	Berryllium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	0.008	<0.001	<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	0.0008	0.0027	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt (Filtered)	mg/L	0.001		<0.001	0.001	0.005	0.081	0.339	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	0.021	0.036	<0.001	<0.001	<0.001	<0.001
	Iron (Filtered)	mg/L	0.05		2.47	6.52	1.48	1.41	5.9	0.88	2.5	<0.05	2.93
	Lead (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001
	Vanadium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005		0.013	0.022	0.008	0.48	1.3	0.01	0.006	0.01	0.007
	Manganese (Filtered)	mg/L	0.001		0.846	1	1.74	10.1	19.6	0.026	0.097	<0.001	0.08
	Mercury (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum (Filtered)	mg/L	0.001		<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
	Nickel (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	0.039	0.171	<0.001	<0.001	<0.001	<0.001
	Selenium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Strontium (Filtered)	mg/L	0.001		5.56	3.7	4.73	0.765	0.735	2.87	3.33	0.375	2.96
	Uranium (Filtered)	mg/L	0.001		0.001	<0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenols	2,4,5-trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2.4.6-Trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
PAH	Acenaphthene	µg/L	1		<1	<1	<1	1.4	1.3	<1	<1	<1	<1
	Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a)pyrene TEQ (zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1		<1	<1	<1	1.2	1.1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1		1.8	1.7	<1	2.2	1.8	<1	<1	<1	<1
	Pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		1.8	1.7	<0.5	4.8	4.2	<0.5	<0.5	<0.5	<0.5
TRH	TPH C6-C10	µg/L	20		<20	<20	<20	<20	<20	<20	<20	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20		<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C16 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C16 - C34 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34 - C40 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C10 - C40 Fraction (Sum)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH	C6 - C9 Fraction	µg/L	20		<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C29-C36 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
	+C10 - C36 (Sum of total)	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
BTEX	Benzene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1

				Field_ID	NS725R	NS726R	NS735R	NS746R	RMB01	RMB02	WRMB01A	WRMB01B	WRMB01C
				Sample Date	1/07/2015	1/07/2015	1/07/2015	1/07/2015	24/06/2015	24/06/2015	24/06/2015	24/06/2015	24/06/2015
Chem Group	Analyte	Units	EQL										
Field	Conductivity (Field)	uS/cm			4048	4841	1636	4504	10,009	8849	1399	3094	3393
	pH (Field)	-			6.47	6.77	6.5	6.4	6.53	6.92	6.16	7.4	8.04
	TDS (Field)	mg/L			2633	3147	1063	2928	6506	5752	910	2010	2206
	DO % (Field)	%			15.7	9.6	17.8	8.4	14.9	33.7	35.4	12.6	26
	DO mg/L (Field)	mg/L			1.42	0.86	1.63	0.78	1.34	3.06	3.21	1.22	2.48
	Redox (Field)	mV			-84.8	-88.4	-110.7	-89.5	-70.8	-91.2	-49.6	-152.7	-34.7
	Temperature (Field)	℃			19.8	20.24	19.38	18.27	18.69	18.55	19.91	17.4	16.94
	Chlorine Free (Field)	mg/L			0.01	0.02	0.02	-	0.02	0	0.05	0	0
	Total Chlorine (Field)	mg/L			-	0.03	0.05	-	0.01	0.05	0.03	0.05	0.06
Key analytes	Ethanolamine	µg/L	1		<1	<1	3	3	5	<1	<1	<1	<1
	Diethanolamine	µg/L	1		<1	<1	11	2	<1	<1	<1	<1	3
	Boron (Filtered)	mg/L	0.05		<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05	0.06	<0.05
	Chloride	mg/L	1		970	1070	357	1030	3020	2600	337	482	674
	Chlorine - Free	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Chlorine - Total Residual	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nitrogen (Total)	mg/L	0.1		0.6	1.6	0.8	0.5	3.2	2.2	0.8	1	1
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		91	5	26	199	4	<1	8	40	<1
	Phosphorus	mg/L	0.01		0.02	0.02	0.03	0.01	0.01	0.06	0.21	0.13	0.04
Lab physical parameters	Conductivity @ 25 C	µS/cm	1		4170	4980	1650	4600	10,100	9010	1380	3120	3400
	pH (Lab)	pH_Units	0.01		7.09	7.43	7.12	6.87	7.1	7.27	6.52	7.87	8.21
	TDS	mg/L	10		2230	2740	920	2540	5750	4860	778	1740	1830
	TSS	mg/L	5		8	64	84	52	<5	<5	56	5	10
Major/minor ions	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		535	639	212	263	885	909	194	973	799
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Alkalinity (total) as CaCO3	mg/L	1		535	639	212	263	885	909	194	973	799
	Calcium (Filtered)	mg/L	1		188	214	106	227	226	139	76	25	14
	Magnesium (Filtered)	mg/L	1		90	54	20	71	106	82	20	2	<1
	Potassium (Filtered)	mg/L	1		15	9	20	20	10	9	4	3	2
	Sodium (Filtered)	mg/L	1		566	782	190	589	1890	1710	170	748	785
	Fluoride	mg/L	0.1		0.3	0.2	0.1	0.2	<0.1	0.4	<0.1	0.3	0.2
	Reactive Silica	mg/L	0.05		30	18.4	38.4	36	16.4	19.4	34.9	17.7	12.9
	Bromine (Filtered)	mg/L	0.1		2.9	2.8	0.8	2.5	9.2	8	0.9	1.2	1.2
	Ionic Balance	%	0.01		2.25	6.82	2.84	5.94	0.25	1.8	2.31	0.18	0.16
Nutrients	Ammonia as N	mg/L	0.01		0.4	1.56	0.65	0.56	2.44	1.7	0.5	1.12	1.09
	Ammonium as N	mg/L	0.01		0.4	1.56	0.65	0.56	2.44	1.69	0.5	1.11	1.05
	Nitrate (as N)	mg/L	0.01		<0.01	<0.01	0.01	0.04	0.04	0.02	0.06	0.01	0.02
	Nitrite (as N)	mg/L	0.01		<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrite + Nitrate as N	mg/L	0.01		<0.01	0.02	0.01	0.04	0.04	0.02	0.06	0.01	0.02
	Kjeldahl Nitrogen Total	mg/L	0.1		0.6	1.6	0.8	0.5	3.2	2.2	0.7	1	1
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	0.11	0.05
	Total Organic Carbon	mg/L	1		3	3	5	3	4	1	1	29	1
Dissolved gas	Methane	mg/L	0.01		0.306	25	0.016	0.092	24.3	17.6	0.986	12	18.4
Dissolved metals	Aluminium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Antimony (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Arsenic (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	0.002
	Barium (Filtered)	mg/L	0.001		0.204	5.42	0.419	0.182	18.3	7.59	0.715	1.16	0.84
	Berryllium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Iron (Filtered)	mg/L	0.05		3.95	0.45	2.22	22.2	0.88	0.68	16.6	0.33	0.07
	Lead (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Vanadium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005		0.014	<0.005	0.014	0.009	0.01	0.005	0.013	<0.005	<0.005
	Manganese (Filtered)	mg/L	0.001		-	-	-	-	0.02	0.126	0.263	0.074	0.036
	Mercury (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum (Filtered)	mg/L	0.001		0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001
	Nickel (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001
	Selenium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Strontium (Filtered)	mg/L	0.001		1.94	8.73	1.07	3.17	16.1	9.84	1.94	2.79	1.48
	Uranium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Phenols	2,4,5-trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2.4.6-Trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	1		<1	<1	1.2	<1	<1	<1	<1	<1	<1
PAH	Acenaphthene	µg/L	1		1	<1	2.3	<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a)pyrene TEQ (zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1		<1	<1	2.1	<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1		1.9	1.3	4	1.8	<1	<1	<1	<1	<1
	Pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		2.9	1.3	9.7	1.8	<0.5	<0.5	<0.5	<0.5	<0.5
TRH	TPH C6-C10	µg/L	20		<20	<20	<20	<20	<20	<20	<20	100	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20		<20	<20	<20	<20	<20	<20	<20	50	<20
	C10 - C16 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C16 - C34 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34 - C40 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C10 - C40 Fraction (Sum)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH	C6 - C9 Fraction	µg/L	20		<20	<20	<20	<20	<20	<20	<20	100	<20
	C10 - C14 Fraction	µg/L	50		<50	<50	80	<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C29-C36 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
	+C10 - C36 (Sum of total)	µg/L	50		<50	<50	80	<50	<50	<50	<50	<50	<50
BTEX	Benzene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	52	<2
	Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1		<1	<1	<1	<1	<1	<1	<1	52	<1
	Naphthalene	µg/L	1		<1	<1	<5 - 1.3	<1	<1	<1	<1	<1	<1

				Field_ID	WKMB01	WKMB02	WKMB03	WKMB06A	WKMB06B	WMB01	WMB02	WMB03	WMB04
				Sampled Date	23/06/2015	23/06/2015	23/06/2015	23/06/2015	23/06/2015	18/06/2015	18/06/2015	19/06/2015	18/06/2015
Chem Group	Analyte	Units	EQL										
Field	Conductivity (Field)	uS/cm			4256	983	3516	2179	1351	2942	5189	4009	3561
	pH (Field)	-			7.86	9.25	11.25	6.06	8.37	6.19	6.4	6.61	6.67
	TDS (Field)	mg/L			2768	639	2286	1416	878	1913	3373	2606	2314
	DO % (Field)	%			6.3	22.7	3.4	28	5.1	22.4	13.9	27.8	38.8
	DO mg/L (Field)	mg/L			0.61	2.09	0.32	2.58	0.48	2.03	1.25	2.58	3.66
	Redox (Field)	mV			-217.2	-182.3	-234.6	-70.1	-279.7	-47.7	-58.9	-82.8	-61.7
	Temperature (Field)	°C			18.12	18.88	18.76	19.22	18.42	19.38	19.65	18.38	17.67
	Chlorine Free (Field)	mg/L			0	0.02	-	0.01	0.01	0	0	0	0.13
	Total Chlorine (Field)	mg/L			-	0.09	-	0.07	0.03	0	-	0	0.18
Key analytes	Ethanolamine	µg/L	1		<1	<1	1	<1	2	<1	<1	1	<1
	Diethanolamine	µg/L	1		<1	<1	4	<1	<1	<1	<1	<1	<1
	Boron (Filtered)	mg/L	0.05		0.1	<0.05	0.08	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
	Chloride	mg/L	1		769	55	359	513	184	671	926	844	813
	Chlorine - Free	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Chlorine - Total Residual	mg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nitrogen (Total)	mg/L	0.1		1.2	0.4	17.4	0.4	0.4	5.8	0.7	5.4	1.7
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		62	28	26	37	31	183	696	356	69
	Phosphorus	mg/L	0.01		0.07	0.09	0.04	0.16	0.58	0.09	0.06	0.26	0.07
Lab physical parameters	Conductivity @ 25 C	µS/cm	1		4380	974	3520	2160	1340	2920	5120	4140	3540
	pH (Lab)	pH_Units	0.01		8.02	9.37	11.2	6.53	8.7	6.41	6.67	7.26	6.83
	TDS	mg/L	10		2300	536	2180	1160	722	1620	3140	2850	1920
	TSS	mg/L	5		<5	<5	30	88	<5	181	6	178	113
Major/minor ions	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		998	215	<1	230	365	155	472	293	588
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	200	1130	<1	45	<1	<1	<1	<1
	Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	197	<1	<1	<1	<1	<1	<1
	Alkalinity (total) as CaCO3	mg/L	1		998	415	1330	230	410	155	472	293	588
	Calcium (Filtered)	mg/L	1		9	2	5	82	3	115	332	309	259
	Magnesium (Filtered)	mg/L	1		1	<1	<1	38	<1	65	85	59	54
	Potassium (Filtered)	mg/L	1		2	14	9	2	1	5	8	8	7
	Sodium (Filtered)	mg/L	1		1010	218	795	295	303	365	679	434	399
	Fluoride	mg/L	0.1		1.7	0.4	2.3	0.1	0.6	<0.1	0.5	0.2	0.1
	Reactive Silica	mg/L	0.05		15.9	20.6	33.5	35.2	13.2	31.4	31.3	33.4	30.4
	Bromine (Filtered)	mg/L	0.1		2.4	0.2	0.9	1.6	0.5	1.6	2.2	1.8	1.5
	Ionic Balance	%	0.01		1.78	2.44	3.07	0.66	2.51	-	-	3	-
Nutrients	Ammonia as N	mg/L	0.01		0.61	0.33	16.6	0.28	0.37	0.01	0.67	2.08	1.2
	Ammonium as N	mg/L	0.01		0.6	0.2	0.28	0.28	0.34	<0.01	0.67	2.08	1.2
	Nitrate (as N)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	0.01	4.91	0.01	0.04	0.26
	Nitrite (as N)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.03
	Nitrite + Nitrate as N	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	0.01	4.93	0.01	0.04	0.29
	Kjeldahl Nitrogen Total	mg/L	0.1		1.2	0.4	17.4	0.4	0.4	0.9	0.7	5.4	1.4
	Reactive Phosphorus as P	mg/L	0.01		0.08	0.08	0.07	<0.05	0.7	0.01	<0.01	<0.01	<0.01
	Total Organic Carbon	mg/L	1		19	5	81	1	3	1	1	8	1
Dissolved gas	Methane	mg/L	0.01		20.8	2.81	20.8	0.021	21	<0.01	0.014	0.044	0.052
Dissolved metals	Aluminium (Filtered)	mg/L	0.01		0.02	0.12	0.08	<0.01	0.04	<0.01	<0.01	<0.01	<0.01
	Antimony (Filtered)	mg/L	0.001		<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Arsenic (Filtered)	mg/L	0.001		0.001	<0.001	0.002	0.008	0.002	<0.001	<0.001	<0.001	0.005
	Barium (Filtered)	mg/L	0.001		0.224	0.08	0.811	0.633	0.09	0.13	0.037	0.087	0.097
	Berryllium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001
	Iron (Filtered)	mg/L	0.05		0.05	<0.05	<0.05	20.6	<0.05	<0.05	3.57	2.56	2.12
	Lead (Filtered)	mg/L	0.001		<0.001	<0.001	0.009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Vanadium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005		<0.005	<0.005	6.94	0.018	<0.005	0.029	0.012	0.025	0.135
	Manganese (Filtered)	mg/L	0.001		0.007	0.004	<0.001	0.36	0.018	0.305	0.396	-	0.11
	Mercury (Filtered)	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum (Filtered)	mg/L	0.001		<0.001	0.002	0.004	<0.001	0.003	<0.001	<0.001	<0.001	<0.001
	Nickel (Filtered)	mg/L	0.001		<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002
	Selenium (Filtered)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Strontium (Filtered)	mg/L	0.001		1.7	0.244	1.15	2.04	0.243	1.08	4.38	9.4	6.15
	Uranium (Filtered)	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenols	2,4,5-trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2.4.6-Trichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
PAH	Acenaphthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a)pyrene TEQ (zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1		<1	<1	<1	<1	<1	1.4	1.2	<1	<1
	Pyrene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	1.4	1.2	<0.5	<0.5
TRH	TPH C6-C10	µg/L	20		<20	<20	70	<20	<20	<20	<20	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20		<20	<20	40	<20	<20	<20	<20	<20	<20
	C10 - C16 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C16 - C34 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34 - C40 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C10 - C40 Fraction (Sum)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH	C6 - C9 Fraction	µg/L	20		<20	<20	70	<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100	<100	<100	<100	<100
	C29-C36 Fraction	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
	+C10 - C36 (Sum of total)	µg/L	50		<50	<50	<50	<50	<50	<50	<50	<50	<50
BTEX	Benzene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2		<2	<2	33	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2		<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1		<1	<1	33	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1		<1	<1	<1	<1	<1	<1	<1	<1	<1

					Field_ID	ASW01	ASW02	FSW01	TSW01	TSW02	WKSW01	WKSW02	WKSW03	WRSW01	WRSW02
					Sampled Date	25/06/2015	25/06/2015	16/06/2015	16/06/2015	24/06/2015	24/06/2015	23/06/2015	23/06/2015	24/06/2015	24/06/2015
				ANZECC 2000 FW 95%											
Chem_Group	ChemName	output unit	EQL												
Field	Conductivity (Field)	uS/cm				373	352	416	445	589	352	414	390	289	296
	pH (Field)	-				6.36	6.1	6.77	7.34	7.49	7.63	6.86	6.87	6.45	7.85
	TDS (Field)	mg/L				0.242	0.228	271	290	0.383	0.229	0.269	0.254	0.188	0.193
	DO % (Field)	%				61.8	-	65.8	79	88	75.1	61.5	71	-	87.4
	DO mg/L (Field)	mg/L				6.81	6.1	6.72	8.06	8.76	8.02	6.62	7.81	6.45	9.43
	Redox (Field)	mV				46.3	55.6	-13.4	-81.1	-69.9	39.5	-17.5	-101.7	7.1	31.5
	Temperature (Field)	°C				11.04	14.27	14.23	14.02	14.37	12.26	11.85	11.03	12.51	11.97
	Chlorine Free (Field)	mg/L				0	-	0.08	0	0.02	0.01	-	0.01	0.01	0.04
	Chlorine Total (Field)	mg/L				0.05	-	0.04	0	0	0.08	-	0	0.06	0.1
	Total Chlorine (Field)	mg/L				-	-	-	-	-	-	-	-	-	-
Key analytes	Ethanolamine	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Diethanolamine	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Boron (Filtered)	mg/L	0.05	0.37		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chloride	mg/L	1			58	55	66	68	110	64	59	61	54	55
	Chlorine - Free	mg/L	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Chlorine - Total Residual	mg/L	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Nitrogen (Total)	mg/L	0.1			0.2	0.2	0.5	0.4	0.6	0.5	0.3	0.4	0.2	0.3
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1			10	10	18	19	40	13	13	18	7	8
	Phosphorus	mg/L	0.01			0.01	<0.01	0.05	0.03	0.04	0.02	0.01	0.02	<0.01	<0.01
Lab physical parameters	Conductivity @ 25 C	µS/cm	1			390	370	368	381	550	362	416	408	293	301
	pH (Lab)	pH_Units	0.01			7.62	7.24	7.16	7.27	7.32	7.42	7.32	7.1	7.31	7.37
	TDS	mg/L	10			184	167	221	240	286	202	196	201	172	174
	TSS	mg/L	5			<5	<5	<5	<5	11	<5	<5	<5	<5	<5
Major/minor ions	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1			60	58	60	59	46	55	88	69	47	52
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Alkalinity (Hydroxide) as CaCO3	mg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Alkalinity (total) as CaCO3	mg/L	1			60	58	60	59	46	55	88	69	47	52
	Calcium (Filtered)	mg/L	1			15	15	13	14	15	14	22	17	13	13
	Magnesium (Filtered)	mg/L	1			9	9	10	10	15	10	12	11	7	7
	Potassium (Filtered)	mg/L	1			2	2	3	2	4	3	3	3	2	2
	Sodium (Filtered)	mg/L	1			44	41	43	43	66	43	43	45	36	36
	Fluoride	mg/L	0.1			<0.1	<0.1	0.1	0.2	<0.1	<0.1	0.1	0.2	0.1	<0.1
	Reactive Silica	mg/L	0.05			17.1	17.7	13	13	2.22	14	9.45	12.2	14.4	14.4
	Bromine (Filtered)	mg/L	0.1			0.2	0.2	<0.1	<0.1	0.3	0.2	0.2	0.2	0.1	0.2
	Ionic Balance	%	0.01			-	-	0.25	0.72	1.02	4.41	4.38	4.31	-	-
Nutrients	Ammonia as N	mg/L	0.01	0.9		0.03	0.01	0.02	0.02	0.05	0.02	<0.01	0.01	<0.01	0.08
	Ammonium as N	mg/L	0.01			0.03	<0.01	0.02	0.02	0.05	0.02	<0.01	<0.01	<0.01	0.08
	Nitrate (as N)	mg/L	0.01			0.03	0.02	0.04	0.02	0.01	0.08	0.02	0.02	0.01	0.06
	Nitrite (as N)	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrite + Nitrate as N	mg/L	0.01			0.03	0.02	0.04	0.02	0.01	0.08	0.02	0.02	0.01	0.06
	Kjeldahl Nitrogen Total	mg/L	0.1			0.2	0.2	0.5	0.4	0.6	0.4	0.3	0.4	0.2	0.2
	Reactive Phosphorus as P	mg/L	0.01			0.01	<0.01	0.01	<0.01	0.01	0.02	0.01	0.02	<0.01	<0.01
	Total Organic Carbon	mg/L	1			6	4	14	11	13	9	6	8	5	5
Dissolved gas	Butane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Butene	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Ethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Ethene	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Methane	mg/L	0.01			0.017	0.024	<0.01	0.019	<0.01	0.012	0.043	0.018	0.013	0.017
	Propane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Propene	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved metals	Aluminium (Filtered)	mg/L	0.01	0.055		<0.01	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
	Antimony (Filtered)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Arsenic (Filtered)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Barium (Filtered)	mg/L	0.001			0.047	0.046	0.043	0.043	0.053	0.045	0.037	0.043	0.05	0.05
	Berryllium (Filtered)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001	0.0002		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (Filtered)	mg/L	0.001			<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt (Filtered)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001	0.0014		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Iron (Filtered)	mg/L	0.05			0.63	0.88	0.4	0.46	0.2	0.44	0.27	0.36	0.3	0.45
	Lead (Filtered)	mg/L	0.001	0.0034		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Vanadium (Filtered)	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Zinc (Filtered)	mg/L	0.005	0.008		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Manganese (Filtered)	mg/L	0.001	1.9		0.046	0.069	0.058	0.054	0.062	0.051	0.027	0.043	0.03	0.036
	Mercury (Filtered)	mg/L	0.0001	0.0006		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum (Filtered)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Nickel (Filtered)	mg/L	0.001	0.011		<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Selenium (Filtered)	mg/L	0.01	0.011		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Strontium (Filtered)	mg/L	0.001			0.202	0.198	0.178	0.18	0.197	0.172	0.226	0.2	0.172	0.179
	Uranium (Filtered)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenols	2,4,5-trichlorophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2.4.6-Trichlorophenol	µg/L	1	20		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1	160		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1	490		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2	10		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Phenol	µg/L	1	320		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PAH	Acenaphthene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b&j)fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a)pyrene TEQ (zero)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Pyrene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	ug/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH	TPH C6-C10	µg/L	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C6 - C10 Fraction minus BTEX (F1)	µg/L	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C16 Fraction	µg/L	100			<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C16 - C34 Fraction	µg/L	100			<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C34 - C40 Fraction	µg/L	100			<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C10 - C40 Fraction (Sum)	µg/L	100			<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100			<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH	C6 - C9 Fraction	µg/L	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100			<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C29-C36 Fraction	µg/L	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	+C10 - C36 (Sum of total)	µg/L	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
BTEX	Benzene	µg/L	1	950		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	350		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1	16		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Appendix C

Laboratory results

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524147**	Page	: 1 of 16
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 17-Jun-2015 15:11
C-O-C number	: ----	Date Analysis Commenced	: 18-Jun-2015
Sampler	: BRENDAN RICE, CAROLINA SARDELLA	Issue Date	: 24-Jun-2015 18:10
Site	: ----		
		No. of samples received	: 7
Quote number	: ----	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
			Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit	ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.98	4.99	7.16	6.73	7.27
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	7020	7270	368	7360	381
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	4160	4420	221	4090	240
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	21	50	<5	18	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	9	60	592	59
Total Alkalinity as CaCO3	----	1	mg/L	158	9	60	592	59
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	562	216	18	71	19
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1950	2420	66	2310	68
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	77	49	13	205	14
Magnesium	7439-95-4	1	mg/L	208	263	10	202	10
Sodium	7440-23-5	1	mg/L	1010	1030	43	1050	43
Potassium	7440-09-7	1	mg/L	20	16	3	2	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.04	1.45	0.01	<0.01	0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Strontium	7440-24-6	0.001	mg/L	0.765	0.735	0.178	5.56	0.180
Barium	7440-39-3	0.001	mg/L	0.044	0.064	0.043	0.192	0.043
Beryllium	7440-41-7	0.001	mg/L	<0.001	0.008	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0008	0.0027	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	0.081	0.339	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.021	0.036	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	10.1	19.6	0.058	0.846	0.054

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
				Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit		ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.039**	**0.171**	**0.002**	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	**0.004**	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.480**	**1.30**	<0.005	**0.013**	<0.005
Iron	7439-89-6	0.05	mg/L		**1.41**	**5.90**	**0.40**	**2.47**	**0.46**
Bromine	7726-95-6	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**52.9**	**68.5**	**13.0**	**37.8**	**13.0**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.8**	**0.7**	**0.1**	**0.2**	**0.2**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.04**	**0.23**	**0.02**	**0.14**	**0.02**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.04**	**0.23**	**0.02**	**0.14**	**0.02**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.05**	**0.21**	**0.04**	**0.01**	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.07**	**0.21**	**0.04**	**0.01**	**0.02**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	**0.6**	**0.5**	**0.2**	**0.4**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.3**	**0.8**	**0.5**	**0.2**	**0.4**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.03**	**0.04**	**0.05**	**0.06**	**0.03**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
				Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit		ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	**0.03**	<0.01
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**69.9**	**72.9**	**3.44**	**78.5**	**3.49**
^ Total Cations	----	0.01	meq/L		**65.4**	**69.3**	**3.42**	**72.6**	**3.44**
^ Ionic Balance	----	0.01	%		**3.31**	**2.57**	**0.25**	**3.91**	**0.72**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**9**	**9**	**14**	<1	**11**
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		<10	<10	<10	**21**	**19**
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
				Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit		ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
				Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit		ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		**1.4**	**1.3**	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		**1.2**	**1.1**	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		**2.2**	**1.8**	<1.0	**1.8**	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
				Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit		ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		**4.8**	**4.2**	<0.5	**1.8**	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB04	TMB05	FSW01	TMB01	TSW01
				Client sampling date / time	16-Jun-2015 08:30	16-Jun-2015 09:30	16-Jun-2015 09:45	16-Jun-2015 10:40	16-Jun-2015 11:00
Compound	CAS Number	LOR	Unit		ES1524147-001	ES1524147-002	ES1524147-003	ES1524147-004	ES1524147-005
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	<1	<1	<1
Diethanolamine	111-42-2	1	µg/L		<1	<1	<1	<1	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		104	99.6	99.8	108	107
Toluene-D8	2037-26-5	5	%		111	103	102	115	115
4-Bromofluorobenzene	460-00-4	5	%		105	98.0	97.6	106	105
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		22.2	33.1	25.6	26.7	29.7
2-Chlorophenol-D4	93951-73-6	1	%		51.2	61.4	49.9	52.5	60.4
2.4.6-Tribromophenol	118-79-6	1	%		45.3	68.0	45.7	55.6	49.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		68.1	79.8	67.2	70.8	75.8
Anthracene-d10	1719-06-8	1	%		74.0	81.3	80.0	79.7	91.7
4-Terphenyl-d14	1718-51-0	1	%		76.2	86.4	78.7	87.5	105
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		94.1	90.0	91.0	97.8	97.1
Toluene-D8	2037-26-5	2	%		107	99.0	98.5	112	111
4-Bromofluorobenzene	460-00-4	2	%		112	106	103	109	110

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.66**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**3760**	----	----	----	----
EA015: Total Dissolved Solids									
^ **Total Dissolved Solids @180°C**	----	10	mg/L		**2310**	----	----	----	----
EA025: Suspended Solids									
^ **Suspended Solids (SS)**	----	5	mg/L		<5	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**197**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**197**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**19**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1110**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**152**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**93**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**438**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**4**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.003**	----	----	----	----
Boron	7440-42-8	0.05	mg/L		<0.05	----	----	----	----
Strontium	7440-24-6	0.001	mg/L		**3.70**	----	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.859**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L		**0.001**	----	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**1.00**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.022**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**6.52**	----	----	----	----
Bromine	7726-95-6	0.1	mg/L		<0.1	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**34.5**	----	----	----	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	----	----	----	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.30**	----	----	----	----
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.30**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.01**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.4**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.4**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.07**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**35.6**	----	----	----	----
^ Total Cations	----	0.01	meq/L		**34.4**	----	----	----	----
^ Ionic Balance	----	0.01	%		**1.78**	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**2**	----	----	----	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**10**	----	----	----	----
Ethene	74-85-1	10	µg/L		<10	----	----	----	----
Ethane	74-84-0	10	µg/L		<10	----	----	----	----
Propene	115-07-1	10	µg/L		<10	----	----	----	----
Propane	74-98-6	10	µg/L		<10	----	----	----	----
Butene	25167-67-3	10	µg/L		<10	----	----	----	----
Butane	106-97-8	10	µg/L		<10	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L		**1.7**	----	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		1.7	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TMB02	TB	----	----	----
				Client sampling date / time	16-Jun-2015 11:50	[16-Jun-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1524147-006	ES1524147-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		**3**	----	----	----	----
Diethanolamine	111-42-2	1	µg/L		<1	----	----	----	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**102**	----	----	----	----
Toluene-D8	2037-26-5	5	%		**112**	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		**98.8**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**24.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		**50.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		**42.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**65.0**	----	----	----	----
Anthracene-d10	1719-06-8	1	%		**75.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		**74.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**92.7**	**101**	----	----	----
Toluene-D8	2037-26-5	2	%		**108**	**115**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**107**	**113**	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524326**	Page	: 1 of 17
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 19-Jun-2015 12:00
C-O-C number	: ----	Date Analysis Commenced	: 22-Jun-2015
Sampler	: CAROLINA SARDELLA	Issue Date	: 26-Jun-2015 18:40
Site	: ----		
		No. of samples received	: 7
Quote number	: ----	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Organic Coordinator	Sydney Organics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
			Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit	ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.83	6.67	6.41	7.41	7.70
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3540	5120	2920	2240	4000
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	1920	3140	1620	1120	2280
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	113	6	181	24	24
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	588	472	155	194	789
Total Alkalinity as CaCO3	----	1	mg/L	588	472	155	194	789
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	69	696	183	<1	74
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	813	926	671	552	740
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	259	332	115	89	81
Magnesium	7439-95-4	1	mg/L	54	85	65	45	30
Sodium	7440-23-5	1	mg/L	399	679	365	279	684
Potassium	7440-09-7	1	mg/L	7	8	5	4	24
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.005	<0.001	<0.001	<0.001	0.002
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	0.17
Strontium	7440-24-6	0.001	mg/L	6.15	4.38	1.08	2.96	6.03
Barium	7440-39-3	0.001	mg/L	0.097	0.037	0.130	2.42	1.68
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.110	0.396	0.305	0.080	0.011

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
				Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.002**	<0.001	**0.001**	<0.001	**0.003**
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	**0.001**
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.135**	**0.012**	**0.029**	**0.007**	<0.005
Iron	7439-89-6	0.05	mg/L		**2.12**	**3.57**	<0.05	**2.93**	<0.05
Bromine	7726-95-6	0.1	mg/L		**1.5**	**2.2**	**1.6**	**0.8**	**2.2**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**30.4**	**31.3**	**31.4**	**6.69**	**22.2**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	**0.5**	<0.1	<0.1	**0.3**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.20**	**0.67**	**0.01**	**0.54**	**1.96**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**1.20**	**0.67**	<0.01	**0.54**	**1.91**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.03**	<0.01	**0.02**	<0.01	**0.01**
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.26**	**0.01**	**4.91**	**0.12**	**0.03**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.29**	**0.01**	**4.93**	**0.12**	**0.04**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.4**	**0.7**	**0.9**	**0.6**	**2.7**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.7**	**0.7**	**5.8**	**0.7**	**2.7**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.07**	**0.06**	**0.09**	**0.01**	**0.08**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
				Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	<0.01	**0.07**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	**1**	**1**	**4**	**94**
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**52**	**14**	<10	**2190**	**3000**
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
				Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
				Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	1.2	1.4	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
				Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	**1.2**	**1.4**	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	<1	<1	<1
Diethanolamine	111-42-2	1	µg/L		<1	<1	<1	<1	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB04	WMB02	WMB01	TTPB	S5MB01
				Client sampling date / time	18-Jun-2015 09:15	18-Jun-2015 09:45	18-Jun-2015 11:15	18-Jun-2015 13:15	18-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524326-001	ES1524326-002	ES1524326-003	ES1524326-004	ES1524326-005
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	5	%		104	118	109	118	117
Toluene-D8	2037-26-5	5	%		108	127	113	127	127
4-Bromofluorobenzene	460-00-4	5	%		94.0	108	100	107	108
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		23.9	27.5	27.5	33.5	20.8
2-Chlorophenol-D4	93951-73-6	1	%		43.2	47.9	50.6	52.8	41.5
2.4.6-Tribromophenol	118-79-6	1	%		38.4	45.6	51.7	46.8	36.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		49.0	56.9	54.8	58.7	49.2
Anthracene-d10	1719-06-8	1	%		56.2	63.8	72.3	67.6	43.6
4-Terphenyl-d14	1718-51-0	1	%		63.3	71.8	92.2	79.2	60.7
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		129	122	113	123	121
Toluene-D8	2037-26-5	2	%		120	114	100	113	113
4-Bromofluorobenzene	460-00-4	2	%		114	106	99.4	107	108

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**9.64**	**7.49**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**3260**	**5290**	----	----	----
EA015: Total Dissolved Solids									
^ **Total Dissolved Solids @180°C**	----	10	mg/L		**1820**	**2880**	----	----	----
EA025: Suspended Solids									
^ **Suspended Solids (SS)**	----	5	mg/L		**71**	**45**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		**744**	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**699**	**818**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**1440**	**818**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	**171**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**285**	**1020**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**4**	**92**	----	----	----
Magnesium	7439-95-4	1	mg/L		<1	**14**	----	----	----
Sodium	7440-23-5	1	mg/L		**761**	**1120**	----	----	----
Potassium	7440-09-7	1	mg/L		**5**	**7**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.01**	<0.01	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	**0.002**	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.10**	**0.09**	----	----	----
Strontium	7440-24-6	0.001	mg/L		**0.756**	**9.98**	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.120**	**0.369**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		<0.001	**0.121**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		**0.002**	**0.002**	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.002**	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.002**	<0.001	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.104**	<0.005	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	**0.76**	----	----	----
Bromine	7726-95-6	0.1	mg/L		**1.0**	**4.5**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**5.11**	**21.6**	----	----	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	----	----	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.5**	**0.3**	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.08**	**0.72**	----	----	----
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.42**	**0.72**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.01**	**0.03**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	**0.03**	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.4**	**1.0**	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.4**	**1.0**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.04**	**0.05**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.02**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**34**	**2**	----	----	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**25000**	**1890**	----	----	----
Ethene	74-85-1	10	µg/L		<10	<10	----	----	----
Ethane	74-84-0	10	µg/L		<10	<10	----	----	----
Propene	115-07-1	10	µg/L		<10	<10	----	----	----
Propane	74-98-6	10	µg/L		<10	<10	----	----	----
Butene	25167-67-3	10	µg/L		<10	<10	----	----	----
Butane	106-97-8	10	µg/L		<10	<10	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	----	----	----
Bromobenzene	108-86-1	5	µg/L		<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L		<5	<5	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		**2.1**	<1.0	----	----	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		**1**	<1	----	----	----
Diethanolamine	111-42-2	1	µg/L		**20**	<1	----	----	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		**7**	**2**	----	----	----
EP074S: VOC Surrogates									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	FKMB01B	FKMB01A	----	----	----
				Client sampling date / time	18-Jun-2015 15:15	18-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524326-006	ES1524326-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	5	%		101	118	----	----	----
Toluene-D8	2037-26-5	5	%		108	123	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		90.2	108	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		23.6	23.6	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		21.7	41.9	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		11.3	43.6	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		63.5	52.2	----	----	----
Anthracene-d10	1719-06-8	1	%		71.3	49.8	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		80.1	72.4	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		125	123	----	----	----
Toluene-D8	2037-26-5	2	%		120	110	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		109	107	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524386**	Page	: 1 of 9
Amendment	: **2**		
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 19-Jun-2015 15:53
C-O-C number	: ----	Date Analysis Commenced	: 19-Jun-2015
Sampler	: BECKY ROLLINS, CAROLINA SARDELLA	Issue Date	: 30-Jul-2015 13:02
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- EK057G: Poor spike recovery for (Nitrite) due to matrix interferences(confirmed by re-analysis).
- EP075(SIM): Poor duplicate precision due to sample heterogeneity. Confirmed by re-analysis.
- This report has been amended and re-released to allow the reporting of additional analytical data, specifically Manganese via EG020A-F analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WMB03	BMB01	BMB02	QA1	----
			Client sampling date / time	19-Jun-2015 10:45	19-Jun-2015 12:15	19-Jun-2015 13:00	[19-Jun-2015]	----
Compound	CAS Number	LOR	Unit	ES1524386-001	ES1524386-002	ES1524386-003	ES1524386-004	--------
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.26	7.68	8.11	7.49	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	4140	5320	4780	5310	----
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	2850	2730	2380	2590	----
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	178	<5	80	<5	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	293	402	574	489	----
Total Alkalinity as CaCO3	----	1	mg/L	293	402	574	489	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	356	17	11	18	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	844	1190	1000	1200	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	309	114	20	114	----
Magnesium	7439-95-4	1	mg/L	59	60	7	60	----
Sodium	7440-23-5	1	mg/L	434	839	913	846	----
Potassium	7440-09-7	1	mg/L	8	5	4	5	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.02	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
Strontium	7440-24-6	0.001	mg/L	9.40	4.86	2.03	4.92	----
Barium	7440-39-3	0.001	mg/L	0.087	0.712	0.981	0.714	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.002	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.168	0.234	0.035	0.236	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB03	BMB01	BMB02	QA1	----
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Compound	CAS Number	LOR	Unit		ES1524386-001	ES1524386-002	ES1524386-003	ES1524386-004	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	**0.002**	<0.001	----
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	**0.002**	<0.001	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L		**0.025**	**0.006**	**0.018**	**0.006**	----
Iron	7439-89-6	0.05	mg/L		**2.56**	**0.70**	<0.05	**0.69**	----
Bromine	7726-95-6	0.1	mg/L		**1.8**	**4.9**	**3.7**	**5.0**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**33.4**	**18.2**	**17.4**	**19.3**	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**0.4**	**0.8**	**0.3**	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**2.08**	**0.35**	**0.79**	**0.34**	----
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**2.08**	**0.35**	**0.77**	**0.34**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.04**	<0.01	**0.01**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.04**	<0.01	**0.01**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**5.4**	**0.4**	**1.5**	**0.5**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**5.4**	**0.4**	**1.5**	**0.5**	----
EK067G: Total Phosphorus as P by Discrete Analyser									

Analytical Results

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Compound	CAS Number	LOR	Unit		ES1524386-001	ES1524386-002	ES1524386-003	ES1524386-004	--------
					Result	Result	Result	Result	Result
EK067G: Total Phosphorus as P by Discrete Analyser - Continued									
Total Phosphorus as P	----	0.01	mg/L		0.26	0.04	0.43	0.06	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	0.10	<0.01	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		37.1	42.0	39.9	44.0	----
^ Total Cations	----	0.01	meq/L		39.4	47.2	41.4	47.6	----
^ Ionic Balance	----	0.01	%		3.00	5.92	1.79	3.87	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		8	2	22	2	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		44	25	41800	24	----
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	----
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	----
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	----
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	----
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	----
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	----

Analytical Results

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Compound	CAS Number	LOR	Unit		ES1524386-001	ES1524386-002	ES1524386-003	ES1524386-004	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	----
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	----
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	----
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	----
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WMB03	BMB01	BMB02	QA1	----
				Client sampling date / time	19-Jun-2015 10:45	19-Jun-2015 12:15	19-Jun-2015 13:00	[19-Jun-2015]	----
Compound	CAS Number	LOR	Unit		ES1524386-001	ES1524386-002	ES1524386-003	ES1524386-004	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	----
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	----
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1	µg/L		<1.0	**1.5**	<1.0	**1.8**	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

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Compound	CAS Number	LOR	Unit		ES1524386-001	ES1524386-002	ES1524386-003	ES1524386-004	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	**1.5**	<0.5	**1.8**	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	----

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					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		**1**	**2**	**1**	**2**	----
Diethanolamine	111-42-2	1	µg/L		<1	<1	**3**	<1	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**95.9**	**89.0**	**95.5**	**93.1**	----
Toluene-D8	2037-26-5	5	%		**91.6**	**83.7**	**87.8**	**84.2**	----
4-Bromofluorobenzene	460-00-4	5	%		**93.0**	**85.6**	**90.5**	**87.0**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**31.5**	**25.6**	**27.0**	**26.2**	----
2-Chlorophenol-D4	93951-73-6	1	%		**57.6**	**50.0**	**51.1**	**57.3**	----
2.4.6-Tribromophenol	118-79-6	1	%		**55.1**	**46.0**	**47.1**	**74.8**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**68.4**	**59.8**	**66.0**	**76.5**	----
Anthracene-d10	1719-06-8	1	%		**76.8**	**64.8**	**70.1**	**63.9**	----
4-Terphenyl-d14	1718-51-0	1	%		**88.7**	**79.1**	**81.1**	**71.1**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**101**	**93.4**	**99.3**	**97.6**	----
Toluene-D8	2037-26-5	2	%		**98.2**	**90.1**	**93.9**	**85.5**	----
4-Bromofluorobenzene	460-00-4	2	%		**89.3**	**81.5**	**85.2**	**77.8**	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524527**	Page	: 1 of 9
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 23-Jun-2015 11:00
C-O-C number	: ----	Date Analysis Commenced	: 24-Jun-2015
Sampler	: ----	Issue Date	: 30-Jun-2015 15:22
Site	: ----		
		No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- EK055G:It has been noted that Ammonia is greater than TKN for sample ID(ES1524527-1) & (ES1524527-2), however this difference is within the limits of experimental variation.
- EK071G: It has been noted that Reactive P is greater than Total P for sample ID(ES1524527-1) &(ES1524527-2), however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.46**	**7.56**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**3020**	**4820**	----	----	----
EA015: Total Dissolved Solids									
^ **Total Dissolved Solids @180°C**	----	10	mg/L		**1860**	**2850**	----	----	----
EA025: Suspended Solids									
^ **Suspended Solids (SS)**	----	5	mg/L		<5	**6**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**314**	**598**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**314**	**598**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	<1	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**776**	**1090**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**285**	**442**	----	----	----
Magnesium	7439-95-4	1	mg/L		**58**	**50**	----	----	----
Sodium	7440-23-5	1	mg/L		**237**	**529**	----	----	----
Potassium	7440-09-7	1	mg/L		**4**	**5**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	<0.01	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	----	----	----
Boron	7440-42-8	0.05	mg/L		<0.05	**0.14**	----	----	----
Strontium	7440-24-6	0.001	mg/L		**14.1**	**28.6**	----	----	----
Barium	7440-39-3	0.001	mg/L		**8.62**	**9.45**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.024**	**0.147**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.002**	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.014**	**0.012**	----	----	----
Iron	7439-89-6	0.05	mg/L		**1.34**	**1.15**	----	----	----
Bromine	7726-95-6	0.1	mg/L		**1.1**	**2.4**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**20.7**	**28.9**	----	----	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	----	----	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	**0.5**	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.33**	**1.92**	----	----	----
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**1.32**	**1.91**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.3**	**1.9**	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.3**	**1.9**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	**0.07**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.07**	**0.09**	----	----	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**28.2**	**42.7**	----	----	----
^ Total Cations	----	0.01	meq/L		**29.4**	**49.3**	----	----	----
^ Ionic Balance	----	0.01	%		**2.19**	**7.21**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**2**	**47**	----	----	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**415**	**8880**	----	----	----
Ethene	74-85-1	10	µg/L		<10	<10	----	----	----
Ethane	74-84-0	10	µg/L		<10	<10	----	----	----
Propene	115-07-1	10	µg/L		<10	<10	----	----	----
Propane	74-98-6	10	µg/L		<10	<10	----	----	----
Butene	25167-67-3	10	µg/L		<10	<10	----	----	----
Butane	106-97-8	10	µg/L		<10	<10	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L		<5	<5	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	1.1	----	----	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		**90**	**60**	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		**90**	**60**	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		**30**	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		**59**	**42**	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		**59**	**42**	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB01	S4MB01	----	----	----
				Client sampling date / time	22-Jun-2015 15:30	22-Jun-2015 17:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1524527-001	ES1524527-002	--------	--------	--------
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	----	----	----
Diethanolamine	111-42-2	1	µg/L		<1	<1	----	----	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**91.2**	**91.3**	----	----	----
Toluene-D8	2037-26-5	5	%		**96.5**	**97.8**	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		**96.2**	**96.7**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**29.9**	**30.9**	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		**57.2**	**62.0**	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		**64.3**	**65.6**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**60.9**	**65.5**	----	----	----
Anthracene-d10	1719-06-8	1	%		**71.1**	**72.2**	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		**77.1**	**79.2**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.8**	**95.1**	----	----	----
Toluene-D8	2037-26-5	2	%		**103**	**105**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**95.1**	**94.3**	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524641**	Page	: 1 of 17
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 24-Jun-2015 11:53
C-O-C number	: ----	Date Analysis Commenced	: 25-Jun-2015
Sampler	: BECKY ROLLINS, CAROLINA SARDELLA	Issue Date	: 01-Jul-2015 16:02
Site	: ----		
		No. of samples received	: 10
Quote number	: ----	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Organic Coordinator	Sydney Organics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- Gross Alpha and Beta Activity analyses are performed by ALS Fyshwick (NATA Accreditation number 992).
- EK071G:LOR raised for Reactive P analysis on sample ID(WKMB06A) due to sample matrix.
- EK071G: It has been noted that Reactive P is greater than Total P for various samples, however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
			Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit	ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.32	7.10	9.35	7.31	8.02
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	416	408	962	402	4380
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	196	201	503	202	2300
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	<5	<5	<5	<5	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	204	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	88	69	205	71	998
Total Alkalinity as CaCO3	----	1	mg/L	88	69	409	71	998
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	18	26	15	62
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	59	61	55	60	769
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	22	17	2	17	9
Magnesium	7439-95-4	1	mg/L	12	11	<1	11	1
Sodium	7440-23-5	1	mg/L	43	45	219	45	1010
Potassium	7440-09-7	1	mg/L	3	3	15	3	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.13	<0.01	0.02
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	0.10
Strontium	7440-24-6	0.001	mg/L	0.226	0.200	0.233	0.205	1.70
Barium	7440-39-3	0.001	mg/L	0.037	0.043	0.074	0.043	0.224
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.002	<0.001
Manganese	7439-96-5	0.001	mg/L	0.027	0.043	0.004	0.041	0.007

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
				Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit		ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	**0.001**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	**0.001**	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	**0.001**	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Iron	7439-89-6	0.05	mg/L		**0.27**	**0.36**	<0.05	**0.36**	**0.05**
Bromine	7726-95-6	0.1	mg/L		**0.2**	**0.2**	**0.2**	**0.2**	**2.4**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**9.45**	**12.2**	**25.4**	**12.3**	**15.9**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	**0.2**	**0.4**	**0.1**	**1.7**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	**0.01**	**0.39**	<0.01	**0.61**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		<0.01	<0.01	**0.24**	<0.01	**0.60**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	**0.02**	<0.01	**0.03**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.02**	<0.01	**0.03**	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.3**	**0.4**	**0.4**	**0.4**	**1.2**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.3**	**0.4**	**0.4**	**0.4**	**1.2**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.01**	**0.02**	**0.09**	**0.02**	**0.07**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
				Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit		ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		0.01	0.02	0.10	0.02	0.08
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		3.69	3.47	10.3	3.42	42.9
^ Total Cations	----	0.01	meq/L		4.03	3.79	10.0	3.79	44.5
^ Ionic Balance	----	0.01	%		4.38	4.31	1.32	5.04	1.78
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		6	8	5	8	19
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		43	18	2800	19	20800
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
				Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit		ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
				Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit		ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
				Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit		ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW02	WKSW03	QA02	QA03	WKMB01
				Client sampling date / time	23-Jun-2015 16:30	23-Jun-2015 15:30	23-Jun-2015 12:00	23-Jun-2015 15:30	23-Jun-2015 10:30
Compound	CAS Number	LOR	Unit		ES1524641-001	ES1524641-002	ES1524641-003	ES1524641-004	ES1524641-005
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	<1	<1	<1
Diethanolamine	111-42-2	1	µg/L		<1	<1	<1	<1	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		106	105	125	110	114
Toluene-D8	2037-26-5	5	%		112	107	125	123	126
4-Bromofluorobenzene	460-00-4	5	%		102	99.5	120	106	110
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		26.9	21.2	24.2	19.7	21.2
2-Chlorophenol-D4	93951-73-6	1	%		52.3	42.0	35.5	42.6	41.6
2.4.6-Tribromophenol	118-79-6	1	%		63.4	46.0	37.7	48.8	41.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		84.7	66.8	96.8	68.0	70.4
Anthracene-d10	1719-06-8	1	%		78.4	57.8	79.0	63.4	66.4
4-Terphenyl-d14	1718-51-0	1	%		54.8	63.8	80.7	64.2	68.7
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		110	109	130	114	118
Toluene-D8	2037-26-5	2	%		100	95.9	117	110	113
4-Bromofluorobenzene	460-00-4	2	%		101	99.0	117	106	108

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
			Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit	ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	9.37	11.2	6.91	6.53	8.70
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	974	3520	2300	2160	1340
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	536	2180	1300	1160	722
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	<5	30	<5	88	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	197	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	200	1130	<1	<1	45
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	215	<1	399	230	365
Total Alkalinity as CaCO3	----	1	mg/L	415	1330	399	230	410
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	28	26	45	37	31
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	55	359	480	513	184
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	5	172	82	3
Magnesium	7439-95-4	1	mg/L	<1	<1	51	38	<1
Sodium	7440-23-5	1	mg/L	218	795	244	295	303
Potassium	7440-09-7	1	mg/L	14	9	4	2	1
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.12	0.08	<0.01	<0.01	0.04
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.002	<0.001	0.008	0.002
Boron	7440-42-8	0.05	mg/L	<0.05	0.08	<0.05	<0.05	0.05
Strontium	7440-24-6	0.001	mg/L	0.244	1.15	3.33	2.04	0.243
Barium	7440-39-3	0.001	mg/L	0.080	0.811	0.755	0.633	0.090
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	0.002	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.004	<0.001	0.097	0.360	0.018

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
				Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit		ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		**0.002**	**0.004**	<0.001	<0.001	**0.003**
Nickel	7440-02-0	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	**0.009**	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	**6.94**	**0.006**	**0.018**	<0.005
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	**2.50**	**20.6**	<0.05
Bromine	7726-95-6	0.1	mg/L		**0.2**	**0.9**	**0.7**	**1.6**	**0.5**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**20.6**	**33.5**	**33.1**	**35.2**	**13.2**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**2.3**	**0.1**	**0.1**	**0.6**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.33**	**16.6**	**0.60**	**0.28**	**0.37**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.20**	**0.28**	**0.60**	**0.28**	**0.34**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.4**	**17.4**	**0.6**	**0.4**	**0.4**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.4**	**17.4**	**0.6**	**0.4**	**0.4**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.09**	**0.04**	**0.24**	**0.16**	**0.58**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
				Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit		ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.08**	**0.07**	**0.03**	<0.05	**0.70**
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**10.4**	**37.2**	**22.4**	**19.8**	**14.0**
^ Total Cations	----	0.01	meq/L		**9.94**	**35.0**	**23.5**	**20.1**	**13.4**
^ Ionic Balance	----	0.01	%		**2.44**	**3.07**	**2.29**	**0.66**	**2.51**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**5**	**81**	**4**	**1**	**3**
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**2810**	**20800**	**14**	**21**	**21000**
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
				Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit		ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
				Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit		ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
				Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit		ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**70**	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	**70**	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	**40**	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	**33**	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	**33**	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKMB02	WKMB03	TTMB02	WKMB06A	WKMB06B
				Client sampling date / time	23-Jun-2015 12:00	23-Jun-2015 12:00	23-Jun-2015 09:00	23-Jun-2015 14:00	23-Jun-2015 15:00
Compound	CAS Number	LOR	Unit		ES1524641-006	ES1524641-007	ES1524641-008	ES1524641-009	ES1524641-010
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	1	2	<1	2
Diethanolamine	111-42-2	1	µg/L		<1	4	<1	<1	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	2	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		111	110	105	110	112
Toluene-D8	2037-26-5	5	%		119	119	112	122	119
4-Bromofluorobenzene	460-00-4	5	%		106	109	93.7	104	104
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		24.5	20.6	22.0	19.4	22.7
2-Chlorophenol-D4	93951-73-6	1	%		36.7	45.3	48.6	41.9	43.2
2.4.6-Tribromophenol	118-79-6	1	%		35.6	36.1	56.9	45.0	40.3
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		95.1	61.1	77.2	65.6	75.8
Anthracene-d10	1719-06-8	1	%		75.7	51.5	71.2	56.1	70.6
4-Terphenyl-d14	1718-51-0	1	%		78.0	58.0	70.5	64.4	70.4
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		115	114	110	114	116
Toluene-D8	2037-26-5	2	%		106	111	100	109	106
4-Bromofluorobenzene	460-00-4	2	%		105	108	93.7	101	103

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524742**	Page	: 1 of 23
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 25-Jun-2015 16:00
C-O-C number	: ----	Date Analysis Commenced	: 26-Jun-2015
Sampler	: ----	Issue Date	: 03-Jul-2015 17:23
Site	: ----		
		No. of samples received	: 11
Quote number	: ----	No. of samples analysed	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EP080: Positive results of WRMB01B have been confirmed by re-analysis.
- EK055G: It has been noted that Ammonia is greater than TKN for sample ID(ES1524742-9) & (ES1524742-10), however this difference is within the limits of experimental variation.
- EK071G: It has been noted that Reactive P is greater than Total P for sample ID(ES1524742-4), however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
			Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit	ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.42	7.32	6.89	7.10	7.27
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	362	550	5730	10100	9010
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	202	286	3210	5750	4860
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	<5	11	<5	<5	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	55	46	541	885	909
Total Alkalinity as CaCO3	----	1	mg/L	55	46	541	885	909
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	40	188	4	<1
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	64	110	1460	3020	2600
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	14	15	193	226	139
Magnesium	7439-95-4	1	mg/L	10	15	133	106	82
Sodium	7440-23-5	1	mg/L	43	66	838	1890	1710
Potassium	7440-09-7	1	mg/L	3	4	2	10	9
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.003	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	0.05	<0.05
Strontium	7440-24-6	0.001	mg/L	0.172	0.197	4.73	16.1	9.84
Barium	7440-39-3	0.001	mg/L	0.045	0.053	0.204	18.3	7.59
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.005	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	0.010	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.051	0.062	1.74	0.020	0.126

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
				Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	**0.001**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	**0.008**	**0.010**	**0.005**
Iron	7439-89-6	0.05	mg/L		**0.44**	**0.20**	**1.48**	**0.88**	**0.68**
Bromine	7726-95-6	0.1	mg/L		**0.2**	**0.3**	**3.2**	**9.2**	**8.0**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**14.0**	**2.22**	**32.9**	**16.4**	**19.4**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	<0.1	**0.3**	<0.1	**0.4**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.02**	**0.05**	**0.07**	**2.44**	**1.70**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.02**	**0.05**	**0.07**	**2.44**	**1.69**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.08**	**0.01**	**0.01**	**0.04**	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.08**	**0.01**	**0.01**	**0.04**	**0.02**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.4**	**0.6**	<0.1	**3.2**	**2.2**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.5**	**0.6**	<0.1	**3.2**	**2.2**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.02**	**0.04**	<0.01	**0.01**	**0.06**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
				Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		0.02	0.01	<0.01	0.02	0.02
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		3.17	4.85	55.9	103	91.5
^ Total Cations	----	0.01	meq/L		3.47	4.96	57.1	102	88.3
^ Ionic Balance	----	0.01	%		4.41	1.02	1.03	0.25	1.80
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		9	13	1	4	1
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		12	<10	18	24300	17600
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
				Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
				Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
				Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WKSW01	TSW02	TMB03	RMB01	RMB02
				Client sampling date / time	24-Jun-2015 17:00	24-Jun-2015 16:00	24-Jun-2015 15:30	24-Jun-2015 14:00	24-Jun-2015 14:00
Compound	CAS Number	LOR	Unit		ES1524742-001	ES1524742-002	ES1524742-003	ES1524742-004	ES1524742-005
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	<1	5	<1
Diethanolamine	111-42-2	1	µg/L		<1	<1	<1	<1	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		122	111	111	113	116
Toluene-D8	2037-26-5	5	%		123	116	122	123	125
4-Bromofluorobenzene	460-00-4	5	%		112	99.6	102	102	104
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		25.0	22.2	22.1	28.4	18.2
2-Chlorophenol-D4	93951-73-6	1	%		56.1	51.5	61.2	63.4	46.1
2.4.6-Tribromophenol	118-79-6	1	%		79.6	77.2	58.2	68.1	54.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		90.3	99.0	84.3	83.3	58.9
Anthracene-d10	1719-06-8	1	%		70.6	67.5	68.4	86.2	74.0
4-Terphenyl-d14	1718-51-0	1	%		98.4	81.1	57.5	96.5	98.7
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		126	114	115	117	120
Toluene-D8	2037-26-5	2	%		110	104	109	110	112
4-Bromofluorobenzene	460-00-4	2	%		109	98.1	100	101	103

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WRSW01	WRSW02	WRMB01A	WRMB01B	WRMB01C
			Client sampling date / time	24-Jun-2015 12:30	24-Jun-2015 11:00	24-Jun-2015 12:00	24-Jun-2015 10:00	24-Jun-2015 10:00
Compound	CAS Number	LOR	Unit	ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.31	7.37	6.52	7.87	8.21
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	293	301	1380	3120	3400
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	172	174	778	1740	1830
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	<5	<5	56	5	10
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	47	52	194	973	799
Total Alkalinity as CaCO3	----	1	mg/L	47	52	194	973	799
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	8	8	40	<1
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	54	55	337	482	674
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	13	13	76	25	14
Magnesium	7439-95-4	1	mg/L	7	7	20	2	<1
Sodium	7440-23-5	1	mg/L	36	36	170	748	785
Potassium	7440-09-7	1	mg/L	2	2	4	3	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	0.005	0.002
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	0.06	<0.05
Strontium	7440-24-6	0.001	mg/L	0.172	0.179	1.94	2.79	1.48
Barium	7440-39-3	0.001	mg/L	0.050	0.050	0.715	1.16	0.840
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.030	0.036	0.263	0.074	0.036

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRSW01	WRSW02	WRMB01A	WRMB01B	WRMB01C
				Client sampling date / time	24-Jun-2015 12:30	24-Jun-2015 11:00	24-Jun-2015 12:00	24-Jun-2015 10:00	24-Jun-2015 10:00
Compound	CAS Number	LOR	Unit		ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	**0.002**	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	**0.003**	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	**0.013**	<0.005	<0.005
Iron	7439-89-6	0.05	mg/L		**0.30**	**0.45**	**16.6**	**0.33**	**0.07**
Bromine	7726-95-6	0.1	mg/L		**0.1**	**0.2**	**0.9**	**1.2**	**1.2**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**14.4**	**14.4**	**34.9**	**17.7**	**12.9**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	<0.1	<0.1	**0.3**	**0.2**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	**0.08**	**0.50**	**1.12**	**1.09**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		<0.01	**0.08**	**0.50**	**1.11**	**1.05**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.01**	**0.06**	**0.06**	**0.01**	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	**0.06**	**0.06**	**0.01**	**0.02**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	**0.2**	**0.7**	**1.0**	**1.0**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.2**	**0.3**	**0.8**	**1.0**	**1.0**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	**0.21**	**0.13**	**0.04**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRSW01	WRSW02	WRMB01A	WRMB01B	WRMB01C
				Client sampling date / time	24-Jun-2015 12:30	24-Jun-2015 11:00	24-Jun-2015 12:00	24-Jun-2015 10:00	24-Jun-2015 10:00
Compound	CAS Number	LOR	Unit		ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	**0.11**	**0.05**
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**2.61**	**2.76**	**13.5**	**33.9**	**35.0**
^ Total Cations	----	0.01	meq/L		**2.84**	**2.84**	**12.9**	**34.0**	**34.9**
^ Ionic Balance	----	0.01	%		**----**	**----**	**2.31**	**0.18**	**0.16**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**5**	**5**	**1**	**29**	**1**
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**13**	**17**	**986**	**12000**	**18400**
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRSW01	WRSW02	WRMB01A	WRMB01B	WRMB01C
				Client sampling date / time	24-Jun-2015 12:30	24-Jun-2015 11:00	24-Jun-2015 12:00	24-Jun-2015 10:00	24-Jun-2015 10:00
Compound	CAS Number	LOR	Unit		ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRSW01	WRSW02	WRMB01A	WRMB01B	WRMB01C
				Client sampling date / time	24-Jun-2015 12:30	24-Jun-2015 11:00	24-Jun-2015 12:00	24-Jun-2015 10:00	24-Jun-2015 10:00
Compound	CAS Number	LOR	Unit		ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

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Compound	CAS Number	LOR	Unit		ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	**100**	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	**100**	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	**50**	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	**52**	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	**52**	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WRSW01	WRSW02	WRMB01A	WRMB01B	WRMB01C
				Client sampling date / time	24-Jun-2015 12:30	24-Jun-2015 11:00	24-Jun-2015 12:00	24-Jun-2015 10:00	24-Jun-2015 10:00
Compound	CAS Number	LOR	Unit		ES1524742-006	ES1524742-007	ES1524742-008	ES1524742-009	ES1524742-010
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	<1	<1	<1
Diethanolamine	111-42-2	1	µg/L		<1	<1	<1	<1	**3**
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**115**	**115**	**113**	**100**	**107**
Toluene-D8	2037-26-5	5	%		**118**	**123**	**121**	**118**	**121**
4-Bromofluorobenzene	460-00-4	5	%		**103**	**102**	**102**	**93.8**	**98.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**19.0**	**18.5**	**21.8**	**27.7**	**18.0**
2-Chlorophenol-D4	93951-73-6	1	%		**50.2**	**50.7**	**53.6**	**63.9**	**43.9**
2.4.6-Tribromophenol	118-79-6	1	%		**57.2**	**65.3**	**71.4**	**94.4**	**52.2**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**78.5**	**79.9**	**82.7**	**108**	**75.5**
Anthracene-d10	1719-06-8	1	%		**70.6**	**72.3**	**71.7**	**67.1**	**63.3**
4-Terphenyl-d14	1718-51-0	1	%		**78.4**	**68.0**	**84.0**	**112**	**94.7**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**119**	**119**	**118**	**120**	**128**
Toluene-D8	2037-26-5	2	%		**105**	**110**	**108**	**116**	**120**
4-Bromofluorobenzene	460-00-4	2	%		**104**	**102**	**101**	**107**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.88**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**5730**	----	----	----	----
EA015: Total Dissolved Solids									
^ **Total Dissolved Solids @180°C**	----	10	mg/L		**3240**	----	----	----	----
EA025: Suspended Solids									
^ **Suspended Solids (SS)**	----	5	mg/L		<5	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**567**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**567**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**175**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1450**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**193**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**135**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**895**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.003**	----	----	----	----
Boron	7440-42-8	0.05	mg/L		<0.05	----	----	----	----
Strontium	7440-24-6	0.001	mg/L		**4.61**	----	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.199**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L		**0.005**	----	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.010**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**1.73**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.008**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**1.49**	----	----	----	----
Bromine	7726-95-6	0.1	mg/L		**3.1**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**32.4**	----	----	----	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	----	----	----	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.07**	----	----	----	----
EK055G-NH4: Ammonium as N by DA									
^ **Ammonium as N**	----	0.01	mg/L		**0.07**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
^ **Nitrate as N**	14797-55-8	0.01	mg/L		**0.01**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		<0.1	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ **Total Nitrogen as N**	----	0.1	mg/L		<0.1	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**55.9**	----	----	----	----
^ Total Cations	----	0.01	meq/L		**59.7**	----	----	----	----
^ Ionic Balance	----	0.01	%		**3.32**	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	----	----	----	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**16**	----	----	----	----
Ethene	74-85-1	10	µg/L		<10	----	----	----	----
Ethane	74-84-0	10	µg/L		<10	----	----	----	----
Propene	115-07-1	10	µg/L		<10	----	----	----	----
Propane	74-98-6	10	µg/L		<10	----	----	----	----
Butene	25167-67-3	10	µg/L		<10	----	----	----	----
Butane	106-97-8	10	µg/L		<10	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QA04	----	----	----	----
				Client sampling date / time	[24-Jun-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1524742-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	----	----	----	----
Diethanolamine	111-42-2	1	µg/L		<1	----	----	----	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**114**	----	----	----	----
Toluene-D8	2037-26-5	5	%		**121**	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		**103**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**12.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		**36.1**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		**55.8**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**67.6**	----	----	----	----
Anthracene-d10	1719-06-8	1	%		**63.3**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		**112**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**118**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**107**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**101**	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524859**	Page	: 1 of 16
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 26-Jun-2015 10:33
C-O-C number	: ----	Date Analysis Commenced	: 26-Jun-2015
Sampler	: ----	Issue Date	: 03-Jul-2015 17:40
Site	: ----		
		No. of samples received	: 9
Quote number	: ----	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Organic Coordinator	Sydney Organics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- ED041G: LOR raised for Sulfate analysis on sample DI: TTMB03, due to matrix interferences.
- EK071G: t has been noted that Reactive P is greater thanTotal P for sample ID(ES1524859-3) &(ES1524859-9), however this difference is within the limits of experimental variation.
- EK055G: It has been noted that Ammonia is greater than TKN for various samples, however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
			Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit	ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.13	7.30	8.98	9.95	7.62
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	4540	4720	2970	3180	390
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	2450	2400	1450	1480	184
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	77	41	<5	34	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	18	158	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	283	292	25	43	60
Total Alkalinity as CaCO3	----	1	mg/L	283	292	43	202	60
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11	2	2	2	10
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1030	1090	747	726	58
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	147	141	68	8	15
Magnesium	7439-95-4	1	mg/L	85	92	36	9	9
Sodium	7440-23-5	1	mg/L	592	675	408	553	44
Potassium	7440-09-7	1	mg/L	2	2	50	5	2
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.015	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	0.05	<0.05
Strontium	7440-24-6	0.001	mg/L	2.36	2.36	2.62	0.632	0.202
Barium	7440-39-3	0.001	mg/L	1.25	1.46	2.97	0.845	0.047
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.363	0.304	0.006	<0.001	0.046

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
				Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit		ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		**0.001**	<0.001	**0.006**	**0.002**	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.015**	**0.007**	<0.005	**0.152**	<0.005
Iron	7439-89-6	0.05	mg/L		**1.53**	**17.5**	**0.06**	<0.05	**0.63**
Bromine	7726-95-6	0.1	mg/L		**3.3**	**3.9**	**2.1**	**2.0**	**0.2**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**33.0**	**33.1**	**7.48**	**0.96**	**17.1**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**0.2**	<0.1	**0.4**	<0.1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.13**	**0.27**	**3.13**	**2.14**	**0.03**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.13**	**0.27**	**3.12**	**0.89**	**0.03**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.01**	**0.02**	**0.01**	**0.07**	**0.03**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	**0.02**	**0.01**	**0.07**	**0.03**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.3**	**0.4**	**3.1**	**2.9**	**0.2**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.3**	**0.4**	**3.1**	**3.0**	**0.2**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.03**	**0.01**	<0.01	<0.01	**0.01**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
				Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit		ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	0.04	<0.01	0.01
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		34.9	36.6	22.0	24.6	3.04
^ Total Cations	----	0.01	meq/L		40.1	44.0	25.4	25.3	3.45
^ Ionic Balance	----	0.01	%		6.92	9.16	7.20	1.51	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		<1	<1	2	8	6
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		29	1910	4870	4380	17
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
				Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit		ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
				Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit		ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	**3.2**	**1.6**	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
				Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit		ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BWMB01A	BWMB01B	BWMB01C	BWMB01D	ASW01
				Client sampling date / time	25-Jun-2015 15:30	25-Jun-2015 16:00	25-Jun-2015 16:30	25-Jun-2015 17:00	25-Jun-2015 13:05
Compound	CAS Number	LOR	Unit		ES1524859-001	ES1524859-002	ES1524859-003	ES1524859-004	ES1524859-005
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		2	<1	<1	1	<1
Diethanolamine	111-42-2	1	µg/L		<1	<1	2	66	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	2	37	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		119	118	119	118	107
Toluene-D8	2037-26-5	5	%		128	122	122	122	116
4-Bromofluorobenzene	460-00-4	5	%		111	109	99.7	101	95.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		35.5	30.6	28.1	29.0	25.5
2-Chlorophenol-D4	93951-73-6	1	%		67.0	61.3	47.8	16.0	54.4
2.4.6-Tribromophenol	118-79-6	1	%		74.1	64.4	38.0	30.8	61.3
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		78.6	68.3	72.4	56.2	63.0
Anthracene-d10	1719-06-8	1	%		81.9	73.8	82.9	62.0	73.8
4-Terphenyl-d14	1718-51-0	1	%		89.4	76.2	82.9	71.7	75.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		123	123	124	122	112
Toluene-D8	2037-26-5	2	%		117	109	109	109	104
4-Bromofluorobenzene	460-00-4	2	%		108	106	96.8	99.3	94.2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
			Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit	ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.24**	**6.42**	**6.63**	**10.9**	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**370**	**2300**	**402**	**3420**	----
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	**167**	**1260**	**208**	**1700**	----
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	<5	**9**	<5	<5	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	**128**	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	**771**	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**58**	**70**	**89**	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	**58**	**70**	**89**	**899**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**10**	**32**	**18**	<10	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**55**	**566**	**47**	**444**	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**15**	**85**	**14**	**2**	----
Magnesium	7439-95-4	1	mg/L	**9**	**52**	**5**	<1	----
Sodium	7440-23-5	1	mg/L	**41**	**245**	**59**	**680**	----
Potassium	7440-09-7	1	mg/L	**2**	**2**	<1	**2**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	**0.002**	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	**0.06**	----
Strontium	7440-24-6	0.001	mg/L	**0.198**	**1.80**	**0.238**	**0.375**	----
Barium	7440-39-3	0.001	mg/L	**0.046**	**0.531**	**0.059**	**0.604**	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.035**	**0.001**	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**0.069**	**3.19**	**0.152**	<0.001	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
				Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit		ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	**0.001**	----
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.009**	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	**0.063**	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L		<0.005	**0.034**	**0.012**	**0.010**	----
Iron	7439-89-6	0.05	mg/L		**0.88**	**7.04**	**0.74**	<0.05	----
Bromine	7726-95-6	0.1	mg/L		**0.2**	**1.0**	**0.2**	**1.1**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**17.7**	**51.6**	**43.5**	**69.4**	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	**0.1**	**0.2**	**1.4**	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.01**	**0.19**	**0.06**	**10.7**	----
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		<0.01	**0.19**	**0.06**	**0.07**	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	<0.01	**0.01**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	<0.01	**0.01**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.2**	**0.2**	<0.1	**10.6**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.2**	**0.2**	<0.1	**10.6**	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	**0.02**	<0.01	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
				Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit		ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.02**	**0.02**	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**2.92**	**18.0**	**3.48**	**30.5**	----
^ Total Cations	----	0.01	meq/L		**3.32**	**19.2**	**3.68**	**29.7**	----
^ Ionic Balance	----	0.01	%		**----**	**3.22**	**2.74**	**1.31**	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**4**	**2**	<1	**8**	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**24**	<10	<10	**49900**	----
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	----
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	----
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	----
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	----
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	----
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
				Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit		ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	----
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	----
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	----
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	----
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
				Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit		ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	----
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
				Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit		ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ASW02	AMB01	AMB02	TTMB03	----
				Client sampling date / time	25-Jun-2015 12:00	25-Jun-2015 12:45	25-Jun-2015 11:15	25-Jun-2015 09:30	----
Compound	CAS Number	LOR	Unit		ES1524859-006	ES1524859-007	ES1524859-008	ES1524859-009	--------
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	<1	<1	**2**	----
Diethanolamine	111-42-2	1	µg/L		<1	<1	<1	**31**	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	**24**	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**116**	**101**	**103**	**104**	----
Toluene-D8	2037-26-5	5	%		**124**	**124**	**117**	**117**	----
4-Bromofluorobenzene	460-00-4	5	%		**104**	**93.2**	**94.2**	**90.6**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**29.4**	**29.8**	**21.1**	**23.6**	----
2-Chlorophenol-D4	93951-73-6	1	%		**60.1**	**60.5**	**43.4**	**55.4**	----
2.4.6-Tribromophenol	118-79-6	1	%		**62.9**	**61.4**	**52.0**	**76.6**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**68.2**	**67.4**	**49.1**	**72.5**	----
Anthracene-d10	1719-06-8	1	%		**77.6**	**75.7**	**66.9**	**93.4**	----
4-Terphenyl-d14	1718-51-0	1	%		**87.0**	**79.1**	**79.8**	**116**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**120**	**121**	**123**	**122**	----
Toluene-D8	2037-26-5	2	%		**110**	**122**	**115**	**115**	----
4-Bromofluorobenzene	460-00-4	2	%		**103**	**104**	**107**	**105**	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1525248**	Page	: 1 of 10
Amendment	: **1**		
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 02-Jul-2015 12:15
C-O-C number	: ----	Date Analysis Commenced	: 02-Jul-2015
Sampler	: BECKY ROLLINS, CAROLINA SARDELLA	Issue Date	: 30-Jul-2015 13:03
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- EP071: Possive results reported for sampe ES1525248_004 have been confirmed by re-extraction and re-analysis.
- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- This report has been amended and re-released to allow the reporting of additional analytical data, specifically Manganese via EG020A-F analysis.
- EK055G: It has been noted that Ammonia is greater than TKN for sample ID (ES1525248-1) & (ES1525248-2), however this difference is within the limits of experimental variation.
- It has been noted that Ammonia is greater than TKN for sample ID (ES1525248-2), however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	NS726R	NS746R	NS725R	NS735R	----
			Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit	ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.43	6.87	7.09	7.12	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	4980	4600	4170	1650	----
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	2740	2540	2230	920	----
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	64	52	8	84	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	639	263	535	212	----
Total Alkalinity as CaCO3	----	1	mg/L	639	263	535	212	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	199	91	26	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1070	1030	970	357	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	214	227	188	106	----
Magnesium	7439-95-4	1	mg/L	54	71	90	20	----
Sodium	7440-23-5	1	mg/L	782	589	566	190	----
Potassium	7440-09-7	1	mg/L	9	20	15	20	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	0.05	<0.05	<0.05	<0.05	----
Strontium	7440-24-6	0.001	mg/L	8.73	3.17	1.94	1.07	----
Barium	7440-39-3	0.001	mg/L	5.42	0.182	0.204	0.419	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.300	1.45	0.618	0.929	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	NS726R	NS746R	NS725R	NS735R	----
			Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit	ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Molybdenum	7439-98-7	0.001	mg/L	<0.001	**0.001**	**0.002**	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	**0.009**	**0.014**	**0.014**	----
Iron	7439-89-6	0.05	mg/L	**0.45**	**22.2**	**3.95**	**2.22**	----
Bromine	7726-95-6	0.1	mg/L	**2.8**	**2.5**	**2.9**	**0.8**	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	**18.4**	**36.0**	**30.0**	**38.4**	----
EK010/011: Chlorine								
Chlorine - Free	----	0.2	mg/L	<0.2	<0.2	<0.2	<0.2	----
Chlorine - Total Residual	----	0.2	mg/L	<0.2	<0.2	<0.2	<0.2	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	**0.2**	**0.3**	**0.1**	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**1.56**	**0.56**	**0.40**	**0.65**	----
EK055G-NH4: Ammonium as N by DA								
^ Ammonium as N	----	0.01	mg/L	**1.56**	**0.56**	**0.40**	**0.65**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.02**	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14797-55-8	0.01	mg/L	<0.01	**0.04**	<0.01	**0.01**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.02**	**0.04**	<0.01	**0.01**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.6**	**0.5**	**0.6**	**0.8**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	**1.6**	**0.5**	**0.6**	**0.8**	----
EK067G: Total Phosphorus as P by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	NS726R	NS746R	NS725R	NS735R	----
				Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit		ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
					Result	Result	Result	Result	Result
EK067G: Total Phosphorus as P by Discrete Analyser - Continued									
Total Phosphorus as P	----	0.01	mg/L		**0.02**	**0.01**	**0.02**	**0.03**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EN055: Ionic Balance									
^ **Total Anions**	----	0.01	meq/L		**43.0**	**38.4**	**39.9**	**14.8**	----
^ **Total Cations**	----	0.01	meq/L		**49.4**	**43.3**	**41.8**	**15.7**	----
^ **Ionic Balance**	----	0.01	%		**6.82**	**5.94**	**2.25**	**2.84**	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**3**	**3**	**5**	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**25000**	**92**	**306**	**16**	----
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	----
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	----
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	----
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	----
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	----
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	NS726R	NS746R	NS725R	NS735R	----
				Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit		ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	----
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	----
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	----
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	----
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	NS726R	NS746R	NS725R	NS735R	----
				Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit		ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	----
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	----
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	**1.2**	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	**1.3**	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	**1.0**	**2.3**	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	**2.1**	----
Phenanthrene	85-01-8	1	µg/L		**1.3**	**1.8**	**1.9**	**4.0**	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	NS726R	NS746R	NS725R	NS735R	----
				Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit		ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		**1.3**	**1.8**	**2.9**	**9.7**	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	**80**	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	**80**	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	NS726R	NS746R	NS725R	NS735R	----
				Client sampling date / time	01-Jul-2015 15:00	01-Jul-2015 16:30	01-Jul-2015 13:20	01-Jul-2015 12:15	----
Compound	CAS Number	LOR	Unit		ES1525248-001	ES1525248-002	ES1525248-003	ES1525248-004	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	**3**	<1	**3**	----
Diethanolamine	111-42-2	1	µg/L		<1	**2**	<1	**11**	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**110**	**114**	**114**	**114**	----
Toluene-D8	2037-26-5	5	%		**116**	**118**	**120**	**115**	----
4-Bromofluorobenzene	460-00-4	5	%		**100**	**100**	**102**	**100**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**22.8**	**24.6**	**21.3**	**21.4**	----
2-Chlorophenol-D4	93951-73-6	1	%		**48.6**	**56.4**	**49.2**	**50.7**	----
2.4.6-Tribromophenol	118-79-6	1	%		**58.6**	**74.0**	**63.5**	**72.7**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**70.8**	**78.3**	**65.8**	**66.5**	----
Anthracene-d10	1719-06-8	1	%		**71.4**	**72.3**	**64.6**	**67.4**	----
4-Terphenyl-d14	1718-51-0	1	%		**70.7**	**79.3**	**71.0**	**74.4**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	**111**	**111**	**111**	----
Toluene-D8	2037-26-5	2	%		**107**	**109**	**112**	**106**	----
4-Bromofluorobenzene	460-00-4	2	%		**102**	**102**	**106**	**103**	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524203**	Page	: 1 of 17
Client	: **PARSONS BRINCKERHOFF AUST P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS RICHARD	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: crichard@pb.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2268520B	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 18-Jun-2015 12:09
C-O-C number	: ----	Date Analysis Commenced	: 19-Jun-2015
Sampler	: BRENDAN RICE, CAROLINA SARDELLA	Issue Date	: 25-Jun-2015 15:10
Site	: ----		
		No. of samples received	: 7
Quote number	: ----	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EG020: Bromine quantification may be unreliable due to its low solubility in acid, leading to variable volatility during measurement by ICPMS.
- ED041G: LOR raised for Sulfate analysis on sample ID: TTMB01, due to matrix interferences.
- EK055G: It has been noted that Ammonia is greater than TKN for various samples , however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
			Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit	ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.86	8.19	7.24	7.09	7.28
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2240	3200	4980	5200	2150
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	1210	1680	2500	2610	1090
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	6	9	24	33	108
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	154	334	1080	1240	519
Total Alkalinity as CaCO3	----	1	mg/L	154	334	1080	1240	519
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	75	146	<10
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	654	872	1090	1060	468
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	104	22	122	129	79
Magnesium	7439-95-4	1	mg/L	24	4	83	126	29
Sodium	7440-23-5	1	mg/L	319	615	836	852	300
Potassium	7440-09-7	1	mg/L	3	3	7	8	4
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.002	0.011	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.08	0.06	<0.05
Strontium	7440-24-6	0.001	mg/L	8.15	1.48	6.47	5.75	2.87
Barium	7440-39-3	0.001	mg/L	3.83	1.56	1.14	0.097	3.56
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.015	0.010	0.074	0.123	0.026

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
				Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit		ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	**0.002**	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.006**	<0.005	<0.005	<0.005	**0.010**
Iron	7439-89-6	0.05	mg/L		**0.11**	<0.05	**0.46**	**0.31**	**0.88**
Bromine	7726-95-6	0.1	mg/L		**0.8**	**1.4**	**2.4**	**2.5**	**0.5**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**14.7**	**13.6**	**18.6**	**17.9**	**27.4**
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	<0.1	**0.2**	**0.2**	**0.1**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.21**	**0.95**	**1.72**	**1.13**	**0.73**
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**1.18**	**0.92**	**1.71**	**1.13**	**0.73**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	**0.02**	**0.02**	**0.04**	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.02**	**0.02**	**0.04**	**0.02**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**1.4**	**0.9**	**1.7**	**1.0**	**0.7**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**1.4**	**0.9**	**1.7**	**1.0**	**0.7**
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.04**	<0.01	**0.07**	**0.02**	**0.30**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
				Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit		ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.01**	<0.01	<0.01	**0.04**
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**21.5**	**31.3**	**53.9**	**57.7**	**23.6**
^ Total Cations	----	0.01	meq/L		**21.1**	**28.2**	**49.5**	**54.1**	**19.5**
^ Ionic Balance	----	0.01	%		**0.95**	**5.10**	**4.31**	**3.28**	**9.52**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**2**	**2**	**4**	<1	**8**
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**4580**	**13000**	**2860**	**165**	**2670**
Ethene	74-85-1	10	µg/L		<10	<10	<10	<10	<10
Ethane	74-84-0	10	µg/L		<10	<10	<10	<10	<10
Propene	115-07-1	10	µg/L		<10	<10	<10	<10	<10
Propane	74-98-6	10	µg/L		<10	<10	<10	<10	<10
Butene	25167-67-3	10	µg/L		<10	<10	<10	<10	<10
Butane	106-97-8	10	µg/L		<10	<10	<10	<10	<10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
				Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit		ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
				Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit		ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
				Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit		ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		**2**	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		**2**	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	S4MB02	S4MB03	S5MB02	S5MB03	TTMB01
				Client sampling date / time	17-Jun-2015 09:30	17-Jun-2015 10:00	17-Jun-2015 11:15	17-Jun-2015 11:30	17-Jun-2015 12:40
Compound	CAS Number	LOR	Unit		ES1524203-001	ES1524203-002	ES1524203-003	ES1524203-004	ES1524203-005
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		**3**	**5**	<1	**2**	<1
Diethanolamine	111-42-2	1	µg/L		<1	**3**	**3**	<1	<1
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**97.6**	**94.0**	**111**	**113**	**105**
Toluene-D8	2037-26-5	5	%		**127**	**120**	**126**	**126**	**127**
4-Bromofluorobenzene	460-00-4	5	%		**109**	**104**	**109**	**107**	**112**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**30.7**	**27.0**	**28.8**	**29.1**	**31.0**
2-Chlorophenol-D4	93951-73-6	1	%		**63.9**	**61.7**	**62.9**	**64.6**	**70.7**
2.4.6-Tribromophenol	118-79-6	1	%		**60.6**	**58.4**	**67.6**	**67.2**	**70.3**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**70.6**	**73.7**	**71.1**	**70.2**	**80.4**
Anthracene-d10	1719-06-8	1	%		**75.5**	**80.1**	**79.0**	**82.1**	**81.6**
4-Terphenyl-d14	1718-51-0	1	%		**76.4**	**81.2**	**74.2**	**81.8**	**81.8**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**101**	**97.7**	**115**	**118**	**109**
Toluene-D8	2037-26-5	2	%		**113**	**108**	**113**	**112**	**118**
4-Bromofluorobenzene	460-00-4	2	%		**109**	**106**	**106**	**106**	**116**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	TCMB02	TCMB04	----	----	----
			Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit	ES1524203-006	ES1524203-007	--------	--------	--------
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**10.4**	**11.9**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2770**	**5700**	----	----	----
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	----	10	mg/L	**1480**	**2540**	----	----	----
EA025: Suspended Solids								
^ Suspended Solids (SS)	----	5	mg/L	**36**	**25**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	**18**	**784**	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	**298**	**422**	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**316**	**1200**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**3**	**27**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**732**	**647**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**17**	**19**	----	----	----
Magnesium	7439-95-4	1	mg/L	**16**	<1	----	----	----
Sodium	7440-23-5	1	mg/L	**525**	**861**	----	----	----
Potassium	7440-09-7	1	mg/L	**7**	**45**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	**2.35**	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.002**	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	**0.07**	----	----	----
Strontium	7440-24-6	0.001	mg/L	**2.49**	**1.18**	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.870**	**0.523**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	**0.001**	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	**0.002**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB02	TCMB04	----	----	----
				Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524203-006	ES1524203-007	--------	--------	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Molybdenum	7439-98-7	0.001	mg/L		**0.001**	**0.008**	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.007**	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	**0.015**	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	**0.002**	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.006**	**1.09**	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	----	----	----
Bromine	7726-95-6	0.1	mg/L		**0.9**	**1.4**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L		**30.6**	**55.2**	----	----	----
EK010/011: Chlorine									
Chlorine - Free	----	0.2	mg/L		<0.2	<0.2	----	----	----
Chlorine - Total Residual	----	0.2	mg/L		<0.2	<0.2	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**0.8**	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**3.00**	**14.1**	----	----	----
EK055G-NH4: Ammonium as N by DA									
^ Ammonium as N	----	0.01	mg/L		**0.20**	**0.02**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	**0.02**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.02**	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**3.0**	**12.0**	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**3.0**	**12.0**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	**0.08**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB02	TCMB04	----	----	----
				Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524203-006	ES1524203-007	--------	--------	--------
					Result	Result	Result	Result	Result
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	----	----	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**27.0**	**42.8**	----	----	----
^ Total Cations	----	0.01	meq/L		**25.2**	**39.6**	----	----	----
^ Ionic Balance	----	0.01	%		**3.56**	**3.98**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**40**	**58**	----	----	----
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L		**4480**	**13700**	----	----	----
Ethene	74-85-1	10	µg/L		<10	<10	----	----	----
Ethane	74-84-0	10	µg/L		<10	<10	----	----	----
Propene	115-07-1	10	µg/L		<10	<10	----	----	----
Propane	74-98-6	10	µg/L		<10	<10	----	----	----
Butene	25167-67-3	10	µg/L		<10	<10	----	----	----
Butane	106-97-8	10	µg/L		<10	<10	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB02	TCMB04	----	----	----
				Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524203-006	ES1524203-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB02	TCMB04	----	----	----
				Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524203-006	ES1524203-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L		<5	<5	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1	µg/L		**3.4**	<1.0	----	----	----
2-Chlorophenol	95-57-8	1	µg/L		<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1	µg/L		<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L		<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1	µg/L		<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L		<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L		<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L		<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L		<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L		<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L		<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2	µg/L		<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB02	TCMB04	----	----	----
				Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524203-006	ES1524203-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		**480**	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		**220**	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**700**	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**730**	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**730**	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		**6**	**2**	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		**6**	**2**	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TCMB02	TCMB04	----	----	----
				Client sampling date / time	17-Jun-2015 14:20	17-Jun-2015 15:45	----	----	----
Compound	CAS Number	LOR	Unit		ES1524203-006	ES1524203-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP262: Ethanolamines									
Ethanolamine	141-43-5	1	µg/L		<1	**10**	----	----	----
Diethanolamine	111-42-2	1	µg/L		**8**	**29**	----	----	----
Methyl diethanolamine (MDEA)	105-59-9	1	µg/L		**5**	**87**	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		**111**	**103**	----	----	----
Toluene-D8	2037-26-5	5	%		**118**	**126**	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		**104**	**107**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**24.3**	**16.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		**83.8**	**33.7**	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		**50.1**	**34.3**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**80.4**	**84.9**	----	----	----
Anthracene-d10	1719-06-8	1	%		**84.6**	**73.6**	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		**93.3**	**72.6**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**115**	**107**	----	----	----
Toluene-D8	2037-26-5	2	%		**106**	**115**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**103**	**108**	----	----	----

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Job 29632
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CoreTrac AP-78282
Containers IsoTube®(2)

Company Lab No.	Isotech Lab No.	Well Name	GC Date	H_2 ppm	O_2 + Ar ppm	CO_2 ppm	N_2 ppm	CO ppm	C_1 ppm	C_2 ppm	C_2H_4 ppm	C_3 ppm	C_3H_6 ppm	iC_4 ppm	nC_4 ppm	iC_5 ppm	nC_5 ppm	C_6+ ppm	MS Date	$\delta^{13}C_1$ ‰	$\delta^{13}C_2$ ‰	$\delta^{13}C_3$ ‰	$\delta^{13}iC_4$ ‰	$\delta^{13}nC_4$ ‰	$\delta^{13}iC_5$ ‰	$\delta^{13}nC_5$ ‰	δDC_1 ‰	δDC_2 ‰	δDC_3 ‰	$\delta^{13}CO_2$ ‰	Comments
6122543929	523698	TGMB01	8/4/2015	nd	211000	400	788600	nd	4	nd	nd	nd	nd	nd	nd	nd	nd	nd												
6122543931	523699	TGMB02	8/4/2015	nd	211400	490	788100	nd	4	nd	nd	nd	nd	nd	nd	nd	nd	nd												

nd = not detected, na = not analyzed

blue = isotopes obtained via cryogenic enrichment