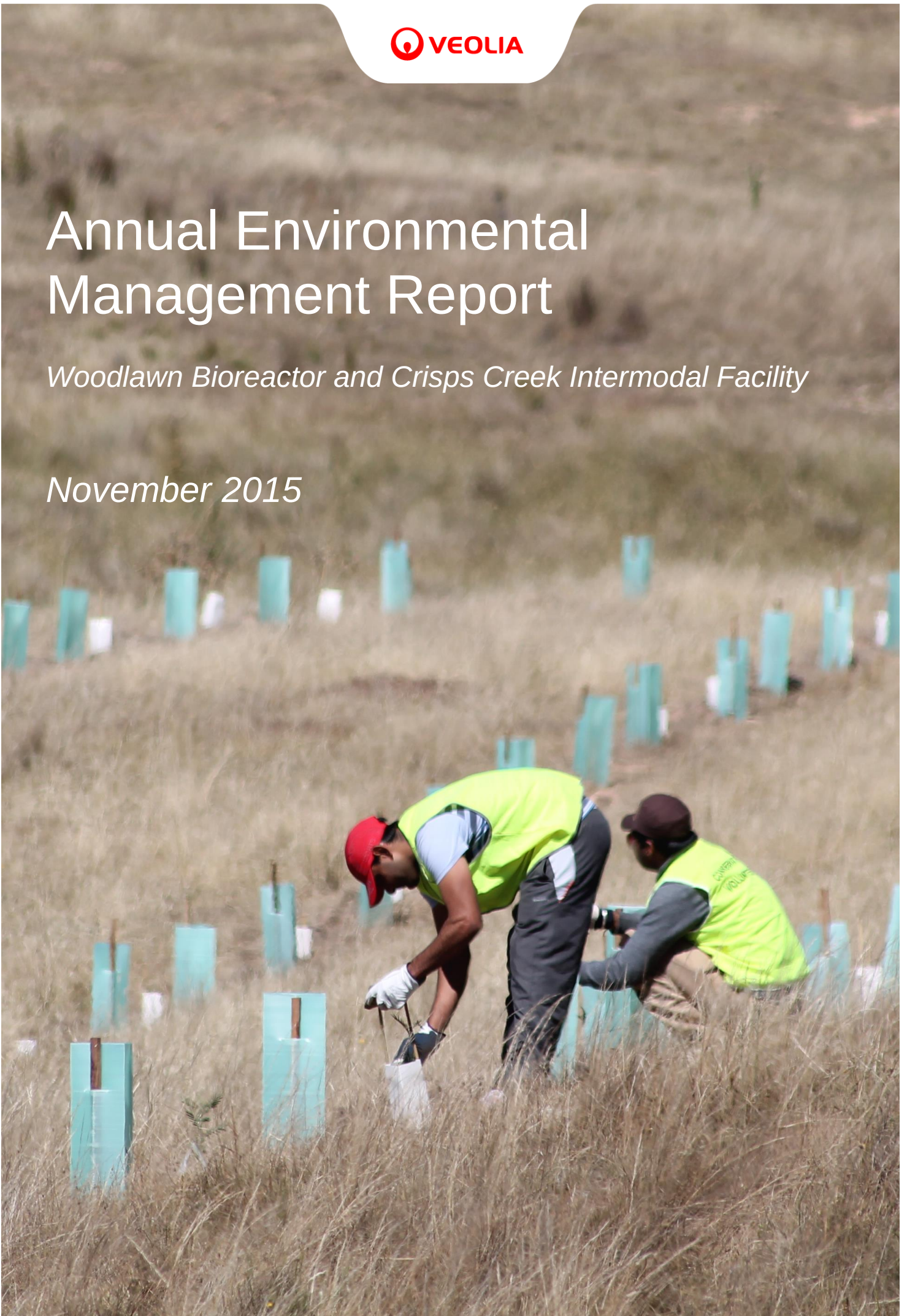


Annual Environmental Management Report

Woodlawn Bioreactor and Crisps Creek Intermodal Facility

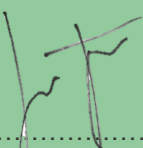
November 2015



Cover: Tree planting restoration works along Crisps Creek on 'Pylara', the Veolia owned property adjoining the Woodlawn Eco Project. The restoration project was jointly funded by the NSW South East Local Land Service and involved Conservation Volunteers Australia and the Tarago and Taylors Creek Landcare groups. Photo: Vanessa Seaton, Veolia.

Quality Information

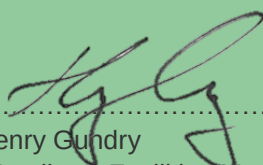
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Date:

5 November 2015

Reference:

WBAEMR1115

Status:

FINAL

Distribution:

Rev No.	Copies	Details	Issued to	Date
0	1	Draft copy	- Woodlawn Bioreactor Site Management	Oct 2015
0	5	Final copy	- NSW Environment Protection Authority; - NSW Department of Planning and Environment; - Goulburn Mulwaree Council; - Woodlawn Bioreactor (<i>Site Copy</i>); - Veolia Technical and Engineering Division (<i>Library Copy</i>);	Nov 2015

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1. Introduction

1 Introduction

1.1 Site Overview

The Woodlawn Eco Project Site (the Eco Project Site), owned and operated by Veolia Australia and New Zealand (Veolia), is located approximately 250 kilometres (km) south west of Sydney in the NSW Southern Highlands. A site location plan is provided in **Appendix 1**. The Eco Project Site, which covers an area of 6000 hectares, comprises of the Pylara and Woodlawn properties. An integral part of the Woodlawn property is the Woodlawn Bioreactor (the Bioreactor), where waste landfilling and landfill gas extraction occurs in the void of a remnant open cut mine, approximately 33 million cubic metres (m³) in capacity.

The Bioreactor has been operating since September 2004, with the collection of landfill gas from landfilled waste to extract methane for energy generation commencing in 2008. This occurs at the adjacent Woodlawn Bio Energy Power Station (the Power Station).

Waste to the Bioreactor from Sydney is transported in shipping containers via rail and unloaded onto road trucks at the Crisps Creek Intermodal Facility (IMF), also owned and operated by Veolia and located approximately 8 km away in the township of Tarago. Local waste from neighboring councils and businesses is transported via road.

In accordance with relevant legislative requirements and industry, the environmental performance of the Bioreactor and the IMF is managed to quite stringent conditions, the reporting of which forms the basis of this Annual Environmental Monitoring Report (AEMR). The AEMR has been prepared in accordance with Environmental Protection Licences (EPL) 11436 and 11455, issued and regulated by the NSW Environment Protection Authority (EPA) for the Bioreactor and the IMF respectively.

The AEMR is submitted to the EPA in conjunction with the Annual Returns which comprise statements of compliance and summaries of monitoring and compliance for both sites, as required under Condition R1 of the EPLs for the reporting period of 6 September 2014 to 5 September 2015.

1. Introduction

1.2 Legislative Requirements

The main legislative instruments governing the activities undertaken at and the environmental performance of the Bioreactor and the IMF pertaining to this AEMR are the Environmental Planning and Assessment Act 1979 (EP&A Act) regulated by the Department of Planning and Environment (DPE) and the Protection of the Environment Operations Act 1997 (POEO Act) regulated by the EPA, as well as their associated regulations.

A supervisory licence (EPL 11437) is also maintained by Goulburn Mulwaree Council (the Council) to supervise the Bioreactor operations, under section 87 of the POEO Act, for a putrescible waste landfill site not operated by a public authority. The Council ensures compliance with the types and volumes of waste received at the Bioreactor, any design works and other matters that the Council deems necessary to facilitate the implementation of a waste strategy under the Waste Avoidance and Resource Recovery (WARR) Act 2001.

Conditions of the Development Consent, Project Approvals and EPLs stipulate the environmental and operational parameters that need to be addressed by Veolia in the management strategies, adopted for both the sites, to maintain compliance and are detailed, where relevant, in this AEMR which is split into a section for each site.

Part 1 EPL 11436

Woodlawn Bioreactor

2. Bioreactor Operations

2 Bioreactor Operations

2.1 Bioreactor Licence Conditions

In accordance with EPL 11436, the Bioreactor is permitted to accept material classified as General Solid Waste (Putrescible) as described in the Waste Classification Guidelines (EPA, 2014) for the activity 'Waste disposal by application to land'. While energy generation is not a requirement of the EPL, Veolia adopts this practice as a sustainable environmental solution for the site.

In addition to the waste management activities, the site EPL mandates the administrative, operative and reporting conditions for the Bioreactor, as described in **Table 2.1** below. A licenced boundary plan is provided in **Appendix 2**.

Table 2.1: Bioreactor Licence Conditions

Condition	Compliance with Condition
1. Administrative conditions	Noted
2. Discharges to air and water and application to land	Noted
3. Limit conditions	L1. Pollution of Waters The Bioreactor is deemed a zero discharge site, as all surface and storm water that comes into contact with waste or leachate is captured, stored and treated onsite. Non contaminated water is managed through diversion drains and bunds. No water was discharged during this reporting period. L3. Waste All waste received at the Bioreactor during this reporting period was in accordance with the waste types permitted in the EPL. Waste generated onsite was deposited in the Bioreactor. L4. Noise Limits No noise complaints were received during this reporting period indicating that noise at the Bioreactor was likely maintained within the 35 dB(A) LAeq (15 minute) criteria at the nearest residential receiver. Noise monitoring will be undertaken by Veolia on the receipt of any such complaints. L5. Hours of Operation All operational activities at the Bioreactor, including haulage of waste from the IMF were undertaken between 6:00 am and 10:00 pm, Monday to Saturday during this reporting period as permitted under the Development Consent. Veolia were granted an exemption by the EPA to operate Sunday 21 December 2014. L6. Potentially Offensive Odour 63 odour complaints were received at the premises during this reporting period. It should be noted that 2 complainants were responsible for 87% of the complaints.

2. Bioreactor Operations

Condition	Compliance with Condition
	An annual independent odour audit is used to assess the effectiveness of odour control measures and to identify improvements to existing odour management practices at the site. The odour audit report indicated Veolia has implemented all recommendations from the previous odour audit. Veolia also actively engages with the community through use of odour diaries and attendance at local community meetings, such as the Tarago and District Progress Association Inc. The odour diaries are collected and reviewed as part of the annual odour audit. Veolia will continue to implement recommended actions from the odour audit in combination with improving current odour control measures identified by Veolia. Veolia received a Penalty Infringement Notice (PIN) and official caution for an odour detected on the 16th of January 2015. Veolia submitted a response to the EPA in regards to the PIN and, as of the end of the reporting period, it is still being reviewed by the EPA. A gas extraction system blockage may have caused odour being detected. Veolia have installed an additional communication system onsite to provide realtime feedback on gas extraction system performance. In conjunction with these improvements, Veolia is improving its leachate treatment abilities to manage liquid in the waste more effectively to improve gas capture and mitigate odour.
4. Operating conditions	O1. Activities Carried out in Competent Manner All licenced activities undertaken at the Bioreactor in this reporting period were carried out in a competent manner and under a high standard of environmental management for which Veolia is certified under ISO 14001. O2. Maintenance of Plant and Equipment The maintenance and operation of all plant and equipment on the premises associated with the licenced activities was undertaken in a proper and efficient condition as required by qualified technicians. All major plant and equipment at the site is stored in a computerised maintenance management system in order to schedule and complete the required maintenance. All Veolia operators hold the appropriate qualifications and licenses to operate plant and equipment used as part of Bioreactor operations. O3. Dust All operations and activities were carried out at the Bioreactor in a manner to minimise dust at the boundary of the premises. These included all access roads from the IMF to the Bioreactor and the haul road used for ancillary operations being sealed, the use of water trucks for dust suppression as required and monthly sampling to monitor for the presence and quantity of depositional dust. O4. Emergency Response The Emergency Response Plan (ERP) for the Bioreactor is maintained on the premises and electronically on Veolia's National Integrated Management System, an online platform for storing Veolia policies procedures and plans.

2. Bioreactor Operations

Condition	Compliance with Condition
	The ERP contains procedures for minimising the risk of and managing incidents such as fires, spills, explosions etc. at the Bioreactor, as well as a Pollution Incidence Response Management Plan (PIRMP) in accordance with the EPL. As per the PIRM requirements, the ERP is tested annually.
	O5. Processes and Management The processes and management of water quality is documented and implemented on site in accordance with the EPL and the Landfill Environmental Management Plan (LEMP) for the Bioreactor. The LEMP provides guidance on the management of surface and stormwater systems such as drainage and pumping networks to divert clean water from any water that has come in contact with waste or leachate. Clean surface and stormwater collected from within the void is pumped to Evaporation Dam 3 South (ED3S) for evaporation. Water contaminated by waste or leachate is collected and treated in the Leachate Treatment System before being transferred to Evaporation Dam 3 North (ED3N) for evaporation. Mechanical evaporators may be used to assist evaporation and are controlled by wind direction sensors to prevent the drifting of sprayed liquids from the premises. The wash bay, used for cleaning of containers and equipment associated with Bioreactor operations, collects sediment in a drainage sump. This sump is periodically drained and the resultant waste deposited in the Bioreactor where it is directed to the leachate collection and treatment systems. A new wheel wash was installed in January 2015 to improve Veolia's capacity clean the undercarriage of vehicles exiting the Bioreactor and eliminate tracking of mud onto regional roads. Waste water from the cleaning process is directed back into the Bioreactor. Veolia maintains site access for the supervisory holder for EPL 11437, which is Goulburn Mulwaree Council (the Council). Veolia grants the Council's representative access to the site and all requested documentation and records. All instructions provided by the Council's representative were complied with by Veolia in this reporting period. This supervisory process provides a secondary compliance check for the design, construction, extension and maintenance of all engineered features of the Bioreactor and ensures they are completed in compliance with the Development Consent and the EPL for the site.
	O6. Waste Management All licenced activities associated with this condition were carried out in accordance during this reporting period. A closure plan shall be submitted prior to the closure date of the Bioreactor. Monitoring undertaken within the Bioreactor void and around the licenced boundary during this reporting period validated that groundwater flows form

2. Bioreactor Operations

Condition	Compliance with Condition
	an inward gradient towards the void ensuring no outward movement of leachate occurs. The leachate recirculation, collection and treatment system was continued to be maintained and operated to optimise the Bioreactor conditions for treatment of leachate, other waste waters and contaminated storm waters. Excess leachate was extracted and treated in the Leachate Treatment System and transferred for storage in ED3N lagoons 1, 2 and 3 (ED3N-1, ED3N-2, ED3N-3). Clay lined barriers were continued to be installed in the southern portion of the void wall as detailed in the previous reporting period. Leachate from the waste accepted at the Clyde Transfer Terminal was the only liquid imported into the void during this reporting period and was processed through the leachate treatment system as approved by the EPA. Virgin Excavated Natural Material (VENM) was sourced from onsite and offsite locations for use as cover material during the reporting period. All waste accepted within the Bioreactor in this reporting period was screened prior to final disposal in accordance with the requirements of the Veolia Control of Non Conforming Waste Procedure and NSW Resource Recovery Screening & Recording of Waste Procedure to ensure only conforming waste is received. Veolia will undertake final capping of the Bioreactor when required and in accordance with the EPL. Veolia operate the Bioreactor to maximise the production of landfill gas for generation of renewable energy at the Power Station, with 2 auxiliary flares as back up treatment of landfill gas emissions captured. The generators and flares satisfy the design, installation and operational requirements within the EPL. A 6th landfill gas generator was installed and commissioned on 12 September 2014 to increase the installed capacity of the Power Station to 6 Megawatts (MW). The landfill gas extraction and utilisation infrastructure in the Bioreactor has been designed to meet the conditions of the landfill including settlement. In this reporting period, Veolia continued to construct temporary access roads to minimise waste delivery vehicles coming in contact with and tracking waste to external surfaces. Dedicated site vehicles that only operate within the void and other operational areas were utilised with a wheel wash facility operating for vehicles exiting the facility. In addition to tracking of waste, a monthly site inspection checklist

2. Bioreactor Operations

Condition	Compliance with Condition
	appended to the Site Management Plan is used to ensure the practical measures in place at the site to prevent litter leaving the premises. O7. Other Operating Conditions No drill holes were required to be sealed during this reporting period.
5. Monitoring and recording conditions	Noted, all compliance monitoring was carried out in this reporting period in accordance with EPL requirements. The results of which are detailed, along with any non-conformances, in Section 3.
6. Reporting conditions	Noted and addressed in this AEMR and the annual return documents, where relevant. Notifications to the EPA were undertaken in a timely fashion.
7. General conditions	Noted.
8. Pollution studies and reduction programs	U1. Trial of Alternative Daily Cover Veolia is in the process of requesting a new trial period for the use of alternate daily cover materials. U2. ED3N-1 Leachate Management At the end of this reporting period Veolia had a licence variation application submitted to the EPA to remove this condition from the licence as these activities have been completed. This is expected to be improved within the next reporting period. Monthly monitoring of the leachate aeration dam was undertaken during this reporting period to ensure efficient performance. The evaporation dams (ED3N-1, ED3N-2 and ED3N-3) were also monitored periodically to confirm consistency of the treated leachate quality. The results of this monitoring indicated that the evaporation dams were being maintained in an alkaline state. Odour emissions testing was undertaken in October 2014 and the results indicated the odour emission profile for the evaporation dams (ED3N-1, ED3N-2, ED3N-3 & ED3N-4) were below the historical reporting periods. Veolia completed a minor upgrade to the leachate treatment system involving the installation of a baffle in the aeration dam to create an anoxic and aerobic zones in the dam, which aims to increase the efficiency of the treatment process. The polymer used to flocculate the activated sludge was also changed in order to increase the effectiveness.
9. Special Conditions	Noted.

2.2 Complaints –

Veolia operates a 24 hour telephone complaints line that enables the receipt of complaints from members of the public, as required under the EPL. Other complaints that were received off site during this reporting period were logged by Goulburn-Mulwaree Council and the EPA. Veolia recorded a total of 63 complaints, relating only to odour, during this reporting period. Upon receipt of an odour complaint, Veolia recorded all details into the site complaints register as required under the EPL and Site Management followed up with the complainant to determine the nature (and scale) of the odour.

2. Bioreactor Operations

In order to proactively engage in effective odour management, Veolia participates in regular community liaisons to encourage and gather feedback from the local residents regarding the odour performance at the Bioreactor. These liaisons are facilitated either through the Community Liaison Committee (CLC) to voice their concerns with the Bioreactor Site and also at the Tarago Progress Association Inc. (TADPAI) meetings. Veolia continues to implement activities to eliminate and minimise odour sources at the site based on annual odour audit recommendations.

Odour diaries were issued in December 2014 to 12 residents located throughout the regional area to identify odour events and record their intensity. Diaries were collected in July 2015 for review internally and for the annual external odour audit. Odour loggers, measuring Hydrogen Sulphide (0-10ppm), were also installed at an onsite and offsite location. Data from these loggers will be assessed in the next reporting period.

3. Bioreactor Environmental Monitoring

3 Bioreactor Environmental Monitoring

3.1 Bioreactor Monitoring Points

Veolia is required to monitor environmental performance of the Bioreactor under EPL 11436. **Table 3.1** details the EPL ID, sampling location, frequency and the type of monitoring undertaken at each licensed point. A monitoring location plan is included in **Appendix 3**.

Table 3.1: Bioreactor Licensed Monitoring Points

EPA ID	Sampling Location	Frequency	Type of Monitoring
1	GMBH1	Quarterly	Subsurface Gas
2	GMBH2		
4	GMBH4		
5	Gas Extraction Booster	Annual	Landfill Gas Input
6	Landfill Surface	Quarterly	Surface Gas
7	Landfill Gas Flare	Annual / Continuous	Air Discharge
8	Landfill Gas Engine Exhaust Point – Gen 1	Annual	Air Discharge
9	Meteorological Station	Continuous	Meteorological
10	DG28 – Pylara	Monthly	Particulates – Deposited Matter
11	DG22		
12	DG24		
13	Site 115 – Allianoyonyige Creek	Quarterly	Surface Water
14	Spring 2 – Crisps Creek		
15	Site 105 – Crisps Creek		
16	WM200 – RWD		
17	WM201 – ERC		
18	WM202 – ED3S		
19	WM203 – ED3N		
21	Pond 2 (Decommissioned)		
22	Pond 3		
23	Leachate Pond	Annual	Leachate
24	Leachate Recirculation System		
25	MB1	Quarterly / Annual	Groundwater
26	MB2		
27	MB3		
28	MB4		
29	MB5		
30	MB6		

3. Bioreactor Environmental Monitoring

EPA ID	Sampling Location	Frequency	Type of Monitoring
31	MB7	Quarterly / Annual	Groundwater
32	MB8		
33	MB10		
34	MB11		
35	MB12		
36	MB13		
37	MB14		
38	MB15		
39	MB16		
40	MB17		
41	ED3B		
42	WM1		
43	WM3 (Decommissioned)		
44	WM4		
45	WM5		
46	WM6		
47	WM7 (Decommissioned)	Quarterly	Standing Water Level
48	P38A & P38B		
49	P44A & P44B		
50	P45A & P45B		
51	P58A & P58B		
52	P59A & P59B		
53	P100A & P100B	Monthly	Storage Volume
54	ED3		
55	MW8S	Quarterly / Annual	Groundwater
56	MW8D		
57	MW9S		
58	MW10S (Dry well)		

All monitoring data collected at the monitoring points identified in **Table 3.1** during this reporting period has been tabulated and provided in **Section 3.2** or in **Appendix 4**. Graphs of data collected have been developed to assist in the assessment of trends and depict any variability within the monitoring results are presented in **Section 3.2** or in **Appendix 5**.

3. Bioreactor Environmental Monitoring

3.2 Bioreactor Monitoring Results

3.2.1 Bioreactor Landfill Gas Monitoring Results

Table 3.2.1: Bioreactor Landfill Gas Monitoring Results

Parameter	Results/Discussion																									
Subsurface Gas	Monitoring of 3 subsurface gas monitoring bores (GMB) was undertaken on a quarterly basis as per EPL requirements and is summarised in Table 3.2.1.1 below: <i>Table 3.2.1.1: Subsurface Gas Monitoring Result</i> <table><tr><th>Gas Monitoring Bore ID</th><th colspan="4">Purged Methane Reading (%)</th></tr><tr><th></th><th>12/03/2015</th><th>19/06/2015</th><th>30/07/2015</th><th>21/08/2015</th></tr><tr><td>GMBH1</td><td>0.1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>GMBH2</td><td>0.1</td><td>0</td><td>0.1</td><td>0</td></tr><tr><td>GMBH4</td><td>0.2</td><td>0</td><td>0.1</td><td>0</td></tr></table> The results show that the gas collection network is effectively capturing and controlling landfill gas within the landfill void. Engineered impermeable barriers and the natural subsurface of the void wall also minimises the potential movement of landfill gas from the Bioreactor, allowing for maximum extraction through the gas collection system.	Gas Monitoring Bore ID	Purged Methane Reading (%)					12/03/2015	19/06/2015	30/07/2015	21/08/2015	GMBH1	0.1	0	0	0	GMBH2	0.1	0	0.1	0	GMBH4	0.2	0	0.1	0
Gas Monitoring Bore ID	Purged Methane Reading (%)																									
	12/03/2015	19/06/2015	30/07/2015	21/08/2015																						
GMBH1	0.1	0	0	0																						
GMBH2	0.1	0	0.1	0																						
GMBH4	0.2	0	0.1	0																						
Landfill Gas Extraction Booster	The data reported for the landfill gas extraction booster at the Power Station is consistent to the historical average since 2008 as summarised in Table 3.2.1.2 below: <i>Table 3.2.1.2: Landfill Gas Extraction Booster Monitoring Results Summary</i> <table><tr><th>Parameter</th><th>Historical Average</th><th>2014/2015 Result</th></tr><tr><td>Temperature (° C)</td><td>36.7</td><td>39.1</td></tr><tr><td>Volumetric Flow (m3/hr)</td><td>2761</td><td>3010</td></tr><tr><td>Methane (%)</td><td>52.1</td><td>50.4</td></tr></table> The detailed data for each of the parameters required under the EPL for the gas extraction booster is provided in Table 1 (refer Appendix 4).	Parameter	Historical Average	2014/2015 Result	Temperature (° C)	36.7	39.1	Volumetric Flow (m3/hr)	2761	3010	Methane (%)	52.1	50.4													
Parameter	Historical Average	2014/2015 Result																								
Temperature (° C)	36.7	39.1																								
Volumetric Flow (m3/hr)	2761	3010																								
Methane (%)	52.1	50.4																								
Surface Gas	Surface gas monitoring was completed on a quarterly basis as per EPL requirements, which are summarised in Table 3.2.1.3 below. The detailed tabulated data is available in Table 2 (refer Appendix 4).																									

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion									
	<i>Table 3.2.1.3: Surface Gas Monitoring Results Summary</i> <table><tr><th>Parameter</th><th>Minimum</th><th>Maximum</th><th>Average</th></tr><tr><td>Methane (%)</td><td>0.0002</td><td>0.197</td><td>0.005</td></tr></table> Methane was detected in varying amounts over the waste surface with an overall average of 0.005% during this reporting period which was lower than 0.01% from the previous reporting period. The emission threshold concentration for methane detected in surface gas emission testing is 500 parts per million (0.05%), as recommended in (Environmental Guidelines for Solid Waste Landfills, January 1996). Surface gas monitoring enables site operational personnel to investigate and apply corrective actions where any high concentrations of methane has been detected to maintain the effectiveness of the landfill cap and prevent migration of landfill gas through preferential pathways to the surface. This can include application of cover material in areas of the void demonstrating settlement cracking, commissioning and rebalancing of gas extraction wells and installing additional gas collection infrastructure. During this reporting period a new vegetation mulch bio-cover was implemented around wells which has assisted in mitigating odour and reducing surface gas emissions.	Parameter	Minimum	Maximum	Average	Methane (%)	0.0002	0.197	0.005	
Parameter	Minimum	Maximum	Average							
Methane (%)	0.0002	0.197	0.005							
Landfill Gas Flare	The landfill gas flares are manufactured to a residence time of 0.3 seconds with a destruction efficiency of 98% for methane and non methanogenic organic compounds to meet the requirements of the EPL. Monitoring was continuously performed during this reporting period, an average of which is summarised in Table 3.2.1.4 below. <i>Table 3.2.1.4: Landfill Gas Flare Monitoring Results</i> <table><tr><th>Parameter</th><th>Units</th><th>Result</th></tr><tr><td>Temperature</td><td>°C</td><td>1085.4</td></tr><tr><td>Residence Time</td><td>Seconds</td><td>< 0.3</td></tr></table>	Parameter	Units	Result	Temperature	°C	1085.4	Residence Time	Seconds	< 0.3
Parameter	Units	Result								
Temperature	°C	1085.4								
Residence Time	Seconds	< 0.3								
Landfill Gas Engine Exhaust Point(s)	Monitoring of a landfill gas engine 3’s exhaust point was completed during the reporting period. The monitoring point stated in the EPL is Generator 1, however due to its unavailability at the time of monitoring, measurement from generator 3 was taken as representative. The results are consistent with the previous monitoring period and presented in Tables 3.1 to 3.5 (refer Appendix 4). Concentration limits for each of the following pollutants are stipulated in the EPL, all of which were below the threshold for each exhaust point test within this reporting period and consistent with previously reported levels, as demonstrated in Figures 3.2.1.1 – 3.2.1.3. • Nitrogen Oxides; • Hydrogen Sulphide; • Sulphuric Acid Mist; and									

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	Sulphur Trioxide. An upward trend in nitrogen oxides was noted from the previous monitoring period however was still within the concentration threshold.

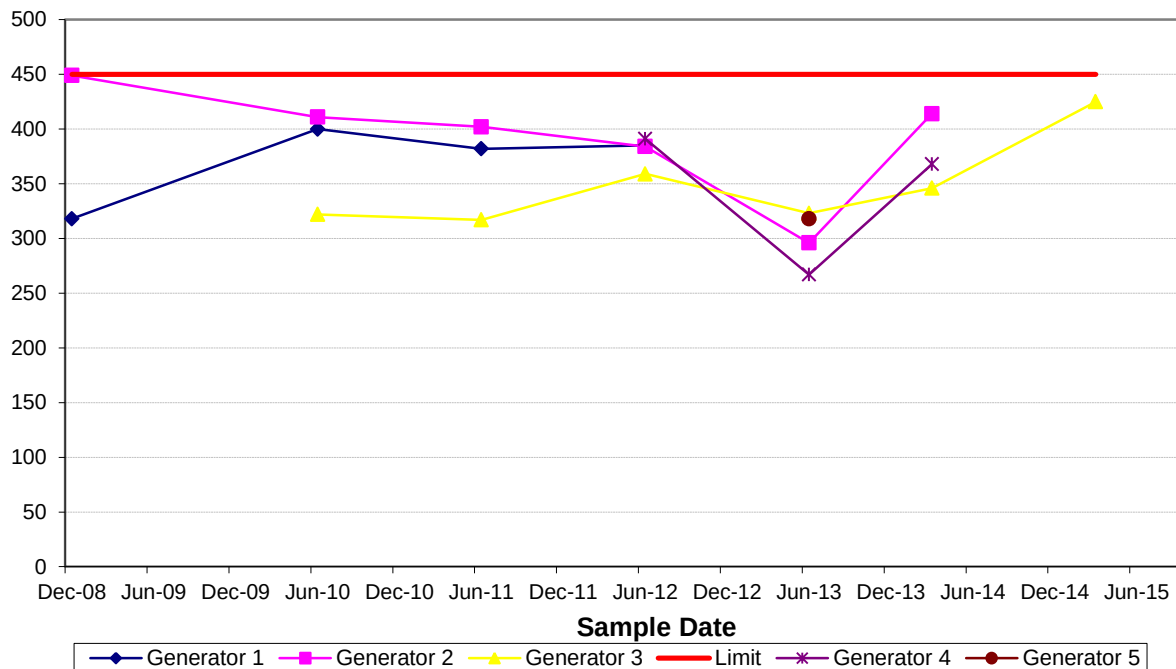


Figure 3.2.1.1 – Landfill Gas Engine Exhaust Point – Nitrogen Oxide Flow (mg/m³)

3. Bioreactor Environmental Monitoring

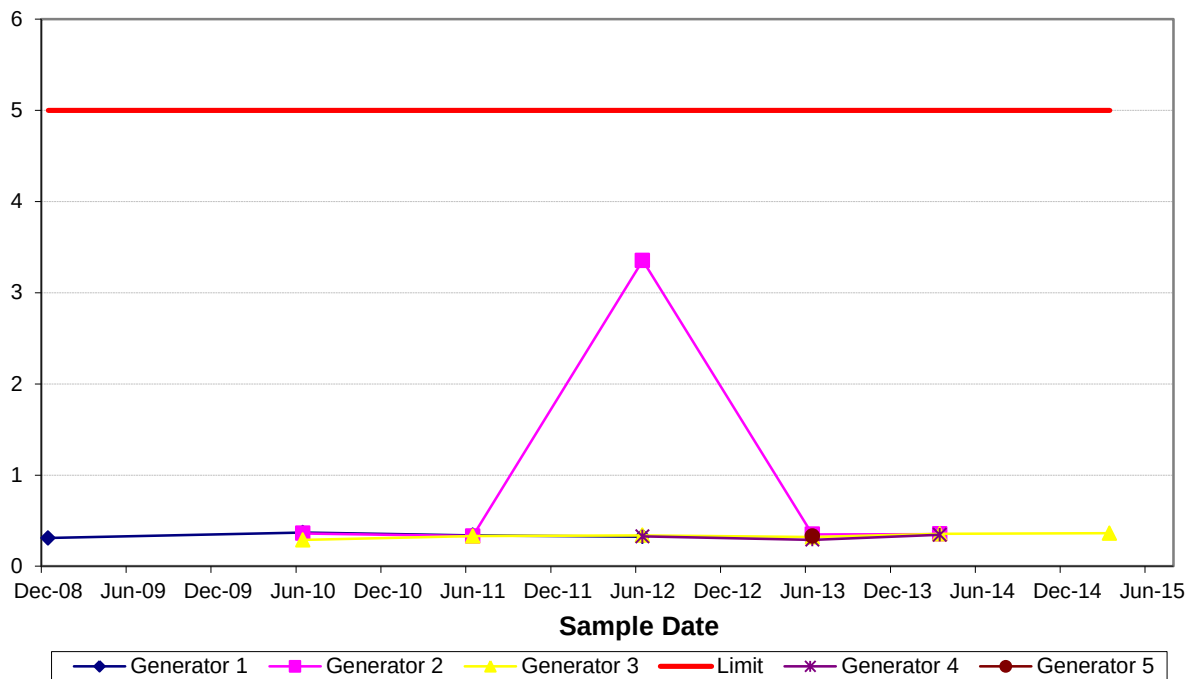


Figure 3.2.1.2 – Landfill Gas Engine Exhaust Point – Hydrogen Sulphide (mg/m^3)

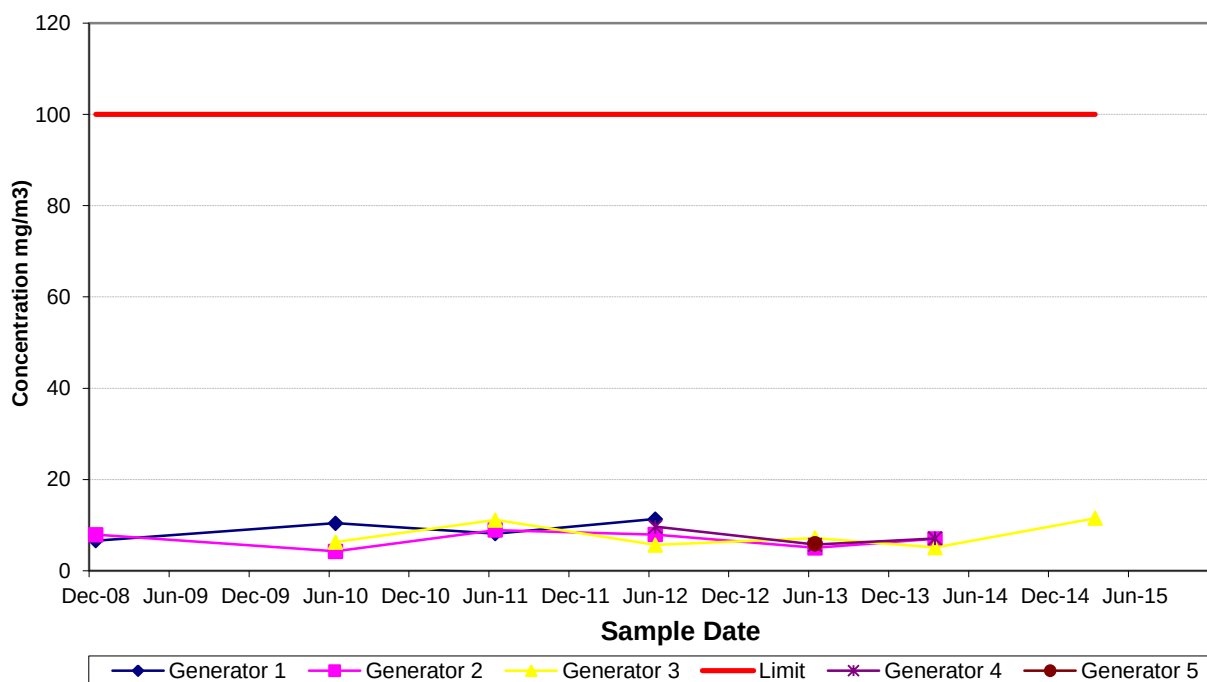


Figure 3.2.1.3 – Landfill Gas Engine Exhaust Point – Sulphuric Acid Mist and Sulphur Trioxide (mg/m^3)

3. Bioreactor Environmental Monitoring

3.2.2 Bioreactor Air Quality Monitoring Results

Table 3.2.2: Bioreactor Air Quality Monitoring Results

Parameter	Results/Discussion																			
Meteorological Station	Veolia operates an onsite meteorological station to continuously monitor climatic data listed in the EPL. Meteorological data recorded includes (but is not limited to): • Wind speed at 10m; • Wind direction at 10m; • Temperature at 2m; • Temperature at 10m; • Rainfall; • Solar radiation; and • Sigma theta at 10m Meteorological data is logged in 15 minute and 24 hour intervals and can be made available for the 2014/2015 reporting period upon request. Servicing and calibration of the meteorological station is carried out quarterly by Hydrometric Consulting Services. Calibration reports can be provided upon request.																			
Particulates/Dust Monitoring	Monitoring of 3 depositional dust gauges (DG) was completed on a monthly basis as required under the EPL, the results of which are generally consistent with previously reporting periods as depicted in Figure 3.2.2.1. The results of total solids found within the depositional dust samples are summarised for each of the monitoring locations in Table 3.2.2.1 below, with the detailed results tabulated in Tables 4.1 - 4.3 (refer Appendix 4). <i>Table 3.2.2.1: Dust Monitoring Results</i> <table><tr><th rowspan="2">Dust Gauge</th><th colspan="3">Summary Total Solids (g/m2/month)</th></tr><tr><th>Minimum</th><th>Maximum</th><th>Average</th></tr><tr><td>DG22</td><td>0.4</td><td>3.9</td><td>1.64</td></tr><tr><td>DG24</td><td>0.2</td><td>17</td><td>5.87</td></tr><tr><td>DG28</td><td>1.2</td><td>16</td><td>5.52</td></tr></table> The maximum dust level recorded in this reporting period was 17 g/m2/month at DG24 in April 2015 which is located on the Western side of the Void. Extensive earthworks were conducted in the immediate vicinity of this gauge during this period to create an access road for multiple Heron Resources mine drilling rigs located around ED3S. This new access road was frequented by dump trucks and heavy vehicles throughout this process. The reading of 16 g/m2/month at DG28, located at the Veolia owned property of Pylara, in February 2015 is abnormal. Given that for the corresponding month there were no similar levels recorded at the dust	Dust Gauge	Summary Total Solids (g/m2/month)			Minimum	Maximum	Average	DG22	0.4	3.9	1.64	DG24	0.2	17	5.87	DG28	1.2	16	5.52
Dust Gauge	Summary Total Solids (g/m2/month)																			
	Minimum	Maximum	Average																	
DG22	0.4	3.9	1.64																	
DG24	0.2	17	5.87																	
DG28	1.2	16	5.52																	

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Parameter	Results/Discussion
	gauges located within the proximity of the landfill void, it can be inferred that this dust emission was not as a result of the Bioreactor activities and can be treated as an outlier. Veolia infer that this result is due to activities, such as mowing and/or camp fires, in the immediate vicinity. Overall dust suppression is generally consistent with previous years and a measure of the dust control measures that the site has in place.

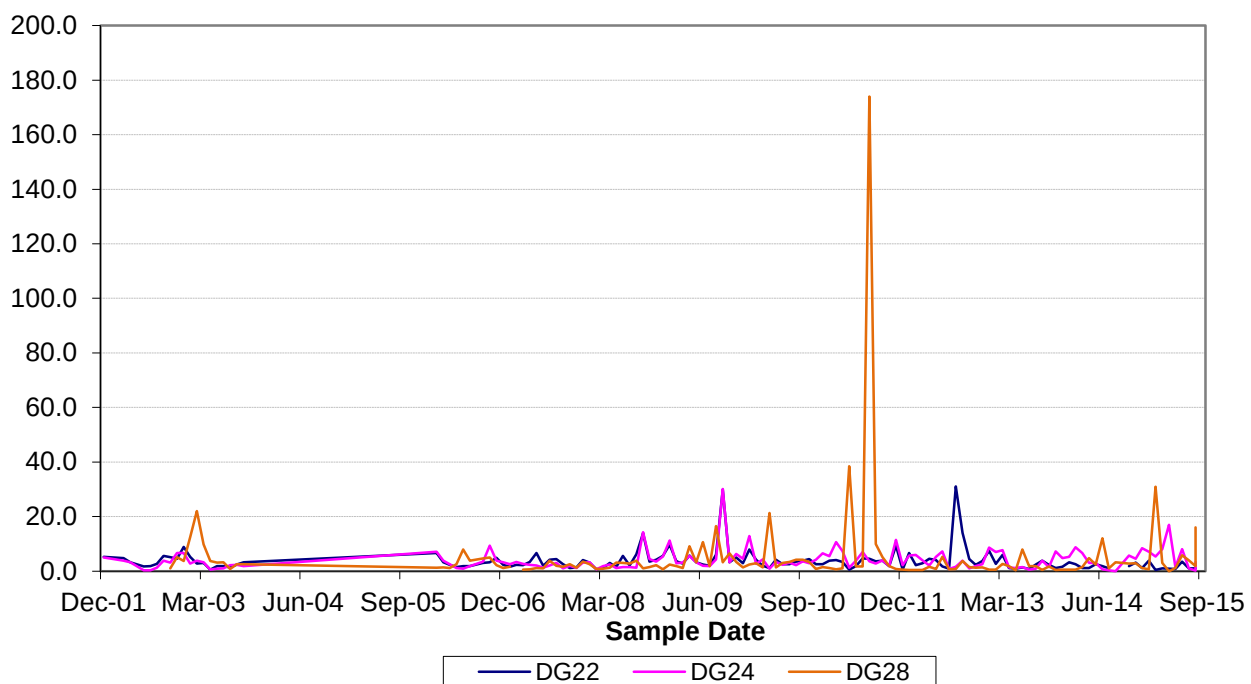


Figure 3.2.2.1 – Bioreactor Depositional Dust Levels (g/m²/month)

3.2.3 Bioreactor Surface Water Monitoring Results

The findings from water quality monitoring of surface water locations required under the EPL is summarised in **Table 3.2.3** below with detailed data provided in **Tables 5.1 - 5.8** (refer **Appendix 4**). Key quality indicators selected to identify likely impacts from the Bioreactor include:

- pH,
- Electrical conductivity (EC),
- Ammonia (NH₃),

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- Total organic carbon (TOC),
- Iron (Fe),
- Sulphate (SO₄), and
- Zinc (Zn).

These are depicted in the trend graphs (**Figures 3.2.3.1 – 3.2.3.8**) provided in **Appendix 5**.

Table 3.2.3: Bioreactor Surface Water Monitoring Results

Parameter	Results/Discussion
Site 115 – Allianyonyige Creek	Site 115 is situated downstream of the evaporation dams. 3 out of 4 quarterly monitoring events required under the EPL were undertaken in this reporting period and have been documented in the Annual Return. Based on the results provided in Table 5.1 (refer Appendix 4), the pollutant concentration trends from previous monitoring periods are generally consistent. • Mean pH at 8.15 (overall range of 6.1 – 8.6) for this location indicates slightly alkaline water. • EC ranges overall between 805 – 2970 µS/cm, indicating fresh to brackish water. This period recorded lower EC readings than the previous reporting period (174 – 4360 µS/cm). Variability can be affected by dilution during rainfall events and evapo-concentration as is likely based on Woodlawn's local climatic conditions and seen historically (Earth2Water, 2010). • NH₃ at 0.1mg/L and TOC at mean of 14 mg/L concentrations recorded in this monitoring period remain consistent with historical monitoring results • Other key indicators (SO₄, Iron, Lead and Zinc) are not required to be sampled under the EPL and were not sampled in this reporting period.
Spring 2	Spring 2 is located upstream of the Bioreactor and is adjacent to Crisps Creek, therefore provides background water quality information to site operations. This location naturally overflows to Crisps Creek in wet weather events. 5 monitoring events were undertaken, an additional 1 than required by the quarterly EPL schedule, in this reporting period and have been documented in the Annual Return. Water quality trend in Spring 2, based on the results provided in Table 5.2 (refer Appendix 4), is consistent with water quality from historical monitoring results. • pH is slightly lower than previous years (average 4.63) which is within the overall range of 3.5 – 8.5 for this location; • EC (average 870 µS/cm) for this reporting period is indicative of

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Parameter	Results/Discussion
	fresh water. • SO₄ (average 211 mg/L) shows an identical trend to conductivity, again indicating a direct affect on EC. • Fe (average 0.8 mg/L) and Zn (average 15 mg/L) concentrations continue to show slow decline from overall averages with some variability likely due to dilution following wet weather periods and concentration during drier periods. • NH₃ (average 0.38 mg/L) and TOC (average 10.4 mg/L) concentrations recorded in this monitoring period were consistent with historical monitoring results.
Site 105 – Crisps Creek	Site 105 is located downstream of the Bioreactor and tailings dams. 3 out of 4 quarterly monitoring events required under the EPL were undertaken in this monitoring period, due to insufficient flow, and have been documented in the Annual Return. Water quality trends in Site 105, based on the results provided in Table 5.3 (refer Appendix 4) are consistent with previous monitoring results. • pH (average 7.9) is within the overall range of 5.4 – 8.6 for this location, indicating relatively neutral water; • EC (average 3003 µS/cm) is consistent with historical results, reflecting brackish water. • TOC (average 17.33 mg/L) and NH₃ (average 0.1 mg/L) were consistent with historical trends. • Other key indicators (SO₄, Iron, Lead and Zinc) are not required to be sampled under the EPL and were not sampled in this reporting period.
WM200 Raw Water Dam	The Raw Water Dam is located to the west of the dolerite stockpile and collects uncontaminated water. Quarterly monitoring events were undertaken in accordance with EPL conditions. Based on the results provided in Table 5.4 (refer Appendix 4), the results for WM200 remain generally consistent with the previous reporting periods. • pH (average 7.2 – 7.9) indicates slightly alkaline water; • EC (average 1460 µS/cm) is slightly lower than the last monitoring period (average 1500 µS/cm) and is indicative of fresh/brackish water; • SO₄ level (average 434 mg/L) was generally consistent with previous trends; • Zn and Fe levels appear to have stabilised at averages of 24 mg/L and 0.2 mg/L respectively, which are lower than the previous reporting period of 52mg/L and 0.78mg/L. Based on historical evidence, it appears the variability in the heavy metals may be quite cyclical; • TOC was an average of 18.75 mg/L in this reporting period compared to 7.2 mg/L from the last reporting period, a slight

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Parameter	Results/Discussion
	increase in trend although relatively consistent with historical results. This could be reflective of the presence of organic matter from riparian zone vegetation surrounding the dam. NH₃ at 0.1 mg/L is at quite low levels at this location.
WM201 – Entrance Road Culvert	The Entrance Road Culvert collects surface water runoff from the Woodlawn Bioreactor administration office and workshop areas. 2 monitoring events were undertaken during this reporting period, the results of which are provided in Table 5.5 (refer Appendix 4). Monitoring contractors did not report flow at this site during the first two quarters of the reporting period. - pH is consistent (average 6.6) with previous reporting periods and remains within the overall range of 4.5 – 8.2 for this location; - EC at 170 µS/cm is reflective of fresh water and lower than previous reporting periods. EC variability can be caused by dilution during rainfall events. - Other key indicators (SO₄, Iron, Lead and Zinc) are not required to be sampled under the EPL and were not sampled in this reporting period. Veolia will continue to monitoring this location in the next reporting period for any likely contaminant run off impacts.
WM202 – Evaporation Dam 3 South	Evaporation Dam 3 South is a storage point to manage stormwater from the void by evaporation. Quarterly monitoring events were undertaken in accordance with EPL conditions. Water quality results indicated a similar trend to previously reported data as seen in Table 5.6 (refer Appendix 4). - pH levels indicate an acidic, yet stable trending result with the average pH of 2.9 consistent from previous reporting period; - Fe (average 65mg/L) is consistent with previous reporting period; - Zn at an average of 845 mg/L shows in increase from the average reporting in the previous period (810 mg/L) however is well within the maximum measured at this location of 1964 mg/L; - SO₄ shows a decrease of an average of 7310 mg/L from an average of 8456 mg/L reported in the previous period - EC (average 8387 µS/cm) remains within the overall average. Both SO₄ and EC concentrations reflect the signature for Acid Mine Drainage (AMD) contaminated waters from remnant mining operations stored in Evaporation Dam 3 South. - NH₃ concentrations (average 73.4 mg/L) declined slightly over the course of the reporting period.
WM203 – Evaporation Dam 3 North	Evaporation Dam 3 North (ED3N) is a storage point to manage leachate by evaporation. Quarterly monitoring events were undertaken in accordance with the EPL.

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Parameter	Results/Discussion
	Based on the water quality results provided in Table 5.7 (refer Appendix 4), for WM203, the following can be confirmed: • pH (average 6.89) shows a upward trend with the 2nd quarter close to achieving neutrality (6.94). The 3rd and 4th quarter results are alkaline and trending upwards. • EC average 24925 µS/cm is trending upward from previously reported period (average 19832.5µS/cm); • SO₄ averages (12023 mg/L) appears to be generally consistent with previous reporting periods upward trend. • Fe levels appear to have decreased slightly from the previous reporting periods to 2.3 mg/L from a minimum of 5.9 mg/L but Zn levels show a slight average increase from 410 – 550 mg/L to an average of 720 mg/L. • NH₃ concentrations (average 855.25 mg/L) remained stable over the course of the reporting period (771 – 936mg/L). • TOC is trending upward (average 558 mg/L) from the previous reporting period. The reading of 8 mg/L in quarter 1 is not consistent with other results and can therefore be classified as an outlier.
Pond 3	Pond 3 is situated on a bench within the landfill void at a relative level (RL) of 740 m above sea level. Pond 3 acts as a transfer point to capture stormwater from the walls of the landfill void to Evaporation Dam 3. Quarterly monitoring events were undertaken in accordance with the EPL, the results of which are tabulated in Table 5.8 (refer Appendix 4). These water quality results consistent results with previous reporting periods. • pH average of 3.14 confirms acidic nature of water that comes in contact with the void walls and is consistent with previous period range of 2.7 – 4.1. • EC (2755 µS/cm) remains similar with previous results, showing variability (1330 – 3450 µS/cm), likely due to weather influences; • SO₄ trends (average 3240 mg/L) mirror variability of EC (2500 – 5600mg/L); • Fe at 67 mg/L is consistent with the previous reporting period and continuing to show a slight decline; • Zn (average 347.5 mg/L) also shows a declining trend; • NH₃ (average 13.325 mg/L) and TOC (average 6.5 mg/L) both mirror a similar trend which appears quite variable over historical monitoring results. These results and trends are deemed representative of the stormwater quality captured from the walls of the void.

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3.2.4 Bioreactor Leachate Monitoring Results

Leachate quality monitoring is undertaken annually at 2 monitoring locations in the Bioreactor as required by the EP. The findings from this reporting period are summarised in **Table 3.2.4** below with the detailed data provided in **Tables 6.1** and **6.2** (refer **Appendix 4**). The key quality indicators selected to characterize the leachate and identify any migration into groundwater or surface water monitoring locations include:

- pH,
- Electrical Conductivity (EC),
- Sulphate (SO₄),
- Lead (Pb),
- Zinc (Zn),
- Ammonia (NH₃), and
- Total Organic Carbon (TOC).

These are depicted in the subsequent trend graphs **Figures 3.2.4.1** and **3.2.4.2**.

Table 3.2.4: Bioreactor Leachate Monitoring Results

Parameter	Results/Discussion
Leachate Dam	The leachate dam is located at the northwest rim of the landfill void where leachate collected and extracted from the void is treated by aeration to oxidise organic compounds. An annual monitoring round was completed during this reporting period as per the requirements of the EPL. Based on the results provided in Table 6.1 (refer Appendix 4), the characteristics of the leachate are: • pH (8.47) is indicative of an increasingly alkaline state from the previous reporting period result of 7.09 • EC (26,900 µS/cm) is consistent with previous reporting period; • SO₄, one of the dominant anions, (738 mg/L) continues to decrease from the previous reporting periods; • Both Pb (0.096 mg/L) and Zn (33.1 mg/L) show an increase in trend from the previous reporting period. This is consistent with the overall average for this location. • NH₃ (1780 mg/L) is consistent with previous reporting readings; • TOC (2410 mg/L) is slightly higher than the previous reporting period (1500 mg/L) but remains considerably lower than previous reporting periods. Leachate quality sampled at this point will be affected by the status of the Leachate Treatment System and how long the leachate has been subjected to the treatment process.
Leachate Recirculation System	The leachate recirculation system is located within the landfill void, comprised of a network of drainage sumps, pipes, pumps and wells that are used to collect and extract leachate from the waste mass.

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Parameter	Results/Discussion
	An annual round was completed during this reporting period in accordance with the EPL, the results of which are detailed in the Table 6.2 (refer Appendix 4). Based on these results, the leachate collected directly from the recirculation system displays similar characteristics to the leachate pond, with some exceptions as summarised below: - pH (7.85) is generally consistent with previous reporting period and slightly less alkaline than the dam; - EC (33,500 $\mu\text{S}/\text{cm}$) is consistent with the previous reporting period (33,000 $\mu\text{S}/\text{cm}$) and is generally consistent with the overall annual average for this location; SO_4 (632 mg/L) shows a significant increase from the previous reporting period, however is still less than the overall annual average for this location; - Both Pb and Zinc show increasing trends from previous reporting period, 0.08 mg/L and 1.75 Mg/L respectively, but are significantly lower than historical averages. - TOC (4460 mg/L) shows a slight decrease from the previous reporting period but is generally consistent with historical monitoring results.

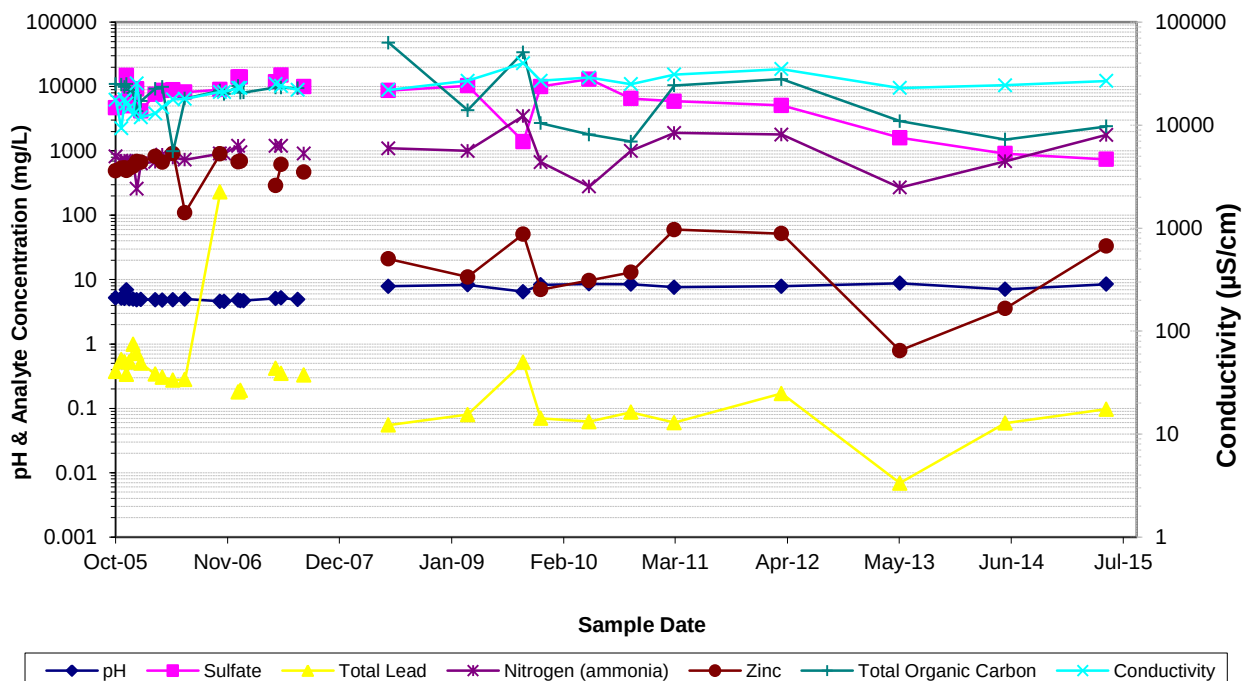


Figure 3.2.4.1 – Leachate Trends – Leachate Dam

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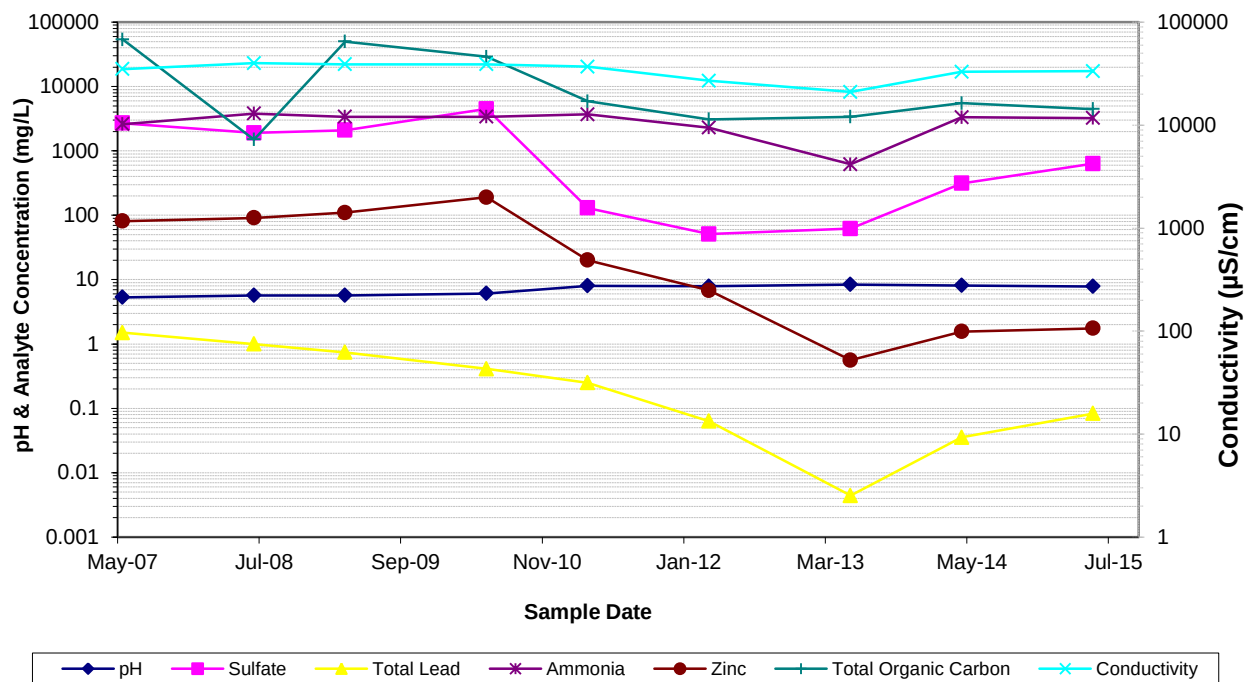


Figure 3.2.4.2 – Leachate Trends – Leachate Recirculation System

3.2.5 Bioreactor Groundwater Monitoring Results

Groundwater quality monitoring at 24 locations was undertaken in this reporting period as required by the EPL, comprising 1 annual and 3 quarterly rounds of monitoring, the results of which are summarised in **Table 3.2.5** below. Detailed data is provided in Tables 7.1 – 7.24 (refer **Appendix 4**).

The groundwater monitoring well network allows for an assessment of potential impacts from the waste operations at the Bioreactor, evaporation dams and tailing dams. The key quality indicators selected to detect any pollutants in groundwater samples are the same as those deemed characteristic for leachate and are as follows:

- pH
- Electrical Conductivity (EC),
- Sulphate (SO₄),
- Lead (Pb),
- Zinc (Zn),
- Ammonia (NH₃), and
- Total Organic Carbon (TOC).

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These are depicted in the trend graphs **Figures 3.2.5.1 to 3.2.5.24** (refer **Appendix 5**). In addition to water quality monitoring, standing water levels (SWL) of the wells are also measured in metres relative to sea level (m RL) and are depicted in the subsequent graphs **Figures 3.2.5A, 3.2.5B and 3.2.5C**.

Table 3.2.5: Bioreactor Groundwater Monitoring Results

Parameter	Results/Discussion
MB1	MB1 is located down gradient of the landfill void. Based on the results provided in Table 7.1 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 774.1 m RL) was slightly higher than the long term average since 2004 (769.98); • pH (average 7.27) neutral – to slightly alkaline consistent with previous reporting period; • EC (average 1517.5 $\mu\text{S}/\text{cm}$) is slightly higher than but generally consistent with previous readings representing fresh water; • SO_4 (average 286.0 mg/L) mirrors EC with a slightly increasing trend but generally consistent with previous periods; • Pb (average 0.0030 mg/L) is generally consistent with previous periods. Zn (average 0.63 mg/L) is seen to be rising from previous reporting period. • NH_3 (average 0.1) is consistent with previous reporting periods. • TOC (4 mg/L) has declined from the previous reporting period however with intermittent sampling, not enough data points exist for a line of best fit. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends at this location indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.
MB2	MB2 is located upstream of Evaporation Dam 2. Based on the results provided in Table 7.2 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 778.6 m RL) was consistent with long term average since 2004; • pH (average 6.66) neutral, consistent with previous reporting period; • EC (average 6780 $\mu\text{S}/\text{cm}$) and SO_4 (average 4040 mg/L) is consistent with previous periods; • Pb (average 0.00023 mg/L) indicates a stable trend consistent with the previous reporting period. • Zn (average 0.111 mg/L) is generally consistent with previous reporting periods. • NH_3 (<0.1 mg/L) same as previous monitoring periods of non detection rates; • TOC (3 mg/L) is consistent with previous reporting periods. All trends indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities. No significant variations

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Parameter	Results/Discussion
	or anomalies were recorded for any analyte tested during this monitoring period.
MB3	MB3 is located upstream of the Bioreactor and mine site. Based on the results provided in Table 7.3 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 791.28 m RL) was consistent with long term average since 2004; • pH (average 6.85) near neutral is consistent with previous reporting period; • EC (average 2017.5 $\mu\text{S}/\text{cm}$) is consistent with previous readings representing fresh water; • SO_4 (average 33.9 mg/L) is stable and consistent with previous periods; • Pb (average 0.0002 mg/L) remains stable while Zn (average 0.03975mg/L) is slightly higher than the previous reporting period. • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (4 mg/L) result is consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and provide an indication of background groundwater concentrations.
MB4	MB4 is located downstream of the Bioreactor. Based on the results provided in Table 7.4 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 774.2 m RL) was consistent with long term average since 2004; • pH (average 5.34) slightly acidic, consistent with previous reporting period; • EC (average 1630 $\mu\text{S}/\text{cm}$) represents fresh water salinity and is consistent with previous period. This trend is reflected in SO_4 (average 204.75 mg/L) results for this period; • Pb (average 0.0048 mg/L) remains stable while Zn (average 0.77 mg/L) is seen to fluctuate which appears consistent with historical cyclic trends; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (1 mg/L) result is consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentrations and there is no indication of contamination from mining or Bioreactor activities.
MB5	MB5 is located upstream of the Western Tailings Dam at the Waste Rock Dump area. Based on the results provided in Table 7.5 (refer Appendix 4), the groundwater quality at this location can be described as:

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Parameter	Results/Discussion
	- SWL (average 828.04 m RL) was consistent with long term average since 2004; - pH (average 5.04) acidic, consistent with previous reporting period, reflecting the characteristic of tailings and waste rock. Note quarter 1 result of 7.62 is historically uncharacteristic and can be treated as an outlier (average 4.12 when excluded) and may be reflective of rain water variability; - EC (average 8100 $\mu\text{S}/\text{cm}$) is consistent historically with brackish water quality; SO_4 (average 5735 mg/L) mirrors the trend of EC; - Pb (average 0.0019 mg/L) and Zn (average 189 mg/L) are consistent with the previous reporting period; NH_3 (average 0.2) is slightly lower than previous reporting period and consistent with long term average; - TOC (5 mg/L) appears consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and there is no indication of contamination from Bioreactor activities. There is indication of impacts from mining activities at this monitoring location although this has been ongoing prior to Veolia obtaining the site. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.
MB6	MB6 is located downstream of Evaporation Dam 3 and upstream of the Bioreactor. Based on the results provided in Table 7.6 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 790.29 m RL) was consistent with historical results; - pH (average 5.61) slightly acidic consistent with previous reporting period; - EC (average 5412.5 $\mu\text{S}/\text{cm}$) represents brackish water and the trend is mirrored by SO_4 (average 841.25 mg/L) consistent with previous periods; - Pb (average 0.0008 mg/L) shows a decreasing trend while Zn (average 11.49 mg/L) is seen to be slightly higher than previous reporting period; NH_3 (average 0.3) is slightly higher than previous monitoring periods of non detection rates but can be attributed to an uncharacteristic result of 8 mg/L in quarter 1 (average 0.14 when excluded) which is consistent with historical results; - TOC (4 mg/L) appears consistent with historical results. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and there is no indication of contamination from Bioreactor activities. There is indication of impacts from mining activities at this monitoring location although this has been ongoing prior to Veolia obtaining the site. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.

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Parameter	Results/Discussion
MB7	MB7 is located upstream of Evaporation Dam 3. Based on the results provided in Table 7.7 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 785.74 m RL) was consistent with long term average since 2004; • pH (average 7.0) neutral is consistent with the previous reporting period; • EC (average 9047 $\mu\text{S}/\text{cm}$) shows an increasing trend whilst SO_4 (average 190.25 mg/L) is overall consistent with previous periods; • Pb (average 0.0002 mg/L) is consistent throughout the reporting period whilst Zn (average 3.18 mg/L) shows a fluctuating trend consistent with historical cycles; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (11 mg/L) appears consistent with the previous reporting period. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities.
MB8	MB8 is located downstream of the Bioreactor on 'Pylara' farm, the agricultural enterprise surrounding the Woodlawn site. Based on the results provided in Table 7.8 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 748.75 m RL) was consistent with previous periods; • pH (average 7.26) neutral to slightly alkaline is consistent with previous reporting period; • EC (average 3555 $\mu\text{S}/\text{cm}$) and SO_4 (average 111.5 mg/L) show a stable trend, overall consistent with previous periods; • Pb (average 0.00028 mg/L) and Zn (average 0.0975 mg/L) show a fluctuating trend consistent with historical cycles; • NH_3 (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; • TOC (2 mg/L) appears consistent with the previous reporting period. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentrations and no indication of contamination from mining or Bioreactor activities is evident.
MB10	MB10 is located adjacent to Evaporation Dam 1. Based on the results provided in Table 7.9 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 781.34 m RL) was consistent with long term average since 2004; • pH (average 7.0) neutral with previous reporting period; • EC (average 7505 $\mu\text{S}/\text{cm}$) is of brackish quality consistent with previous readings representing fresh water; • SO_4 (average 3722.5 mg/L) mirrors EC and is generally consistent

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Parameter	Results/Discussion
	with previous periods; - Pb (average 0.000275 mg/L) is stable while Zn (average 0.08 mg/L) is generally consistent with previous reporting periods when an abnormal result (0.21 mg/L) in quarter 3 is excluded (0.040 mg/L mean). - NH₃ (< 0.1 mg/L) is consistent with previous monitoring periods of non detection rates; - TOC (5 mg/L) appears consistent with the previous reporting period. The concentration is indicative of natural conditions. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. All trends indicate fairly stable concentrations and there is no indication of contamination from mining or Bioreactor activities.
MB11	MB11 is located between Evaporation Dam 2 (ED2) and the Seepage Collection Trench (SCT), which is a dedicated capture area for seepage waters. Based on the results provided in Table 7.10 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 782.25 m RL) was consistent with long term average since 2004; - pH (average 3.8) acidic and consistent with previous reporting period; - EC (average 35,350 µS/cm) consistent with previous readings for saline water; - SO₄ (average 47,150 mg/L) mirrors the trend of EC but is generally consistent with previous periods; - Pb (average 0.02 mg/L) shows a decreasing trend while Zn (average 4304 mg/L) is slightly lower than previous reporting period. - NH₃ (average 0.275 mg/L) is slightly higher than previous monitoring periods which were close to non-detection limits; - TOC (14 mg/L) is slightly higher than previous reporting period but still indicative of natural conditions. Any fluctuations in trends is influenced by seepage water from ED2, which has been ongoing since Veolia assumed responsibility for the site however there is no indication of increasing trends. Veolia is managing the water volume in ED2 by promoting evaporation and limiting inputs from rainfall to minimise the volume of seepage at this location. In addition to monitoring this well. Veolia monitor groundwater wells MB19 and MB20 located down gradient of the SCT. These wells are monitored to determine downgrade migration from the SCT. Results of these wells have been tabulated and provided in Tables 11.1 and 11.2 (refer Appendix 6). The evaporation dams have been previously identified by Veolia for rehabilitation. During the reporting period Heron Resources assumed responsibilities for SML20. Heron Resources are preparing a new Mining Operations Plan in consultation with the Department of Resources and Energy.

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
MB12	MB12 is also located at ED2 SCT, adjacent to MB11. Based on the results provided in Table 7.11 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 778.29 m RL) consistent with previous historical results noting that results were heavily skewed by an inaccurate reading in 2013-14 Quarter 1 (747.15 m RL) which is not possible due to well depth (possible transcription error); • pH (average 3.6) acidic and consistent with previous reporting period; • EC (average 40,425 µS/cm) consistent with previous readings for saline water; • SO₄ (average 56,650 mg/L) mirrors EC is slightly lower than previous reporting period but generally consistent with historical records; • Pb (average 0.91 mg/L) and Zn (average 6842.5 mg/L) show a decreasing trend although generally stable and consistent with previous reporting period. • NH₃ (average 0.6 mg/L) is consistent with previous monitoring periods of close to non detection rates; • TOC (14 mg/L) is slightly lower than previous reporting period but still indicative of natural conditions. All trends indicate fairly stable concentrations.
MB13	MB13 is located downstream of Evaporation Dam 1 (ED1) and surface water monitoring point Site 115. Based on the results provided in Table 7.12 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 746.3 m RL) was consistent with long term average since 2004; • pH (average 7.2) neutral to slightly alkaline consistent with previous reporting period; • EC (average 3377 µS/cm) consistent with previous readings for brackish water; • SO₄ (average 75.8 mg/L) mirrors EC and is generally consistent with previous periods; • Pb (average 0.0004 mg/L) remains stable while Zn (average 0.65 mg/L) is variable but consistent with historical records. • NH₃ (< 0.1 mg/L) is at non detection rates; • TOC (8 mg/L) appears consistent with previous reporting period and indicative of organic matter being present in the groundwater at this location, which may be influenced by local microbial communities rather than Bioreactor operations. All trends indicate fairly stable concentrations and no contamination from mining or Bioreactor activities.
MB14	MB14 is located upstream of Evaporation Dam 2. Based on the results provided in Table 7.13 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 783.2 m RL) consistent with long term average since 2004;

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	- pH (average 7.3) neutral – to slightly alkaline consistent with previous reporting period; - EC (average 3397.5 $\mu\text{S}/\text{cm}$) consistent with previous reporting period for brackish water; SO_4 (average 1805 mg/L) is higher than the previous reporting period but generally consistent with historical records; - Pb (average 0.0002 mg/L) remains stable while Zn (average 0.162 mg/L) displays a fluctuating trend consistent with previous reporting periods. NH_3 (< 0.1 mg/L) is at non detection rates; - TOC (4 mg/L) consistent with historical results is indicative of natural conditions. No significant variations or anomalies were recorded for any analyte tested at this location during this monitoring period.
MB15	MB15 is located downstream of the Waste Rock Dam (WRD). Based on the results provided in Table 7.14 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 764.86 m RL) was consistent with long term average since 2004; - pH (average 6.9) near neutral and generally consistent with historical results; - EC (average 7815 $\mu\text{S}/\text{cm}$) representative of brackish water and SO_4 (average 5512.5 mg/L) follow a similar and stable trend consistent with previous periods; - Pb (average 0.0002 mg/L) and Zn (average 2.77 mg/L) is higher than previous reporting period but displays a fluctuating trend consistent with historical cycles; NH_3 (average 0.1) is lower than previous monitoring periods at non detection rates; - TOC (9 mg/L) is higher than the previous reporting period but comparable with historical results and indicative of natural conditions, which may include some influence from microbial communities; All trends indicate fairly stable concentrations, with the exception of fluctuating metal trends. The waste rock area has been previously identified by Veolia for rehabilitation. During the reporting period Heron Resources assumed responsibilities for SML20. Heron Resources are preparing a new Mining Operations Plan in consultation with the Department of Resources and Energy. There is no indication of contamination from Bioreactor activities at this monitoring location.
MB16	MB16 is located downstream of the WRD. Based on the results provided in Table 7.15 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 769 mRL) was consistent with long term average since 2004; - pH (average 3.15) acidic consistent with previous reporting period;

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	- EC (average 35,875 $\mu\text{S}/\text{cm}$) representative of brackish water and SO_4 (average 63,600 mg/L) follows similar trends consistent with previous periods; - Pb (average 0.5 mg/L) remains while Zn (average 6907 mg/L) is consistent with a long term upward trend. NH_3 (average 8.4 mg/L) is stable and consistent with previous monitoring periods; - TOC (32 mg/L) is consistent with previous monitoring period indicating the likely presence of organic matter present in groundwater at this location (which may also be attributed to microbial communities). There appears to be no indication of contamination from Bioreactor activities.
MB17	MB17 is located upstream of the WRD. Based on the results provided in Table 7.16 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 767.8 mRL) was consistent with long term average since 2004; - pH (average 6.5) is slightly acidic consistent with previous reporting period; - EC (average 12025 $\mu\text{S}/\text{cm}$) indicating brackish water and SO_4 (average 10170 mg/L) follow similar trends consistent with previous periods; - Pb (average 0.0005 mg/L) shows a decreasing trend while Zn (average 7.6 mg/L) is seen to be rising from previous reporting period. NH_3 (< 0.1 mg/L) is at non detection rates; - TOC (10mg/L) is consistent with long term averages and confirms the abnormality of 140 mg/L from the previous reporting period. Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved. Contamination from Bioreactor activities at this location is not evident.
ED3B	ED3B is located downstream of Evaporation Dam 3. Based on the results provided in Table 7.17 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 785.11 mRL) was consistent with long term average since 2004; - pH (average 7.18) is neutral – slightly alkaline and consistent with previous reporting period; - EC (average 7807.5 $\mu\text{S}/\text{cm}$) indicating brackish water and SO_4 (average 1088.25 mg/L) follow similar trends consistent with previous periods; - Pb (average 0.00023 mg/L) remains stable while Zn (average 2.46 mg/L) is seen to be rising from previous reporting period noting that Quarter 2's result (9.38 mg/L) was significantly different to historical records. NH_3 (< 0.1 mg/L) is at non detection rates; - TOC (8 mg/L) is slightly higher but generally consistent with

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	previous reporting periods. All trends indicate fairly stable concentrations at this location with no evidence of contamination from mining or Bioreactor activities.
WM1	WM1 is located northeast of the landfill void. Based on the results provided in Table 7.18 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 737.8 m RL) is stable and consistent with the previous reporting period; • pH (average 7.3) neutral – to slightly alkaline consistent with previous reporting period; • EC (average 2232.5 $\mu\text{S}/\text{cm}$) represents slightly brackish water, consistent with previous readings; • SO_4 (average 1011.5 mg/L) is similar in trend to EC; • Pb (average 0.001 mg/L) shows a decreasing trend while Zn (average 4.29 mg/L) remains stable from previous reporting period. • NH_3 (< 0.1 mg/L) is at non detection rates; • TOC (5 mg/L) is consistent with previous monitoring period reflecting natural conditions; All trends indicate fairly stable concentrations at this location with no evidence of contamination from mining or Bioreactor activities.
WM3	Decommissioned. Veolia has submitted a licence amendment application to remove this monitoring point from the licence. We expect this to be finalised in the next reporting period.
WM4	WM4 is located northeast of the void. Based on the results provided in Table 7.19 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 639.11 mRL) has seen a noticeable increase since previous reporting periods. This increase is likely due to the compaction of landfill waste within the void preventing water ingress. • pH (average 6.9) neutral is slightly lower than previous periods but generally consistent; • EC (average 1997.5 $\mu\text{S}/\text{cm}$) is generally consistent with previous readings representing fresh water; • SO_4 (average 991/5 mg/L) is similar to EC trend; • Pb (average 0.0015 mg/L) and Zn (average 0.98 mg/L) both seen to be fluctuating, which appears consistent with historical cyclic trends; • NH_3 (< 0.25 mg/L) is higher than previous reporting periods but consists of an anomalous reading in Quarter 4 (0.7 mg/L). Subsequent monitoring has seen a return to below detection limit readings; • TOC (3 mg/L) is lower than previous readings consistent with previous monitoring period reflecting natural conditions; No other significant variations or anomalies were recorded for any analytes tested during this monitoring period from the data available.

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
WM5	WM5 is located to the west of the void near Evaporation Dam 3 South. Based on the results provided in Table 7.20 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 785.1 mRL) is consistent with long term averages; • pH (average 7.4) neutral is slightly lower than previous period but generally consistent; • EC (average 6652.5 μS/cm) is representative of saline water and consistent with the previous reporting period; • SO₄ (average 160 mg/L) is similar to previous reporting period (158.5 mg/L). Noting that the 2013-14 AEMR had a transcription error (reading 888 mg/L instead of 158.5 mg/L) • Pb (average 0.0002 mg/L) and Zn (average 0.10625 mg/L) are both lower than the previous reporting period but can be seen to be fluctuating which appears consistent with historical cyclic trends; • NH₃ (< 0.1 mg/L) is at non detection rates; • TOC (10 mg/L) is consistent with previous monitoring period reflecting natural conditions; No significant variations or anomalies were recorded for any analyte tested in this location during this monitoring period from the data available.
WM6	WM6 is located to the west of the void adjacent to Evaporation Dam 3 North. Based on the results provided in Table 7.21 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 785.8 m RL) is consistent with previous reporting period; • pH (average 5.85) is slightly acidic, but stable and consistent with previous reporting period; • EC (average 13,575 μS/cm) represents brackish to slightly saline water, consistent with previous reporting period; • SO₄ (average 335.5 mg/L) mirrors EC's stable trend; • Pb (average 0.006 mg/L) and Zn (average 0.269 mg/L) are both lower than the previous reporting period are generally consistent with historical fluctuations. • NH₃ (< 0.1 mg/L) is at non detection rates; • TOC (5 mg/L) is consistent with previous monitoring period reflecting natural conditions; All trends are relatively consistent and there is no indication of contamination from mining or Bioreactor activities.
WM7	Decommissioned. Veolia has submitted a licence amendment application to remove this monitoring point from the licence. We expect this to be finalised in the next reporting period.
MW8S	MW8S is located northern side of ED3N. Based on the results provided in Table 7.22 (refer Appendix 4), the groundwater quality at this location can be described as: • SWL (average 785.4 m RL) was consistent with long term average since 2004; • pH (average 6.85) near neutral and consistent with previous reporting period;

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	- EC (average 11650 $\mu\text{S}/\text{cm}$) remains stable with previous reporting period results; SO_4 (average 1405 mg/L) shows a slight decreasing trend but is generally consistent with previous periods; - Pb (average 0.15 mg/L) shows an increasing trend while Zn (average 4.98 mg/L) is seen to be declining from previous reporting period. NH_3 (< 0.1 mg/L) is at non detection rates; - TOC (11 mg/L) is consistent with previous monitoring period reflecting natural conditions; The fluctuations noted could be attributed to the recharging of this well only following significant wet weather events which indicates that this well intercepts the shallow unconfined aquifer. There is no indication of contamination from mining or Bioreactor activities.
MW8D	MW8D is located adjacent to MW8S. Based on the results provided in Table 7.23 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 785.95 m RL) was consistent with long term average since 2004; - pH (average 6.7) slightly acidic to neutral consistent with previous reporting period. Noting that Quarter 2 result (7.58 mg/L) is abnormal from the long term average - EC (average 10550 $\mu\text{S}/\text{cm}$) represents brackish water which is consistent with previous readings; SO_4 (average 4702.5 mg/L) mirrors EC consistent with previous periods; - Pb (average 0.0007 mg/L) and Zn (average 17.9 mg/L) are both consistent with previous periods; NH_3 (< 0.1 mg/L) is at non detection rates; - TOC (4 mg/L) is consistent with previous monitoring period reflecting natural conditions; All trends indicate fairly stable concentrations with no evidence of contamination from mining or Bioreactor activities.
MW9S	MW9S is located on the northwest side of ED3N. Based on the results provided in Table 7.24 (refer Appendix 4), the groundwater quality at this location can be described as: - SWL (average 786.6) was consistent with previous reporting period; - pH (average 6.8) close to neutral consistent with previous reporting period; - EC (average 11,100 $\mu\text{S}/\text{cm}$) remains stable, consistent with previous reporting period for brackish water; SO_4 (average 5042.5 mg/L) is lower than the previous reporting period and consistent with previous periods; - Pb (average 0.0003 mg/L) and Zn (average 1.428 mg/L) were both generally consistent with historical results noting that Quarter 1 (4.77 mg/L) was substantially anomalous with historical readings. NH_3 (< 0.1 mg/L) is at non detection rates;

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	TOC (6 mg/L) reflecting natural conditions is consistent with historical results; No significant variations or anomalies were recorded for any analyte tested at this location during this monitoring period.
MW10S	MW10S is located on the northeast side of ED3. No sampling of MW10S could be undertaken during the reporting period as this well was continually dry. This has been a consistent observation since the well was commissioned in 2007. No data is available to produce tables or graphs for this monitoring point.

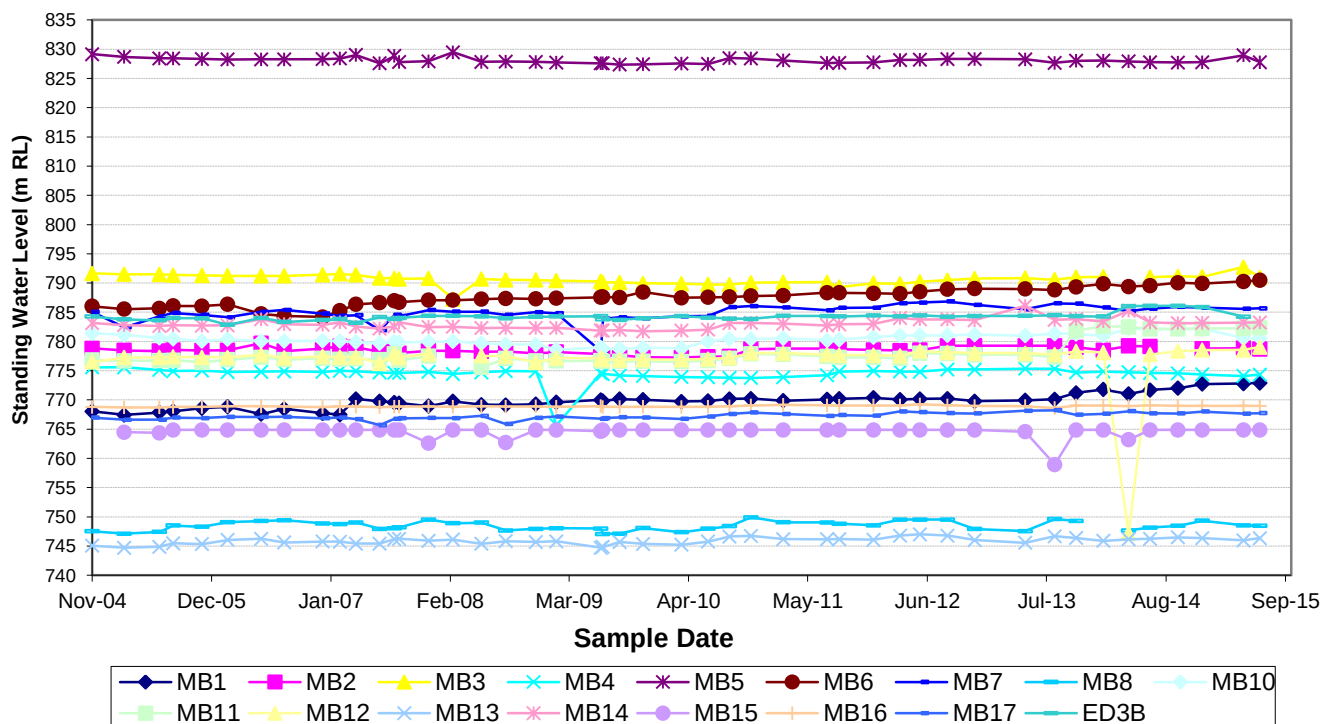


Figure 3.2.5A – Groundwater Levels – MB1 to MB17 and ED3B

3. Bioreactor Environmental Monitoring

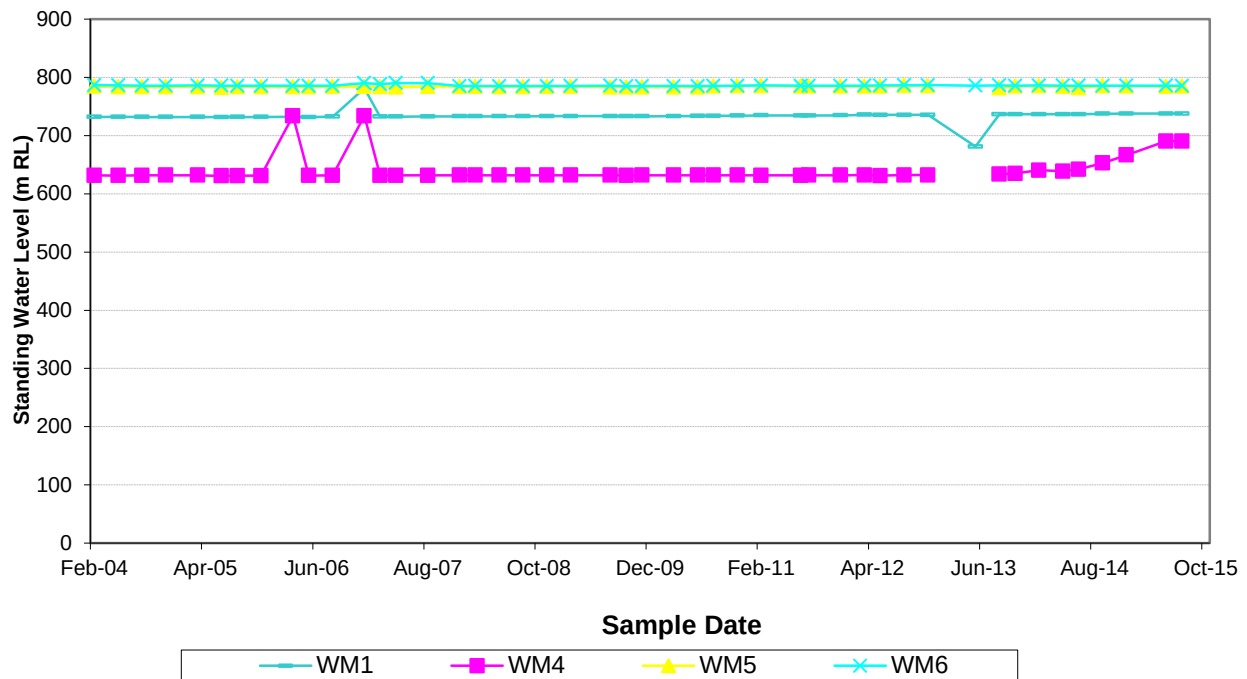


Figure 3.2.5B – Groundwater Levels – WM1 to WM6

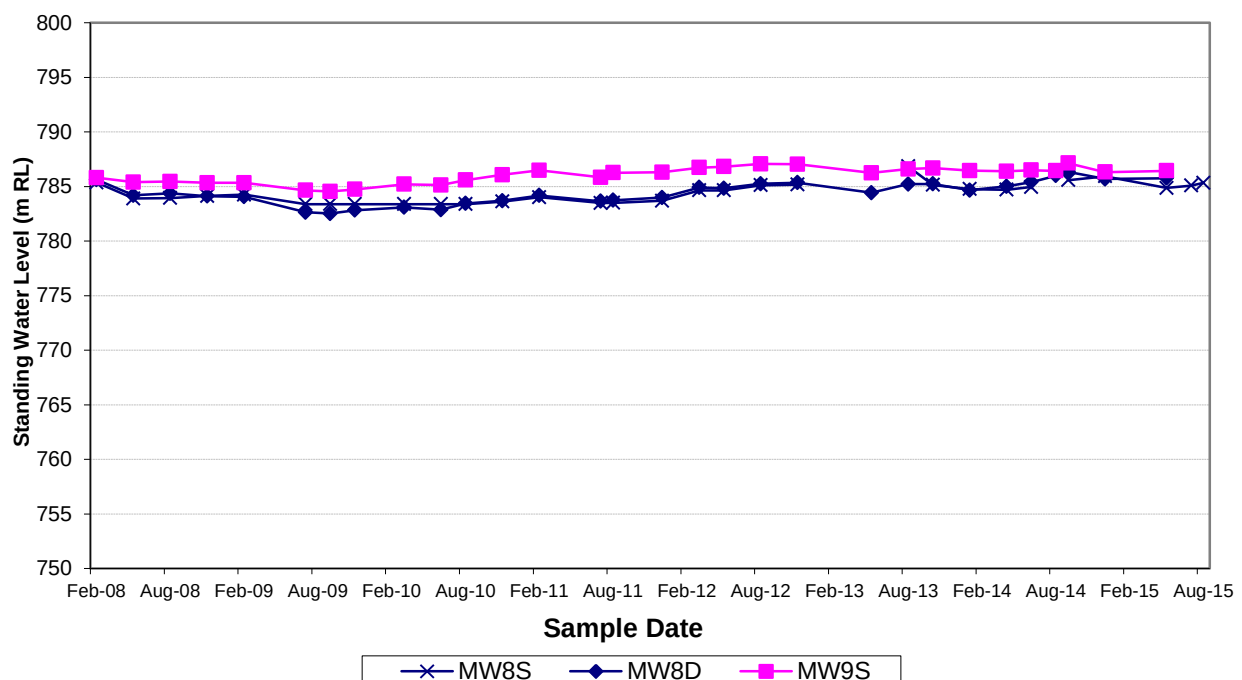


Figure 3.2.5C – Groundwater Levels – MW8S to MW10S

3. Bioreactor Environmental Monitoring

3.2.6 Bioreactor Piezometers Level Monitoring Results

Measurements for groundwater standing water levels (SWL) in the vicinity of the Bioreactor were undertaken at 5 out of 6 piezometers around the landfill void in accordance with the EPL and have been documented in the Annual Return. Each location consists of a shallow (reference A) and deep (reference B) piezometer.

The findings of the monitoring are summarised in Table 3.2.6 below and detailed quarterly levels are provided in Tables 8.1 – 8.5 (refer **Appendix 4**)

Table 3.2.6: Bioreactor Piezometers Level Monitoring Results

Parameter	Results/Discussion
P38A & P38B	Access to the monitoring location P38 has been restricted by Site Management due to safety concerns regarding the instability of this area of the void. The EPA has been notified of the geotechnical safety concerns therefore monitoring of this site ceased in 2010. Veolia have submitted a licence variation application to remove this monitoring point and expect this to be finalised in the next reporting period.
P44A & P44B	P44 is located east of the void. Standing water levels are presented in Table 8.1 (refer Appendix 4). SWL in P44A (shallow aquifer)) indicated a variable standing water level from 717.69 metres Relative Level (m RL) to 718.99m RL during this reporting period, similar to previous trends, indicative of rainfall and infiltration influence. SWL in P44B (deep) has increased approximately 10 m from the previous reporting period and is trending upward. This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.
P45A & P45B	P45 is located east of the mine void, and to the south of P44. Standing water levels are presented in Table 8.2 (refer Appendix 4). SWL in P45A (shallow) showed a range of 724.66m RL to 726.22m RL, stable and is approximately 10 m higher than previous reporting periods. SWL in P45B (deep) fluctuated between 724.31 m RL and 725.91 m RL and is about 5m higher than previous reporting periods. This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.
P58A & P58B	P58 is located west of the void. Standing water levels are presented in Table 8.3 (refer Appendix 4). SWL in P58A (shallow) showed a range of 763.85m RL to 768.382m RL and is stable.

3. Bioreactor Environmental Monitoring

Parameter	Results/Discussion
	SWL in P58B (deep) is similar to previous reporting period fluctuating between 754.86 m RL and 756.15 mRL.
P59A & P59B	P59 is located west of the void and to the south of P58. Standing water levels are presented in Table 8.4 (refer Appendix 4). SWL in P59A (shallow) ranged from 787.33m RL to 787.60 m RL in this reporting period, consistent with previous reporting period. SWL in P59B (deep) ranged between 786.78 and 788, which is almost identical to the level within the shallow piezometer as per previous reporting periods.
P100A & P100B	P100 is located northeast of the void. Standing water levels are presented in Table 8.5 (refer Appendix 4). SWL in P100A (shallow) is lower than previous reporting periods averaging between 738.88 m RL to 740.05 m RL. P100B (deep) averaged between 707.28 m RL and 719.05 m RL which indicates water above the base level of 698.29 m RL which has been recorded in previous periods. This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.

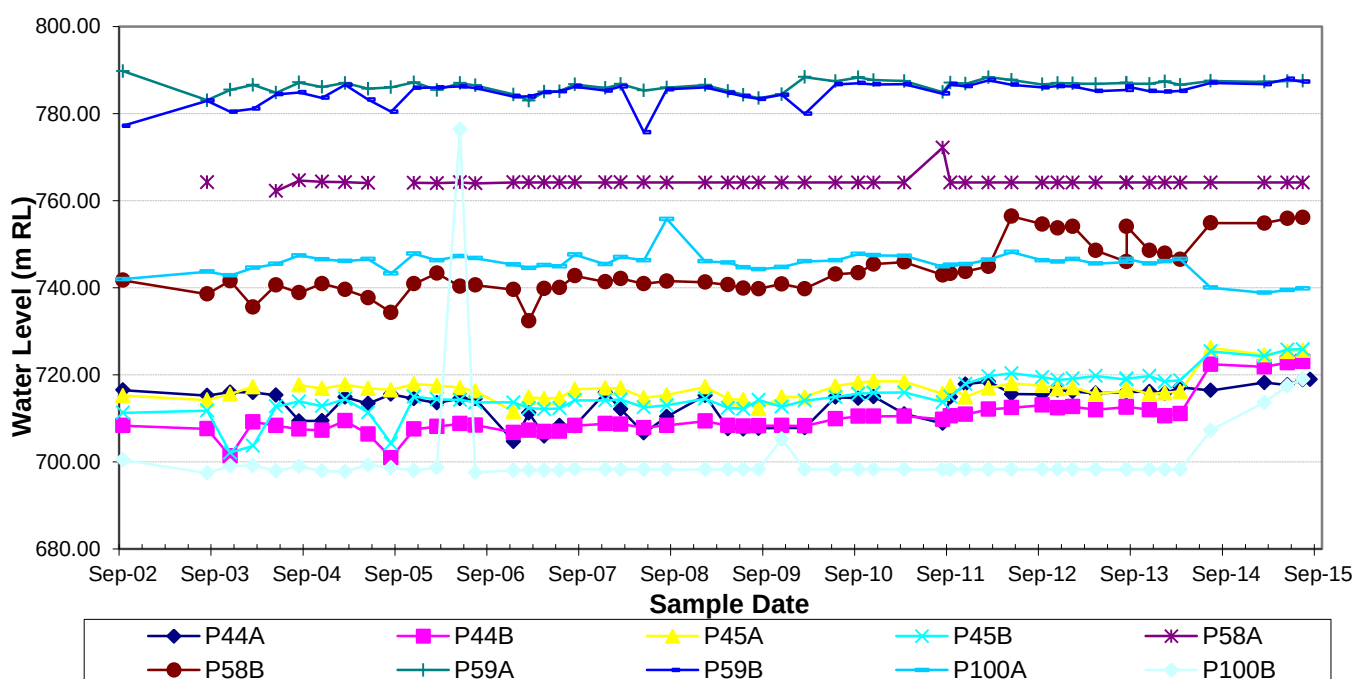


Figure 3.2.6.1 – Piezometer Standing Water Levels – P44 to P100

3. Bioreactor Environmental Monitoring

3.2.7 Bioreactor Evaporation Dam Volume Monitoring Results

The Evaporation Dam 3 (ED3) system comprises extracted (and treated) leachate from the landfill void and captured stormwater. The water volume has to be maintained in Evaporation Dam 3 to below 323 Megalitres as specified in the EPL.

Water levels are taken monthly as detailed in **Table 3.2.7**, which shows that the dam levels have been kept at an average of 213.99 Megalitres in this reporting period. The subsequent graph, **Figure 3.2.7.1** shows the overall trend over time.

Table 3.2.7: ED3 Water Volume Monitoring Results

Date	ED3S	ED3N Lagoon 1	ED3N Lagoon 2	ED3N Lagoon 3	ED3N Lagoon 4	ED3 System Total Volume
Sep-14	79.4	24.33	13.58	18.06	45.7	181.07
Oct-15	83	23.37	17.94	17.32	43.5	185.13
Nov-14	83	23.08	18.58	16.4	41.65	182.71
Dec-14	83	22.25	21.44	17.19	44.44	188.32
Jan-15	96.4	22.08	17.44	17.46	50.88	204.26
Feb-15	115	21.58	21.34	18	47.94	223.86
Apr-15	104.4	21.57	15.11	16.93	51.88	209.89
Apr-15	98	21.74	13.06	17.32	61.1	211.22
May-15	112.1	21.49	15.78	17	62.5	228.87
Jun-15	109.6	21.66	20.03	17.19	66.85	235.33
Jul-15	121.4	23.28	22.12	17.66	67.17	251.63
Aug-15	129	23.63	21.33	17.66	74	265.62
Minimum	79	21.49	13.06	16.4	41.65	181.07
Mean	89.88	22.505	18.15	17.35	54.80	213.99
Maximum	115	24.33	22.12	18.06	74	265.62

3. Bioreactor Environmental Monitoring

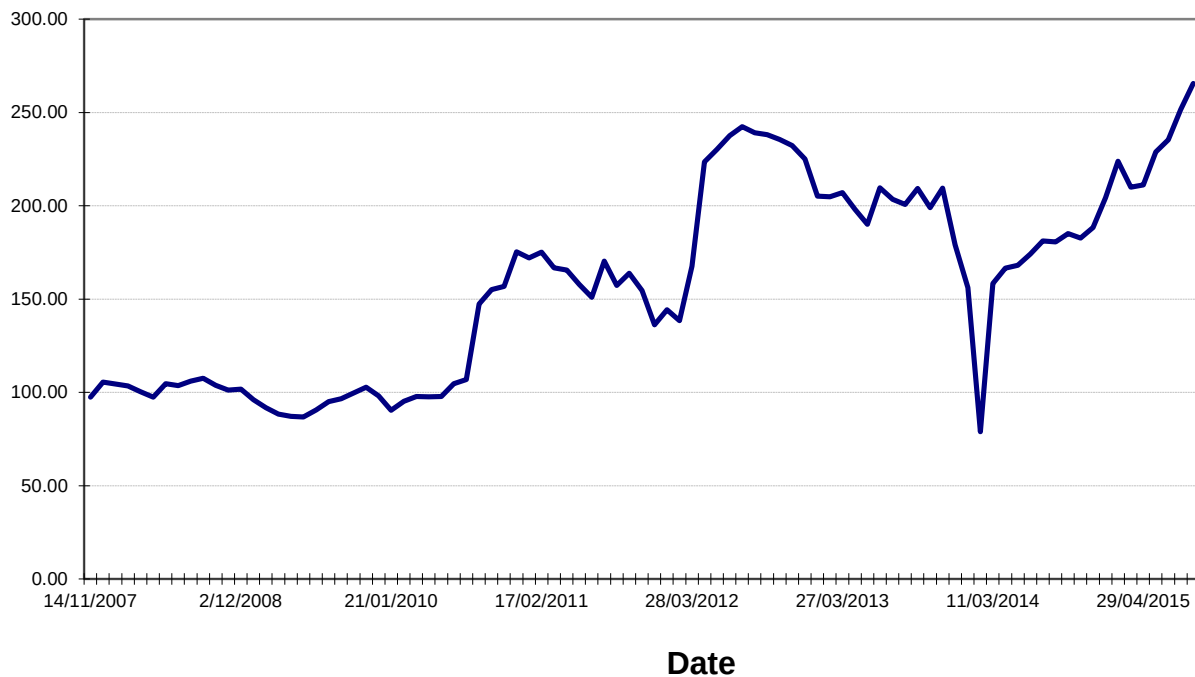


Figure 3.2.7.1 – Evaporation Dam 3 Water Volume (Megalitres)

Part 2 EPL 11455

Crisps Creek Intermodal Facility

4. IMF Operations

4 Intermodal Facility Operations

Veolia operates the Crisps Creek Intermodal Facility (IMF) which is comprised of a hardstand located adjacent to the regional rail network (approximately 1 km south of Tarago train station and 8 km from the Bioreactor) to enable transfer of containerized waste received by rail from Sydney onto road trucks and subsequent to the Bioreactor for disposal.

4.1 IMF Licence Conditions

The IMF is operated under EPL 11455 which details the operating conditions and environmental monitoring requirements as noted in **Table 4.1**.

Table 4.1: IMF Licence Conditions

Condition	Compliance with Condition
1. Administrative conditions	Noted
2. Discharges to air and water and application to land	Noted
3. Limit conditions	L1. Pollution of Waters All clean surface and storm water collected at the IMF was diverted to the onsite retention system for storage, as part of the first flush stormwater management system, in this reporting period. Following rainfall events, surface water monitoring was undertaken to assess the water quality prior to discharge into the Mulwaree River. L5. Waste All waste received at the IMF during this reporting period was in accordance with the waste types permitted in the EPL, received via rail from the Clyde Transfer Terminal in Sydney. All waste was maintained in sealed containers and transported to the Bioreactor on the same day. L6. Noise Limits No noise complaints were received during this reporting period indicating that noise from operational activities at the IMF was likely maintained within the 35 dB(A) LAeq (15 minute) criteria at the nearest residential receiver. Similarly it can be inferred that noise from freight trains did not exceed 45 dB(A) LAeq (15 minute and 50 dB(A) LAeq (15 minute before and after 7:00 am respectively. Noise monitoring will be undertaken by Veolia on the receipt of any such complaints. L7. Hours of Operation All operational activities at the IMF including haulage of waste to the Bioreactor were undertaken between 6:00 am and 10:00 pm, Monday to Saturday during this reporting period as permitted under the DA. Veolia were granted an exemption by the EPA to operate Sunday 21 December 2014.

4. IMF Operations

Condition	Compliance with Condition
4. Operating conditions	L8. Potentially Offensive Odour No odour complaints were received for the IMF during this reporting period.
	01. Activities Carried out in Competent Manner All licenced activities undertaken at the IMF in this reporting period were carried out in a competent manner and under a high standard of environmental management for which Veolia is certified under ISO 14001.
	02. Maintenance of Plant and Equipment The maintenance and operation of all plant and equipment on the premises associated with the licenced activities was undertaken in a proper and efficient condition as required by qualified technicians. All major plant and equipment at the site is stored in a computerised maintenance management system in order to schedule and complete the required maintenance. All Veolia operators hold the appropriate qualifications and licenses to operate plant and equipment used as part of IMF operations.
	03. Dust Control All operations and activities were carried out at the IMF in a manner to minimise dust at the boundary of the premises. These included operating on a hardstand site with fully paved access roads to the site. All haulage of waste to the Bioreactor occurred within enclosed containers. Monitoring for the presence and quantity of depositional dust is undertaken monthly to verify the performance.
	04. Stormwater and Wastewater Management – Operating Phase The first flush stormwater management system was operated effectively in this reporting period in accordance with the EPL requirements to capture all the clean storm and surface water from the paved and sealed areas of the IMF. No sewage was removed from the IMF in this reporting period. Uncontaminated stormwater is permitted under the EPL to be utilised in vegetated areas of the IMF, as requirement.
	05. Tracking of Mud and Waste As all waste container unloading and movements occurred within enclosed containers on a hardstand site, tracking of mud and waste from the IMF did not occur during this reporting period. No opening of containers was required to be undertaken at the IMF during this reporting period.
	06. Waste Transportation All containers utilised in the transportation of waste in this reporting period were maintained in accordance with the EPL requirements to minimise potential odour emissions. All containers had rubber seals to prevent the leakage of leachate during transport and handling activities.
	07. Fire Extinguishment There were no fires at the IMF during this reporting period.
	08. Fire Fighting Capability All Veolia operators are trained in handling emergency situations, which include fire fighting in accordance with site specific Emergency Response Plans. Fire extinguishers and a 20,000 litre water tank were maintained onsite during this reporting period to enable effective fire fighting capabilities. In addition, Crisps Creek and Mulwaree River are located adjacent to the IMF

4. IMF Operations

Condition	Compliance with Condition
	as approved and readily available water source for fire fighting. The Tarago Fire Brigade is also located approximately 1 km from the site which enables fast mobilisation at the site.
5. Monitoring and recording conditions	Noted, all compliance monitoring was carried out in this reporting period in according to EPL requirements, the results of which are detailed, along with any non conformances in Section 5.
6. Reporting conditions	Noted and addressed in this AEMR and the annual return documents, where relevant. Notifications to the EPA were undertaken in a timely fashion.
General conditions	Noted.
Pollution studies and reduction programs	N/A
Special Conditions	N/A

5. IMF Environmental Monitoring

5 IMF Environmental Monitoring

5.1 IMF Monitoring Points

Veolia is required to monitor environmental performance of the IMF under the site EPL. **Table 5.1** details the EPA ID, Veolia monitoring point identification, frequency and the type of monitoring undertaken at each licensed point. A monitoring location plan is included in **Appendix 3**.

Table 5.1: IMF Licensed Monitoring Points

EPA ID	Veolia ID	Frequency	Type of Monitoring
1	Site 110 - Upstream	6 x Annually	Surface Water
2	Site 150 - Downstream		
3	IMF First Flush		
4	DG18 IMF	Monthly	Dust / Particulates

Veolia also undertakes additional surface water quality monitoring at Site 130 (located upstream of Crisps Creek Intermodal in Mulwaree River) to provide additional background quality information.

5.2 IMF Monitoring Results

5.2.1 IMF Surface Water Monitoring Results

Surface water quality monitoring at 3 monitoring locations was undertaken as required by the EPL, the findings of which are summarised in **Table 5.2.1**. Detailed quality results are provided in **Tables 9.1 to 9.4** (refer **Appendix 4**). The key quality indicators selected to identify any contamination in the receiving surface waters from site operations include:

- pH,
- Electrical Conductivity (EC),
- Sulphate (SO₄),
- Iron (Fe),
- Zinc (Zn),
- Ammonia (NH₃), and
- Total Organic Carbon (TOC).

These are depicted in trend graphs **Figures 5.2.1.1 to 5.2.1.4** (refer **Appendix 5**).

5. IMF Environmental Monitoring

Table 5.2.1: IMF Surface Water Monitoring Results

Parameter	Results/Discussion
Site 110 - Upstream	Site 110 is located upstream of the IMF in Crisps Creek. It is approximately 8 km downstream of the Bioreactor. Results provided in Table 9.1 (refer Appendix 4) indicate the following trends: - pH is close to neutral (average 7.73), slightly higher than the previous reporting period; - EC (average 1448 $\mu\text{S}/\text{cm}$) is slightly higher but generally consistent with the previous period and representative of fresh water salinity; SO_4 (average 150 mg/L) is slightly lower but generally consistent with previous reporting period; - Fe (average 0.7) is consistent with previous reporting periods, whilst Zinc indicates a fluctuating trend (average 0.186 mg/L), consistent with historical cyclic results; NH_3 (average 0.12 mg/L) is slightly above previous reporting periods but continues to be at almost non-detection levels. - TOC (average 11.8 mg/L) is lower than the previous reporting period and is generally reflective of natural organic matter in streams. While the indicator trends for this location indicate some variability over time, this is not uncommon when sampling intermittent streams.
Site 130 - Upstream	Site 130 is located upstream of the IMF in the Mulwaree River. Results provided in Table 9.2 (refer Appendix 4) indicate the following trends: - pH is close to neutral (average 7.78), slightly higher than the previous reporting period; - EC (average 584 $\mu\text{S}/\text{cm}$) is higher than the previous reporting period but representative of fresh water salinity; SO_4 (average 29.5 mg/L) is also slightly higher but generally consistent with previous reporting period; - Fe and Zn, average 0.43 mg/L and 0.02 mg/L respectively indicate consistency with fluctuating cycles in previous reporting periods; NH_3 (< 0.1mg/L) continued to be not detected during this reporting period. - TOC (average 9.3 mg/L) is lower than previous reporting periods.
Site 150 – Mulwaree River	Site 150 is located 2 km downstream of the IMF on the Mulwaree River, which is also downstream of a railway bridge and Braidwood Road. Results provided in Table 9.3 (refer Appendix 4) indicate the following trends: pH (average 7.85) is slightly alkaline, consistent with the previous

5. IMF Environmental Monitoring

Parameter	Results/Discussion
	reporting period; • EC (average 1069 $\mu\text{S}/\text{cm}$) shows a slight upward trend but is generally consistent with the previous period and fresh water salinity; • SO_4 (average 105 mg/L) is also slightly higher, reflecting EC trend, but generally consistent with previous reporting period; • Fe and Zn, average 0.25 mg/L and 0.05 mg/L are lower than the previous reporting period but reflective of fluctuating cycles. • NH_3 ($< 0.1\text{mg}/\text{L}$) continued to be not detected during this reporting period. • TOC (average 10.8 mg/L), is slightly lower but generally consistent with previous reporting periods; These results are consistent with the trends for Site 110.
First Flush Stormwater Outlet	The IMF First Flush is located at the surface water outlet point of the site, prior to runoff into Crisps Creek. Results provided in Table 9.4 (refer Appendix 4) indicate the following trends: • pH (average 7.54) is close to neutral, consistent with the previous reporting period; • EC (average 267.67 $\mu\text{S}/\text{cm}$) shows a slight downward trend but is generally consistent with the previous period and fresh water salinity; • SO_4 (average 33.75 mg/L) is also slightly lower, reflecting EC trend, but generally consistent with previous reporting period; • Fe and Zn, average 0.91 mg/L and 0.79 mg/L are lower than the previous reporting period but reflective of fluctuating cycles. • NH_3 ($< 0.1\text{mg}/\text{L}$) continued to be not detected during this reporting period. • TOC (average 9.5 mg/L) which is lower than previous reporting periods;

5.2.2 IMF Air Quality Monitoring Results

Dust monitoring is undertaken monthly at 1 location at the IMF in accordance with the EPL. A summary of this reporting period is provided in **Table 5.2.2.1** and detailed in **Table 10** (refer **Appendix 4**).

The results at DG18 indicate an average level of total solid matter is $3.19 \text{ g}/\text{m}^2/\text{month}$, which is generally consistent with overall historical trends as seen in the subsequent graph, **Figure 5.2.2.1**. The handling of waste and associated operational activities at the IMF are undertaken in a manner to ensure minimal emissions of dust. This includes no opening of containerised waste on unloading and operating on hardstand site.

5. IMF Environmental Monitoring

Table 5.2.2: Dust Monitoring Results

Dust Gauge	Summary Total Solids (g/m2/month)		
	Minimum	Maximum	Average
DG18	0.5	8.4	3.19

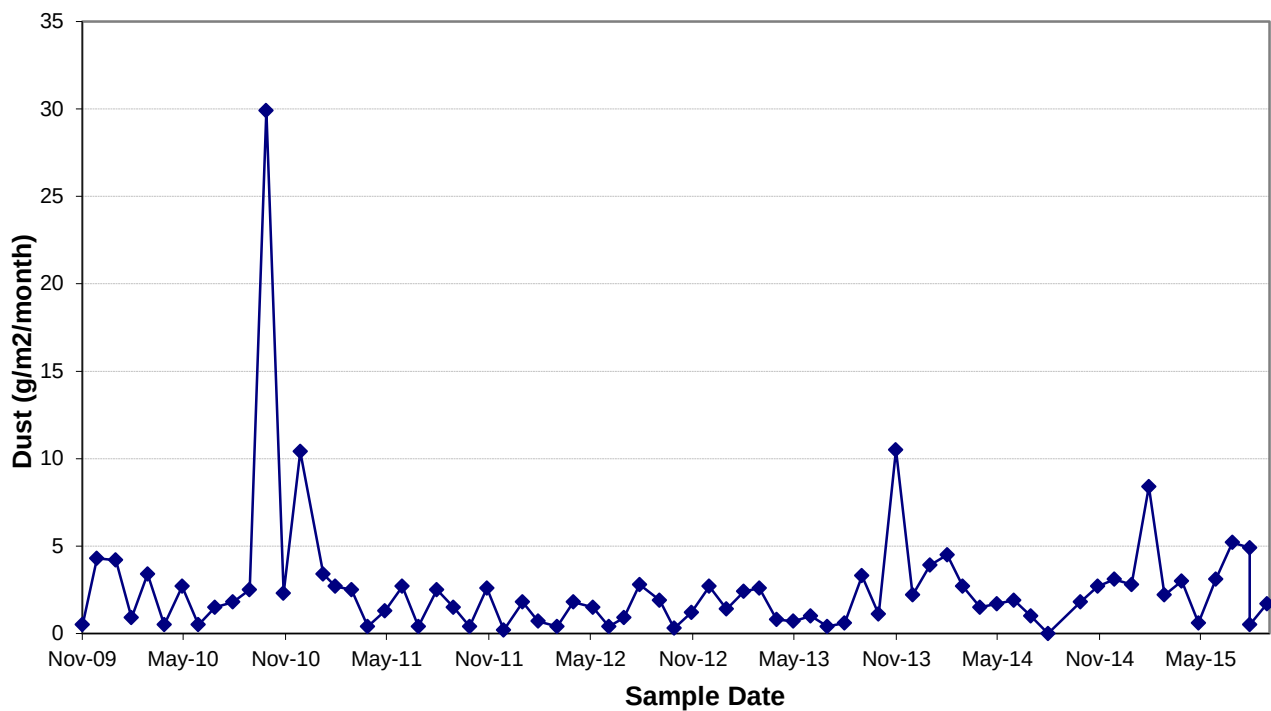


Figure 5.2.2.1 – IMF Depositional Dust Levels – DG18

6. Bioreactor and IMF Environmental Performance

- Based on the results of monitoring undertaken at both the Bioreactor and IMF sites in accordance with the respective EPLs, the overall environmental performance of the Woodlawn Eco Project in this reporting period can be demonstrated to be well managed.
- Non conformances resulting from missed sampling periods at certain locations relate to the lack of flow recorded at these points during sampling sessions conducted by monitoring consultants. This has been documented in the Annual Return which has been submitted to the EPA.
- Veolia received a Penalty Infringement Notice (PIN) and official caution for an odour detected on the 16th of January 2015. Veolia submitted a response to the EPA in regards to the PIN and, as of the end of the reporting period, it is still being reviewed by the EPA.
- In this reporting period, Veolia have also implemented the recommendations for environmental and operational improvements identified in the 2013/2014 AEMR.
- Additional improvements proposed for the 2014/2015 reporting period at the Bioreactor and the IMF are as follows in **Table 6.1**:

Table 6.1: 2013/2014 Reporting Period Recommendations

Item No.	Recommendation	2014-15 Action
1.	Implementing actions recommended from the most recent annual odour audit undertaken at the Bioreactor (report yet to be finalised);	All mandatory recommendations completed.
2.	Upgrades to the Leachate Treatment System at the Bioreactor, which currently comprises an Aeration Dam, Polymer Dosing System and a Settlement Tank to improve capacity to treat additional leachate from the void; This may include design and installation of additional settlement tanks.	A baffle has been installed in the leachate aeration dam and a new polymer dosing system has been installed in the treatment system. Performance of these upgrades is currently being monitored and will be reported in the 2015-16 AEMR.
3.	Consistent leachate treatment and operational monitoring is to be maintained to ensure leachate quality is kept at a level that does not produce offensive odour. The treated leachate is to be maintained at alkaline conditions in the lagoons for Evaporation Dam 3 North (ED3N-1, ED3N-2, and ED3N-3) to prevent reproduction of odour in stagnant condition.	Operational monitoring is conducted monthly and ED3-N dams have been maintained in an alkaline state ensuring odour is controlled from these storage ponds.
4.	Following up non conformances identified in the	Veolia employed an Environmental Officer

6. Bioreactor and IMF Environmental Performance

Item No.	Recommendation	2014-15 Action
	reporting period and documented both in the Annual Return and this AEMR. Corrective actions will include ensuring that missing analytes, monitoring periods and/or locations are further minimised with the adoption of the following practices:	at Woodlawn during the 2014-15 reporting period and have subsequently developed a monitoring matrix as identified as an action from the previous reporting year. This has improved Veolia's capacity to monitor frequencies for all monitoring points and will help to ensure non-compliances are reduced moving forward.
5.	Effectively communicating and promoting the monitoring requirements template developed in the previous monitoring period to monitoring personnel and updating the monitoring calendar for the new reporting period;	As indicated above, employment of an Environmental Officer has improved Veolia's monitoring capacity and negated the need for communication with an external party. A detailed monitoring matrix has been developed to ensure monitoring is conducted at the required frequency.
6.	Effectively communicating sample analysis requirements and liaising with the laboratory to ensure any missed testing is corrected immediately, including retaining samples to provide adequate time for review of analysis results; Continuing to refine automate sampling proformas.	The Environmental Officer has developed Chain of Custody master templates ensuring all analytes are correctly tested as per their required frequency. This has ensured no analytes have been missed during this reporting period.
7.	Liaising with the EPA to review the existing conditions on EPLs that are not practically complied with and streamlining monitoring requirements to reduce non conformances.	Veolia has submitted a licence variation application and this is currently being reviewed by the EPA.

Table 6.2: 2015/2016 Reporting Period Recommendations

Item No.	Recommendation
1.	Implementing actions recommended from the most recent annual odour audit undertaken at the Bioreactor (report yet to be finalised).
2.	Consistent leachate treatment and operational monitoring is to be maintained to ensure leachate quality is kept at a level that does not produce offensive odour. The treated leachate is to continue to be maintained at alkaline conditions in the lagoons for Evaporation Dam 3 North (ED3N-1, ED3N-2, ED3N-3 and ED3N-4) to prevent reproduction of odour in stagnant condition.

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References

References

- **Earth2Water (2010)** EPL - Annual Assessment of Woodlawn Bioreactor and Intermodal Facility Monitoring Data, 30 November 2010;
- **EPA (1996)** Environmental Guidelines: Solid Waste Landfills, January 1996;
- **Veolia (2014)** Annual Environmental Monitoring Report – Woodlawn Bioreactor and Crisps Creek Intermodal Facility, November 2014;

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Appendices

Appendices

Note: All documents appended to this Report are provided electronically.

Appendices

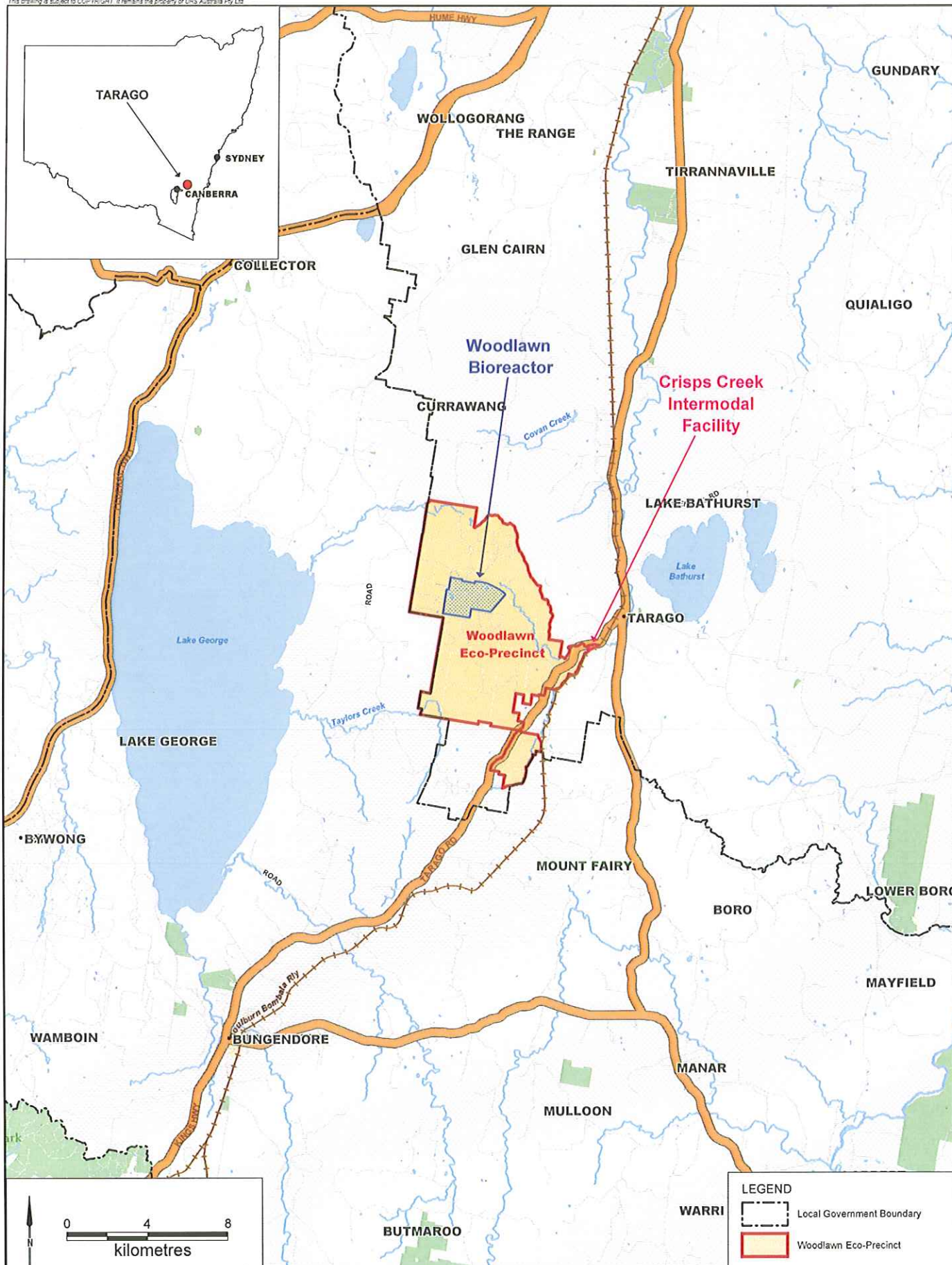
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Appendices

Appendix 1 Site Location Plan

Appendices

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Map compiled using MapInfo StreetView Data. © 2010 MapInfo Australia Pty Ltd. URS Australia and PSMA Australia Ltd. URS Australia, MapInfo Australia or PSMA Australia do not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that these companies shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Client VEOLIA ENVIRONMENTAL SERVICES PTY LTD	Project WOODLAWN EXPANSION PROJECT	Title WOODLAWN ECO-PRECINCT LOCATION
	Drawn: SB Approved: LO Date: 06/08/2010 Job No: 43177703 File No: 43177703.018.wor	Figure: 1.1

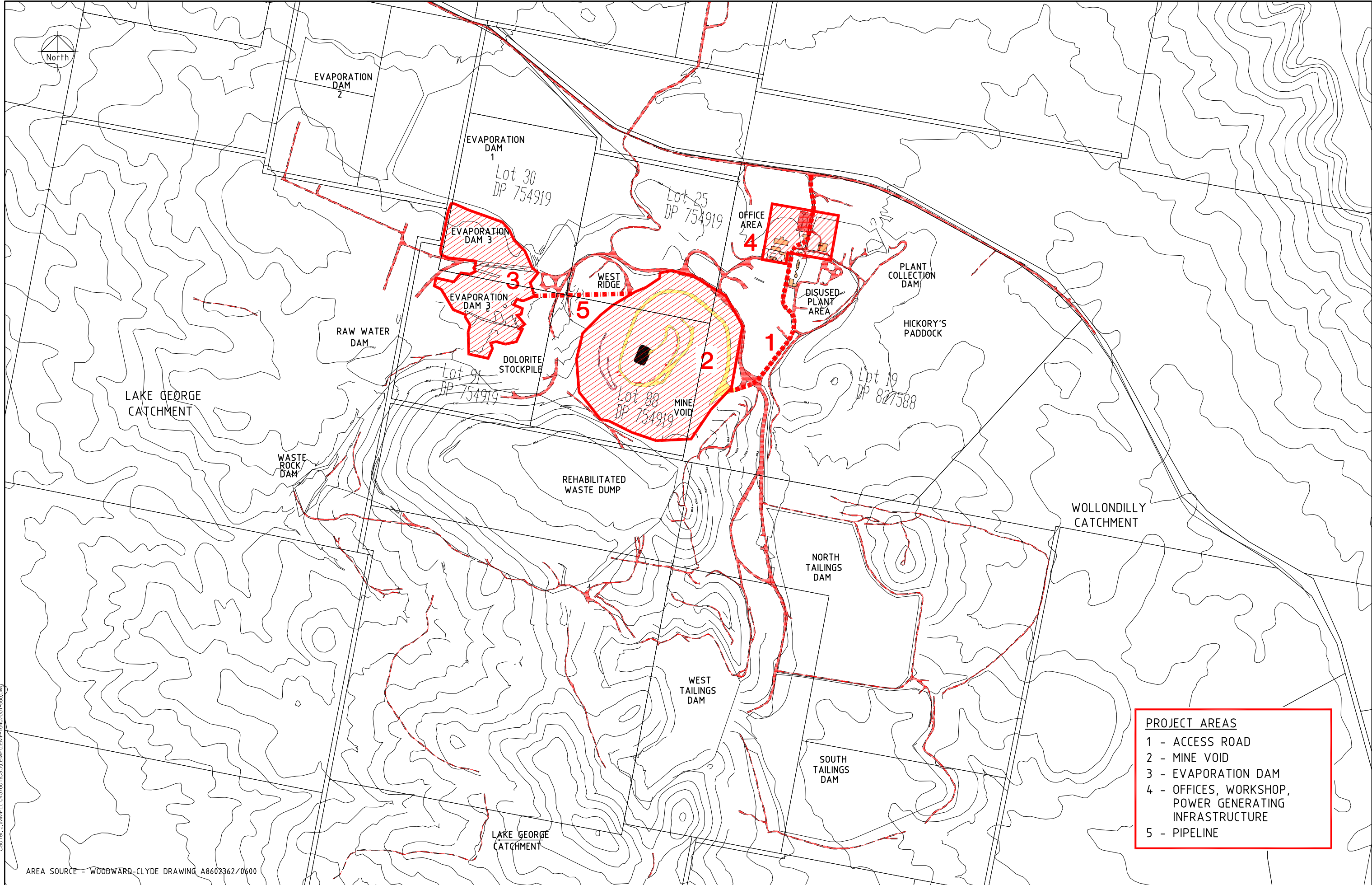
Appendices

Appendix 2

EPL Boundary

Appendices

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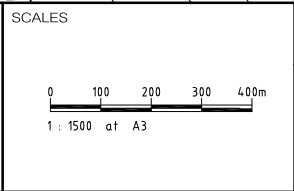


- PROJECT AREAS**
- 1 - ACCESS ROAD
 - 2 - MINE VOID
 - 3 - EVAPORATION DAM
 - 4 - OFFICES, WORKSHOP, POWER GENERATING INFRASTRUCTURE
 - 5 - PIPELINE

REVISIONS				
No.	BY	DATE	DESCRIPTION	APPD
A	SGG	23.6.04		

Before commencing work, all controlling dimensions on the drawings must be verified on the site, particularly those relative to property alignments, other structures, and services.

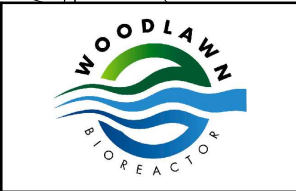
Figured dimensions take preference over scaled. If in doubt, ask.



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DESIGN	PREPARED	CHECKED	PASSED
DRAFTING	PM		DATE

**maunsell**

Maunsell Australia Pty Ltd A.B.N. 20 093 846 925
An AECOM company



WOODLAWN MINE SITE	
LICENCED PREMISES	
10407001-560	A

Appendices

Appendix 3

Monitoring Locations Plan

Appendices

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ISSUE	AMENDMENT	DRAWN	DATE
A	INITIAL ISSUE	BR	12/10/2007
B	ADDITIONAL SITES ADDED	SH	01/06/2015
C	WELL POSITIONS AMENDED	MK	18/09/2015
D	REDUNDANT WELLS REMOVED & PLAN RESCALED	MK	06/10/2015
E	WELL LABELLING ENHANCED	MK	19/10/2015

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LandTeam

A1 SHEET	VEOLIA ENVIRONMENTAL SERVICES	WOODLAWN BIOREACTOR COLLECTOR ROAD, TARAGO
WOODLAWN BIOREACTOR SITE MONITORING LOCATIONS		DESIGNED: N/A DRAWN: MK CHECKED: JK DRAWING No.
DATUM	N/A	CONTOUR INTERVAL
N/A	N/A	DATE
19/10/2015	16800-220	ISSUE E

Appendices

Appendix 4

Tabulated Monitoring Results

Appendices

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Table 1 - Landfill Gas Extraction Booster Results

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Date	Carbon Dioxide	Dry Gas Density	Moisture Content	Molecular weight of stack gases	Oxygen	Temperature	Volatile Organic Compounds	Volumetric Flow rate	Volumetric Flow rate	Methane
	%	%	%	mg/m3	%	Deg C	mg/m3	m3/hour	m3/sec	%
1/06/2011	37.04			N/A	1.09	22.2		771.83	0.21	
14/10/2011	34.8	11617	8.5	30.17	1.6	44.7	0.09	5380	1.49	48.6
6/05/2013	36.1			N/A	0.53	32.2		2124	0.59	61.4
29/05/2014	44.7	105	7.8	N/A	1.68	47.8		2520	0.7	48
5/08/2015	46.9	104.2	7.6	N/A	0.3	39.1		3010	0.84	50.4

OVERALL

Minimum	34.8	104.2	7.6	30.17	0.3	22.2	0.09	771.83	0.21	48
Maximum	46.9	11617	8.5	30.17	1.68	47.8	0.09	5380	1.49	61.4
Average	39.91	3942.07	7.97	30.17	1.04	36.7	0.09	2761.17	0.77	52.10
StdDev	5.49	N/A	N/A	N/A	0.62	10.27	N/A	1683.88	0.47	6.28
Count	5	3	3	1	5	5	1	5	5	4

Table 2 - Surface Gas Monitoring Results

Quarter 1 - Surface Gas Results					
1/12/2014					
Transect	Time	No of measurements	Min Methane(%)	Max Methane (%)	Average Methane (%)
1	11:30:00 PM	11	0.0003	0.0098	0.0033
2		11	0.0003	0.0133	0.0044
3		12	0.0004	0.0058	0.0028
4		12	0.0002	0.0055	0.0021
5		13	0.0006	0.0117	0.0043
6		13	0.0003	0.0082	0.0023
7		13	0.0024	0.0228	0.0095
8		12	0.0017	0.0207	0.0076
9		14	0.0008	0.0100	0.0050
10		10	0.0010	0.0179	0.0042
11		10	0.0008	0.0063	0.0037
12		12	0.0009	0.0111	0.0037
13	2:30:00 PM	10	0.0013	0.0330	0.0060
Total Measurements		153	0.000	0.023	0.005

Quarter 3 Surface Gas Results					
7/07/2015					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	8:30:00 AM	10	0.0062	0.0350	0.0225
2		11	0.0076	0.0288	0.0172
3		10	0.0040	0.0281	0.0150
4		19	0.0006	0.0227	0.0064
5		10	0.0009	0.0087	0.0035
6		11	0.0005	0.0022	0.0010
7		13	0.0004	0.0019	0.0011
8		12	0.0005	0.0085	0.0026
9		12	0.0003	0.0058	0.0017
10		15	0.0004	0.0083	0.0023
11		15	0.0011	0.0103	0.0037
12		16	0.0006	0.0097	0.0033
13	10:15:00 AM	10	0.0015	0.0087	0.0039
Total Measurements		164	0.000	0.035	0.006

Quarter 2 - Surface Gas Results					
5/03/2014					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	8:00:00 AM	11	0.0017	0.1970	0.0348
2		11	0.0025	0.0067	0.0039
3		11	0.0028	0.0162	0.0064
4		13	0.0017	0.0067	0.0043
5		12	0.0012	0.0100	0.0028
6		11	0.0009	0.0032	0.0019
7		11	0.0010	0.0032	0.0020
8		10	0.0009	0.0097	0.0038
9		10	0.0017	0.0076	0.0036
10		15	0.0004	0.0093	0.0031
11		15	0.0004	0.0037	0.0014
12		16	0.0006	0.0076	0.0027
13	12:00:00 PM	11	0.0007	0.0078	0.0027
Total Measurements		157	0.000	0.197	0.006

Quarter 4 - Surface Gas Results					
1/09/2015					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	11:30:00 AM	7	0.0008	0.0038	0.0020
2		11	0.0007	0.0181	0.0057
3		10	0.0010	0.0222	0.0067
4		14	0.0007	0.0153	0.0045
5		15	0.0004	0.0237	0.0065
6		15	0.0002	0.0166	0.0044
7		13	0.0007	0.0078	0.0033
8		13	0.0005	0.0056	0.0019
9		13	0.0006	0.0055	0.0021
10		13	0.0009	0.0053	0.0022
11		12	0.0007	0.0082	0.0033
12		11	0.0008	0.0063	0.0026
13	13:15:00 AM	10	0.0015	0.0096	0.0043
Total Measurements		157	0.000	0.024	0.004

2014/2015 Surface Gas Results Summary			
	Minimum	Maximum	Average
Methane (%)	0.000	0.197	0.005

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Note: A TAN coloured cell indicates that the indicated value is LESS THAN (<) indicated

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Table 4.1 - Dust Deposition Results - DG22 East Void

Site Name	ALS Batch Code	Date	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG22	995053	Oct-14	1.4	0.4	33	0.2	1.8	1.8
DG22	996818	Nov-14	1.5	0.7	92	0.9	2.2	3.1
DG22	998680	Dec-14	0.9	0.3	34	0.2	1.2	1.2
DG22	1001148	Jan-15	1.1	0.5	110	2.3	1.6	3.9
DG22	1005718	Feb-15	0.21	0.17	9	0.2	0.4	0.4
DG22	1006172	Mar-15	0.72	0.25	18	0.2	1	1
DG22	1008524	Apr-15	0.67	0.19	100	0.2	0.9	0.9
DG22	02162-001	May-15	0.58	0.22	10	0.2	0.8	0.8
DG22	02637-001	Jun-15	2.5	1	49	0.2	3.5	3.5
DG22	03064-001	Jul-15	0.85	0.2	40	0.2	1	1
DG22	03297-003	Aug-15	0.8	0.2	12	0.2	1	1
DG22	03563-002	Aug-15	0.52	0.38	32	0.2	0.9	1.1
Min			0.21	0.17	9	0.2	0.4	0.4
Avg			0.98	0.38	44.92	0.43	1.36	1.64
Max			2.5	1	110	2.3	3.5	3.9
stDev			0.60	0.25	36.02	0.62	0.83	1.18

Table 4.2 - Dust Deposition Results - DG24 West Void

Site Name	ALS Batch Code	Date	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG24	995054	Oct-14	3	2	44	0.7	5	5.7
DG24	996819	Nov-14	2.7	1.8	110	0.2	4.5	4.5
DG24	998681	Dec-14	2.4	2.2	64	3.8	4.6	8.4
DG24	1001149	Jan-15	2.4	1	110	3.7	3.4	7.1
DG24	1005719	Feb-15	3	1.4	12	1	4.4	5.4
DG24	1006173	Mar-15	2.2	0.7	27	5.2	2.9	8.1
DG24	1008525	Apr-15	2.4	1.8	110	13.1	4.2	17
DG24	CA150216	May-15	0.77	0.33	16	0.4	1.1	1.5
DG24	CA150263	Jun-15	6.62	1.48	63	0.2	8.1	8.1
DG24	CA150306	Jul-15	0.45	0.25	39	0.3	0.7	1
DG24	CA150329	Aug-15	0.11	0.2	16	0.2	0.2	0.2
DG24	CA150356	Aug-15	1.48	0.72	30	1.2	2.2	3.4
Min			0.11	0.2	12	0.2	0.2	0.2
Avg			2.29	1.16	53.42	2.50	3.44	5.87
Max			6.62	2.2	110	13.1	8.1	17
stDev			1.68	0.72	37.98	3.75	2.20	4.52

Table 4.3 - Dust Deposition Results - DG28 Pylara

Site Name	ALS Batch Code	Date	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG28	995055	Oct-14	0.44	0.76	38	0.2	1.2	1.2
DG28	996819	Nov-14	2.2	2.4	110	1.1	4.7	5.8
DG28	998682	Dec-14	1.9	1	52	1.1	2.9	4
DG28	1001150	Jan-15	1.2	0.7	100	0.2	1.9	1.9
DG28	1005720	Feb-15	5.4	8.5	13	1.9	13.9	16
DG28	1006174	Mar-15	1.8	2.3	22	0.4	4.1	4.5
DG28	1008526	Apr-15	6.1	1.6	110	3.8	7.7	12
DG28	CA150216	May-15	2.42	0.98	22	0.2	3.4	3.4
DG28	CA150263	Jun-15	4.06	2.74	55	0.2	6.8	6.8
DG28	CA150306	Jul-15	4.7	1.1	57	0.5	5.8	6.3
DG28	CA150329	Aug-15	1.35	0.95	24	0.6	2.3	2.9
DG28	CA150356	Aug-15	0.66	0.74	42	0.2	1.4	1.4
Min			0.44	0.7	13	0.2	1.2	1.2
Avg			2.69	1.98	53.75	0.87	4.68	5.52
Max			6.1	8.5	110	3.8	13.9	16
stDev			1.90	2.17	34.94	1.06	3.58	4.45

Dust Gauge	Summary Total Solids (g/m2/month)		
	Minimum	Maximum	Average
DG22	0.4	3.9	1.6
DG24	0.2	17	5.87
DG28	1.2	16	5.5

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Total Zinc
mg/L
20
6.8
0.56
1.56
1.75

Table 7.1 - Groundwater Results - MB 1

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EPA ID#	Statistics		Field Information		Analytical Information																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Date	Site Code	Time	Sampler	pH	Conductivity	Dissolved Oxygen	Reduction	Dissolved Oxygen	Temperature	Depth to Water	RL Water Level	Laboratory Sample																		Recovery																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
													Carbonate	Alkalinity (CaCO3)	Nitrogen (Ammonia)	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Sodium	pH	Sulfate	Total Dissolved Solids	Chromium (Hex)	Dissolved Arsenic	Dissolved Barium	Dissolved Cadmium	Dissolved Copper	Dissolved Lead	Dissolved Manganese	Dissolved Mercury	Dissolved Silver	Dissolved Zinc	Fluoride	Nitrate	Nitrite	Organic chlorine	Organic phosphorus	Phytoplankton	Aromatic Hydrocarbons	THP C6	THP C8	THP C10	THP C12	THP C14	THP C16	THP C18	THP C20	THP C22	THP C24	THP C26	THP C28	THP C30	THP C32	THP C34	THP C36	THP C38	THP C40	THP C42	THP C44	THP C46	THP C48	THP C50	THP C52	THP C54	THP C56	THP C58	THP C60	THP C62	THP C64	THP C66	THP C68	THP C70	THP C72	THP C74	THP C76	THP C78	THP C80	THP C82	THP C84	THP C86	THP C88	THP C90	THP C92	THP C94	THP C96	THP C98	THP C100	THP C102	THP C104	THP C106	THP C108	THP C110	THP C112	THP C114	THP C116	THP C118	THP C120	THP C122	THP C124	THP C126	THP C128	THP C130	THP C132	THP C134	THP C136	THP C138	THP C140	THP C142	THP C144	THP C146	THP C148	THP C150	THP C152	THP C154	THP C156	THP C158	THP C160	THP C162	THP C164	THP C166	THP C168	THP C170	THP C172	THP C174	THP C176	THP C178	THP C180	THP C182	THP C184	THP C186	THP C188	THP C190	THP C192	THP C194	THP C196	THP C198	THP C200	THP C202	THP C204	THP C206	THP C208	THP C210	THP C212	THP C214	THP C216	THP C218	THP C220	THP C222	THP C224	THP C226	THP C228	THP C230	THP C232	THP C234	THP C236	THP C238	THP C240	THP C242	THP C244	THP C246	THP C248	THP C250	THP C252	THP C254	THP C256	THP C258	THP C260	THP C262	THP C264	THP C266	THP C268	THP C270	THP C272	THP C274	THP C276	THP C278	THP C280	THP C282	THP C284	THP C286	THP C288	THP C290	THP C292	THP C294	THP C296	THP C298	THP C300	THP C302	THP C304	THP C306	THP C308	THP C310	THP C312	THP C314	THP C316	THP C318	THP C320	THP C322	THP C324	THP C326	THP C328	THP C330	THP C332	THP C334	THP C336	THP C338	THP C340	THP C342	THP C344	THP C346	THP C348	THP C350	THP C352	THP C354	THP C356	THP C358	THP C360	THP C362	THP C364	THP C366	THP C368	THP C370	THP C372	THP C374	THP C376	THP C378	THP C380	THP C382	THP C384	THP C386	THP C388	THP C390	THP C392	THP C394	THP C396	THP C398	THP C400	THP C402	THP C404	THP C406	THP C408	THP C410	THP C412	THP C414	THP C416	THP C418	THP C420	THP C422	THP C424	THP C426	THP C428	THP C430	THP C432	THP C434	THP C436	THP C438	THP C440	THP C442	THP C444	THP C446	THP C448	THP C450	THP C452	THP C454	THP C456	THP C458	THP C460	THP C462	THP C464	THP C466	THP C468	THP C470	THP C472	THP C474	THP C476	THP C478	THP C480	THP C482	THP C484	THP C486	THP C488	THP C490	THP C492	THP C494	THP C496	THP C498	THP C500	THP C502	THP C504	THP C506	THP C508	THP C510	THP C512	THP C514	THP C516	THP C518	THP C520	THP C522	THP C524	THP C526	THP C528	THP C530	THP C532	THP C534	THP C536	THP C538	THP C540	THP C542	THP C544	THP C546	THP C548	THP C550	THP C552	THP C554	THP C556	THP C558	THP C560	THP C562	THP C564	THP C566	THP C568	THP C570	THP C572	THP C574	THP C576	THP C578	THP C580	THP C582	THP C584	THP C586	THP C588	THP C590	THP C592	THP C594	THP C596	THP C598	THP C600	THP C602	THP C604	THP C606	THP C608	THP C610	THP C612	THP C614	THP C616	THP C618	THP C620	THP C622	THP C624	THP C626	THP C628	THP C630	THP C632	THP C634	THP C636	THP C638	THP C640	THP C642	THP C644	THP C646	THP C648	THP C650	THP C652	THP C654	THP C656	THP C658	THP C660	THP C662	THP C664	THP C666	THP C668	THP C670	THP C672	THP C674	THP C676	THP C678	THP C680	THP C682	THP C684	THP C686	THP C688	THP C690	THP C692	THP C694	THP C696	THP C698	THP C700	THP C702	THP C704	THP C706	THP C708	THP C710	THP C712	THP C714	THP C716	THP C718	THP C720	THP C722	THP C724	THP C726	THP C728	THP C730	THP C732	THP C734	THP C736	THP C738	THP C740	THP C742	THP C744	THP C746	THP C748	THP C750	THP C752	THP C754	THP C756	THP C758	THP C760	THP C762	THP C764	THP C766	THP C768	THP C770	THP C772	THP C774	THP C776	THP C778	THP C780	THP C782	THP C784	THP C786	THP C788	THP C790	THP C792	THP C794	THP C796	THP C798	THP C800	THP C802	THP C804	THP C806	THP C808	THP C810	THP C812	THP C814	THP C816	THP C818	THP C820	THP C822	THP C824	THP C826	THP C828	THP C830	THP C832	THP C834	THP C836	THP C838	THP C840	THP C842	THP C844	THP C846	THP C848	THP C850	THP C852	THP C854	THP C856	THP C858	THP C860	THP C862	THP C864	THP C866	THP C868	THP C870	THP C872	THP C874	THP C876	THP C878	THP C880	THP C882	THP C884	THP C886	THP C888	THP C890	THP C892	THP C894	THP C896	THP C898	THP C900	THP C902	THP C904	THP C906	THP C908	THP C910	THP C912	THP C914	THP C916	THP C918	THP C920	THP C922	THP C924	THP C926	THP C928	THP C930	THP C932	THP C934	THP C936	THP C938	THP C940	THP C942	THP C944	THP C946	THP C948	THP C950	THP C952	THP C954	THP C956	THP C958	THP C960	THP C962	THP C964	THP C966	THP C968	THP C970	THP C972	THP C974	THP C976	THP C978	THP C980	THP C982	THP C984	THP C986	THP C988	THP C990	THP C992	THP C994	THP C996	THP C998	THP C1000	THP C1002	THP C1004	THP C1006	THP C1008	THP C1010	THP C1012	THP C1014	THP C1016	THP C1018	THP C1020	THP C1022	THP C1024	THP C1026	THP C1028	THP C1030	THP C1032	THP C1034	THP C1036	THP C1038	THP C1040	THP C1042	THP C1044	THP C1046	THP C1048	THP C1050	THP C1052	THP C1054	THP C1056	THP C1058	THP C1060	THP C1062	THP C1064	THP C1066	THP C1068	THP C1070	THP C1072	THP C1074	THP C1076	THP C1078	THP C1080	THP C1082	THP C1084	THP C1086	THP C1088	THP C1090	THP C1092	THP C1094	THP C1096	THP C1098	THP C1100	THP C1102	THP C1104	THP C1106	THP C1108	THP C1110	THP C1112	THP C1114	THP C1116	THP C1118	THP C1120	THP C1122	THP C1124	THP C1126	THP C1128	THP C1130	THP C1132	THP C1134	THP C1136	THP C1138	THP C1140	THP C1142	THP C1144	THP C1146	THP C1148	THP C1150	THP C1152	THP C1154	THP C1156	THP C1158	THP C1160	THP C1162	THP C1164	THP C1166	THP C1168	THP C1170	THP C1172	THP C1174	THP C1176	THP C1178	THP C1180	THP C1182	THP C1184	THP C1186	THP C1188	THP C1190	THP C1192	THP C1194	THP C1196	THP C1198	THP C1200	THP C1202	THP C1204	THP C1206	THP C1208	THP C1210	THP C1212	THP C1214	THP C1216	THP C1218	THP C1220	THP C1222	THP C1224	THP C1226	THP C1228	THP C1230	THP C1232	THP C1234	THP C1236	THP C1238	THP C1240	THP C1242	THP C1244	THP C1246	THP C1248	THP C1250	THP C1252	THP C1254	THP C1256	THP C1258	THP C1260	THP C1262	THP C1264	THP C1266	THP C1268	THP C1270	THP C1272	THP C1274	THP C1276	THP C1278	THP C1280	THP C1282	THP C1284	THP C1286	THP C1288	THP C1290	THP C1292	THP C1294	THP C1296	THP C1298	THP C1300	THP C1302	THP C1304	THP C1306	THP C1308	THP C1310	THP C1312	THP C1314	THP C1316	THP C1318	THP C1320	THP C1322	THP C1324	THP C1326	THP C1328	THP C1330	THP C1332	THP C1334	THP C1336	THP C1338	THP C1340	THP C1342	THP C1344	THP C1346	THP C1348	THP C1350	THP C1352	THP C1354	THP C1356	THP C1358	THP C1360	THP C1362	THP C1364	THP C1366	THP C1368	THP C1370	THP C1372	THP C1374	THP C1376	THP C1378	THP C1380	THP C1382	THP C1384	THP C1386	THP C1388	THP C1390	THP C1392	THP C1394	THP C1396	THP C1398	THP C1400	THP C1402	THP C1404	THP C1406	THP C1408	THP C1410	THP C1412	THP C1414	THP C1416	THP C1418	THP C1420	THP C1422	THP C1424	THP C1426	THP C1428	THP C1430	THP C1432	THP C1434	THP C1436	THP C1438	THP C1440	THP C1442	THP C1444	THP C1446	THP C1448	THP C1450	THP C1452	THP C1454	THP C1456	THP C1458	THP C1460	THP C1462	THP C1464	THP C1466	THP C1468	THP C1470	THP C1472	THP C1474	THP C1476	THP C1478	THP C1480	THP C1482	THP C1484	THP C1486	THP C1488	THP C1490	THP C1492	THP C1494	THP C1496	THP C1498	THP C1500	THP C1502	THP C1504	THP C1506	THP C1508	THP C1510	THP C1512	THP C1514	THP C1516	THP C1518	THP C1520	THP C1522	THP C1524	THP C1526	THP C1528	THP C1530	THP C1532	THP C1534	THP C1536	THP C1538	THP C1540	THP C1542	THP C1544	THP C1546	THP C1548	THP C1550	THP C1552	THP C1554	THP C1556	THP C1558	THP C1560	THP C1562	THP C1564	THP C1566	THP C1568	THP C1570	THP C1572	THP C1574	THP C1576	THP C1578	THP C1580	THP C1582	THP C1584	THP C1586	THP C1588	THP C1590	THP C1592	THP C1594	THP C1596	THP C1598	THP C1600	THP C1602	THP C1604	THP C1606	THP C1608	THP C1610	THP C1612	THP C1614	THP C1616	THP C1618	THP C1620	THP C1622	THP C1624	THP C1626	THP C1628	THP C1630	THP C1632	THP C1634	THP C1636	THP C1638	THP C1640	THP C1642	THP C1644	THP C1646	THP C1648	THP C1650	THP C1652	THP C1654	THP C1656	THP C1658	THP C1660	THP C1662	THP C1664	THP C1666	THP C1668	THP C1670	THP C1672	THP C1674	THP C1676	THP C1678	THP C1680	THP C1682	THP C1684	THP C1686	THP C1688	THP C1690	THP C1692	THP C1694	THP C1696	THP C1698	THP C1700	THP C1702	THP C1704	THP C1706	THP C1708	THP C1710	THP C1712	THP C1714	THP C1716	THP C1718	THP C1720	THP C1722	THP C1724	THP C1726	THP C1728	THP C1730	THP C1732	THP C1734	THP C1736	THP C1738	THP C1740	THP C1742	THP C1744	THP C1746	THP C1748	THP C1750	THP C1752	THP C1754	THP C1756	THP C1758	THP C1760	THP C1762	THP C1764	THP C1766	THP C1768	THP C1770	THP C1772	THP C1774	THP C1776	THP C1778	THP C1780	THP C1782	THP C1784	THP C1786	THP C1788	THP C1790	THP C1792	THP C1794	THP C1796	THP C1798	THP C1800	THP C1802	THP C1804	THP C1806	THP C1808	THP C1810	THP C1812	THP C1814	THP C1816	THP C1818	THP C1820	THP C1822	THP C1824	THP C1826	THP C1828	THP C1830	THP C1832	THP C1834	THP C1836	THP C1838	THP C1840	THP C1842	THP C1844	THP C1846	THP C1848	THP C1850	THP C1852	THP C1854	THP C1856	THP C1858	THP C1860	THP C1862	THP C1864	THP C1866	THP C1868	THP C1870	THP C1872	THP C1874	THP C1876	THP C1878	THP C1880	THP C1882	THP C1884	THP C1886	THP C1888	THP C1890	THP C1892	THP C1894	THP C1896	THP C1898	THP C1900	THP C1902	THP C1904	THP C1906	THP C1908	THP C1910	THP C1912	THP C1914	THP C1916	THP C1918	THP C1920	THP C1922	THP C1924	THP C1926	THP C1928	THP C1930	THP C1932	THP C1934	THP C1936	THP C1938	THP C1940	THP C1942	THP C1944	THP C1946	THP C1948	THP C1950	THP C1952	THP C1954	THP C1956	THP C1958	THP C1960	THP C1962	THP C1964	THP C1966	THP C1968	THP C1970	THP C1972	THP C1974	THP C1976	THP C1978	THP C1980	THP C1982	THP C1984	THP C1986	THP C1988	THP C1990	THP C1992	THP C1994	THP C1996	THP C1998	THP C2000	THP C2002	THP C2004	THP C2006	THP C2008	THP C2010	THP C2012	THP C2014	THP C2016	THP C2018	THP C2020	THP C2022	THP C2024	THP C2026	THP C2028	THP C2030	THP C2032	THP C2034	THP C2036	THP C2038	THP C2040	THP C2042	THP C2044	THP C2046	THP C2048	THP C2050	THP C2052	THP C2054	THP C2056	THP C2058	THP C2060	THP C2062

[illegible][illegible][illegible][illegible]

Table 8.1 - Piezometer Water Level Results - P44A & P44B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler	EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/02/2015	P44A	12.8	718.25	JE/HG			23/02/2015	P44B	8.60	722.45	JE/HG
		29/05/2015	P44A	13.36	717.69	JE			29/05/2015	P44B	9.20	721.85	JE
		29/07/2015	P44A	12.13	718.92	JE			29/07/2015	P44B	8.23	722.82	JE
		21/08/2015	P44A	12.06	718.99	JE			21/08/2015	P44B	7.98	723.07	JE
		2014/15		Minimum		12.06			717.69		2014/15		Minimum
		Maximum		13.36	718.99				Maximum		9.20	723.07	
		Average		12.59	718.46				Average		8.50	722.55	
		StdDev		0.613589	0.613589				StdDev		0.530181	0.530181	
		Count		4	4				Count		4	4	

Table 8.2 - Piezometer Water Level Results - P45A & P45B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler	EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/02/2015	P45A	4.94	726.22	JE/HG			23/02/2015	P45B	5.68	725.43	JE/HG
		29/05/2015	P45A	6.50	724.66	JE			29/05/2015	P45B	6.80	724.31	JE
		29/07/2015	P45A	5.77	725.39	JE			29/07/2015	P45B	5.28	725.83	JE
		21/08/2015	P45A	5.47	725.69	JE			21/08/2015	P45B	5.20	725.91	JE
		2014/15		Minimum		4.94			724.66		2014/15		Minimum
		Maximum		6.50	726.22				Maximum		6.80	725.91	
		Average		5.67	725.49				Average		5.74	725.37	
		StdDev		0.651102	0.651102				StdDev		0.737202	0.737202	
		Count		4	4				Count		4	4	

Table 8.3 - Piezometer Water Level Results - P58A & P58B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler	Comments	EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/02/2015	P58A	42.4	763.85	JE/HG				23/02/2015	P58B	51.35	754.90	JE/HG
		29/05/2015	P58A	42.14	764.11	JE				29/05/2015	P58B	51.39	754.86	JE
		29/07/2015	P58A	37.87	768.38	JE				29/07/2015	P58B	50.32	755.93	JE
		21/08/2015	P58A	42.2	764.05	JE				21/08/2015	P58B	50.10	756.15	JE
		2014/15		Minimum		37.87	763.85					2014/15		Minimum
		Maximum		42.4	768.38					Maximum		51.39	756.15	
		Average		41.1525	765.0975					Average		50.79	755.46	
		StdDev		2.191155	2.191155					StdDev		0.68	0.68	
		Count		4	4					Count		4	4	

Table 8.4 - Piezometer Water Level Results - P59A & P59B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler	EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/02/2015	P59A	17.13	787.57	JE/HG			23/02/2015	P59B	17.59	787.11	JE/HG
		29/05/2015	P59A	17.37	787.33	JE			29/05/2015	P59B	17.92	786.78	JE
		29/07/2015	P59A	17.2	787.50	JE			29/07/2015	P59B	16.7	788.00	JE
		21/08/2015	P59A	17.1	787.60	JE			21/08/2015	P59B	17.35	787.35	JE
		2014/15		Minimum		17.1			787.33		2014/15		Minimum
		Maximum		17.37	787.6				Maximum		17.92	788	
		Average		17.2	787.5				Average		17.39	787.31	
		StdDev		0.12083	0.12083				StdDev		0.515946	0.515946	
		Count		4	4				Count		4	4	

Table 8.5 - Piezometer Water Level Results - P100A & P100B

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler	EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/02/2015	P100A	36.38	740.05	JE/HG			23/02/2015	P100B	69.15	707.28	JE/HG
		29/05/2015	P100A	37.55	738.88	JE			29/05/2015	P100B	62.75	713.68	JE
		29/07/2015	P100A	36.91	739.52	JE			29/07/2015	P100B	58.94	717.49	JE
		21/08/2015	P100A	36.57	739.86	JE			21/08/2015	P100B	57.38	719.05	JE
		2014/15		Minimum		36.38			738.88		2014/15		Minimum
	Maximum			37.55	740.05			Maximum			69.15	719.05	
	Average			36.8525	739.5775			Average			62.06	714.38	
	StdDev			0.514093	0.514093			StdDev			5.24	5.24	
	Count			4	4			Count			4	4	

Table 9.1 - IMF Surface Water Results - Site 110

[illegible]

Table 9.2 - IMF Surface Water Results - Site 130

[illegible]

Table 9.3 - IMF Surface Water Results - Site 150

[illegible]

Table 9.4 - IMF Surface Water Results - First Flush System

[illegible]

Table 10 - Dust Deposition Results - DG18

Site Name	Date	ALS Batch Code	Ash Residue	Combustibles	Calculated Rainfall	Soluble Matter	Insoluble Solids	Total Solids
			g/m2/mth	g/m2/mth	mm	g/m2/mth	g/m2/mth	g/m2/mth
DG18	Oct-14	995056	1	0.8	47	0.2	1.8	1.8
DG18	Nov-14	996821	1.4	0.7	86	0.6	2.1	2.7
DG18	Dec-14	998683	1.1	0.6	52	1.4	1.7	3.1
DG18	Jan-15	1001151	0.62	0.58	110	1.6	1.2	2.8
DG18	Feb-15	1005721	2.2	4.4	4	1.8	6.6	8.4
DG18	Mar-15	1006175	0.86	0.44	19	0.9	1.3	2.2
DG18	Apr-15	1008527	0.64	0.46	93	1.9	1.1	3
DG18	May-15	CA1502162-0	0.36	0.24	10	0.2	0.6	0.6
DG18	Jun-15	CA1502637-0	1.16	1.44	40	0.5	2.6	3.1
DG18	Jul-15	CA1503064-0	2.52	1.28	48	1.4	3.8	5.2
DG18	Aug-15	CA1503297-0	0.86	2.44	12	1.6	3.3	4.9
DG18	Aug-15	CA1503563-0	0.25	0.25	46	0.2	0.5	0.5

2014/2015

Min	0.25	0.24	4	0.2	0.5	0.5
Max	2.52	4.4	110	1.9	6.6	8.4
Avg	1.08	1.14	47.25	1.03	2.22	3.19
stDev	0.68	1.20	34.26	0.66	1.71	2.16

Appendices

Appendix 5

Monitoring Trend Graphs

Appendices

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Figure 5.1 - Surface Water Trends - Site 115

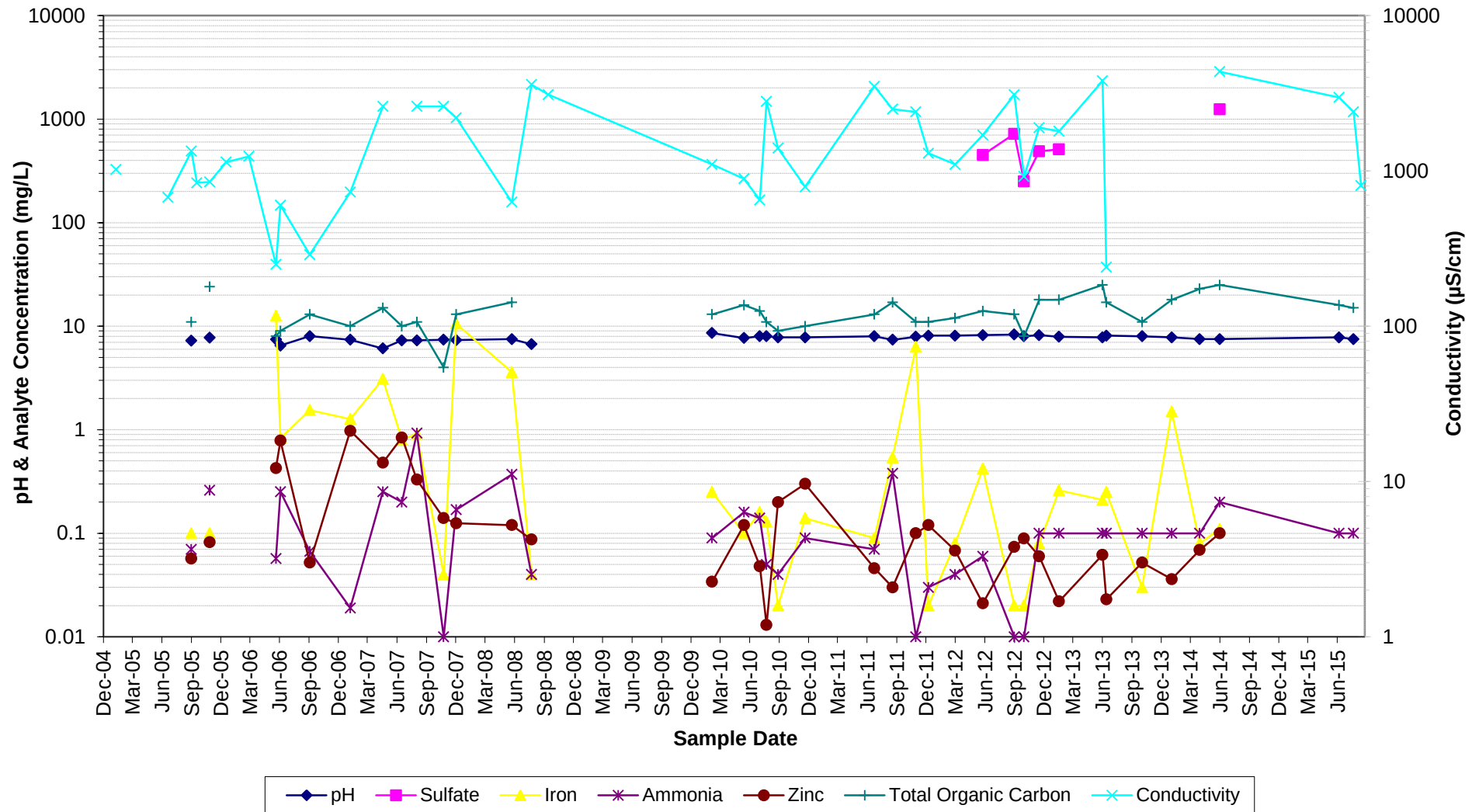


Figure 5.2 - Surface Water Trends - Spring 2

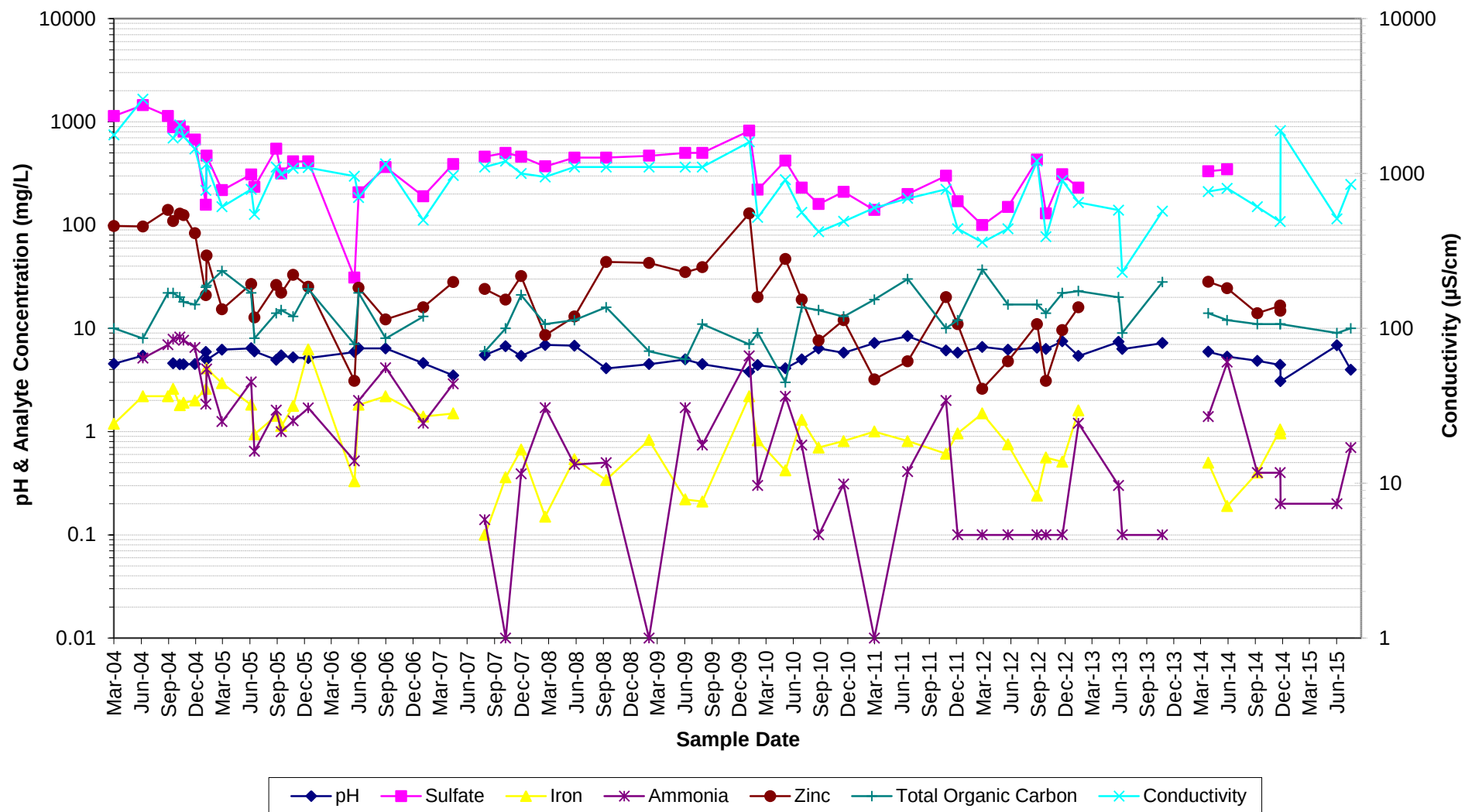


Figure 5.3 - Surface Water Trends - Site 105

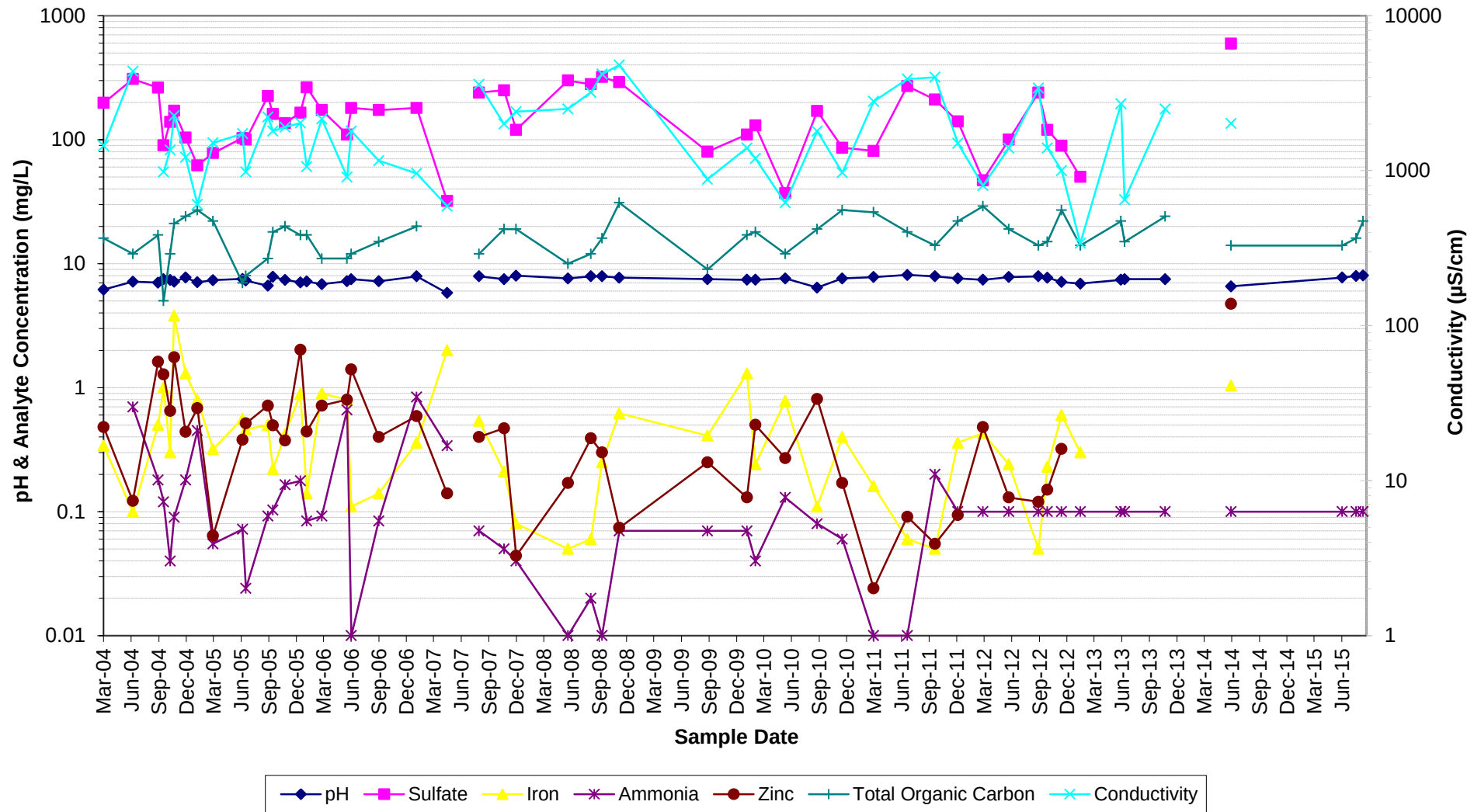


Figure 5.4 - Surface Water Trends - WM200

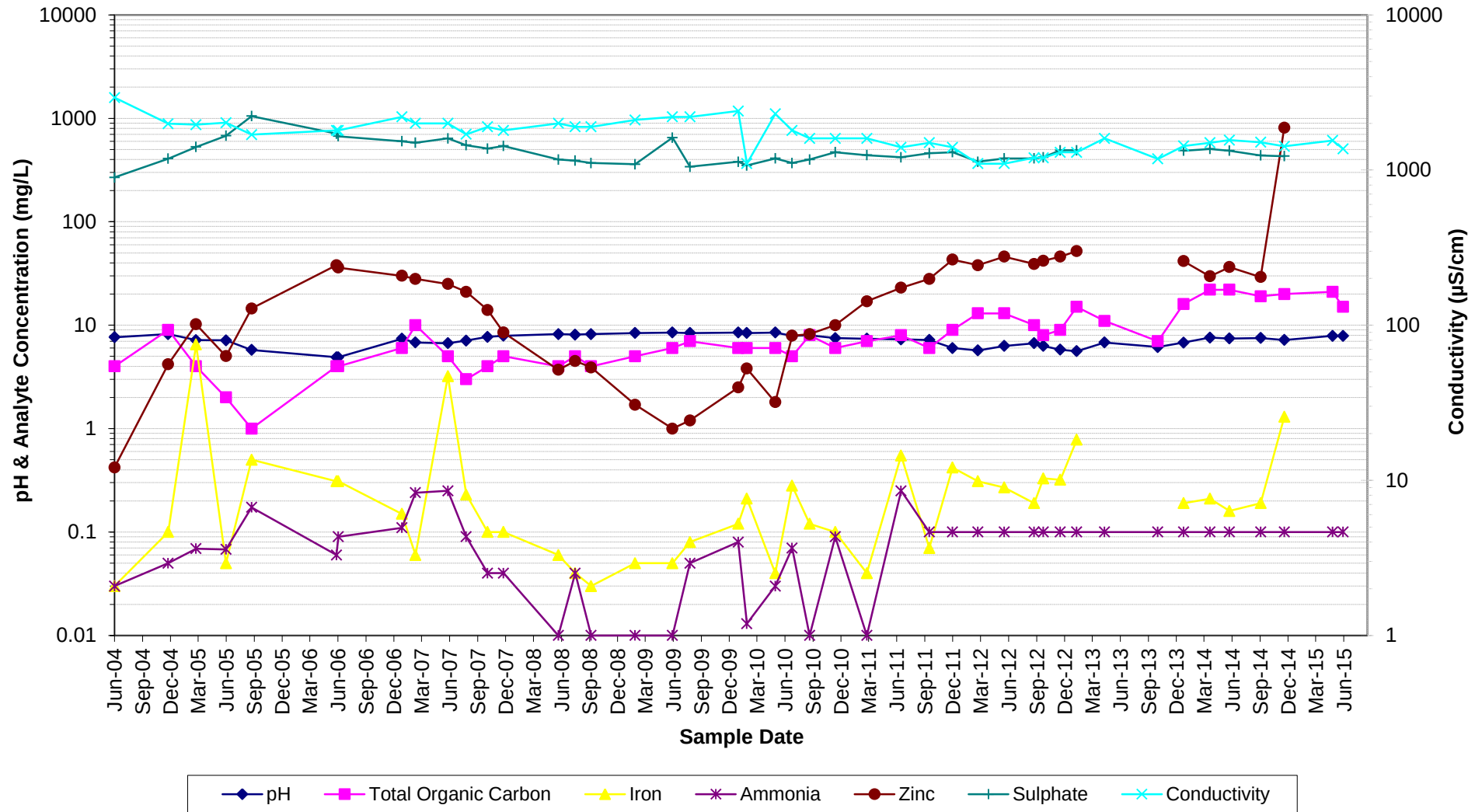


Figure 5.5 - Surface Water Trends - WM201

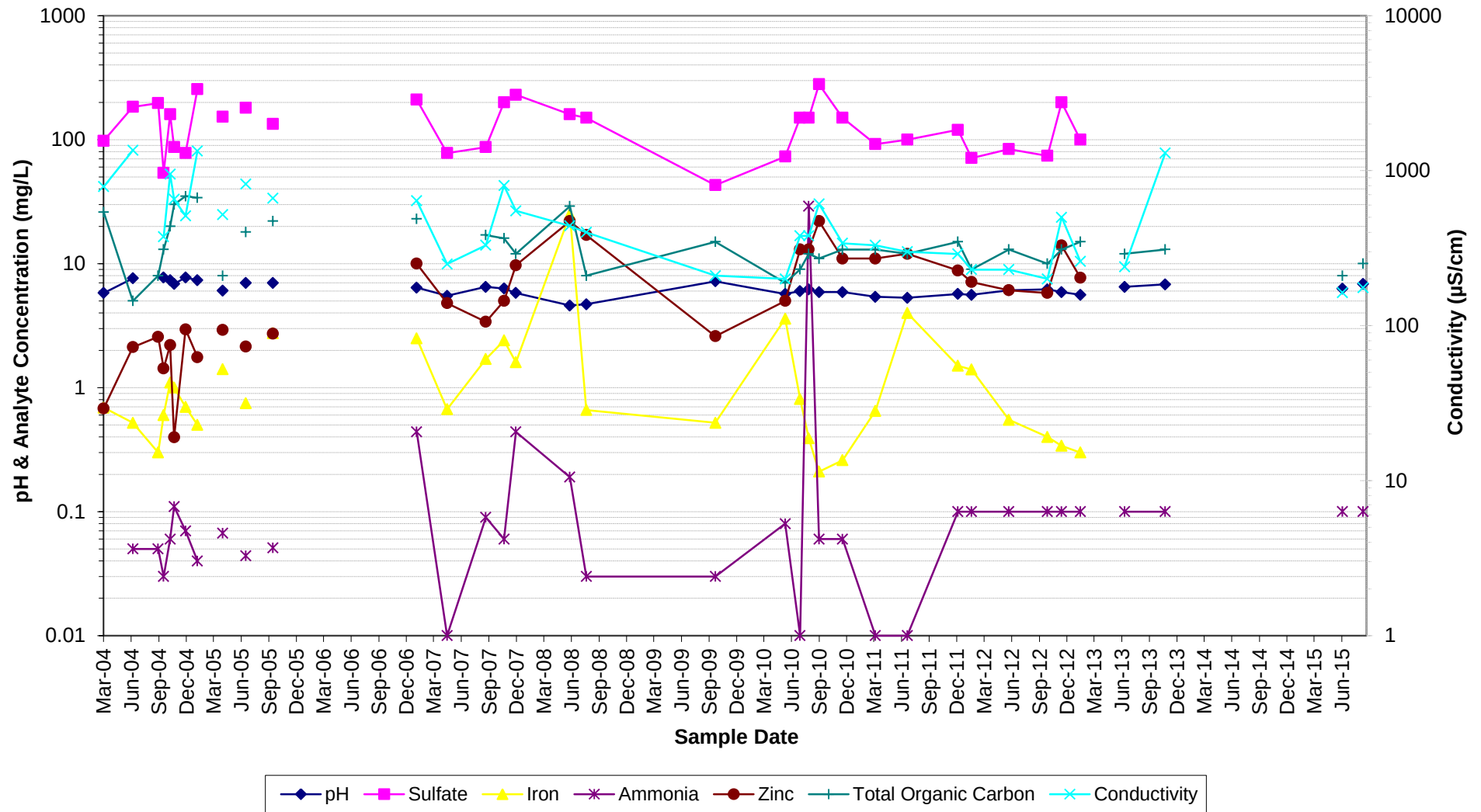


Figure 5.6 - Surface Water Trends - WM202

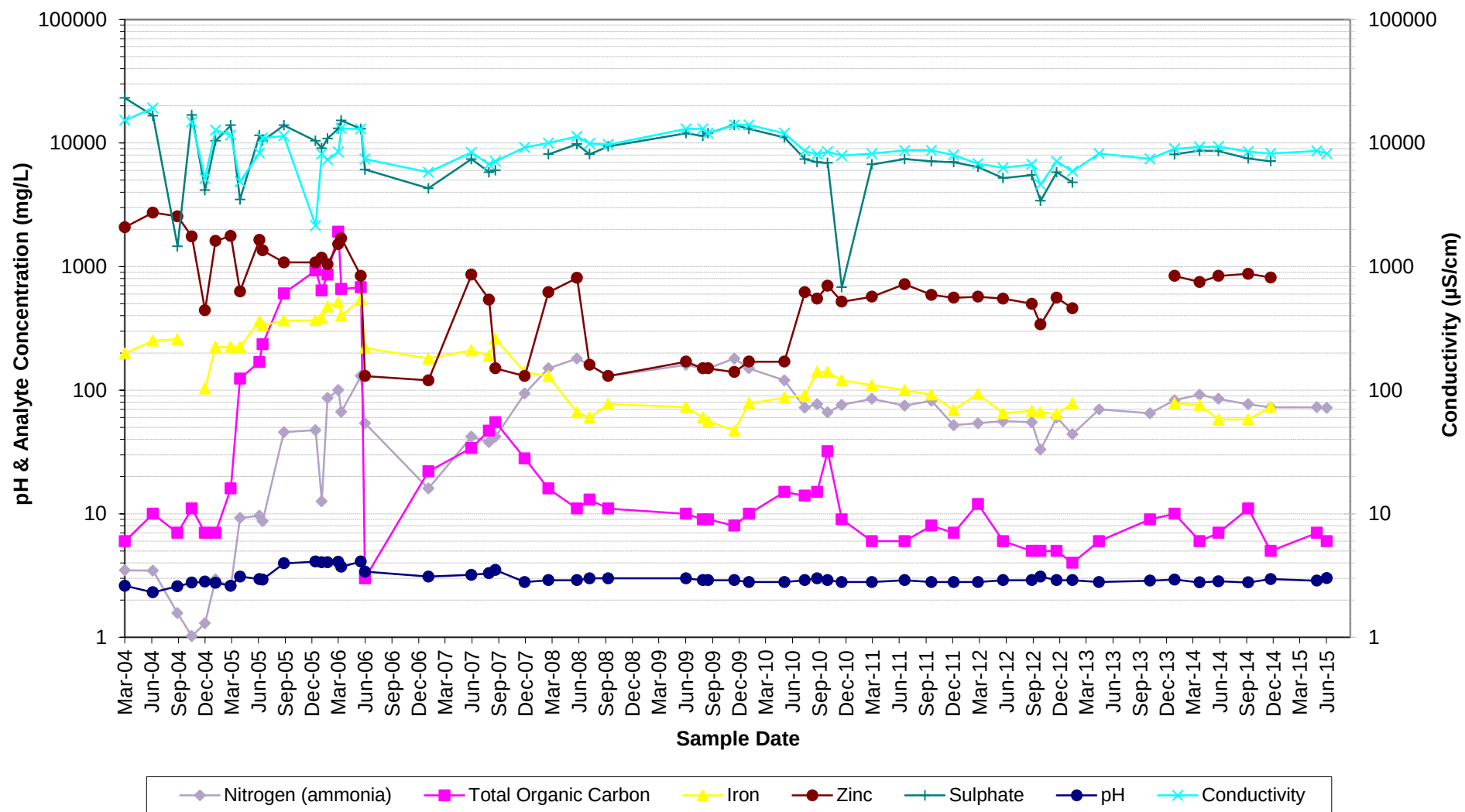


Figure 5.7 - Surface Water Trends - WM203

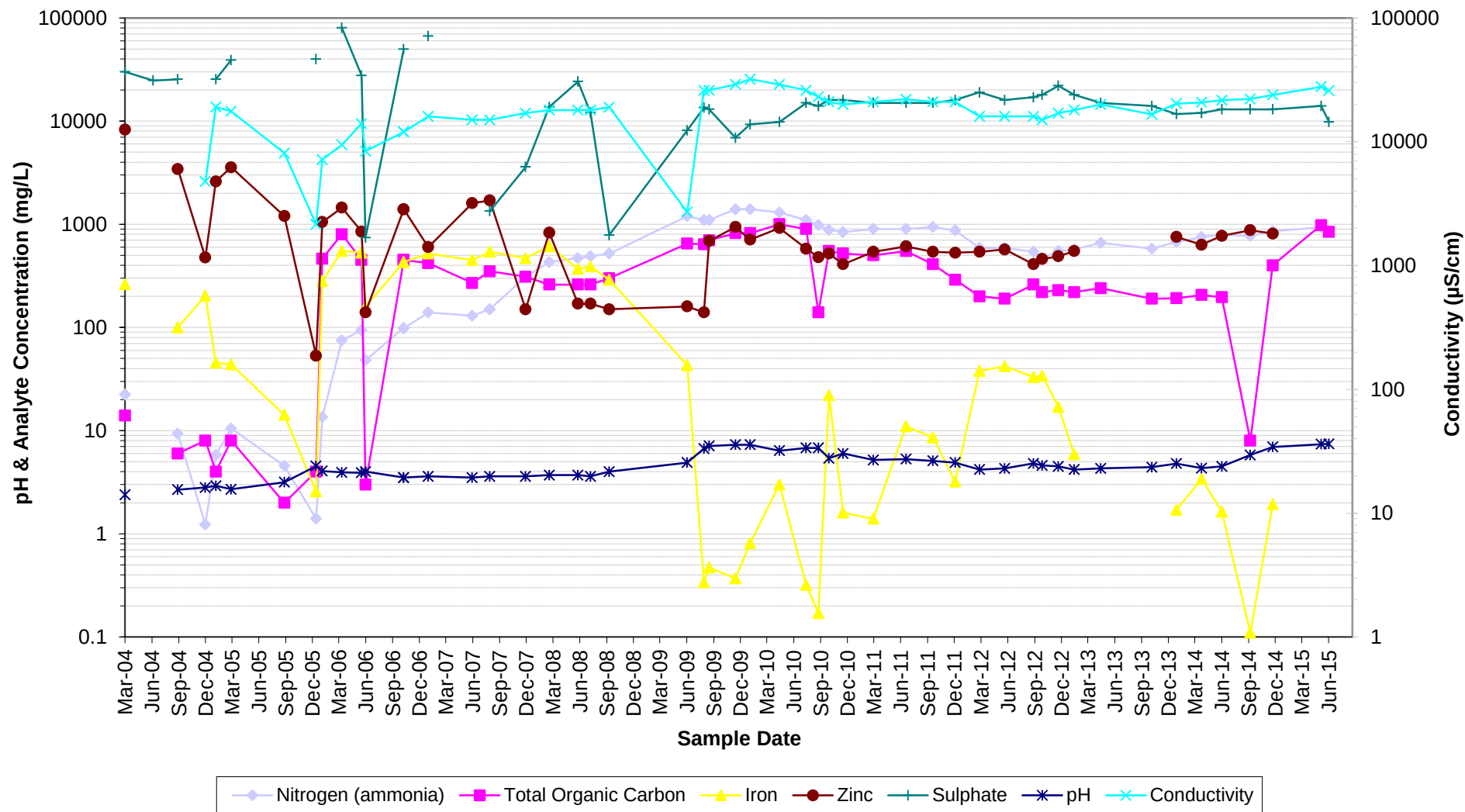


Figure 5.8 - Surface Water Trends - Pond 3

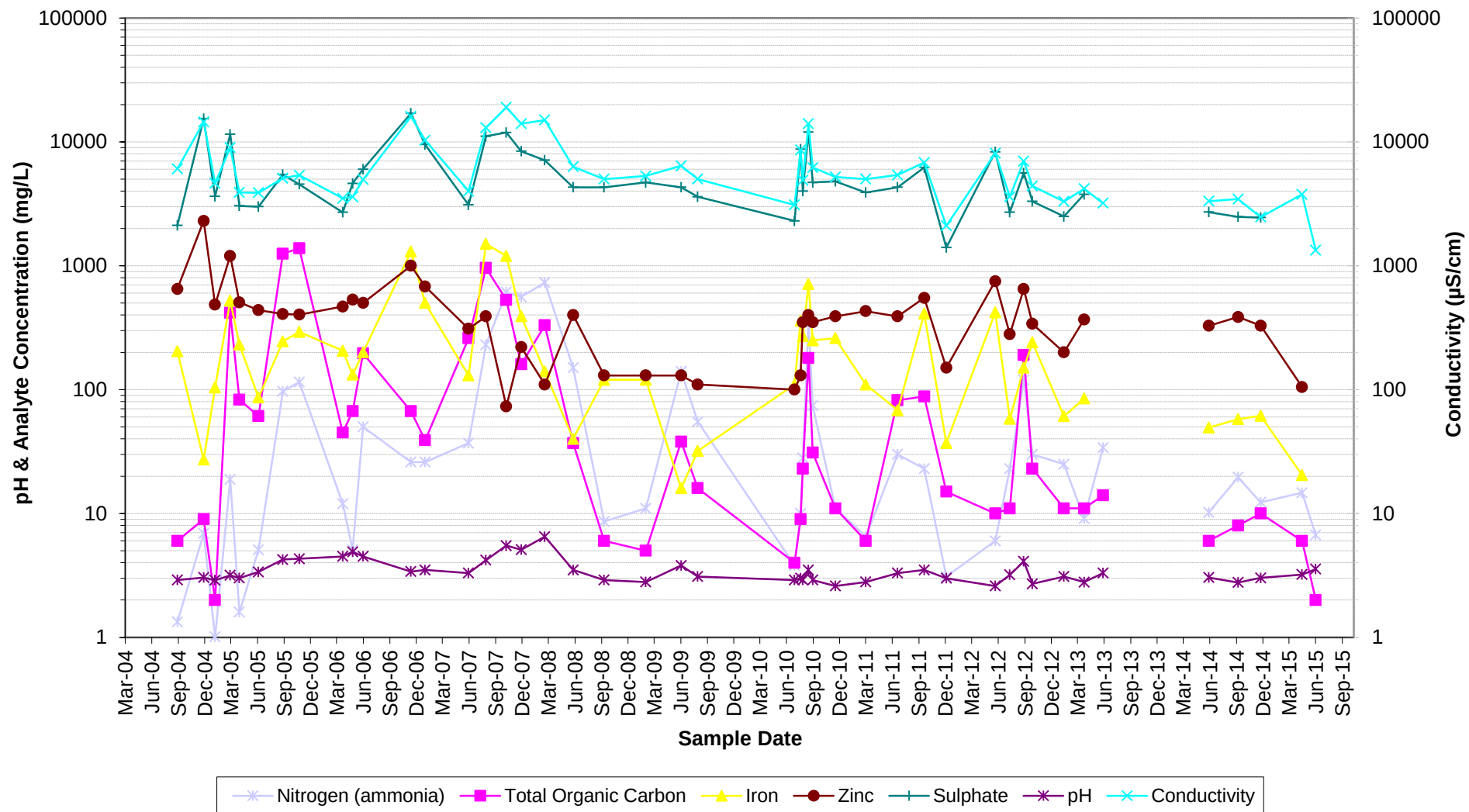


Figure 3.2.5A - Groundwater Levels - MB1 to MB17 and ED3B

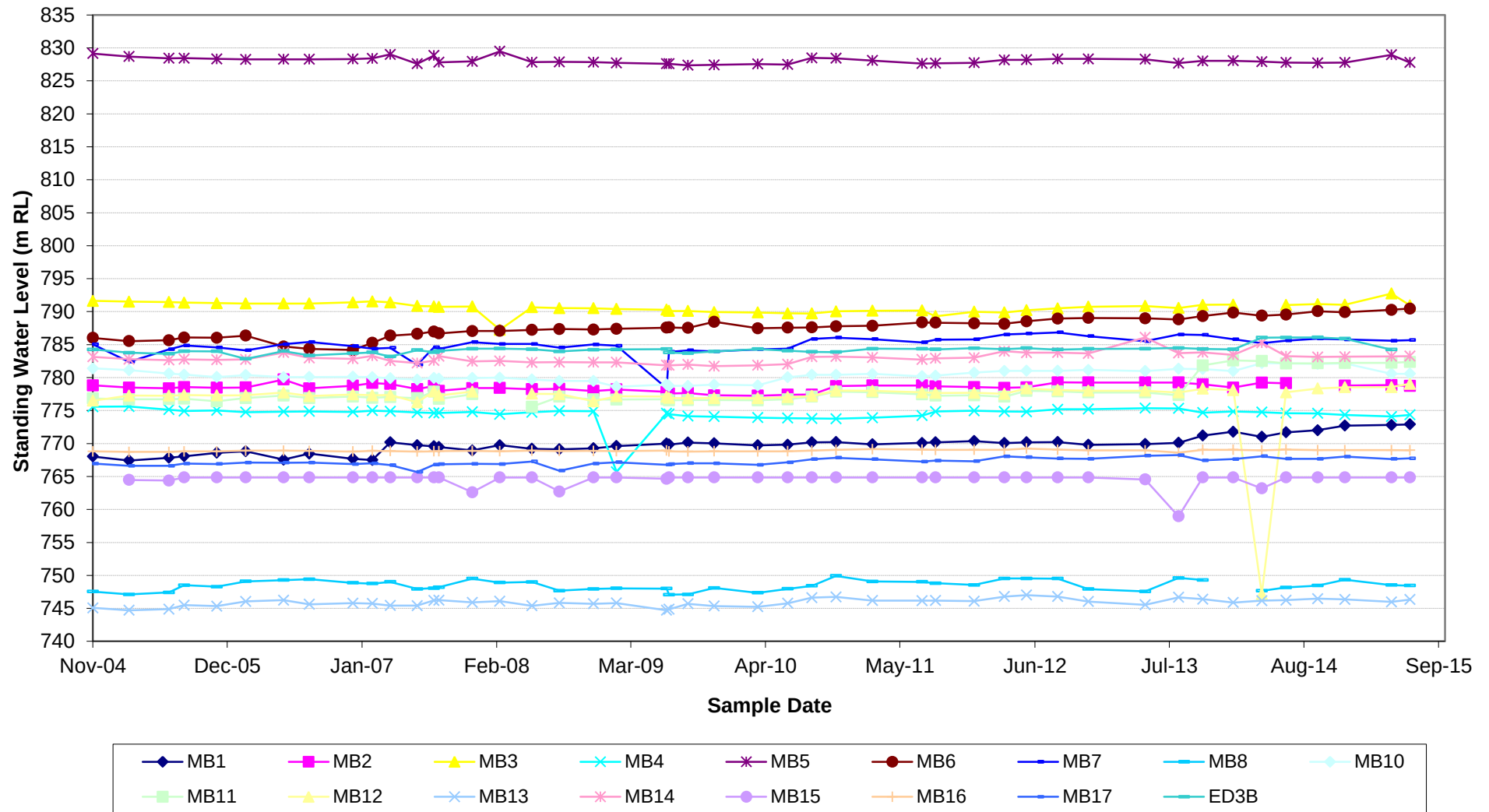


Figure 3.2.5.1 - Groundwater Trends - MB1

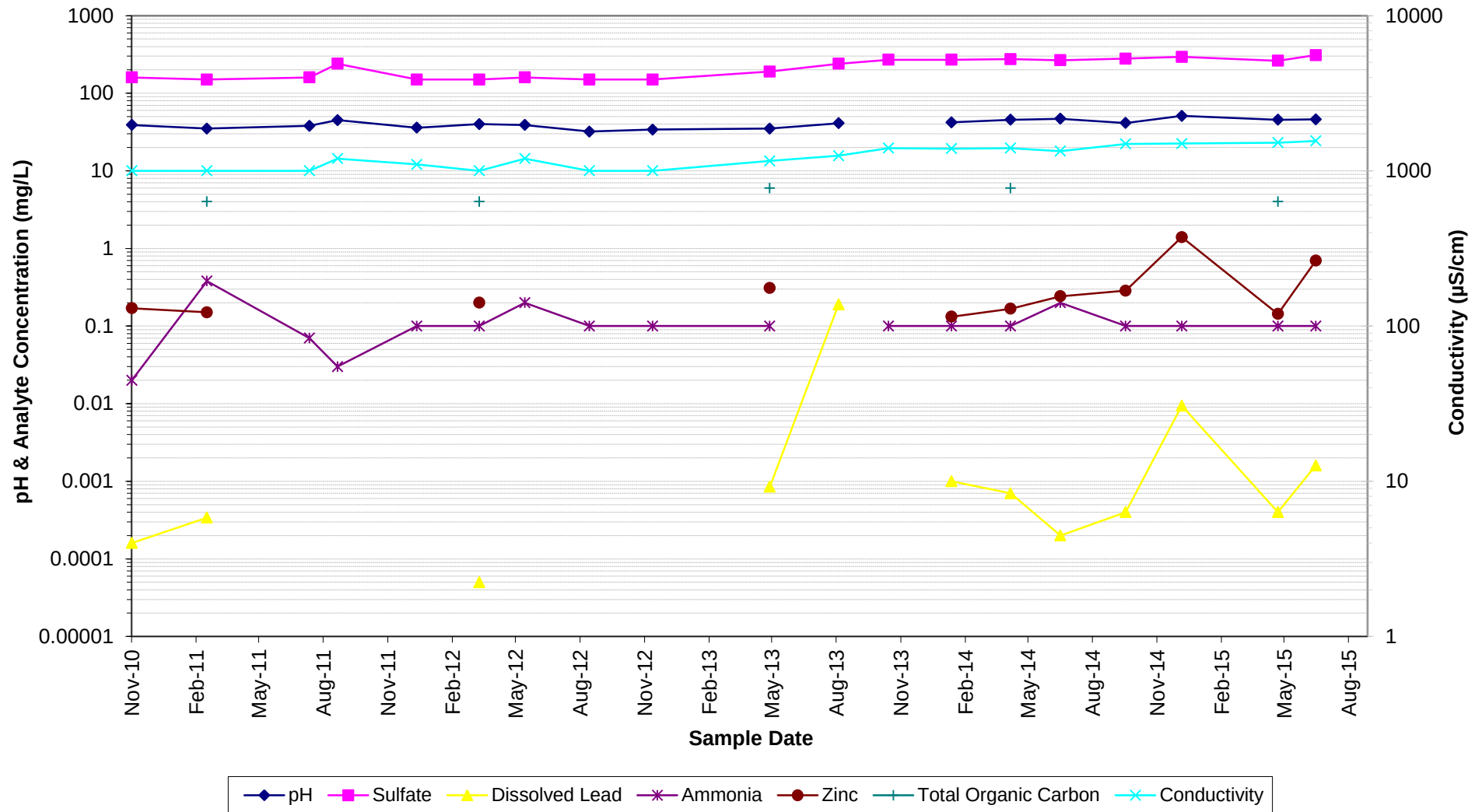


Figure 3.2.5.2 - Groundwater Trends - MB2

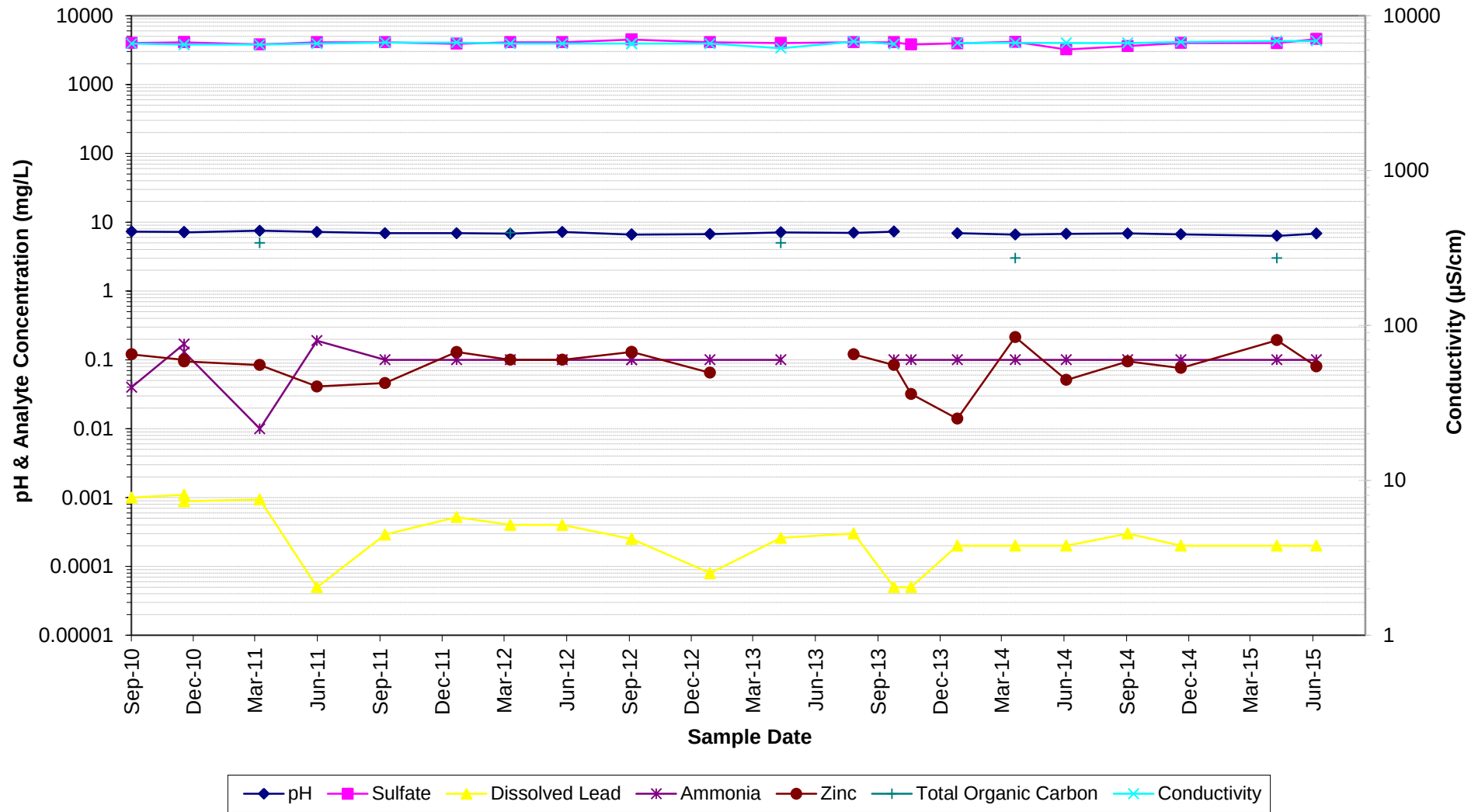


Figure 3.2.5.3 - Groundwater Trends - MB3

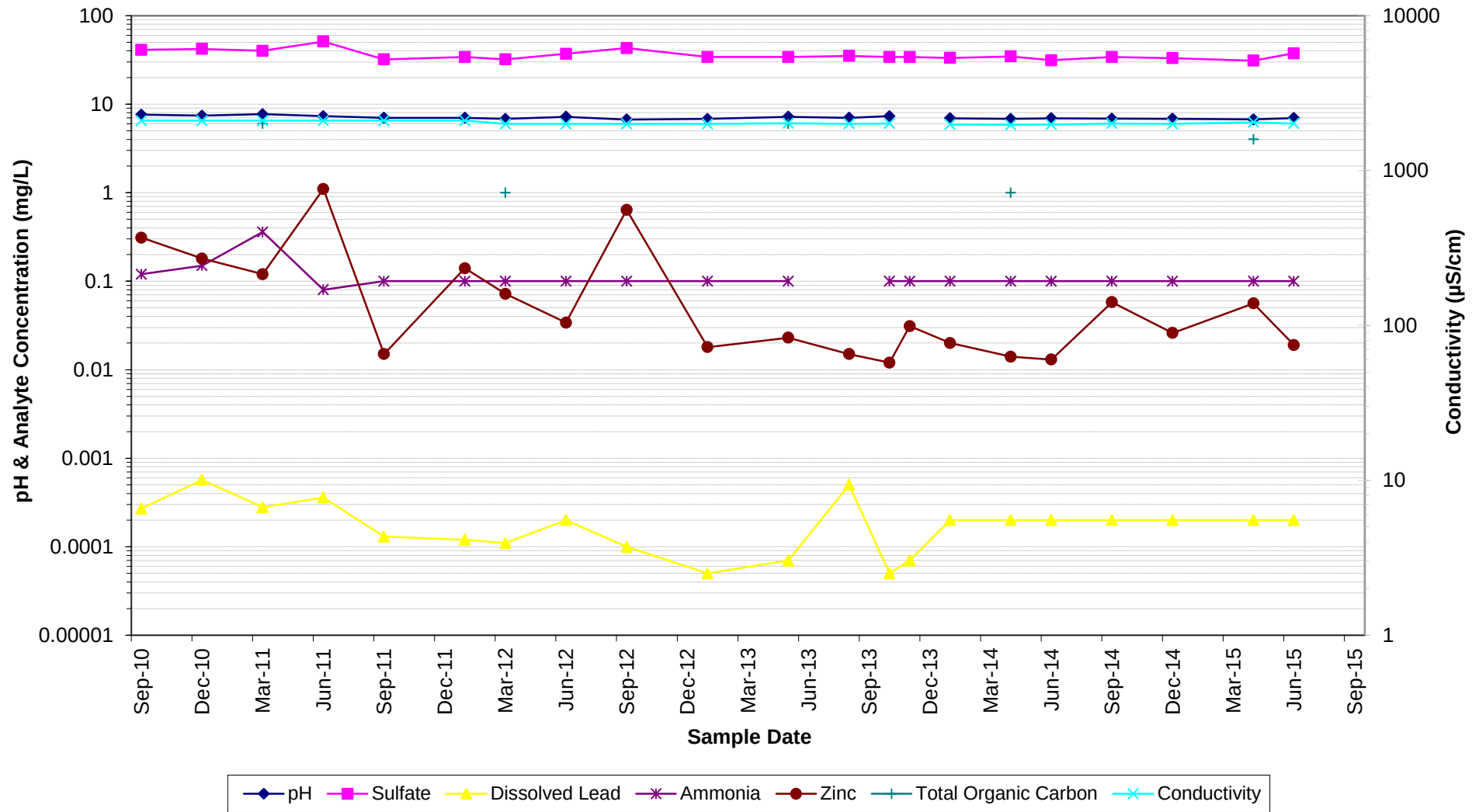


Figure 3.2.5.4 - Groundwater Trends - MB4

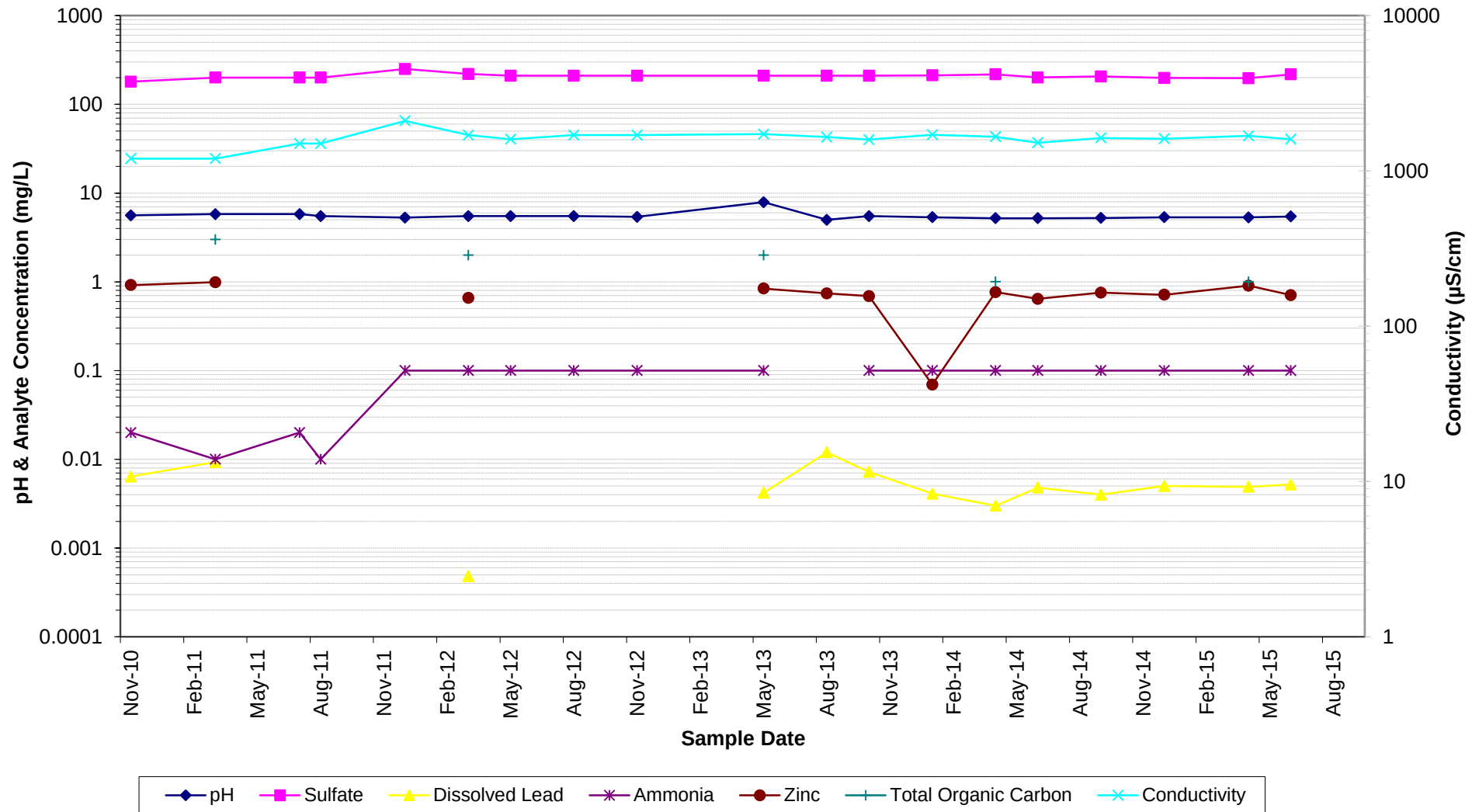


Figure 3.2.5.5 - Groundwater Trends - MB5

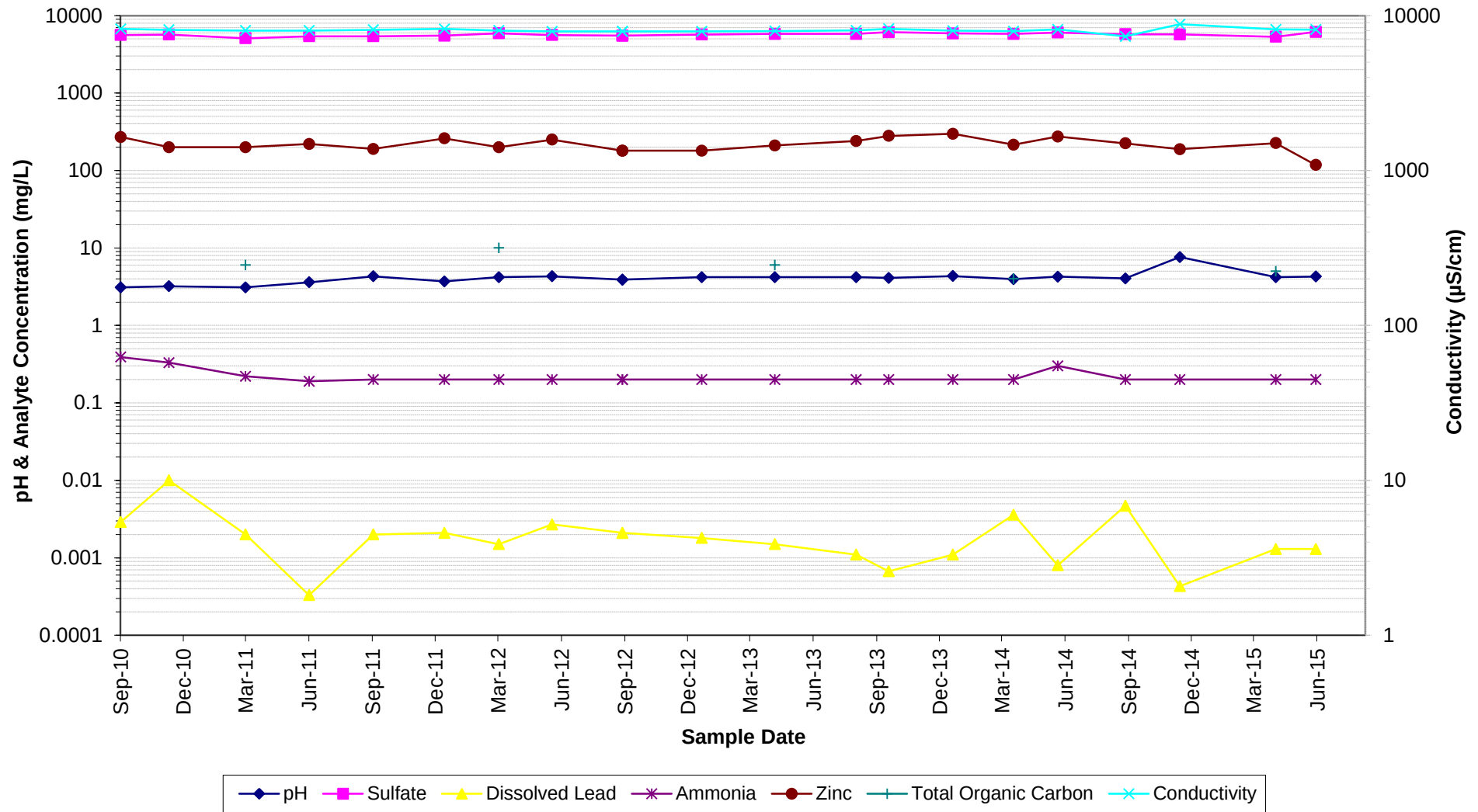


Figure 3.2.5.6 - Groundwater Trends - MB6

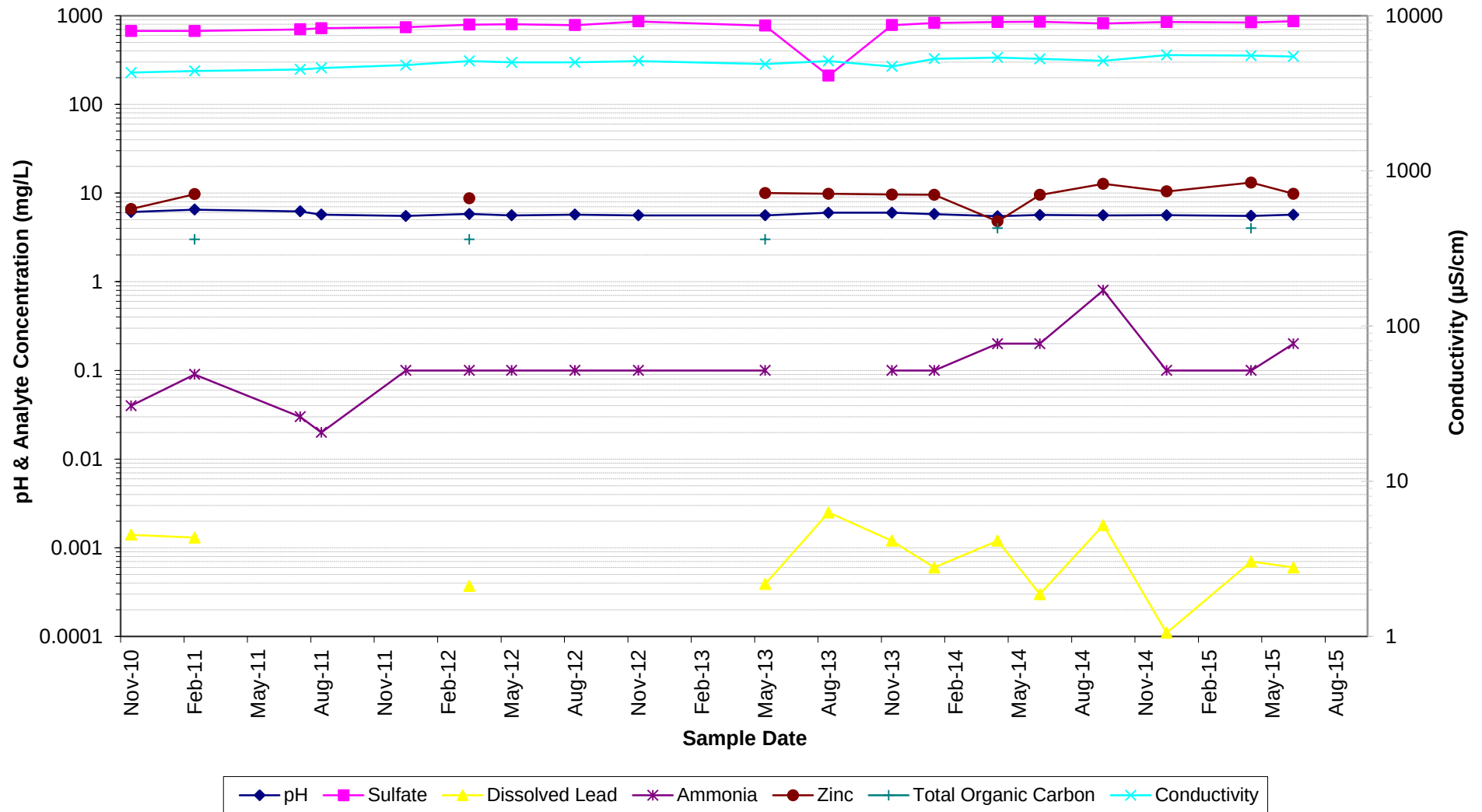


Figure 3.2.5.7 - Groundwater Trends - MB7

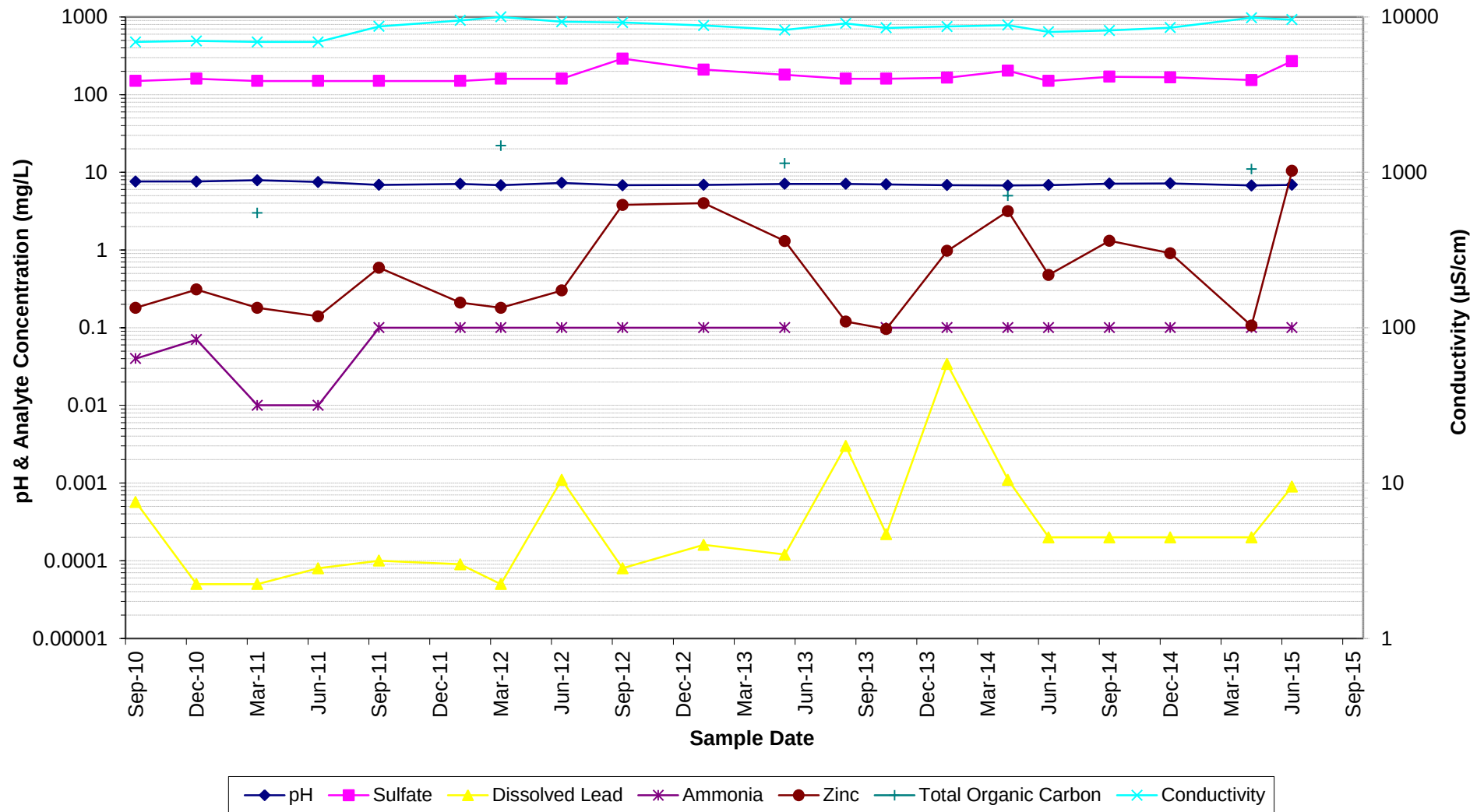


Figure 3.2.5.8 - Groundwater Trends - MB8

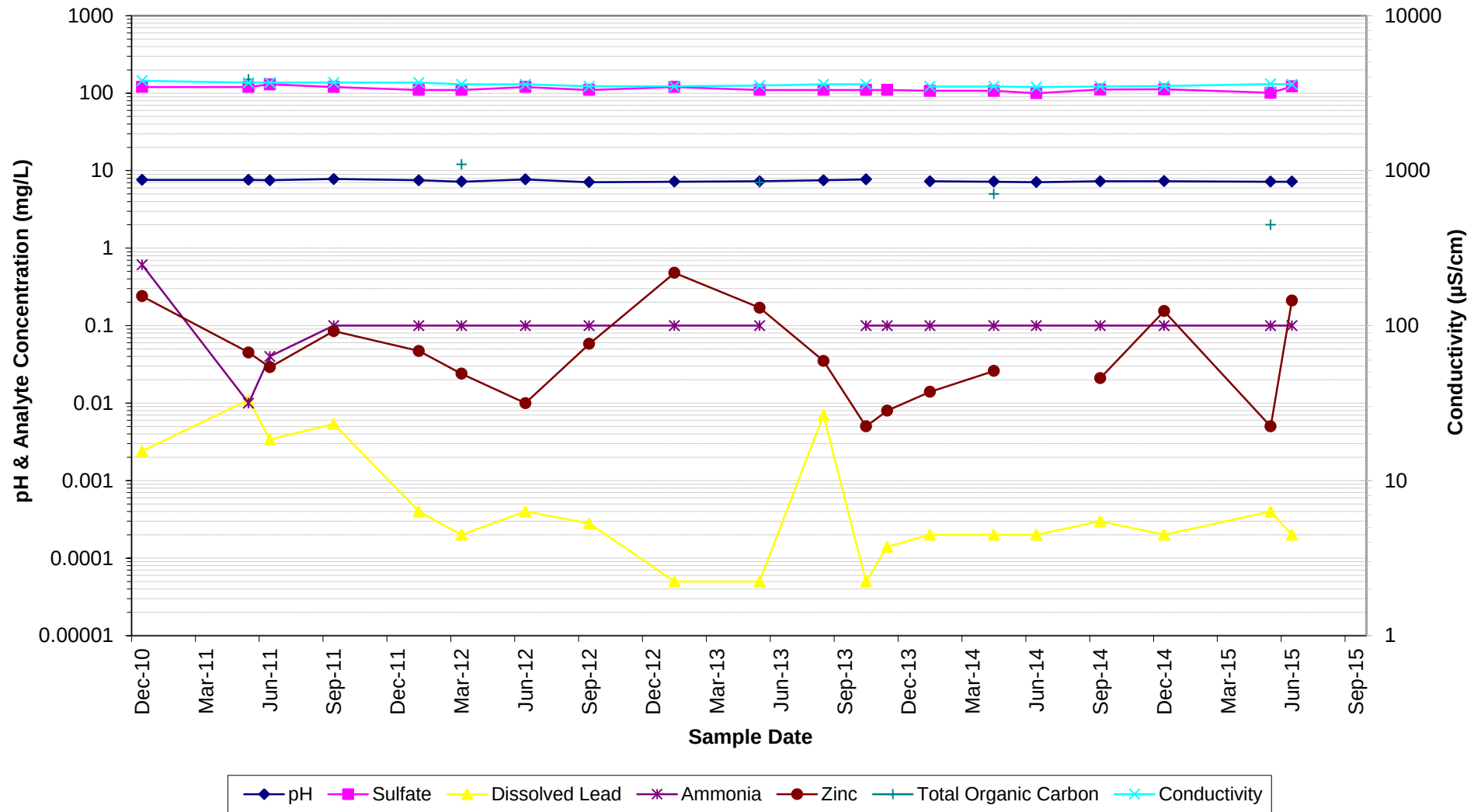


Figure 3.2.5B - Groundwater Levels - WM1 to WM6

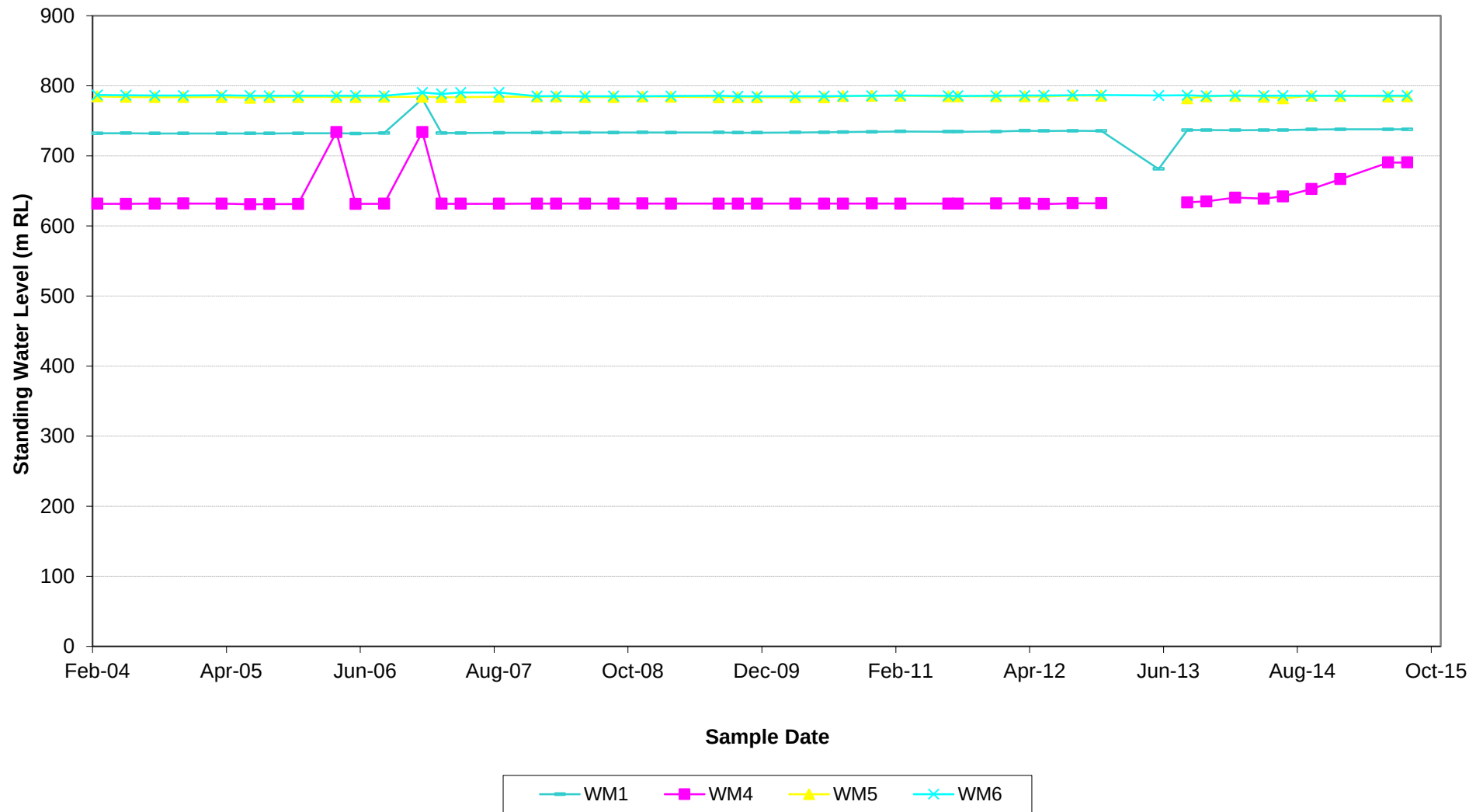


Figure 3.2.5C - Groundwater Levels - MW8S to MW10S

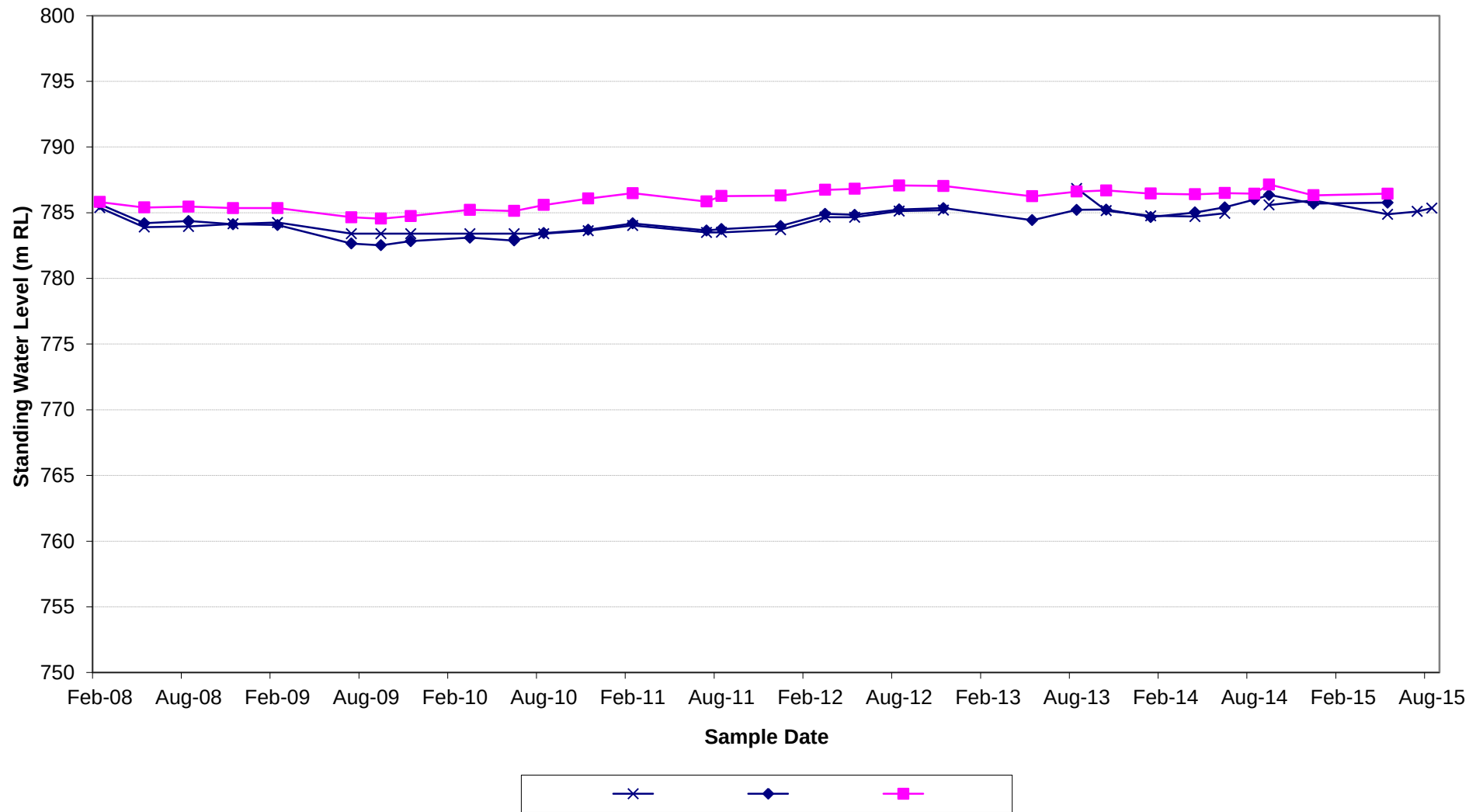


Figure 3.2.5.18 - Groundwater Trends - WM1

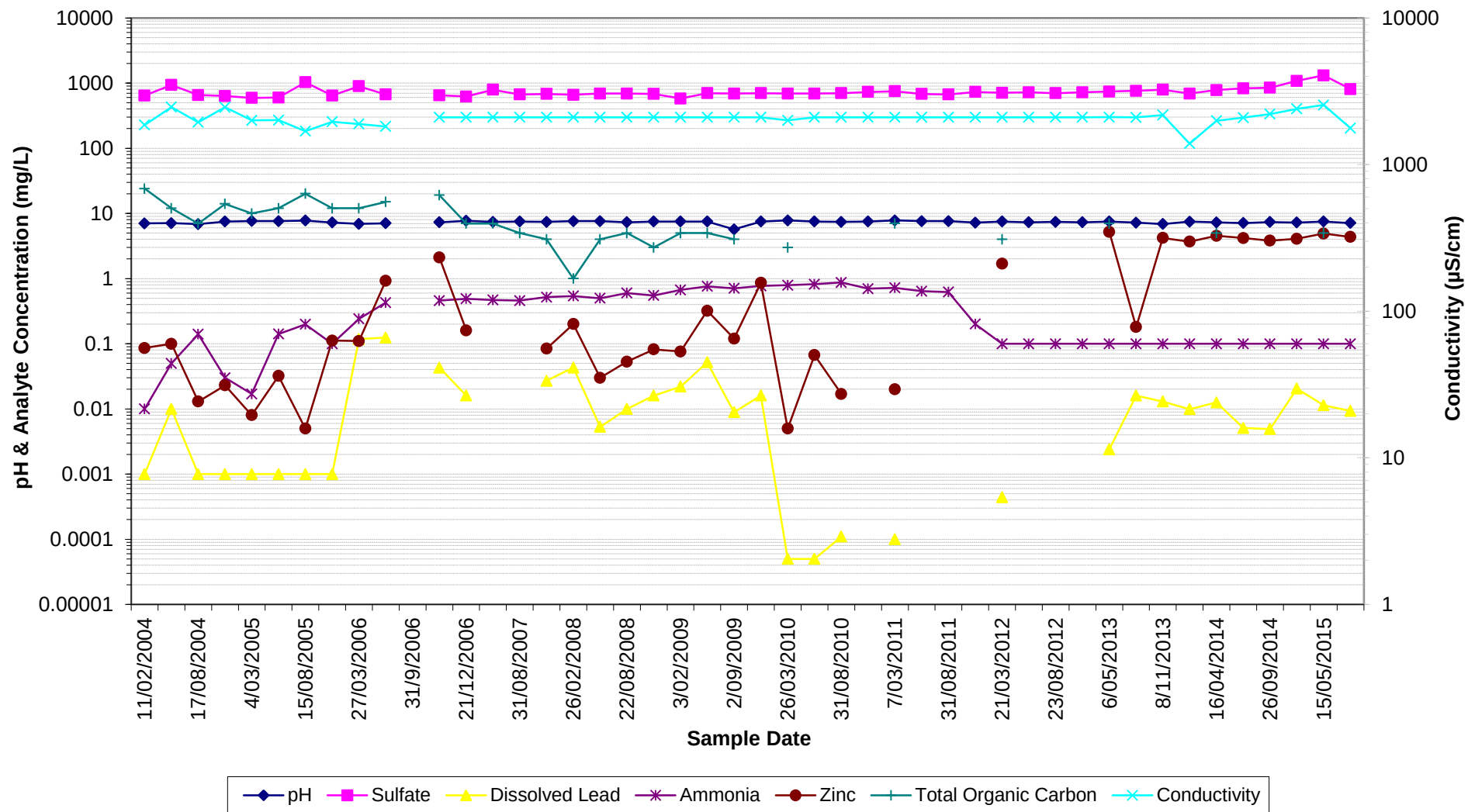


Figure 3.2.5.19 - Groundwater Trends - WM4

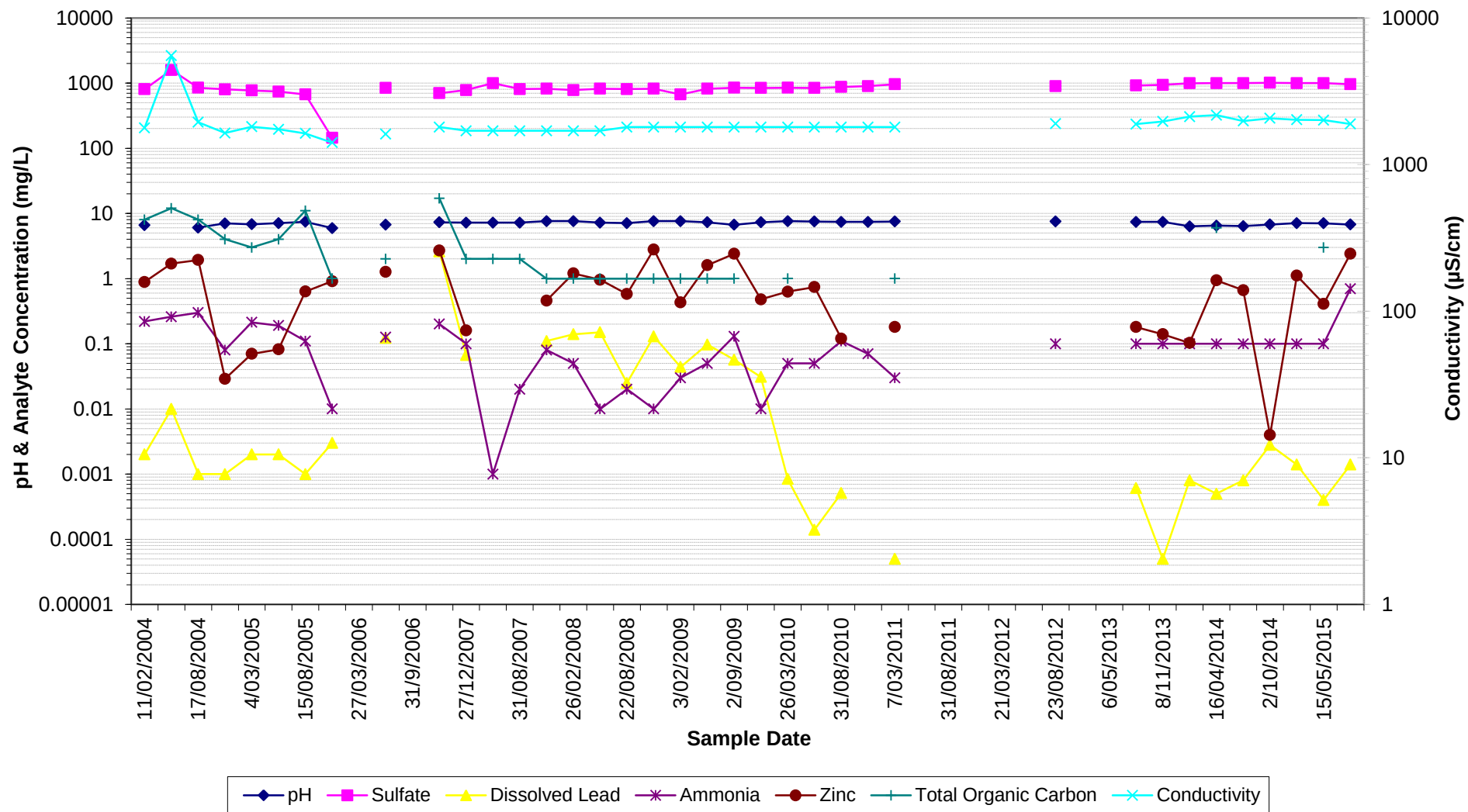


Figure 3.2.5.20 - Groundwater Trends - WM5

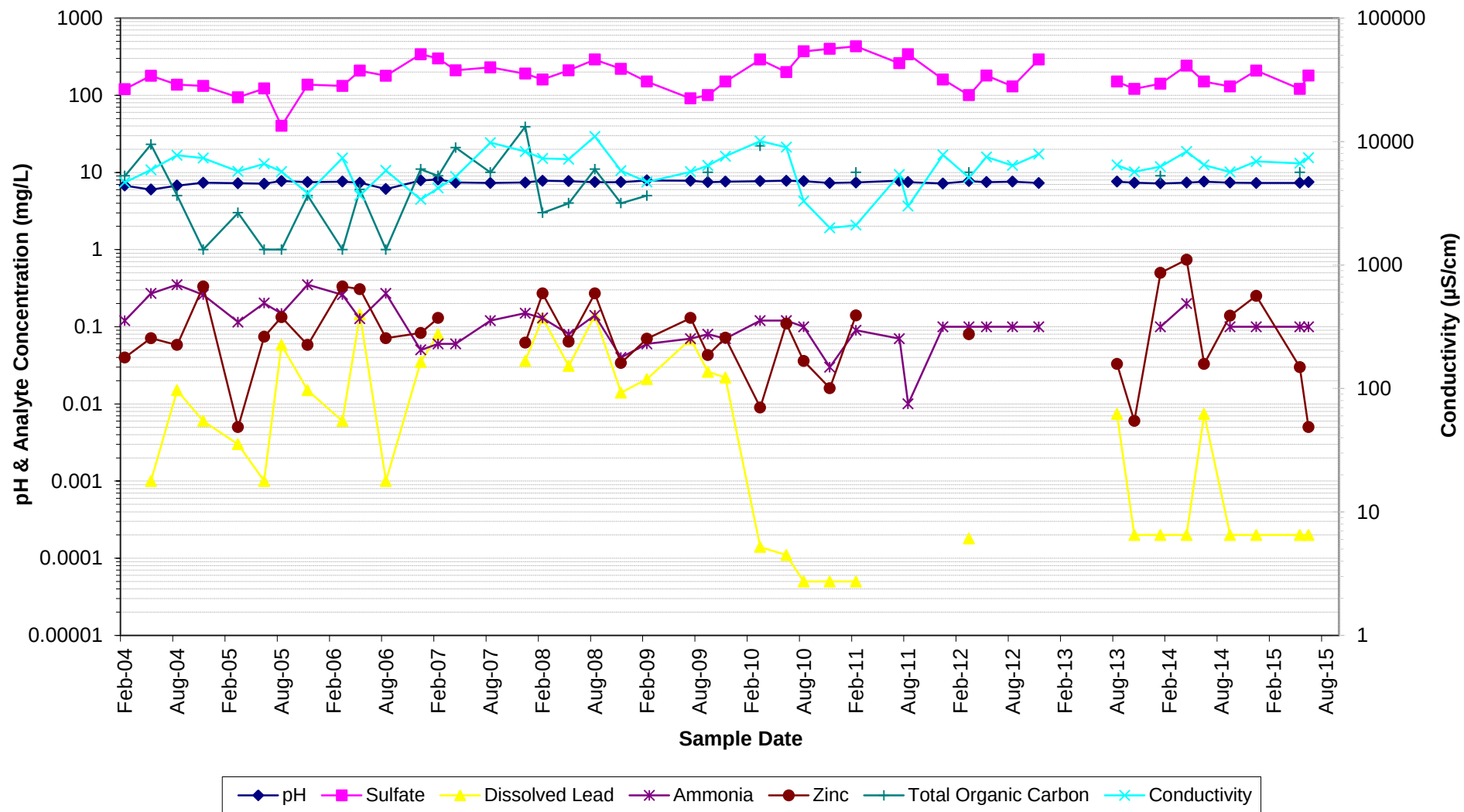


Figure 3.2.5.21 - Groundwater Trends - WM6

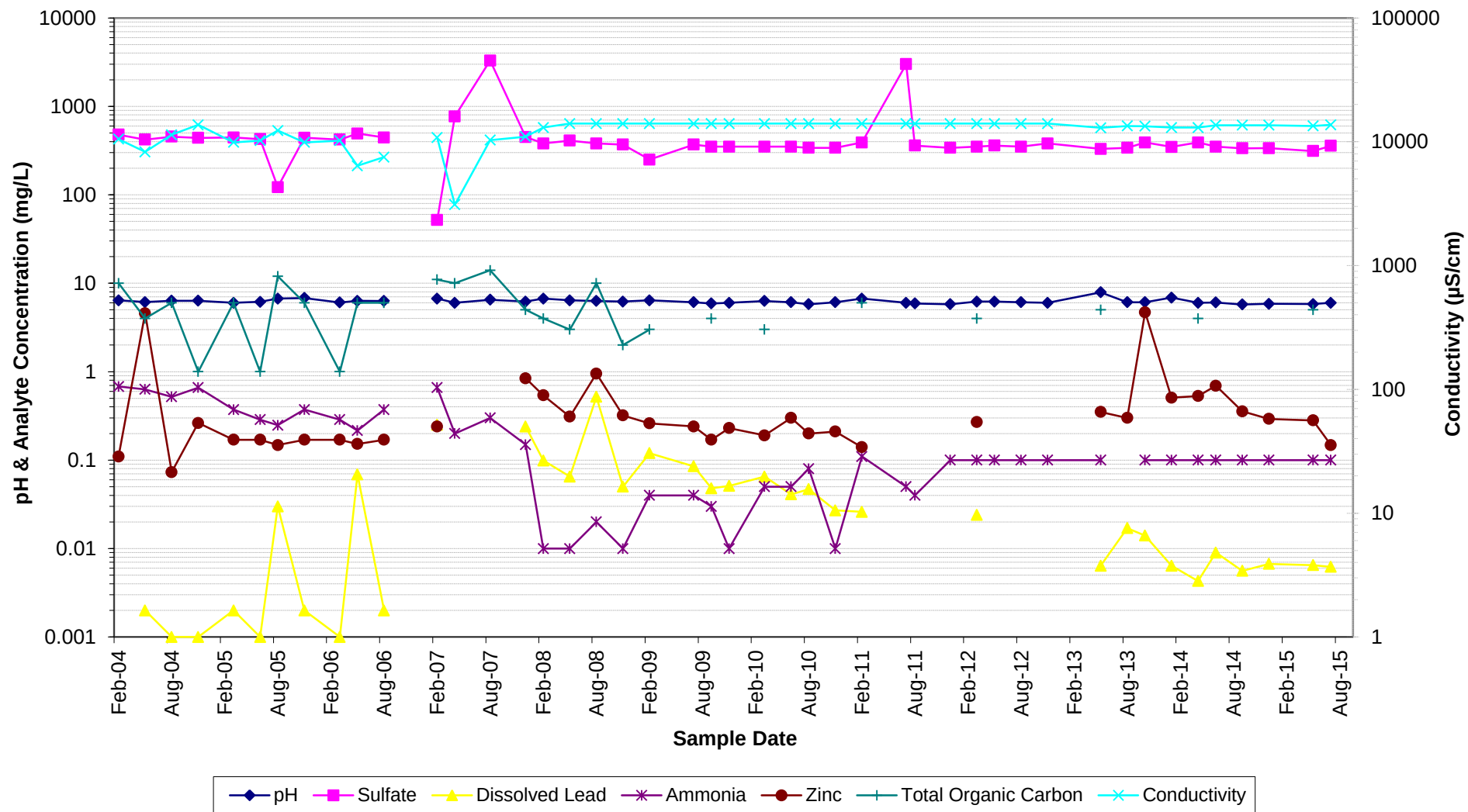


Figure 3.2.5.22 - Groundwater Trends - MW8S

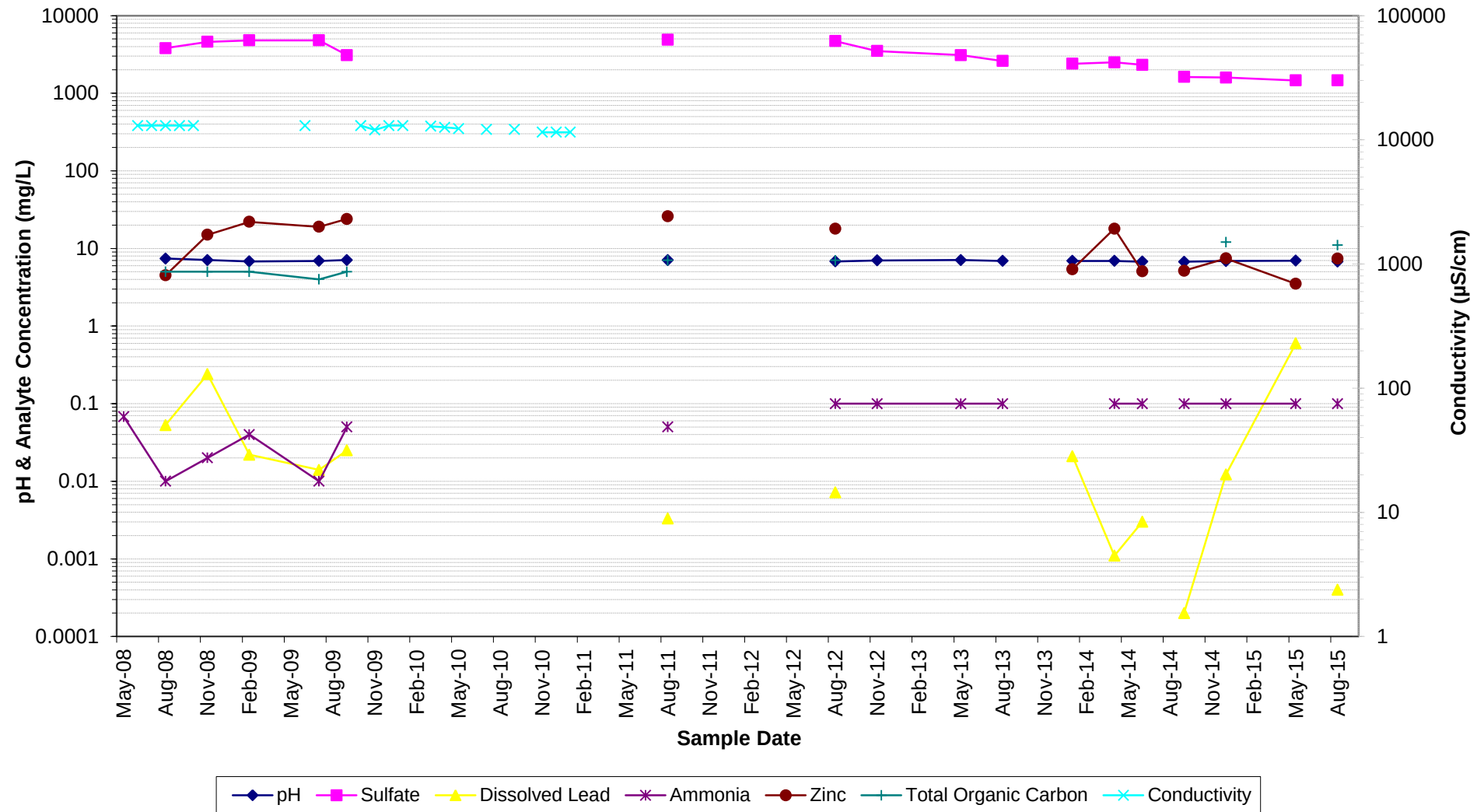


Figure 3.2.5.23 - Groundwater Trends - MW8D

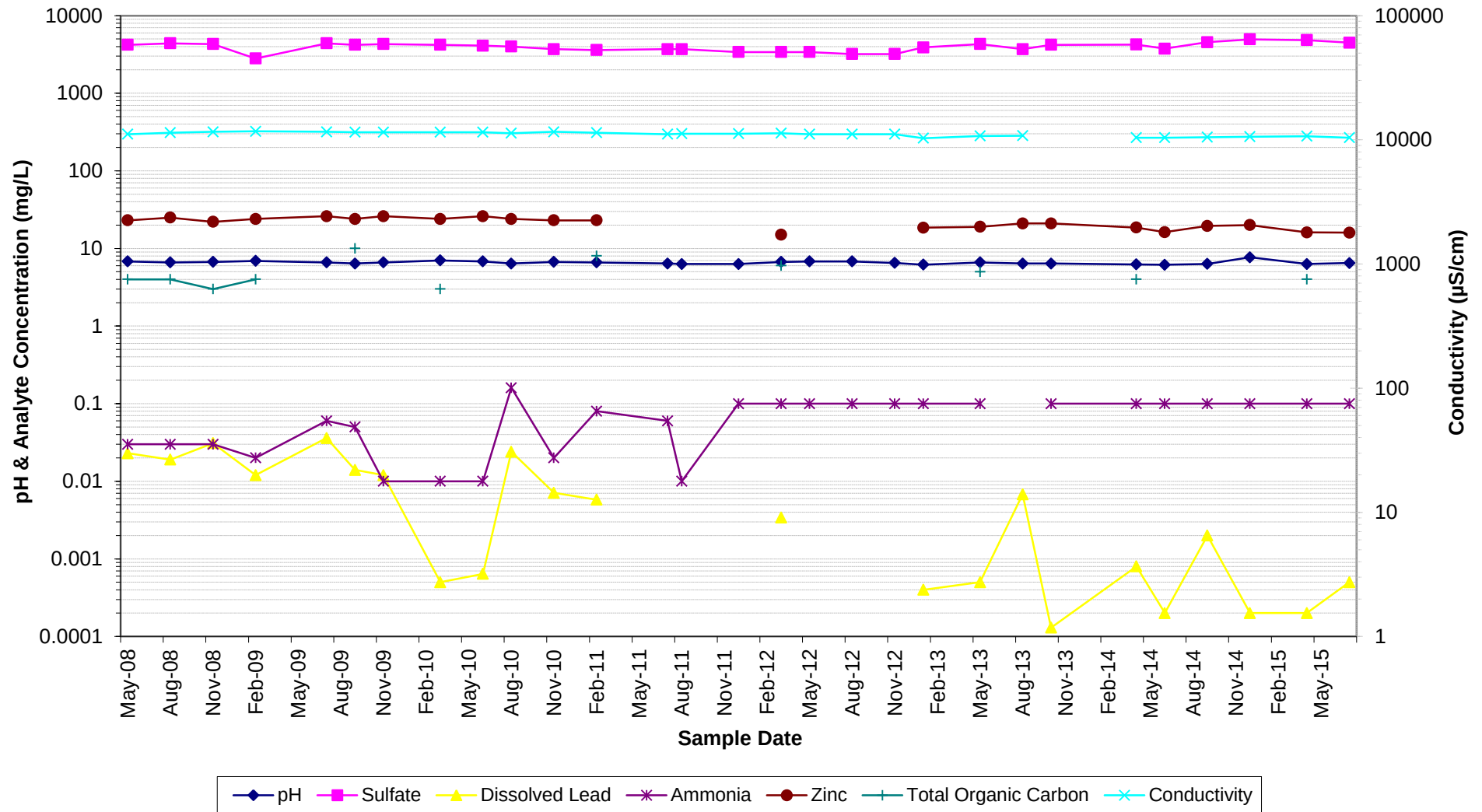


Figure 3.2.5.24 - Groundwater Trends - MW9S

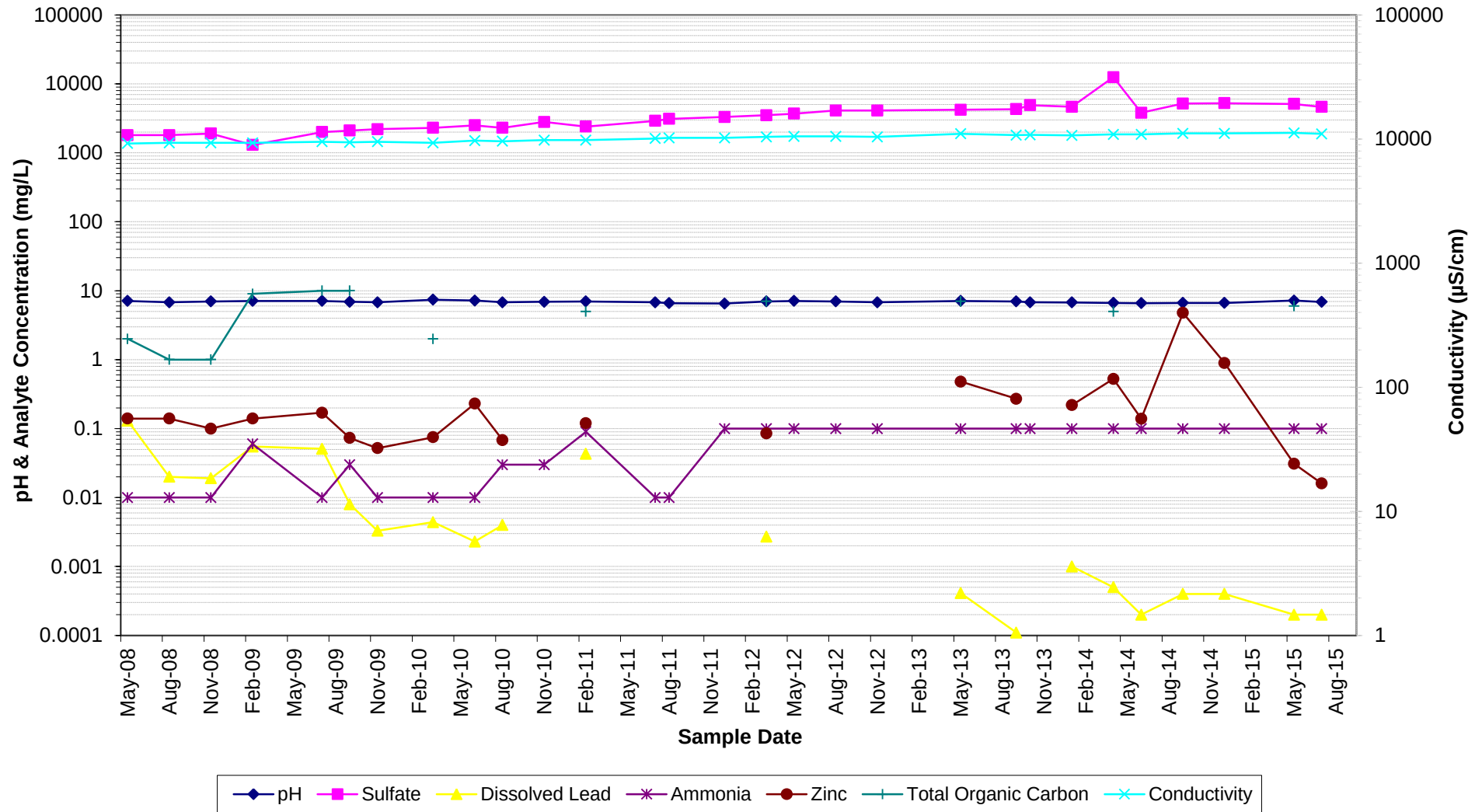


Figure 5.2.1.1 - IMF Surface Water Trends - Site 110

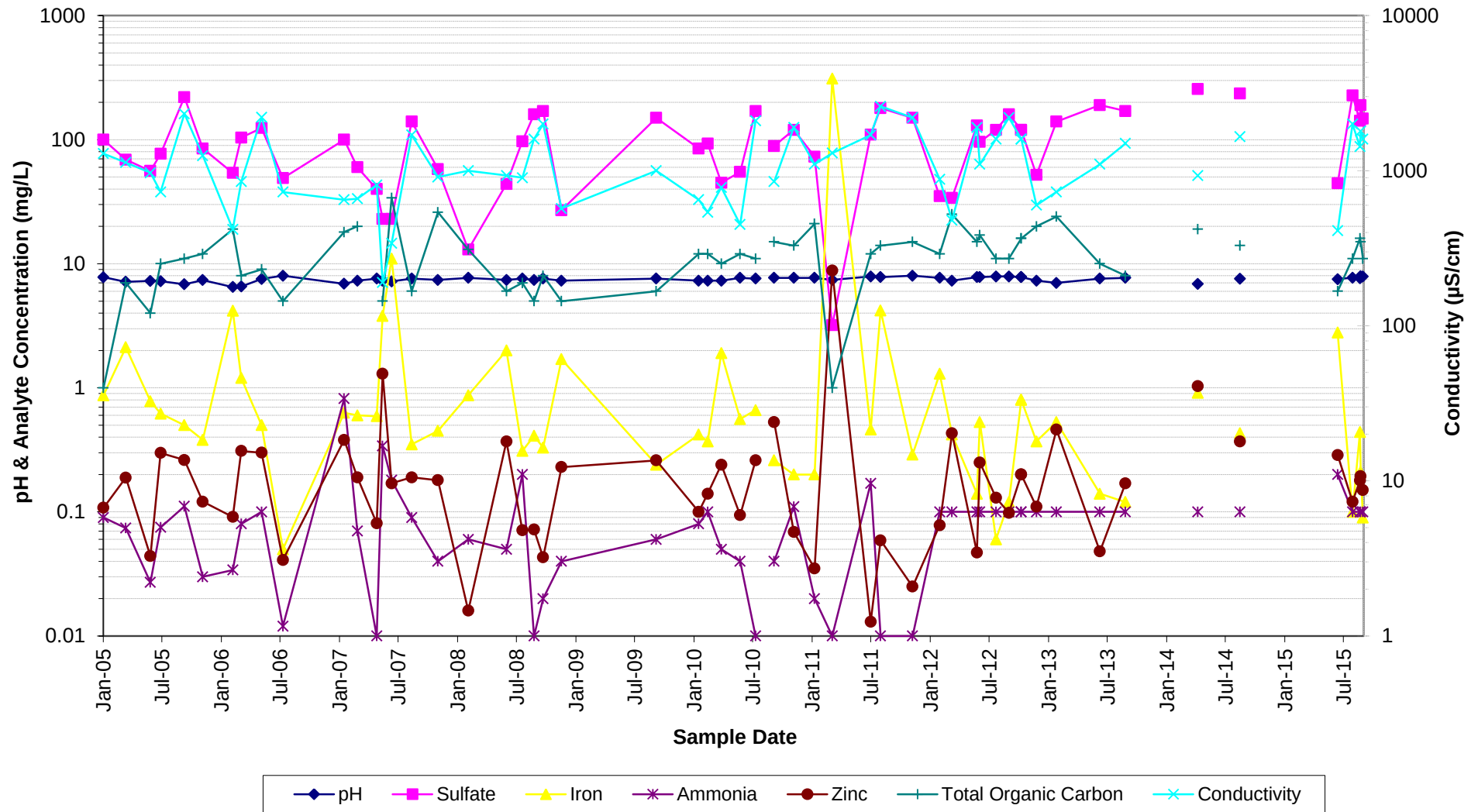


Figure 5.2.1.2 - IMF Surface Water Trends - Site 130

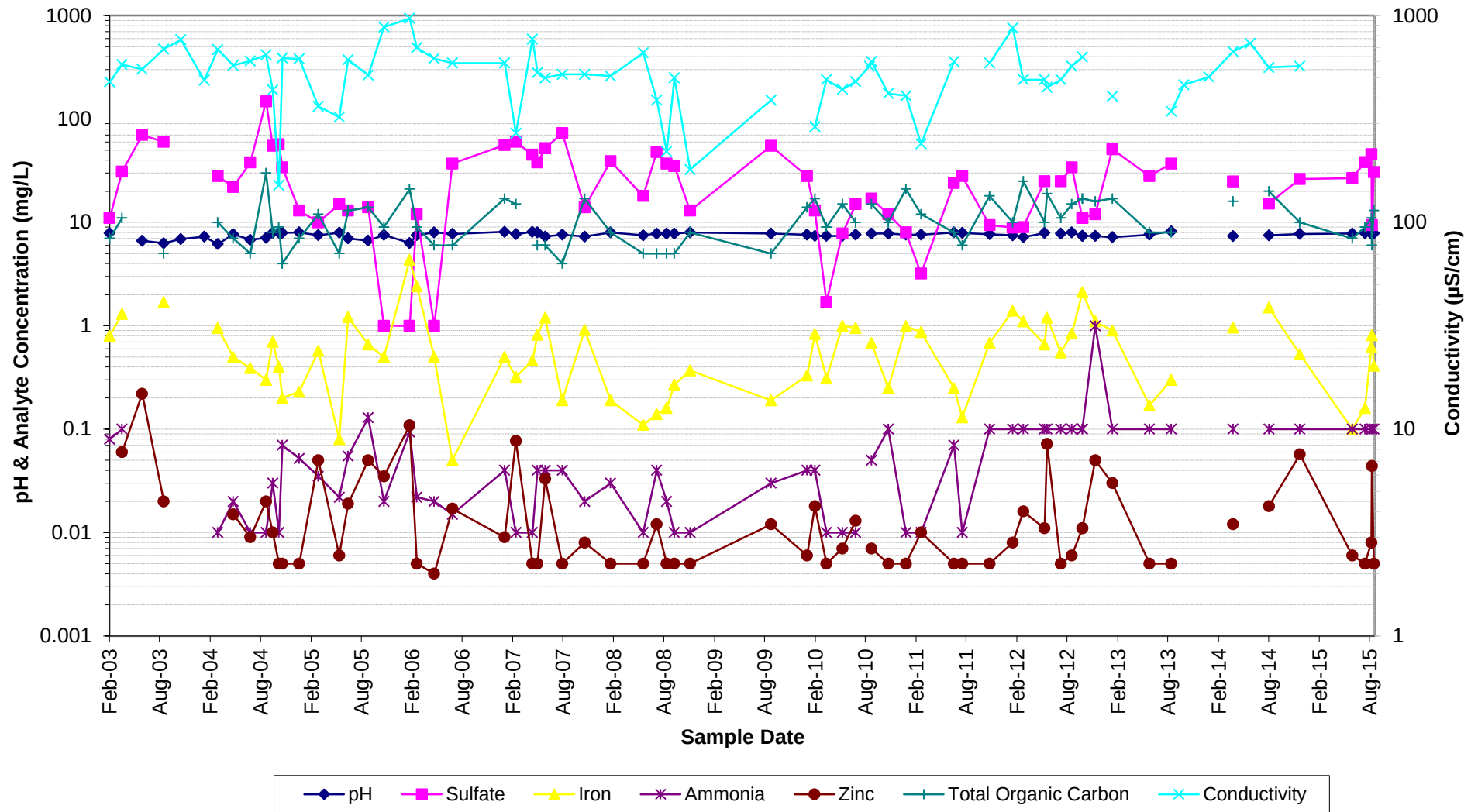


Figure 5.2.1.3 - IMF Surface Water Trends - Site 150

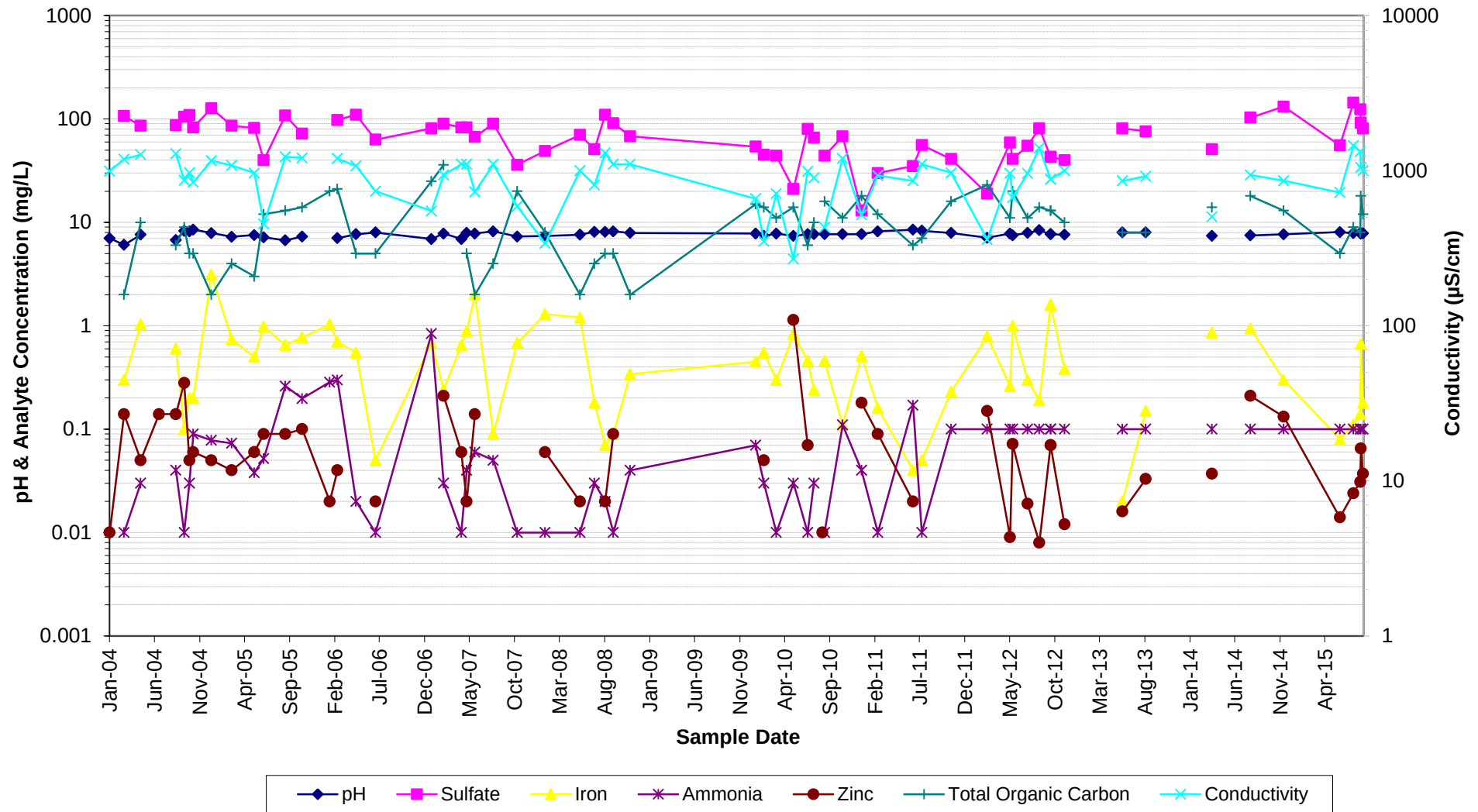
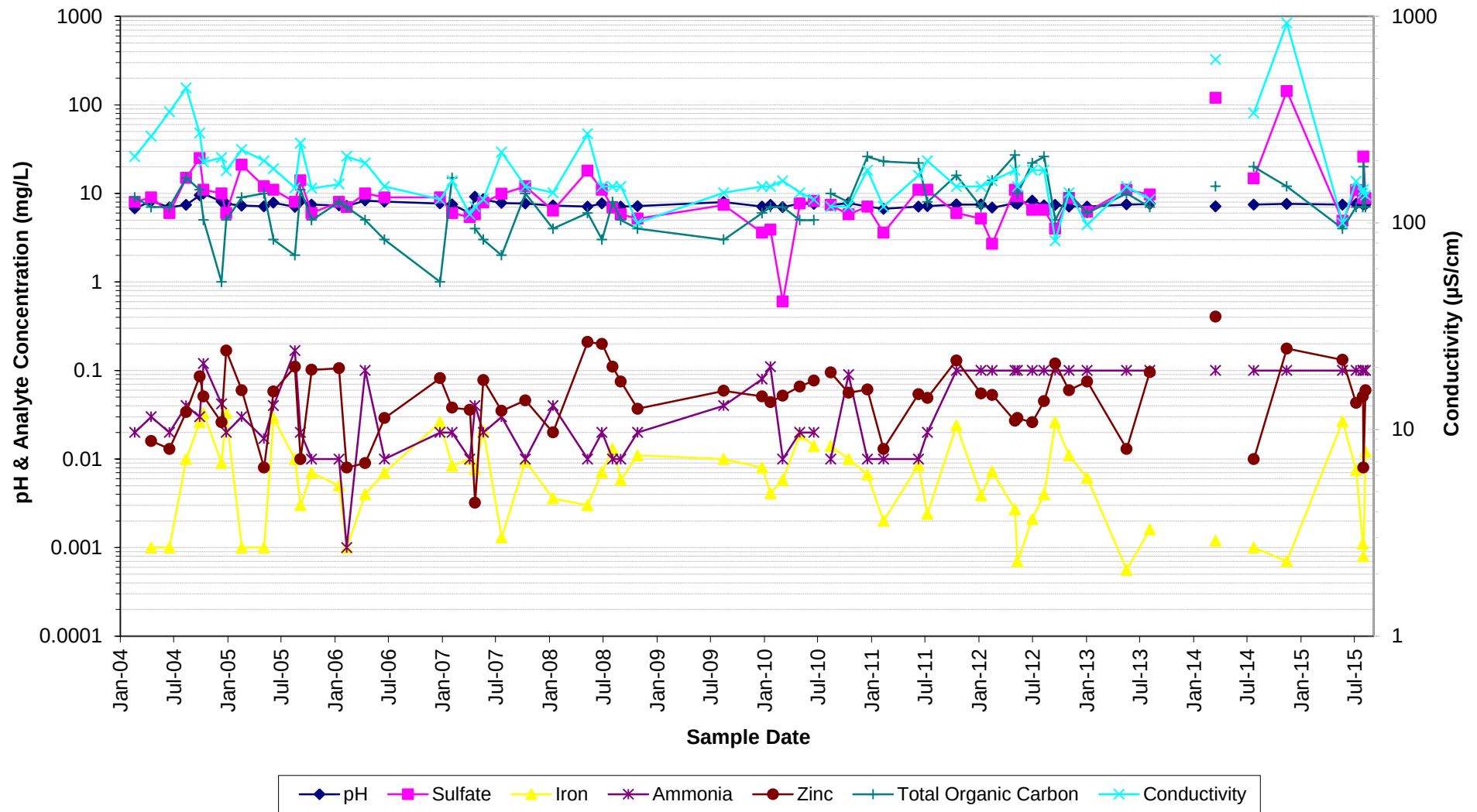


Figure 5.2.1.4 - IMF Surface Water Trends - First Flush



Appendices

Appendix 6

MB19 and MB20 Monitoring Results

Appendices

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Appendix 6 - MB19 & MB20

Table 11.1 - Groundwater Results - Monitoring Bore 19

Statistics	Field Information											Analytical Information													
	Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids
			AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L
	24/09/2014	MB19	10:00am	TB	6.57	6160	13.6	3.73	4.5	1.3	776.22	CA1402959-001	554	0.1	554	0.1	906	6430	614	454	1.9	250	6.86	2530	5620
	15/12/2014	MB19	9:55am	TB	6.8	6300	16.9	3.08	31.8	1.5	776.02	CA1404137-002	559	0.1	559	0.1	1250	6710	689	455	1.9	260	6.8	2410	6540
	4/06/2015	MB19	10:20am	JE/Rbe	7.26	6210.4	15.12	2.06		1.91	775.61	CA1502141-001	581	0.1	581	0.1	1400	7400	781	512	1.6	245	6.73	2380	6930
	23/06/2015	MB19	#####	JE	6.31	6214	15	2.03		1.64	775.88	CA1502458-001	584	0.1	584	0.1	1560	7380	753	520	1.8	252	6.82	2500	6920

Table 11.2 - Groundwater Results - Monitoring Bore 20

Statistics	Field Information											Analytical Information													
	Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Oxidation-Reduction Potential	Depth to Water	RL Water Level	Laboratory Sample Code	Bicarbonate	Carbonate	Alkalinity (as CaCO3)	Nitrogen (ammonia)	Chloride	Conductivity	Dissolved Calcium	Dissolved Magnesium	Dissolved Potassium	Dissolved Sodium	pH	Sulphate	Total Dissolved Solids
			AM/PM	Initials	pH	µS/cm	°C	mg/L	mV	m	m RL		mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L
	24/09/2014	MB20	10:15am	TB	6.55	5210	14	3.85	5.6	1.87	776.15	CA1402956-002	405	0.1	405	0.1	588	5420	580	370	1.2	188	6.72	2500	4980
	15/12/2014	MB20	10:05am	TB	6.55	5930	15.3	3.21	6.2	2.2	775.82	CA1404137-002	462	0.1	462	0.1	662	5690	617	395	1.3	226	8.84	2610	5980
	4/06/2015	MB20	10:40am	JE/Rbe	7.21	5517.4	14.83	1.52		2.57	775.45	CA1502141-002	521	0.1	521	0.1	841	6600	689	504	1.3	266	6.83	2870	6170
	23/06/2015	MB20	14:40	JE	6.32	5267	14.81	1.04		2.44	775.58	CA1502458-002	510	0.1	510	0.1	906	6300	644	484	1.4	253	6.77	2930	5940