

# **Annual Environmental Management Report**

**For  
Woodlawn Waste Expansion Project  
And  
Woodlawn Alternative Waste Technology  
Project**

***December 2018***



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**DEFINITIONS/ABBREVIATIONS**

<b>AEMR</b>	Annual Environmental Management Report
<b>BMS</b>	Business Management System
<b>BTT</b>	Banksmeadow Transfer Terminal
<b>CTT</b>	Clyde Transfer Terminal
<b>DPE</b>	NSW Department of Planning and Environment
<b>EMP</b>	Environmental Management Plan (IMF)
<b>EIS</b>	Environmental Impact Statement
<b>EP&amp;A</b>	<i>Environmental Planning and Assessment Act 1979</i> (and Regulations)
<b>EPA</b>	NSW Environment Protection Authority
<b>EPL</b>	Environment Protection Licence
<b>IEA</b>	Independent Environmental Audit
<b>IMF</b>	Crisps Creek Intermodal Facility
<b>LEMP</b>	Landfill Environment Management Plan
<b>LMP</b>	Leachate Management Plan
<b>MBT</b>	Woodlawn Mechanical Biological Facility
<b>MWOO</b>	Mixed Waste Organic Output
<b>NMP</b>	Noise Management Plan
<b>OEMP</b>	Operational Environmental Management Plan (MBT)
<b>PA</b>	Project Approval
<b>POEO</b>	<i>Protection of the Environment Operations Act 1997</i> (and Regulations)
<b>SWMP</b>	Soil Water and Management Plan
<b>TADPAI</b>	Tarago and District Progress Association Inc.
<b>TPA</b>	Tonnes per annum
<b>Veolia</b>	Veolia Australia and New Zealand
<b>WHS</b>	Work Health and Safety Act 2011 (and Regulation)



## **EXECUTIVE SUMMARY**

This Annual Environmental Management Report (AEMR) has been prepared in accordance with the Woodlawn Waste Expansion Project under Project Approval (PA) 10\_0012 and the Alternative Waste Technology Project under PA 06\_0239, as well as relevant legislative requirements and industry best practices .

On instruction from the Department of Planning and Environment (DPE), the requirements under each PA as per Schedule 7, Condition 5 of PA 10\_0012 and Schedule 4, Condition 5 of PA 06\_0239 have been combined in this AEMR and comprise collectively the 2017 - 2018 reporting period (9 September 2017 to 8 September 2018) respectively for the Woodlawn Bioreactor (the Bioreactor) and Crisps Creek Intermodal Facility (IMF) and the Woodlawn Mechanical Biological Treatment Facility (MBT).

This AEMR details the environmental performance of Bioreactor, IMF and MBT for the reporting period as a summary of environmental monitoring conducted in keeping with the PAs, as well as corrective actions resulting from any non-compliances identified and/or other findings from regulatory inspections, external and internal audit programs.

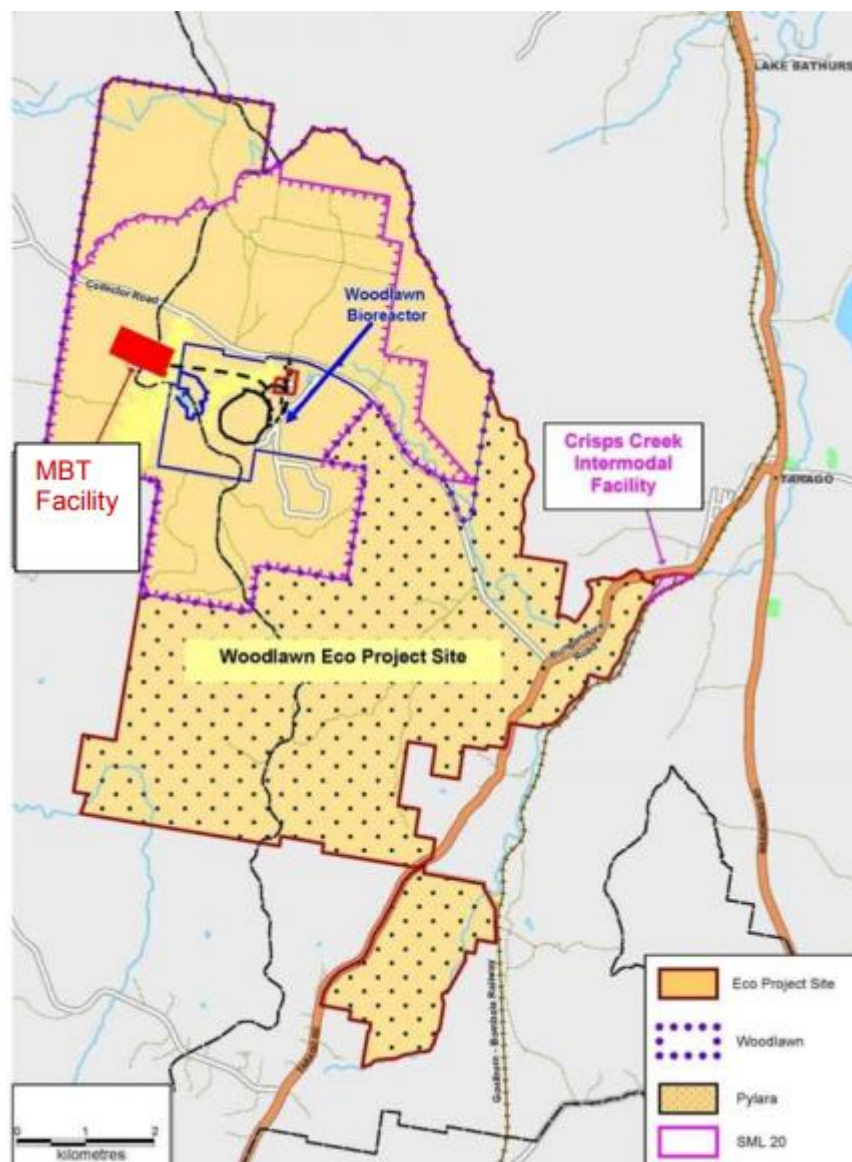
# Section 1

## Introduction

## INTRODUCTION

### 1.1. Site Overview

Veolia Australian and New Zealand (Veolia) own and operate the Woodlawn Eco Precinct (the Eco Precinct), which is located approximately 40 km south of Goulburn and 50 km north of Canberra and comprises of the Woodlawn Bioreactor (the Bioreactor), Crisps Creek Intermodal Facility (IMF) and the Woodlawn Mechanical Biological Treatment Facility (MBT) as depicted in **Figure 1.1 and Appendix 1**.



**Figure 1.1 The Woodlawn Eco Precinct**

#### 1.1.1 Woodlawn Bioreactor and Crisps Creek Intermodal Facility

The Bioreactor, where waste landfilling and landfill gas extraction occurs in the void of a remnant open cut mine, approximately 33 million cubic metres (m<sup>3</sup>) in capacity. Originally

approved to accept a maximum of 500,000 tonnes per annum (tpa) of putrescible waste, the Bioreactor, is now approved to accept a maximum throughput of 1.13 million tpa.

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 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 addition to the above operations, the DPE has also granted approval (December 2017) to modify the Bioreactor's PA for construction and operation of a leachate treatment plant (LTP) to process leachate was approved on. Construction of the LTP commenced following the approval and it is anticipated that the LTP will be operational to full capacity by March 2019. The LTP will facilitate better environmental and operational performance by allowing Veolia to extract and treat greater volumes of leachate from the Bioreactor and minimise and reduce the generation of odour, and enable more efficient gas extraction maximizing the waste to energy benefits of the Bioreactor.

Woodlawn Mechanical Biological Treatment FacilityThe MBT PA was granted in November 2007 and has been designed to process municipal solid waste (MSW) received from a collective of Sydney based councils to extract recyclable materials and produce MWOO from the organic fraction. The MWOO is produced with the intent to rehabilitate the former mine site on which the Bioreactor is situated.

The MBT facility currently comprises six building/processing areas (waste reception, area BRS drums, refining building, buffer storage area, fermentation hall and maturation storage areas. Changes to site layout, technology and operating hours were approved by the DPE as a modification to the PA in 2014.

Permitted to accept 240,000 tpa of mixed waste and 40,000 tpa of garden waste from Sydney, the first stage of the MBT commenced commissioning in March 2017 and operation in July 2017 processing up to 144,000 tpa of mixed waste.

## **1.2 Legislative Requirements**

The main legislative instruments governing the environmental performance and activities undertaken at the Terminal include the *Environmental Planning and Assessment Act 1979* (the EP&A Act) regulated by the DPE, and the *Protection of the Environment Operations Act 1997* (POEO Act) regulated by the EPA, as well as their respective associated regulations.

In addition to the PAs, Environment Protection Licences (EPLs) issued by the EPA, under the POEO Act, regulate the operational activities conducted at the Bioreactor,



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IMF and MBT. Monitoring activities undertaken at both facilities are reflected in the EPLs consistent with the consent requirements

An Environmental Management Plan has been prepared to reflect the requirements of the PAs for the operation of the Bioreactor (LEMP), IMF (EMP) and MBT (OEMP) respectively.

These 3 documents concentrate on key environmental issues identified in the environmental assessment undertaken for these 3 facilities and set out the criteria for managing and monitoring environmental parameters such as water quality, waste, traffic, air quality, greenhouse gas, noise, landscape and vegetation and emergency response.

The above requirements stipulate the performance standards that need to be met to maintain compliance at the 3 sites, and those relevant to the preparation of this AEMR are provided in **Table 1.2.1** and **Table 1.2.2** and further discussed in Section 2.

**Table 0.2.1: Bioreactor and IMF conditions relevant for the preparation of this AEMR**

Relevant Condition	Requirement
<b>SCHEDULE 7 – ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING</b>	
<b>Annual Environment Management Review</b>	
5	One (1) year after the commencement of expanded operations, and annually thereafter, the Proponent shall prepare an Annual Environmental Management Report (AEMR) to review the environmental performance of the project to the satisfaction of the Director-General. This review must: a) describe the operations that were carried out in the past year; analyse the monitoring results and complaints records of the Project over the past year, which includes a comparison of these results against the <ul style="list-style-type: none"><li>• relevant statutory requirements, limits or performance measures/criteria;</li><li>• monitoring results of previous years; and</li><li>• relevant predictions in the EA;</li></ul> c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; d) identify any trends in the monitoring data over the life of the Project; and e) describe what measure will be implemented over the next year to improve the environmental performance of the Project.

**Table 0.2.2: MBT conditions relevant for the preparation of this AEMR**

Relevant Condition	Requirement
<b>SCHEDULE 4 – REPORTING</b>	
<b>Annual Reporting</b>	
<b>5</b>	<p>Every year from the date of this approval, unless the Director-General agrees otherwise, the Proponent shall submit an AEMR to the Director-General and relevant agencies. The AEMR shall:</p> <ul style="list-style-type: none"> <li>a) identify the standards and performance measures that apply to the development;</li> <li>b) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;</li> <li>c) include a summary of the monitoring results for the development during the past year;</li> <li>d) include an analysis of these monitoring results against the relevant: <ul style="list-style-type: none"> <li>• Impact assessment criteria;</li> <li>• Monitoring results from previous years; and</li> <li>• Predictions in the EIS;</li> </ul> </li> <li>e) identify any trends in the monitoring results over the life of the development;</li> <li>f) identify any non-compliance during the previous year; and</li> <li>g) describe what actions were, or are being taken to ensure compliance.</li> </ul>

Table 1.2.3 summaries the list of environmental approvals in place for the Bioreactor, IMF and MBT:

**Table 0.2.3: Environmental Approvals**

Description	Permit Number
Conditions of Development Consent: The Woodlawn Waste Management Facility (issued by DPE)	31-02-99
Project Approval: <i>Woodlawn Waste Expansion Project</i> (issued by DPE)	10_0012
Bioreactor Environment Protection Licence (issued by EPA)	11436
Special (Crown & Private Lands) Lease 20 (SML 20) (issued by Department of Primary Industries)	SML 20
Water Access Licence: Willeroo Borefield (issued by Water NSW)	40WA411642
IMF Environment Protection Licence (issued by EPA)	11455
MBT Environment Protection Licence (issued by EPA)	20476
Project Approval: <i>Woodlawn Alternative Waste Technology Project</i> (issued by DPE)	PA 06_0239

### **1.3 Responsibilities**

- Environmental monitoring for the Bioreactor and IMF was undertaken and/or supervised by Ark Du (Landfill Engineer) and Harneet Puarr (Woodlawn Environmental Officer)
- Environmental monitoring for the MBT was undertaken and/or supervised by Christian Chang (MBT Process Engineer).
- Analyses of collected samples were performed at Australian Laboratory Services Pty Ltd (ALS), which is a NATA accredited laboratory.
- The Odour Unit Pty Ltd (TOU) was appointed in January 2018 to conduct odour audits for the Bioreactor and IMF.
- An Independent Environmental Audit (IEA) for the Bioreactor/IMF was conducted by Ramboll Environ Australia Pty Ltd in the previous reporting period, the findings of which and corrective actions implemented in this reporting period are presented in this AEMR.
- The audit team associated with the Bioreactor IEA included Victoria Sedwick (Lead Auditor), David Ford (Auditor) and Ronan Kellaghan (Reviewed). The audit team was approved by the DPE.
- An independent noise audit was conducted by SLR Consulting Australia Pty Ltd (SLR) in October 2017 for MBT. The audit team associated with this noise assessment included Mark Blake and John Sleeman. The audit team was approved by the DPE.

## Section 2

# Environmental Assessment Criteria

## SECTION 2 ENVIRONMENTAL ASSESSMENT CRITERIA

Based on the risk predictions in the environmental assessments undertaken for the 3 facilities, the implemented controls measures described in the EMPs became the assessment criteria to determine the environmental performance of the respective operations. These are summaries in **Table 2** and results of monitoring measures in this reporting period are described in subsequent sections of this AEMR.

**Table 2: Assessment Criteria**

Issue	Environmental Risk	Likelihood of Occurrence	Control Measure	AEMR Section Reference
Air quality (dust and odour)	Emission of air pollutants and odour above the EPA guidelines.	Low level of risk due to the large buffer distance between the Bioreactor and sensitive receptors.	Monthly Dust monitoring Annual Independent Odour Audits	Section 3.2
Greenhouse gas emissions and energy use	Excessive energy consumption and related GHG emissions compared to similar facilities.	Known consequences with significant offset through generation of electricity from methane produced at the site.	Extraction & monitoring of the gas for green energy generation , reporting under National Greenhouse and Energy Scheme	Section 3.3
Surface Water	Contamination of surface water.	Possible without control measures, but unlikely due to existing approved Surface Water Management Scheme.	Ongoing Surface and Ground water monitoring, Leachate monitoring	Section 3.4
Groundwater	Contamination of ground water.	Possible without control measures, however unlikely due to the use of leachate barrier systems and existing Groundwater Management Scheme.	Ongoing Surface and Ground water monitoring, Leachate monitoring	



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Issue	Environmental Risk	Likelihood of Occurrence	Control Measure	AEMR Section Reference
Noise	Increased noise impacts above the EPA guidelines. Impacts on local residents.	Rare due to the large buffer distance between the Bioreactor sensitive receivers.	In the event a noise complaint is received , Noise monitoring is carried out at the site	Section 3.5
Pest, disease and agriculture related impacts	Introduction of pests and the spreading of disease as a result of the proposed expansion.	Possible without control measures, however unlikely due to existing approved, operational management measures.	Routine Site Inspections	Section 3.7
Traffic and transport	Significant impacts on local Tarago community, impacting levels of service and traffic flow.	The risk is rare due to the relatively low level of truck movements.	Limit the transfer of waste within approved operational hours	Sections 3.5 and 3.6
Socio economic	Negative impact on existing social conditions and on economic vitality of the Tarago district.	Rare as the Project will generate additional employment demand, while amenity impacts are low.	Veolia has well established mechanisms in place for addressing community concerns for engaging with the community to assist in the management of issues raised	N/A
Hazard and risk	Increased risk to human health and the environment from expansion, especially from dangerous materials and gases.	Rare as hazardous substances may not be received at the Bioreactor and IMF.	All known hazards are understood and managed by Veolia with any incidents dealt with as part of the Fire and Emergency Response Plan	N/A

## SECTION 3 ENVIRONMENTAL MONITORING

### 3.1 Monitoring Requirements

This section presents the monitoring undertaken at the Bioreactor, IMF and MBT throughout the reporting period, in accordance with the requirements of the PAs, as detailed in the respective EMPs.

An Environmental Monitoring Program (EMP) has prepared to guide monitoring requirements, which enable the continuous measuring and assessment of suitability, adequacy and effectiveness of on-site environmental management measures. These requirements are summarised in **Table 3.1.1**, **Table 3.1.2** and **Table 3.1.3** and discussed in subsections below.

A monitoring location plan is included in **Appendix 3**.

**Table 3.1.1: Bioreactor Monitoring Requirements**

Consent Reference	Type of Monitoring	Frequency	Commentary
Schedule 4, Condition 3	Site Inspection	Daily	Ongoing basis
Schedule 4, Condition 7	Odour Audit	Annually	Condition satisfied , odour audit conducted 02/02/17
Schedule 4, Condition 11	Dust Monitoring	Monthly	Ongoing basis
Schedule 4, Condition 12/ Air Quality and Greenhouse management Plan	Odour – Site inspections	Daily or as required	Ongoing basis
Schedule 4, Condition 17/ Soil and Water management Plan/EPL	Surface water monitoring Groundwater monitoring	Quarterly/ Annually	Ongoing basis
Schedule 4, Condition 18/ Leachate Management Plan	Leachate pond monitoring and Leachate recirculation monitoring	Annually	Ongoing basis
Schedule 4, Condition 19/ Noise Management Plan	Noise Monitoring	As required	Not triggered
Schedule 4, Condition 22	Meteorological monitoring	Continuous	Ongoing basis
Schedule 4, Condition 23/ Landscaping and Vegetation Management	Site Inspections	Weekly housekeeping	Ongoing basis

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Consent Reference	Type of Monitoring	Frequency	Commentary
Plan			
Schedule 4 Condition 24/ Pest ,Vermin & Noxious Weed Management	Site Inspections	Weekly housekeeping	Ongoing basis

**Table 3.1.2: Crisps Creek IMF Monitoring Requirements**

Consent Reference	Type of Monitoring	Frequency	Commentary
Schedule 5, Condition 5	Litter control	Daily	Ongoing basis
Schedule 5 Condition 6/ Pest ,Vermin & Noxious Weed Management	Site Inspections	Weekly housekeeping	Ongoing basis
Schedule 5, Condition 9	Odour Audit	Annually	Condition satisfied , odour audit conducted January 2018
Schedule 5, Condition 15	Noise Monitoring	As required	Not triggered

**Table 3.1.3: MBT Monitoring Requirements**

Condition Reference	Type of Monitoring	Frequency	Commentary
Schedule 3, Condition 29 EPL Condition M4	Meteorological monitoring	Continuous	Ongoing basis
Schedule 3, Condition 23 & 24 EPL Condition M2.2	Depositional Dust Monitoring	Monthly	Ongoing basis
Schedule 3, Condition 25 & 26 EPL Condition L4	Operational noise monitoring	As required	Condition satisfied, monitoring conducted: 2 – 3 October 2017
Schedule 3, Condition 20 EPL Condition M2.3	Surface Water Monitoring	Quarterly	Ongoing basis

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EPL Condition L2.4	Discharge Monitoring	Daily during any discharge	Ongoing basis
Schedule 3, Condition 20 EPL Condition M2.3	Groundwater Quality Monitoring	Quarterly	Ongoing basis
Schedule 3, Condition 20 EPL Condition M2.3	Leachate Monitoring	Six monthly	Ongoing basis
EPL Condition O5.3	Leachate Level	Weekly or as required	Ongoing basis
Schedule 3, Condition 6 EPL Condition L3.1	Waste volume monitoring	Daily	Ongoing basis
Schedule 3, Condition 9	Site Inspection and Housekeeping	Weekly	Ongoing basis
Schedule 3, Condition 10	Pest and Vermin Checks	Every two months	Ongoing basis

## 3.2 Air Quality

Air quality monitoring, pertaining to odour and dust emissions, was undertaken in accordance with the Consent to determine whether activities conducted at the Bioreactor, Crisps Creek IMF and MBT affected ambient air quality.

### 3.2.1 Bioreactor Air Quality Monitoring Results

#### 3.2.1.1 Meteorology

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 2017/2018 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)

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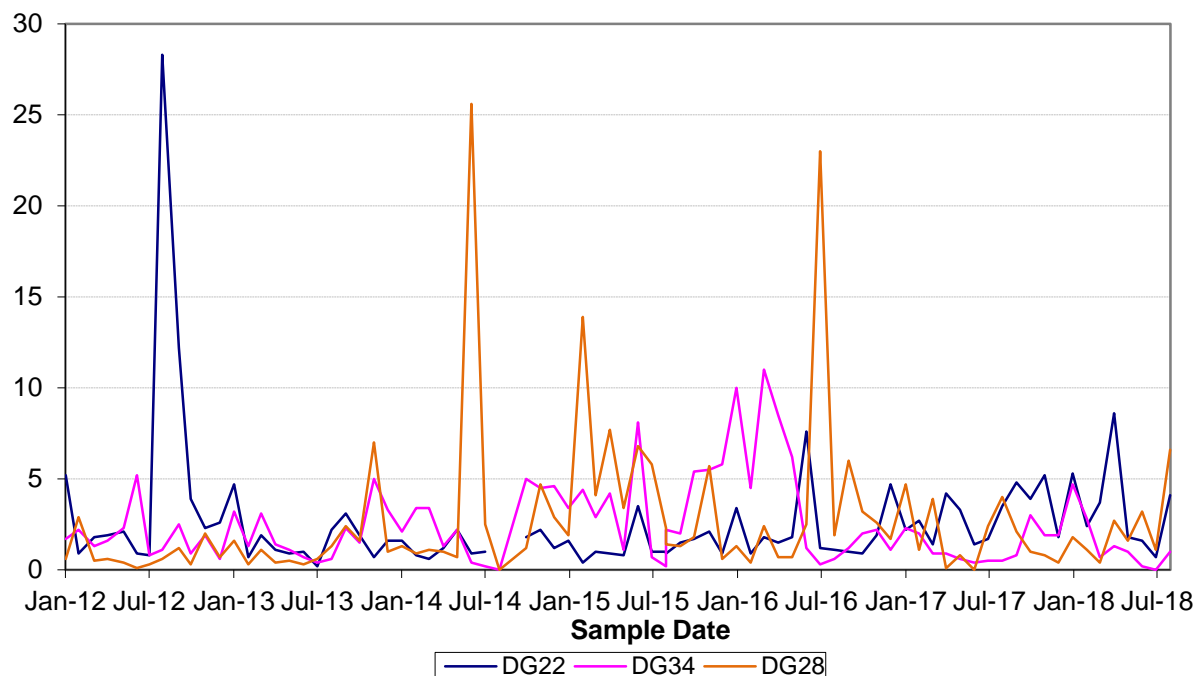
### 3.2.1.2 Dust

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.

**Table 3.2.1: Bioreactor Air Quality Monitoring Results**

Parameter	Results/Discussion																			
Particulates/Dust Monitoring	<p>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 <b>Figure 3.2.1</b></p> <p>The results of total insoluble solids found within the depositional dust samples are summarised for each of the monitoring locations in <b>Table 3.2.1</b> below, with the detailed results tabulated in <b>Tables 4.1 - 4.3</b> (refer <b>Appendix 3</b>).</p> <p style="text-align: center;"><b>Table 3.2.1.1: Dust Monitoring Results</b></p> <table><tr><th rowspan="2">Dust Gauge</th><th colspan="3">Summary Total Insoluble Solids (g/m2/month)</th></tr><tr><th>Minimum</th><th>Maximum</th><th>Average</th></tr><tr><td>DG22</td><td>0.7</td><td>8.6</td><td>3.66</td></tr><tr><td>DG34</td><td>0.2</td><td>4.7</td><td>1.75</td></tr><tr><td>DG28</td><td>0.4</td><td>6.6</td><td>1.90</td></tr></table> <p>The maximum dust level recorded in this reporting period was 8.6 g/m2/month at DG22 in April 2018 which is located on the East side of the Bioreactor. Given that for the corresponding month there were no similar levels recorded at the dust 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 Heron Resources' construction activities directly next to DG22.</p> <p>Overall dust suppression is generally consistent with previous years and a measure of the dust control measures that the site has in place.</p>	Dust Gauge	Summary Total Insoluble Solids (g/m2/month)			Minimum	Maximum	Average	DG22	0.7	8.6	3.66	DG34	0.2	4.7	1.75	DG28	0.4	6.6	1.90
Dust Gauge	Summary Total Insoluble Solids (g/m2/month)																			
	Minimum	Maximum	Average																	
DG22	0.7	8.6	3.66																	
DG34	0.2	4.7	1.75																	
DG28	0.4	6.6	1.90																	
Odour Monitoring	<p>41 odour complaints were received at the premises during this reporting period.</p> <p>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.</p> <p>Veolia will continue to implement recommended actions from the odour audit in combination with improving current odour control measures identified by Veolia.</p>																			





**Figure 3.2.1: Bioreactor Depositional Dust Levels (g/m<sup>2</sup>/month)**

\* Data before 2011 has been removed to allow for better interpretation of performance for recent reporting periods.

### **3.2.1.3 PM10/TSP monitoring results**

Results taken in 2016/2017 show that there were no exceedance both on and offsite. The maximum PM10 level was 21.7µg/m<sup>3</sup> onsite, which was under the limit. (Note: Monitoring for the month November started 11/11/2016)

Note: Heron Resources, as part of their construction activities, have begun PM10/TSP monitoring at the Pylara monitoring site and started on the 17 October 2017.

## **3.2.2 IMF Air Quality Monitoring Results**

### **3.2.2.1 Dust**

Dust monitoring is undertaken monthly at one location at the IMF in accordance with the EPL. A summary of this reporting period is provided in Table 3.2.2 and detailed in Table 10 (refer Appendix 3).

The results at DG18 indicate an average level of total insoluble solid matter is 0.75 g/m<sup>2</sup>/month, which is generally consistent with overall historical trends as seen in the subsequent graph, Figure 3.2.2. 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.

**Table 3.2.2: Dust Monitoring Results**

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Dust Gauge	Summary Total Insoluble Solids (g/m <sup>2</sup> /month)		
	Minimum	Maximum	Average
DG18	0.4	1.4	0.75

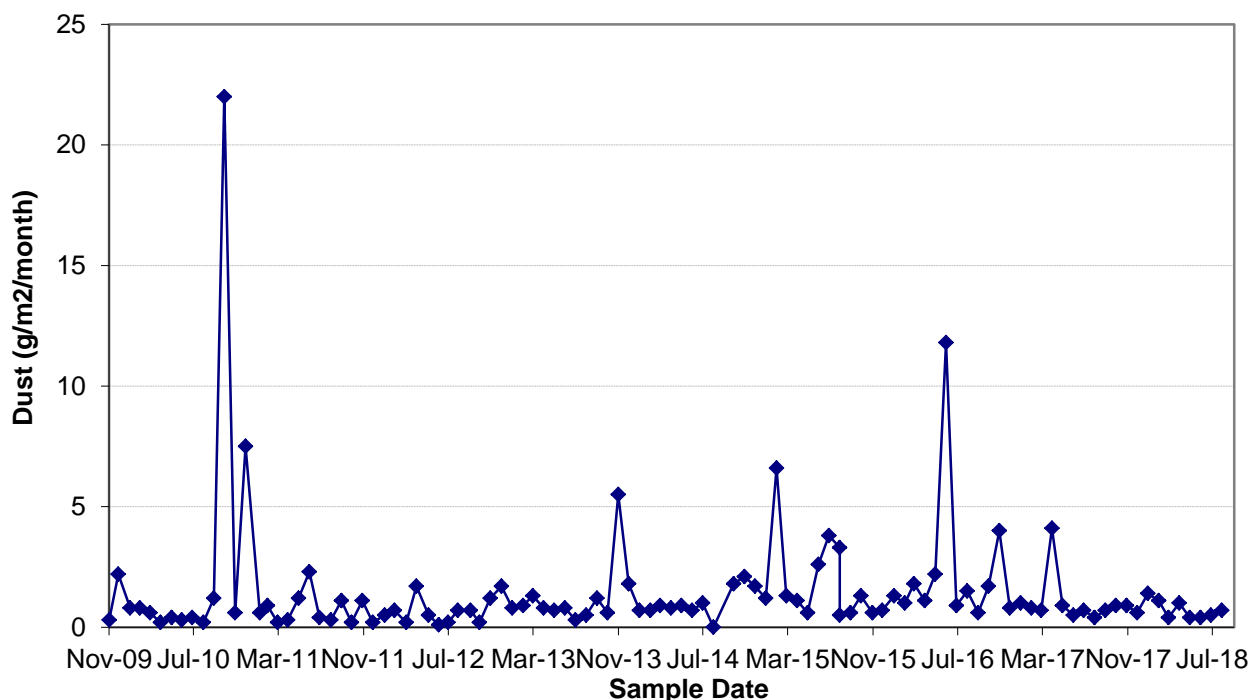


Figure 3.2.2: IMF Depositional Dust Levels – DG18

### 3.2.2.2 Odour

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 and is further discussed in Section 6 of this AEMR.

Veolia will continue to implement recommended actions from the odour audit in combination with improving current odour control measures identified by Veolia.

No odour complaints were received for the IMF during this reporting period.

### **3.2.3 MBT Air Quality Monitoring Results**

#### 3.2.3.1 Dust

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Dust monitoring is undertaken monthly at the MBT facility in accordance with the EPL. A summary of this reporting period is provided in Table 3.2.3 and detailed in Table 4 & 11 (refer Appendix 3).

**Table 3.2.3: MBT Air Quality Monitoring Results**

Parameter	Results/Discussion											
Particulates/Dust Monitoring	<p>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 <b>Figure 3.2.1 &amp; 3.2.3</b>.</p> <p>MBT shares 2 depositional dust gauges with the Bioreactor, which include Pylara (DG28) and West Void (DG 34), which are summarised in section 3.2.1. In addition, there is a dust gauge (DG 33) close to the MBT facility. A summary of this reporting period at the dust gauge is provided in Table 3.2.3.1 and detailed in Table 11 (refer Appendix 3)</p> <p style="text-align: center;"><b>Table 3.2.3.1: Dust Monitoring Results</b></p> <table><tr><th rowspan="2">Dust Gauge</th><th colspan="3">Summary Total Insoluble Solids (g/m2/month)</th></tr><tr><th>Minimum</th><th>Maximum</th><th>Average</th></tr><tr><td>DG 33 (Point 7)</td><td>0.2</td><td>2.4</td><td>0.84</td></tr></table> <p>The average level of total insoluble solid matter is 0.84 g/m2.month, which is generally consistent with overall historical trends as seen in the Figure 3.3. The maximum dust level recorded in this reporting period was 2.4 g/m2/month at DG 33. The maximum dust level observed is related to the dry weather condition during this period. In addition, the maximum dust observed at the area is lower than background dust level in other monitoring points.</p>	Dust Gauge	Summary Total Insoluble Solids (g/m2/month)			Minimum	Maximum	Average	DG 33 (Point 7)	0.2	2.4	0.84
Dust Gauge	Summary Total Insoluble Solids (g/m2/month)											
	Minimum	Maximum	Average									
DG 33 (Point 7)	0.2	2.4	0.84									
Odour Monitoring	<p>The air quality impact assessment (AIA) prepared by SLR, predicted that MBT Facility operations would comply with relevant air quality goals and are not expected to generate offensive or nuisance odours at nearby sensitive receivers.</p> <p>The adopted odour criterion of 6 OU was predicted to be achieve at all receptors with the exception of the TriAusMin (now Heron) administration building, which was predicted to experience a 99th percentile odour concentration of 8.5 OU. This concentration was predicted to be dominated by the existing source of the Bioreactor, rather than the operation of the Facility, which was predicted to result in a 99th percentile concentration of 1.7 OU when modelled alone.</p> <p style="text-align: center;"><b>Table 3.2.3.2 - Odour Emission Performance Criteria</b></p> <table><tr><th>Parameter</th><th>Performance Measure</th><th>Standards</th><th>Statutory Requirement</th></tr><tr><td>Odour Emissions</td><td>6 OU</td><td>German Standard VDI</td><td>OEMP</td></tr></table>	Parameter	Performance Measure	Standards	Statutory Requirement	Odour Emissions	6 OU	German Standard VDI	OEMP			
Parameter	Performance Measure	Standards	Statutory Requirement									
Odour Emissions	6 OU	German Standard VDI	OEMP									

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			3940 'Determination of Odorants in Ambient Air by Field Inspections'	<p>The management of odour emissions from each of the proposed processing stages is maintained by the use of biofilters. Biofilters are pollution control mechanisms which use living material to biologically degrade and filter pollutants which may cause odours. These pollutants are absorbed into the biofilter material whereby it is broken down by microorganisms. Two biofilter odour control systems (OCS) are located adjacent to the processing areas at the Site. The two biofilter system are maintained regularly to ensure the odour control system is working with the best performance.</p> <p>No odour complaints were received in this reporting period.</p>
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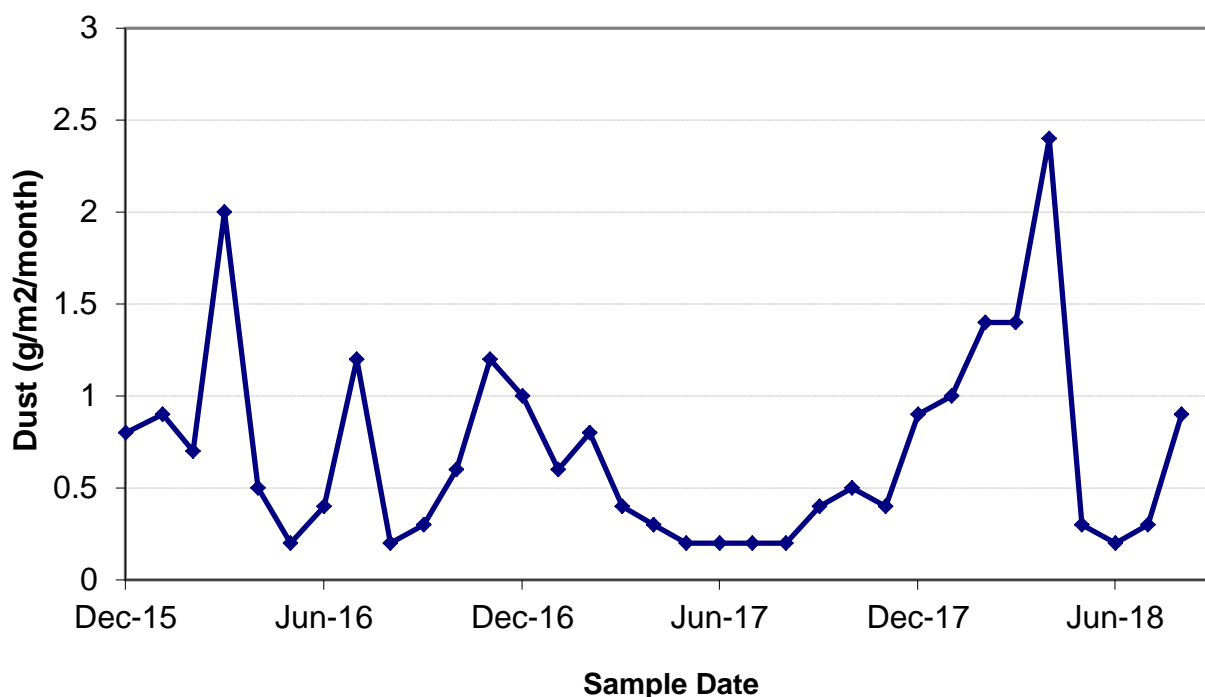


Figure 3.2.3 – MBT Depositional Dust Levels – DG33

### 3.3 Bioreactor Landfill Gas Monitoring results

Veolia operate the Bioreactor to maximise the production of landfill gas for generation of renewable energy at the Power Station, where 7 generators have been installed and commissioned, 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 Consent and EPL.

The landfill gas extraction and utilisation infrastructure in the Bioreactor has been designed to meet the conditions of the landfill including settlement.

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The findings from Landfill gas monitoring required under the Consent and EPL is summarised in **Table 3.3** below

**Table 3.3: Bioreactor Landfill Gas Monitoring Results**

Table 3.3: 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 <b>Table 3.3.1</b> below:				
	<b>Table 3.3.1: Subsurface Gas Monitoring Result</b>				
	Gas Monitoring Bore ID	Purged Methane Reading (%)			
		29/11/2017	23/03/2018	9/07/2018	16/08/2018
	GMBH1	0	0	0	0
	GMBH2	0	0	0	0
	GMBH4	0	0	0	0
	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.				
	Landfill Gas Extraction Booster	The data reported for the landfill gas extraction booster at the Power Station is consistent to the historical average since 2016 as summarised in <b>Table 3.3.2</b> below:			
		<b>Table 3.3.2: Landfill Gas Extraction Booster Monitoring Results Summary</b>			
Parameter		Historical Average	2017/2018 Result		
Temperature (° C)		2.7	5		
Volumetric Flow (m3/hr)		2157	3400		
Methane (%)	53.4	51			
The detailed data for each of the parameters required under the EPL for the gas extraction booster is provided in <b>Table 1</b> (refer <b>Appendix 3</b> ).					
Surface Gas	Surface gas monitoring was completed on a quarterly basis as per EPL requirements, which are summarised in <b>Table 3.3.3</b> below. The detailed tabulated data is available in <b>Table 2</b> (refer <b>Appendix 3</b> ).				
	<b>Table 3.3.3: Surface Gas Monitoring Results Summary</b>				
	Parameter	Minimum	Maximum	Average	
Methane (%)	0.0001	0.08	0.009		
Methane was detected in varying amounts over the waste surface with a					



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	<p>decreasing overall average of 0.009% during this reporting period compared to 0.010% last reporting period.</p> <p>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, Second Edition 2016).</p> <p>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.</p> <p>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 vegetation mulch bio-cover was implemented around wells which have assisted in mitigating odour and reducing surface gas emissions.</p>									
Landfill Gas Flare	<p>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 <b>Table 3.3.4</b> below.</p> <div><p><b>Table 3.3.4: Landfill Gas Flare Monitoring Results</b></p><table><tr><th>Parameter</th><th>Units</th><th>Result</th></tr><tr><td>Temperature</td><td>°C</td><td>1057</td></tr><tr><td>Residence Time</td><td>Seconds</td><td>&lt; 0.3</td></tr></table></div>	Parameter	Units	Result	Temperature	°C	1057	Residence Time	Seconds	< 0.3
Parameter	Units	Result								
Temperature	°C	1057								
Residence Time	Seconds	< 0.3								
Landfill Gas Engine Exhaust Point(s)	<p>Monitoring of a landfill gas engine exhaust point was completed during the reporting period. The results are consistent with the previous monitoring period and presented in <b>Tables 3.1 to 3.5</b> (refer <b>Appendix 3</b>).</p> <p>Concentration limits for each of the following pollutants are stipulated in the EPL, all of which were below the threshold for the exhaust point test within this reporting period and consistent with previously reported levels, as demonstrated in <b>Figures 3.3.1 – 3.3.3</b>.</p> <ul style="list-style-type: none"><li>• Nitrogen Oxides;</li><li>• Hydrogen Sulphide;</li><li>• Sulphuric Acid Mist; and</li><li>• Sulphur Trioxide.</li></ul>									

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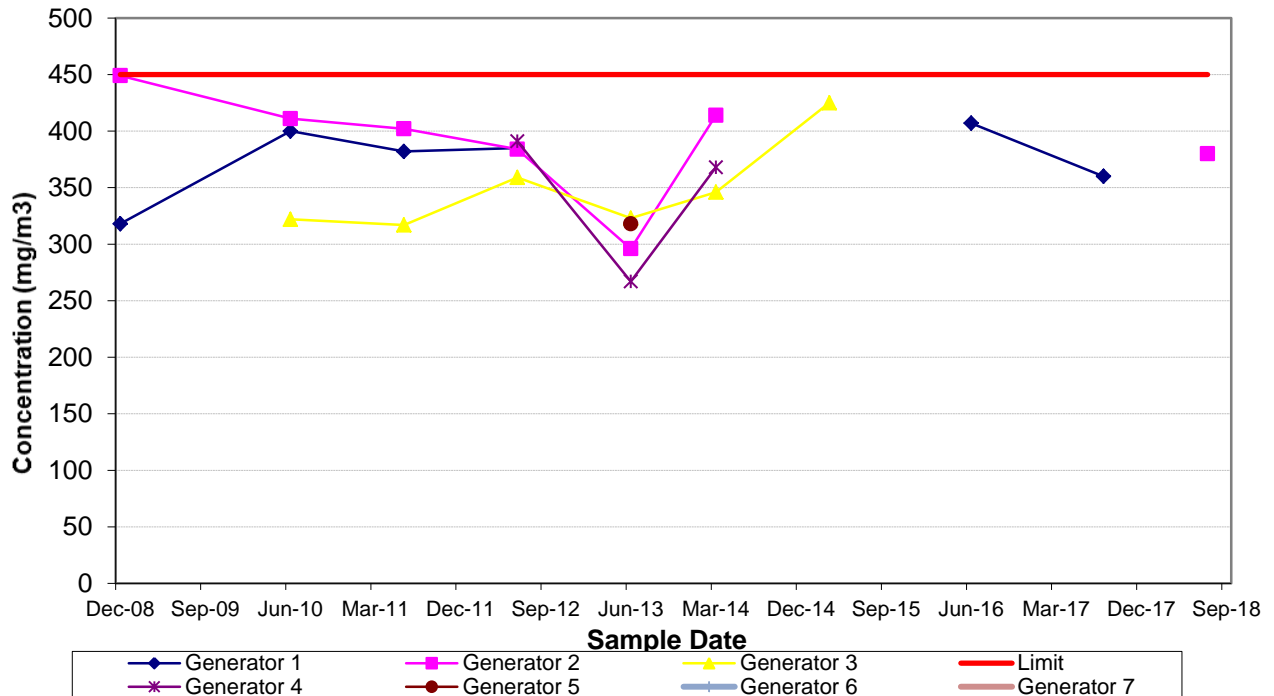


Figure 3.3.1 – Landfill Gas Engine Exhaust Point – Nitrogen Oxide Flow (mg/m<sup>3</sup>)

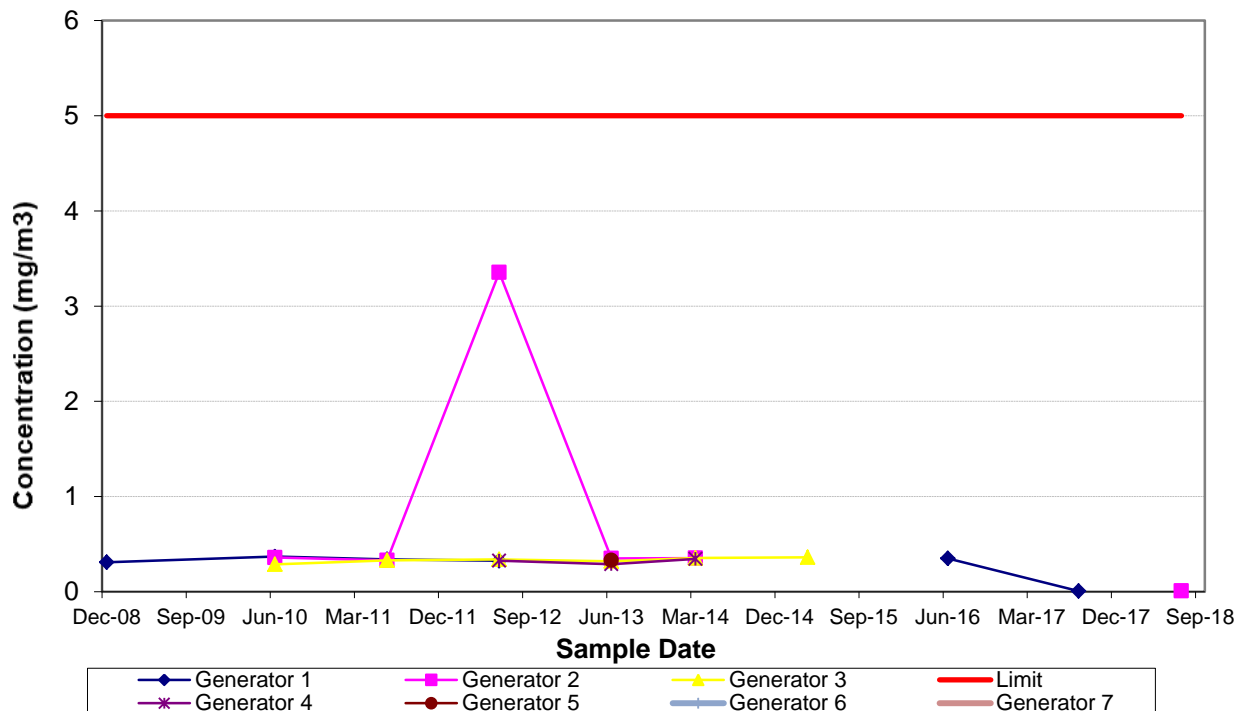


Figure 3.3.2 – Landfill Gas Engine Exhaust Point – Hydrogen Sulphide (mg/m<sup>3</sup>)

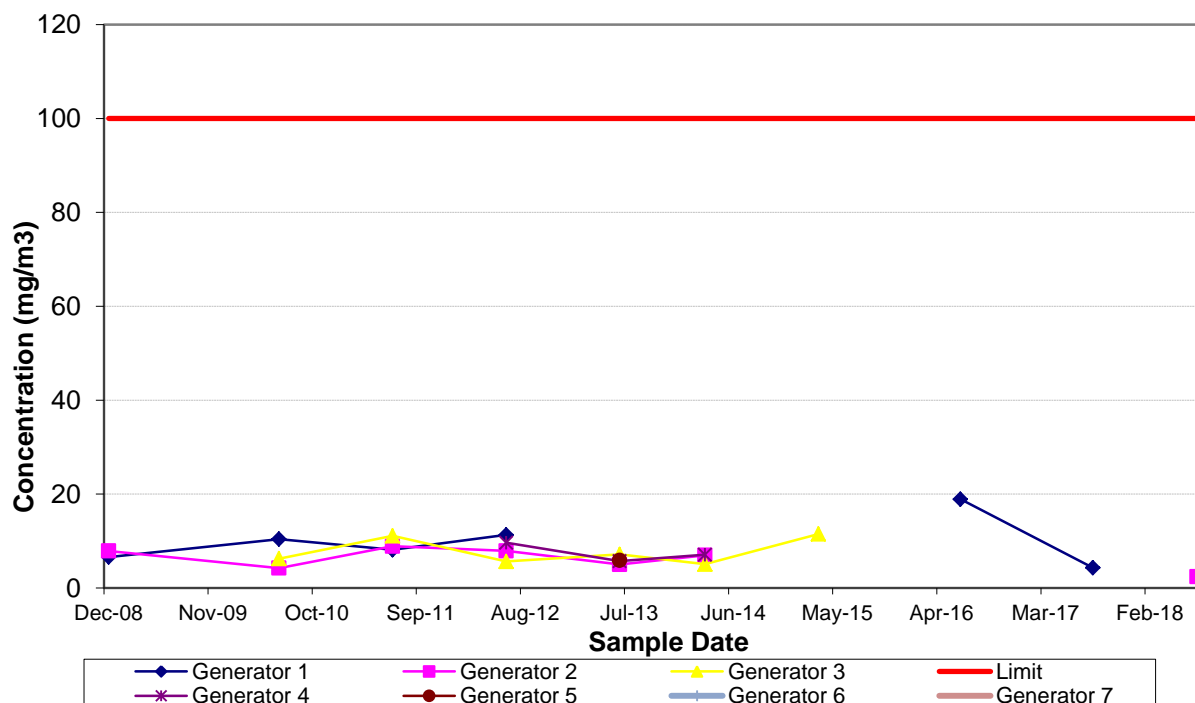


Figure 3.3.3 – Landfill Gas Engine Exhaust Point – Sulphuric Acid Mist and Sulphur Trioxide (mg/m3)

## 3.4 Water Monitoring

### 3.4.1 Bioreactor Surface Water Monitoring

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.

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The findings from water quality monitoring of surface water locations required under the Consent and EPL is summarised in Table 3.4.1 below with detailed data provided in Tables 5.1 - 5.10 (refer Appendix 3). Key quality indicators selected to identify likely impacts from the Bioreactor include:

- pH,
- Electrical conductivity (EC),
- Ammonia (NH<sub>3</sub>),
- Total organic carbon (TOC),
- Iron (Fe),
- Sulphate (SO<sub>4</sub>), and
- Zinc (Zn).

These are depicted in the trend graphs (Figures 3.4.1.1 – 3.4.1.10) provided in Appendix 4.

\*It should be noted that for some monitoring locations, surface water monitoring results are only available to April 2018 as there was insufficient rain following this period to cause water flow. Hence samples were unable to be obtained for the purpose of conducting surface water monitoring.

\*For Quarter 4 2018, monitoring was undertaken slightly earlier for 2 reasons - samples are collected in conjunction with the Heron Resources Environmental Officer for safety reasons and the schedule followed was consistent with the previous reporting period.

**Table 3.4.1: Bioreactor Surface Water Monitoring Results**

Parameter	Results/Discussion
Site 115 – Allianoyonyige Creek	<p>Site 115 is situated downstream of the evaporation dams. 1 out of 4 quarterly monitoring events required under the EPL was undertaken in this monitoring period, due to insufficient flow, and have been documented in the Annual Return.</p> <p>Based on the results provided in <b>Table 5.1</b> (refer <b>Appendix 3</b>), the pollutant concentration trends from previous monitoring periods are generally consistent.</p> <ul style="list-style-type: none"> <li>• Mean pH at 7.74 for this location indicates slightly alkaline water.</li> <li>• EC at 1080 µS/cm, indicating fresh to brackish water.</li> <li>• NH<sub>3</sub> at &lt;0.1mg/L and TOC at mean of 19 mg/L concentrations recorded in this monitoring period remain consistent with historical monitoring results</li> <li>• Heavy metal concentrations are of low magnitude for this reporting period – less than 0.0012 mg/L for Pb and less than 0.07mg/L for Zn, indicating no contaminated runoff is impacting surface water at this monitoring location.</li> </ul>

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Parameter	Results/Discussion
Spring 2	<p>Spring 2 is located upstream of the Bioreactor and adjacent to Crisps Creek. The site therefore provides background water quality information to site operations. The spring naturally overflows to Crisps Creek during rainfall events.</p> <p>4 out of 4 quarterly monitoring events required under the EPL were undertaken in this monitoring period, and have been documented in the Annual Return. Water quality trend in Spring 2, based on the results provided in <b>Table 5.2</b> (refer <b>Appendix 3</b>), is consistent with water quality from historical monitoring records.</p> <ul style="list-style-type: none"> <li>• pH is consistent with previous years (average 7.2) and reflective of the overall range of 3.5 – 8.5 for this location;</li> <li>• EC (average 522 <math>\mu\text{S}/\text{cm}</math>) for this reporting period is indicative of fresh water.</li> <li>• <math>\text{SO}_4</math> (average 171 mg/L) shows an identical trend to conductivity, again indicating a direct effect on EC.</li> <li>• Pb (average 0.01mg/L) and Zn (average 4.50mg/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.</li> <li>• <math>\text{NH}_3</math> (average 0.25mg/L) and TOC (average 17mg/L) concentrations recorded in this monitoring period were consistent with historical monitoring results.</li> </ul>
Site 105 – Crisps Creek	<p>Site 105 is located downstream of the Bioreactor and tailings dams. 2 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.</p> <p>Water quality trends in Site 105, based on the results provided in <b>Table 5.3</b> (refer <b>Appendix 3</b>) are consistent with previous monitoring results.</p> <ul style="list-style-type: none"> <li>• pH (average 7.6) is within the overall range of 5.4 – 8.6 for this location, indicating relatively neutral water;</li> <li>• EC (average 1665 <math>\mu\text{S}/\text{cm}</math>) is consistent with historical results, reflecting brackish water.</li> <li>• TOC (average 20 mg/L) and <math>\text{NH}_3</math> (average 0.1 mg/L) were consistent with historical trends.</li> <li>• Zn and Pb remain consistent and average 0.33 mg/L and 0.01 mg/L respectively consistent with historical results.</li> </ul>
WM200 Raw Water Dam	<p>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.</p> <p>Based on the results provided in <b>Table 5.4</b> (refer <b>Appendix 3</b>), the</p>



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Parameter	Results/Discussion
	<p>results for WM200 remain generally consistent with the previous reporting periods.</p> <ul style="list-style-type: none"> <li>pH (average 8.15) indicates slightly alkaline water;</li> <li>EC (average 1655 <math>\mu\text{S}/\text{cm}</math>) is consistent with historical results;</li> <li><math>\text{SO}_4</math> level (average 202 mg/L) is lower than previous reporting period;</li> <li>Zn and Fe levels were lower at averages of 3.1 mg/L and 0.13mg/L respectively than previous reporting period;</li> <li>TOC was an average of 7 mg/L in this reporting period which is consistent with historical results. This could be reflective of the presence of organic matter from riparian zone vegetation surrounding the dam.</li> <li><math>\text{NH}_3</math> at an average of 0.45 mg/L is at quite low levels at this location.</li> </ul>
WM201 – Entrance Road Culvert	<p>The Entrance Road Culvert collects surface water runoff from the Woodlawn Bioreactor administration office and workshop areas. 4 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, the results of which are provided in <b>Table 5.5</b> (refer <b>Appendix 3</b>).</p> <ul style="list-style-type: none"> <li>pH is consistent (average 7.32) with previous reporting periods and remains within the overall range of 4.5 – 8.2 for this location;</li> <li>EC at 387 <math>\mu\text{S}/\text{cm}</math> is reflective of fresh water and is consistent with previous reporting periods. EC variability can be caused by dilution during rainfall events.</li> <li>Pb, Zn and Fe average 2.52 mg/L, 9.2 mg/L and 49.8 mg/L respectively, results in quarter 4 were high and treated as an anomaly as a subsequent sample was tested and resulted with usual readings.</li> </ul> <p>Veolia will continue to monitoring this location in the next reporting period for any likely contaminant run off impacts.</p>
WM202 – ED3S	<p>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.</p> <p>Water quality results indicated a similar trend to previously reported data as seen in <b>Table 5.9</b> (refer <b>Appendix 3</b>).</p> <ul style="list-style-type: none"> <li>pH levels indicate an acidic, yet stable trending result with the average pH of 3.17 appears to be generally consistent with previous reporting periods;</li> <li>Fe (average 61.65 mg/L) is consistent with previous reporting periods;</li> </ul>

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Parameter	Results/Discussion
	<ul style="list-style-type: none"> <li>Zn at an average of 788.75 mg/L is consistent with previous reporting periods;</li> <li>SO<sub>4</sub> (average 8870 mg/L) is consistent with previous reporting periods</li> <li>EC (average 10082.5 µS/cm) remains within the overall average. Both SO<sub>4</sub> and EC concentrations reflect the signature for Acid Mine Drainage (AMD) contaminated waters from remnant mining operations stored in Evaporation Dam 3 South.</li> <li>NH<sub>3</sub> concentrations (average 138 mg/L) which is consistent with previous reporting periods.</li> </ul>
WM203 – Evaporation Dam 3 North	<p>Evaporation Dam 3 North (ED3N) is a storage point to manage treated leachate by evaporation. Quarterly monitoring events were undertaken in accordance with the EPL.</p> <p>Based on the water quality results provided in <b>Table 5.7</b> (refer <b>Appendix 3</b>), for WM203, the following can be confirmed:</p> <ul style="list-style-type: none"> <li>pH (average 8.23) appears to be generally consistent with previous reporting periods.</li> <li>EC average (31275 µS/cm) appears to be fairly consistent with previous reporting periods;</li> <li>SO<sub>4</sub> averages (5698.5 mg/L) is lower than previous monitoring periods</li> <li>Fe levels (average 39 mg/L) are slightly higher than previous years whilst Zn levels (average 149.82) reflect a downward trend.</li> <li>NH<sub>3</sub> concentrations (average 747 mg/L) remained stable over the course of the reporting period (592 – 885 mg/L).</li> </ul> <p>TOC is trending upward (average 1820 mg/L) from the previous reporting period.</p>
Pond 3	<p>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 South.</p> <p>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, the results of which are tabulated in <b>Table 5.8</b> (refer <b>Appendix 3</b>). Pond 3 was decommissioned at the end of the reporting period. These water quality results are consistent with previous reporting periods.</p> <ul style="list-style-type: none"> <li>pH average of 3.8 confirms acidic nature of water that comes in contact with the void walls and is generally consistent with previous results</li> <li>EC (average 2765.7 µS/cm) is generally consistent with previous results;</li> <li>SO<sub>4</sub> trends (average 1832 mg/L) is generally consistent with previous results</li> </ul>

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Parameter	Results/Discussion
	<ul style="list-style-type: none"> <li>Pb average of 7.7 mg/L is generally consistent with previous results</li> <li>Zn (average 206 mg/L) is generally consistent with previous results;</li> <li>NH<sub>3</sub> (average 37 mg/L) and TOC (average 45 mg/L) both mirror a similar trend which appears quite variable over historical monitoring results.</li> </ul> <p>These results and trends are deemed representative of the stormwater quality captured from the walls of the void.</p>
ED1 – Evaporation Dam 1	<p>Evaporation Dam 1 (ED1) is a storage point to manage runoff stormwater from its external catchment including dolerite stockpile area. Quarterly monitoring events were undertaken in accordance with the EPL.</p> <p>Based on the water quality results provided in <b>Table 5.10</b> (refer <b>Appendix 3</b>), for ED1, the following can be confirmed:</p> <ul style="list-style-type: none"> <li>pH (average 3.1) which is consistent with previous reporting periods</li> <li>EC average 20125 µS/cm which is consistent with previous reporting periods</li> <li>SO<sub>4</sub> (averages 21825 mg/L) and Fe levels (average 99 mg/L) is greater than previous reporting period</li> <li>Zn levels (average 2967.5 mg/L) is greater than previous reporting period</li> <li>NH<sub>3</sub> concentrations (average 15.5 mg/L) remained stable over the course of the reporting period.</li> <li>TOC averages 6 mg/L remains consistent with previous reporting periods</li> </ul> <p>Fe and Zn levels were noted significantly higher in quarter 4 this reporting period as Heron Resources were pumping into ED1 from the tailings dam at that time as part of the overall management of water across the site. Water will be progressively evaporated.</p>
ED3SS – Lagoon 5	<p>Evaporation Dam 3 South-South (ED3SS) is a new storage point to manage treated leachate by evaporation. Quarterly monitoring events were undertaken in accordance with the EPL.</p> <p>Based on the water quality results provided in <b>Table 5.6</b> (refer <b>Appendix 3</b>), for ED3SS, the following can be confirmed:</p> <ul style="list-style-type: none"> <li>pH (average 8.4) appears to be fairly consistent with the existing treated leachate quality</li> <li>EC average 24200 µS/cm appears to be generally consistent with the existing treated leachate quality</li> <li>SO<sub>4</sub> averages (675.75 mg/L) is lower than previous monitoring periods</li> <li>Fe levels (average 29.92mg/L) Zn levels (average 8.5mg/L) are lower than previous monitoring periods</li> <li>NH<sub>3</sub> concentrations (average 962.5 mg/L) remained stable over the course of the reporting period</li> </ul>

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Parameter	Results/Discussion
	<ul style="list-style-type: none"> <li>TOC (average 2420 mg/L) appears to be fairly consistent with the existing treated leachate quality</li> </ul>

### 3.4.2 IMF Surface Water Monitoring Results

Surface water quality monitoring at three monitoring locations was undertaken as required by the EPL, the findings of which are summarised in Table 3.4.2. Detailed quality results are provided in Tables 9.1 to 9.4 (refer Appendix 3). The key quality indicators selected to identify any contamination in the receiving surface waters from site operations include:

- pH,
- Electrical Conductivity (EC),
- Sulphate (SO<sub>4</sub>),
- Iron (Fe),
- Zinc (Zn),
- Ammonia (NH<sub>3</sub>), and
- Total Organic Carbon (TOC).

These are depicted in trend graphs Figures 3.4.2.1 to 3.4.2.4 (refer Appendix 4).

**Table 3.4.2: IMF Surface Water Monitoring Results**

Parameter	Results/Discussion
Site 110 - Upstream	<p>Site 110 is located upstream of the IMF in Crisps Creek. It is approximately 8 km downstream of the Bioreactor.</p> <p>Results provided in Table 9.1 (refer <b>Appendix 3</b>) indicate the following trends:</p> <ul style="list-style-type: none"> <li>• pH is close to neutral (average 7.50), consistent with previous reporting periods;</li> <li>• EC (average 881.50 µS/cm) is consistent with the previous period and representative of fresh water salinity;</li> <li>• SO<sub>4</sub> (average 113.55 mg/L) is consistent with previous reporting periods;</li> <li>• Fe (average 0.28 mg/L) is consistent with previous reporting periods, whilst Zinc indicates a fluctuating trend (average 0.13mg/L), consistent with historical cyclic results;</li> <li>• NH<sub>3</sub> (average 0.1 mg/L) is consistent with previous reporting periods and continues to be at non-detection levels.</li> <li>• TOC (average 13 mg/L) is slightly higher than the previous reporting period and is generally reflective of natural organic matter in streams.</li> </ul> <p>While the indicator trends for this location indicate some variability over time, this is not uncommon when sampling intermittent streams.</p>
Site 130 - Upstream	<p>Site 130 is located upstream of the IMF in the Mulwaree River.</p> <p>Results provided in Table 9.2 (refer <b>Appendix 3</b>) indicate the following trends:</p> <ul style="list-style-type: none"> <li>• pH is close to neutral (average 7.58), slightly lower than the</li> </ul>

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Parameter	Results/Discussion
	<p>previous reporting period;</p> <ul style="list-style-type: none"> <li>EC (average 401 <math>\mu\text{S/cm}</math>) is consistent with the previous reporting period and representative of fresh water salinity;</li> <li><math>\text{SO}_4</math> (average 16.30 mg/L) is lower but generally consistent with previous reporting period;</li> <li>Fe and Zn, average 0.72 mg/L and 0.02 mg/L respectively indicate consistency with fluctuating cycles in previous reporting periods;</li> <li><math>\text{NH}_3</math> (&lt;0.1 mg/L) continued to be un-detectable during this reporting period.</li> <li>TOC (average 13.50 mg/L) is consistent with previous reporting periods.</li> </ul>
Site 150 – Mulwaree River	<p>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.</p> <p>Results provided in <b>Table 9.3</b> (refer <b>Appendix 3</b>) indicate the following trends:</p> <ul style="list-style-type: none"> <li>pH (average 7.64) is slightly alkaline, consistent with the previous reporting period;</li> <li>EC (average 680 <math>\mu\text{S/cm}</math>) shows a fluctuating trend and is generally consistent with previous periods and fresh water salinity;</li> <li><math>\text{SO}_4</math> (average 45.35 mg/L) reflecting EC trend, is generally consistent with previous reporting period;</li> <li>Fe and Zn, average 0.40 mg/L and 0.08 mg/L respectively indicate consistency with fluctuating cycles in previous reporting periods.</li> <li><math>\text{NH}_3</math> (&lt; 0.1mg/L) continued to be not detected during this reporting period.</li> <li>TOC (average 14 mg/L), is generally consistent with previous reporting periods;</li> </ul> <p>These results are consistent with the trends for Site 110.</p>
First Flush Stormwater Outlet	<p>The IMF First Flush is located at the surface water outlet point of the site, prior to runoff into Crisps Creek.</p> <p>Results provided in <b>Table 9.4</b> (refer <b>Appendix 3</b>) indicate the following trends:</p> <ul style="list-style-type: none"> <li>pH (average 7.33) is close to neutral, consistent with the previous reporting period;</li> <li>EC (average 124.17 <math>\mu\text{S/cm}</math>) shows a slight downward trend but is generally consistent with the previous period and representative of fresh water salinity;</li> <li><math>\text{SO}_4</math> (average 9.93 mg/L) is also slightly lower, reflecting EC trend, but generally consistent with previous reporting period;</li> <li>Fe and Zn, average 0.83 mg/L and 0.07mg/L are generally</li> </ul>

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Parameter	Results/Discussion
	<p>consistent with the previous period but reflective of fluctuating cycles.</p> <ul style="list-style-type: none"> <li>NH<sub>3</sub> (&lt; 0.1mg/L) continued to be not detected during this reporting period.</li> <li>TOC (average 6 mg/L) which is lower than previous reporting periods.</li> </ul>

### 3.4.3 MBT Surface Water Monitoring Results

Quarterly surface water monitoring is carried out to monitor any potential surface water impacts of the project on the surrounding area.

Baseline data for surface water has been obtained from historical water quality monitoring undertaken for monitoring location Site 115 - Allianoyonyiga Creek.

For results of the surface water monitoring point Site 115, refer to section 3.4.1.

### 3.4.4 MBT Discharge Monitoring Results

Surface water discharge monitoring is conducted at the MBT facility to determine whether surface water flowing offsite could be contaminated as a result of operational activities. The results of discharge monitoring are assessed against discharge limits stipulated within the Consent and EPL 20476, which are described in Table 3.4.4.

**Table 3.4.4 - Discharge Parameters and Performance Measures**

Parameter	Performance Measure	Standards	Statutory Requirements
pH	6.5 – 8.5	Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales	EPL Condition L2.4
Total Suspended Solids (TSS)	50 mg/L		

Condition 19 of the Consent states the stormwater retention pond must capture and store all stormwater runoff generated at the premises during a 24-hour duration 1-in-100-year Average Recurrence Interval (ARI) rainfall event. Following the commencement of operations the Facility must ensure it maintains a closed water management system, which ensures no discharge to the downstream environment.

Since start of the reporting period, no discharge events were recorded at Site 140. This is indicating compliance with this condition. This is due to low rainfall during this reporting period.



### 3.4.5 Bioreactor Leachate Monitoring Results

Leachate quality monitoring is undertaken annually at two monitoring locations in the Bioreactor as required by the EP. The findings from this reporting period are summarised in Table 3.4.5 below with the detailed data provided in Tables 6.1 and 6.2 (refer Appendix 3). 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 (SO<sub>4</sub>),
- Lead (Pb),
- Zinc (Zn),
- Ammonia (NH<sub>3</sub>), and
- Total Organic Carbon (TOC).

These are depicted in the subsequent trend graphs **Figures 3.4.5.1** and **3.4.5.2**.

**Table 3.4.5: Bioreactor Leachate Monitoring Results**

Parameter	Results/Discussion
Leachate Dam	<p>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.</p> <p>Based on the results provided in <b>Table 6.1</b> (refer <b>Appendix 3</b>), the characteristics of the leachate are:</p> <ul style="list-style-type: none"> <li>• pH (8.26) is indicative of a slightly decreasing alkaline state from the previous reporting period result of 8.74</li> <li>• EC (23,500 µS/cm) is consistent with the previous reporting period;</li> <li>• SO<sub>4</sub>, one of the dominant anions, (354 mg/L) is consistent with previous reporting readings;</li> <li>• Pb (0.175 mg/L) and Zn (3.45 mg/L) ) is consistent with the previous reporting period</li> <li>• NH<sub>3</sub> (284 mg/L) is lower compared to previous reporting readings;</li> <li>• TOC (2790 mg/L) is consistent with previous reporting</li> </ul>
Leachate Recirculation System	<p>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.</p> <p>An annual round was completed during this reporting period in accordance with the EPL, the results of which are detailed in the <b>Table 6.2</b> (refer <b>Appendix 3</b>).</p> <p>Based on these results, the leachate collected directly from the recirculation system displays similar characteristics to the leachate</p>

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Parameter	Results/Discussion
	<p>pond, with some exceptions as summarised below:</p> <ul style="list-style-type: none"> <li>pH (8.2) is generally consistent with previous reporting period;</li> <li>EC (40,300 <math>\mu\text{S}/\text{cm}</math>) is consistent with the previous reporting period and is generally consistent with the overall annual average for this location;</li> <li><math>\text{SO}_4</math> (255 mg/L) is consistent with previous reporting period;</li> <li>Both Pb and Zinc are consistent with previous reporting period, 0.326 mg/L and 2.4 mg/L respectively.</li> <li>TOC (7380 mg/L) is consistent with historical monitoring results.</li> </ul>

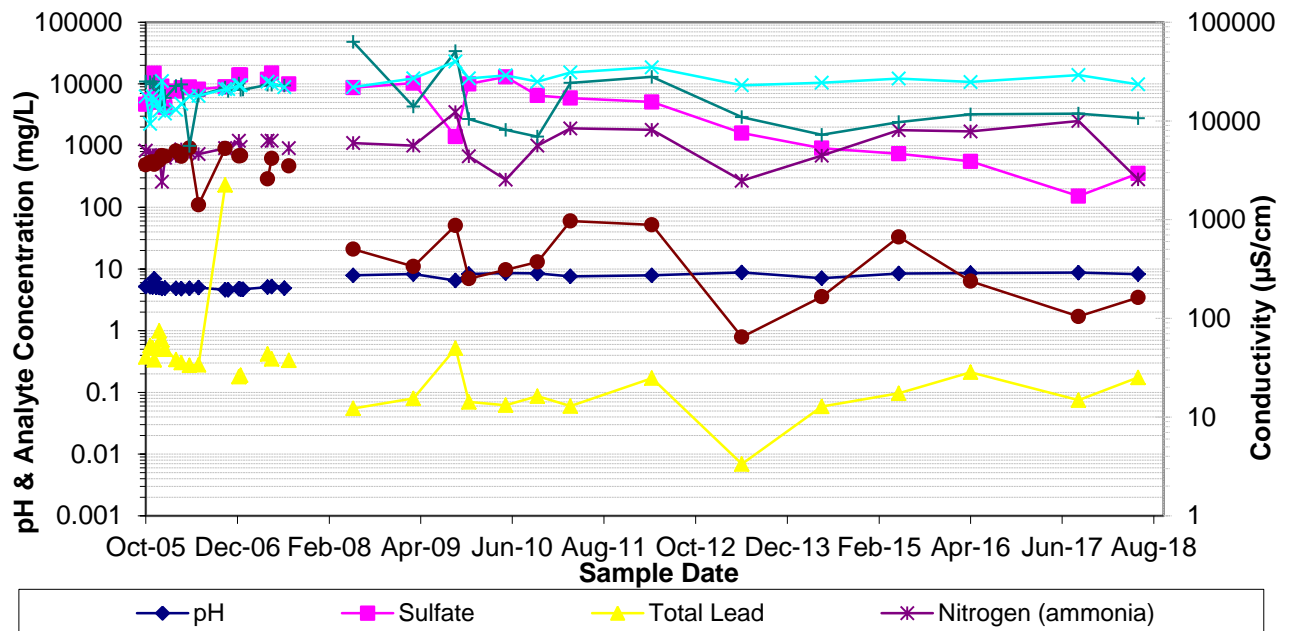


Figure 3.4.5.1 – Leachate Trends – Leachate Dam

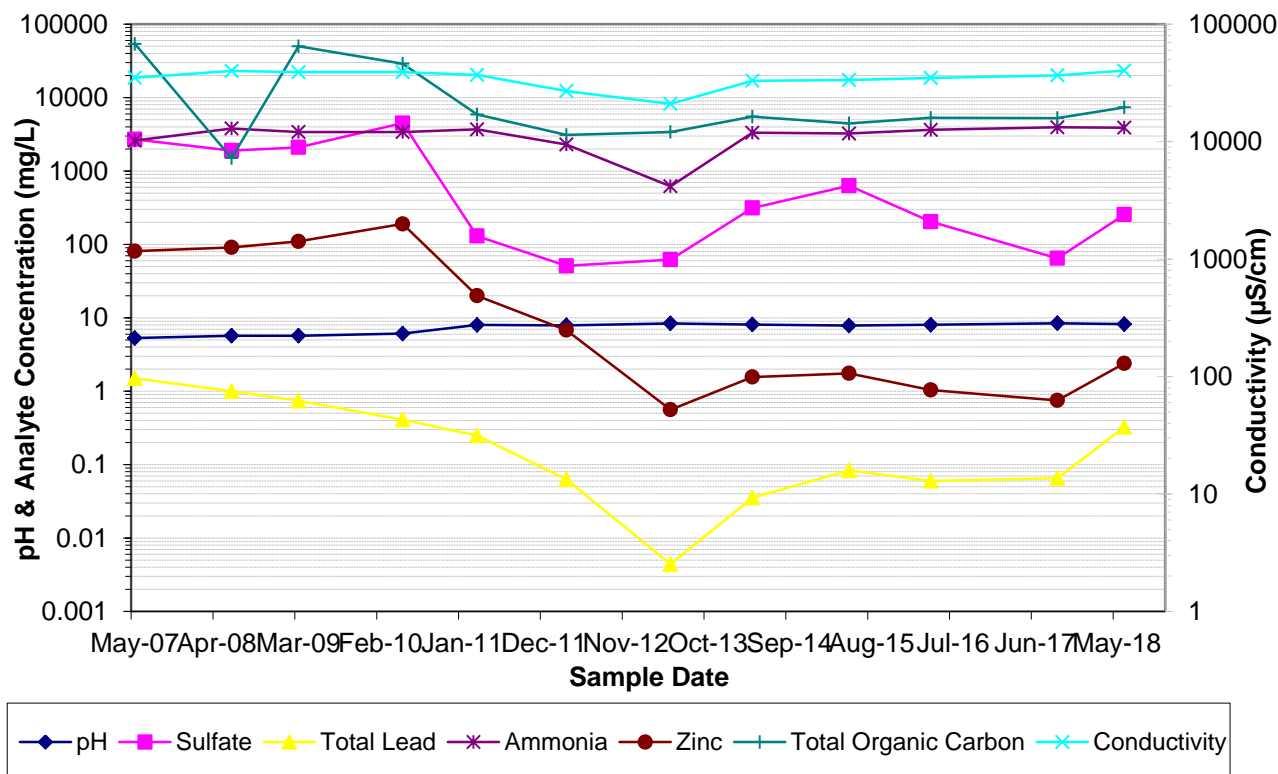


Figure 3.4.5.2 – Leachate Trends – Leachate Recirculation System

### 3.4.6 MBT Leachate Monitoring Results

Leachate quality monitoring is undertaken half-yearly at the MBT leachate aeration dam as required by the EPL. The findings from this reporting period are summarised in Table 3.4.6 below with the detailed data provided in Tables 6.3 (refer Appendix 3). Same key quality indicators are used as per section 3.4.5 and are depicted in **Figures 3.4.6**.

In addition to chemical testing, the level of the water in the leachate aeration pond is also monitored on a weekly basis and after every rainfall event to ensure the freeboard is not exceeded as per Condition O5.3 of the EPL.

Table 3.4.6: MBT Leachate Monitoring Results

Parameter	Results/Discussion
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Parameter	Results/Discussion
MBT Leachate Aeration Dam	<p>The leachate aeration dam is located at the northern side of the MBT facility where leachate collected from the facility is treated by aeration to oxidise organic compounds in leachate.</p> <p>Based on the results provided in <b>Table 6.3</b> (refer <b>Appendix 3</b>), the characteristics of the leachate are:</p> <ul style="list-style-type: none"> <li>pH average (7.44) is showing a decreasing alkaline state from the previous reporting period result of 8.12.</li> <li>EC average (13,800 <math>\mu\text{S}/\text{cm}</math>) has increased from the previous reporting period (1,200 <math>\mu\text{S}/\text{cm}</math>) due to increased organic load.</li> <li><math>\text{SO}_4</math> average (154 mg/L) is lower than the previous reading (299 mg/L);</li> <li>Pb average (0.0013 mg/L) and Zn (0.141 mg/L) is consistent with the previous reporting period.</li> <li><math>\text{NH}_3</math> average (570 mg/L) is higher compare to previous reporting reading (3.5 mg/L);</li> <li>TOC average (4100 mg/L) is higher compare to previous reporting reading (23 mg/L).</li> </ul> <p>The first round leachate sample was taken in May 2017 and was at the start of commissioning. The aeration dam was mostly accumulated by storm water. There is leachate collected and stored at the leachate pond during this reporting period, which resulted higher concentration in organic compounds and ammonia.</p>

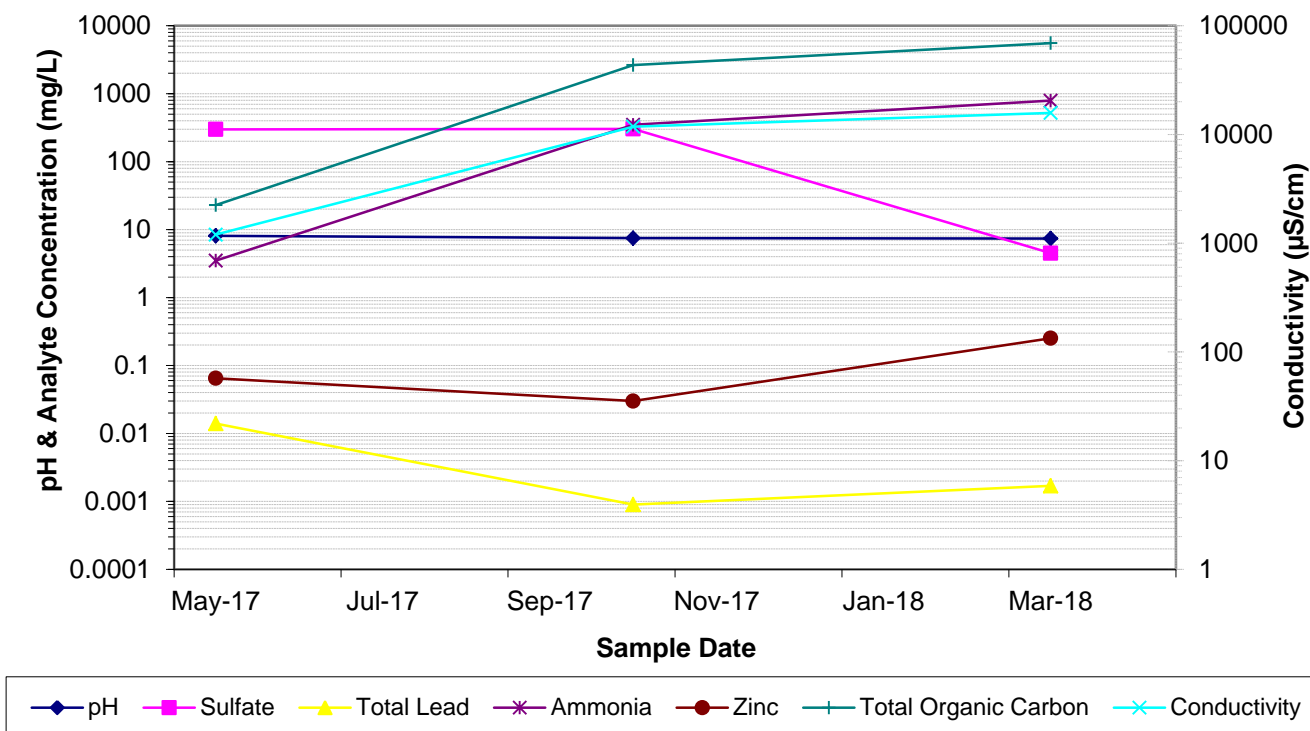


Figure 3.4.6 - Leachate Trends - MBT Leachate Pond

### 3.4.7 Bioreactor Groundwater Monitoring Results

Groundwater quality monitoring at 15 locations was undertaken in this reporting period as required by the EPL, comprising of one annual and three quarterly rounds of monitoring, the results of which are summarised in **Table 3.4.7** below. Detailed data is provided in Tables **7.1 – 7.14** (refer **Appendix 3**).

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 (SO<sub>4</sub>),
- Lead (Pb),
- Zinc (Zn),
- Ammonia (NH<sub>3</sub>), and
- Total Organic Carbon (TOC).

These are depicted in the trend graphs Figures **3.4.7.1 to 3.4.7.14** (refer **Appendix 4**). 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 **3.4.7A, 3.4.7B** and **3.4.7C**.

\*It should be noted that the sampling frequency for some groundwater analytes are annual instead of quarterly, consistent with the requirements of the relevant EPL (refer section 3.4.8).

**Table 3.4.7: Bioreactor Groundwater Monitoring Results**

Parameter	Results/Discussion
MB1	<p>MB1 is located down gradient of the landfill void. Based on the results provided in <b>Table 7.1</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 777.4 m RL) was slightly lower than previous reporting periods due to insufficient rainfall events;</li> <li>• pH (average 7.6) neutral – to slightly alkaline consistent with previous reporting period;</li> <li>• EC (average 1700 µS/cm) is slightly higher than but generally consistent with previous readings representing fresh water;</li> <li>• SO<sub>4</sub> (average 297.5 mg/L) is generally consistent with previous periods;</li> <li>• Pb and Zn (average 0.0002 mg/L and 0.076 mg/L respectively) are generally consistent with previous periods.</li> <li>• NH<sub>3</sub> (average 0.1) is consistent with previous reporting periods.</li> <li>• TOC (3 mg/L) is consistent with the previous reporting period and historical trends. 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.</li> </ul>

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Parameter	Results/Discussion
	<p>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.</p>
MB2	<p>MB2 is located upstream of Evaporation Dam 2. Based on the results provided in <b>Table 7.2</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 778.93 m RL) was consistent with long term average since 2004;</li> <li>• pH (average 7.33) neutral, consistent with previous reporting period;</li> <li>• EC (average 6835 <math>\mu\text{S}/\text{cm}</math>) and <math>\text{SO}_4</math> (average 3947.5 mg/L) is consistent with previous periods;</li> <li>• Pb (average 0.0002 mg/L) indicates a stable trend consistent with the previous reporting period.</li> <li>• Zn (average 0.05 mg/L) is generally consistent with previous reporting periods.</li> <li>• <math>\text{NH}_3</math> (0.12 mg/L) same as previous monitoring periods of non-detection rates;</li> <li>• TOC (4 mg/L) is consistent with previous reporting periods.</li> </ul> <p>All trends 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.</p>
MB3	<p>MB3 is located upstream of the Bioreactor and mine site. Based on the results provided in <b>Table 7.3</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 791.42 m RL) was consistent with long term average since 2004;</li> <li>• pH (average 7.47) near neutral is consistent with previous reporting period;</li> <li>• EC (average 1997.5 <math>\mu\text{S}/\text{cm}</math>) is consistent with previous readings representing fresh water;</li> <li>• <math>\text{SO}_4</math> (average 30.7 mg/L) is stable and consistent with previous periods;</li> <li>• Pb (average 0.0002 mg/L) and Zn (average 0.024 mg/L) are stable and consistent with previous periods.</li> <li>• <math>\text{NH}_3</math> (0.1 mg/L) is consistent with previous monitoring periods of non detection rates;</li> <li>• 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.</li> </ul> <p>All trends indicate fairly stable concentration and provide an indication of background groundwater concentrations.</p>

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Parameter	Results/Discussion
MB4	<p>MB4 is located downstream of the Bioreactor. Based on the results provided in <b>Table 7.4</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 773.76 m RL) was consistent with long term average since 2004;</li> <li>• pH (average 5.6) slightly acidic, consistent with previous reporting period;</li> <li>• EC (average 1605 <math>\mu\text{S}/\text{cm}</math>) represents fresh water salinity and is consistent with previous period. This trend is reflected in <math>\text{SO}_4</math> (average 195.75 mg/L) results for this period;</li> <li>• Pb (average 0.0049 mg/L) remains stable while Zn (average 0.9 mg/L) is seen to fluctuate which appears consistent with historical cyclic trends;</li> <li>• <math>\text{NH}_3</math> (0.1 mg/L) is consistent with previous monitoring periods of non detection rates;</li> <li>• TOC (2 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.</li> </ul> <p>All trends indicate fairly stable concentrations and there is no indication of contamination from mining or Bioreactor activities.</p>
MB6	<p>MB6 is located downstream of Evaporation Dam 3 and upstream of the Bioreactor. Based on the results provided in <b>Table 7.5</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 791.02 m RL) was consistent with historical results;</li> <li>• pH (average 6.07) slightly acidic consistent with previous reporting period;</li> <li>• EC (average 5457.5 <math>\mu\text{S}/\text{cm}</math>) represents brackish water and the trend is mirrored by <math>\text{SO}_4</math> (average 887 mg/L) consistent with previous periods;</li> <li>• Pb (average 0.0006 mg/L) and Zn (average 11.7 mg/L) is consistent with previous periods;</li> <li>• TOC (4 mg/L) and <math>\text{NH}_3</math> average of 0.6 mg/l is lower than previous reporting period.</li> </ul> <p>Veolia will continue to monitoring this parameter in the future to ensure water quality at this location is preserved.</p>
MB7	<p>MB7 is located upstream of Evaporation Dam 3. Based on the results provided in <b>Table 7.6</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 785.93 m RL) was consistent with long term average since 2004;</li> <li>• pH (average 7.62) neutral is consistent with the previous reporting period;</li> <li>• EC (average 7467.50 <math>\mu\text{S}/\text{cm}</math>) and <math>\text{SO}_4</math> (average 231.75 mg/L) follow a similar stable trend to previous reporting periods ;</li> <li>• Pb (average 0.0002 mg/L) is consistent throughout the reporting</li> </ul>



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Parameter	Results/Discussion
	<p>period whilst Zn (average 0.18 mg/L) shows a fluctuating trend consistent with historical cycles;</p> <ul style="list-style-type: none"> <li>NH<sub>3</sub> (&lt; 0.1 mg/L) is consistent with previous monitoring periods of non detection rates;</li> <li>TOC (15 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.</li> </ul> <p>All trends indicate fairly stable concentration and there is no indication of contamination from mining or Bioreactor activities.</p>
MB10	<p>MB10 is located adjacent to Evaporation Dam 1. Based on the results provided in <b>Table 7.7</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>SWL (average 780.6 m RL) was consistent with previous monitoring periods;</li> <li>pH (average 7.36) neutral is consistent with previous reporting periods;</li> <li>EC (average 7747.5 µS/cm) is of brackish quality consistent with previous readings;</li> <li>SO<sub>4</sub> (average 3717.5 mg/L) mirrors EC and is generally consistent with previous periods;</li> <li>Pb (average 0.0002 mg/L) is stable while Zn (average 0.007 mg/L) and is generally consistent with previous reporting periods;</li> <li>NH<sub>3</sub> (&lt; 0.1 mg/L) is consistent with previous monitoring periods of non detection rates;</li> <li>TOC (4 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.</li> </ul> <p>All trends indicate fairly stable concentrations and there is no indication of contamination from mining or Bioreactor activities.</p>
ED3B	<p>ED3B is located downstream of Evaporation Dam 3. Based on the results provided in <b>Table 7.8</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>SWL (average 784.39 mRL) was consistent with previous monitoring periods;</li> <li>pH (average 7.47) is neutral – slightly alkaline and consistent with previous reporting period;</li> <li>EC (average 7685 µS/cm) indicating brackish water and SO<sub>4</sub> (average 986.25 mg/L) follow similar trends consistent with previous periods;</li> <li>Pb (average 0.0005 mg/L) remains stable while Zn (average 0.23 mg/L) is consistent with previous monitoring periods.</li> <li>NH<sub>3</sub> (0.1 mg/L) is at non detection rates;</li> <li>TOC (12 mg/L) is slightly higher but reflective of historical results in previous reporting periods.</li> </ul> <p>All trends indicate fairly stable concentrations at this location with no</p>

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Parameter	Results/Discussion
	evidence of contamination from mining or Bioreactor activities.
WM1	<p>WM1 is located northeast of the landfill void. Based on the results provided in <b>Table 7.9</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 740.24 m RL) is consistent with previous monitoring periods;</li> <li>• pH (average 7.69) neutral – to slightly alkaline consistent with previous reporting period;</li> <li>• EC (average 2902.5 <math>\mu\text{S}/\text{cm}</math>) represents slightly brackish water, and is consistent with previous historical records;</li> <li>• <math>\text{SO}_4</math> (average 1607.5 mg/L) is similar in trend to EC and demonstrating a long term upward trend;</li> <li>• Both Pb (average 0.007 mg/L) and Zn (average 6.22 mg/L) remain consistent with previous reporting periods.</li> <li>• <math>\text{NH}_3</math> (average 0.1 mg/L) is close to, or within, non-detection rates;</li> <li>• TOC (3 mg/L) is consistent with previous monitoring period reflective of natural conditions;</li> </ul> <p>All trends indicate fairly stable concentrations at this location with no evidence of contamination from mining or Bioreactor activities.</p>
WM5	<p>WM5 is located to the west of the void near Evaporation Dam 3 South. Based on the results provided in <b>Table 7.10</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 784.09 mRL) is consistent with long term averages;</li> <li>• pH (average 7.7) neutral is consistent with the previous period.</li> <li>• EC (average 10170 <math>\mu\text{S}/\text{cm}</math>) is representative of saline water and consistent with the previous reporting period;</li> <li>• <math>\text{SO}_4</math> (average 313 mg/L) is consistent with previous monitoring periods.</li> <li>• Pb (average 0.0002 mg/L) and Zn (average 0.009 mg/L) are both lower than the previous reporting period but can be seen to be fluctuating which appears consistent with historical cyclic trends;</li> <li>• <math>\text{NH}_3</math> (average 0.1 mg/L) is close to non-detection rates;</li> <li>• TOC (14 mg/L) is consistent with previous monitoring periods reflecting natural conditions;</li> </ul> <p>No significant variations or anomalies were recorded for any analyte tested in this location during this monitoring period from the data available.</p>
WM6	<p>WM6 is located to the west of the void adjacent to Evaporation Dam 3 North. Based on the results provided in <b>Table 7.11</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 786.06 m RL) is consistent with the previous reporting period;</li> <li>• pH (average 6.39) is slightly acidic, but stable and consistent with previous reporting period;</li> <li>• EC (average 13,750 <math>\mu\text{S}/\text{cm}</math>) represents brackish to slightly saline water, consistent with previous reporting period;</li> <li>• <math>\text{SO}_4</math> (average 372.25 mg/L) mirrors EC's stable trend;</li> </ul>

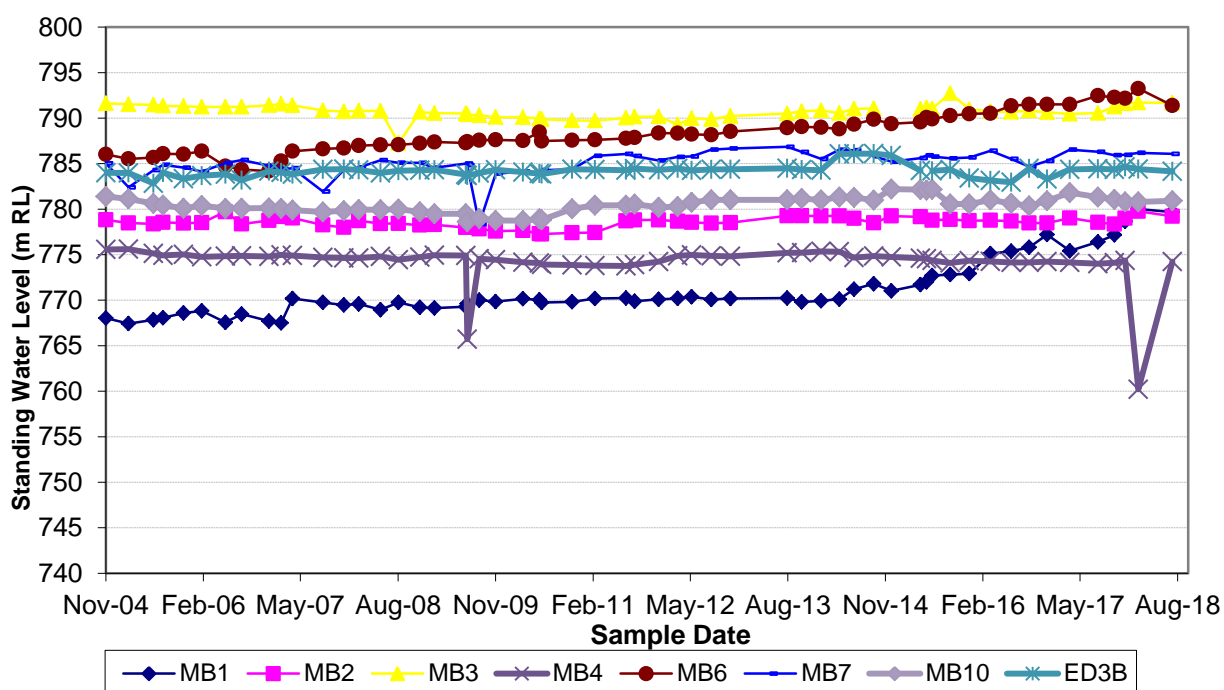
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Parameter	Results/Discussion
	<ul style="list-style-type: none"> <li>Pb (average 0.0042 mg/L) and Zn (average 0.214 mg/L) are both similar to the previous reporting period and generally consistent with historical fluctuations.</li> <li>NH<sub>3</sub> (average 0.1 mg/L) is close to, or within, non-detection rates;</li> <li>TOC (4 mg/L) is consistent with previous monitoring period reflecting natural conditions;</li> </ul> <p>All trends are relatively consistent and there is no indication of contamination from mining or Bioreactor activities.</p>
MW8S	<p>MW8S is located northern side of ED3N. Based on the results provided in <b>Table 7.12</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>SWL (average 785.76 m RL) was consistent with long term average since 2004;</li> <li>pH (average 7.44) is neutral and consistent with previous reporting period;</li> <li>EC (average 11225 µS/cm) remains stable with previous reporting period results;</li> <li>SO<sub>4</sub> (average 1328 mg/L) continues to show a declining trend but is generally consistent with previous periods;</li> <li>Pb (average 0.0003 mg/L) is stable whilst Zn (average 0.86 mg/L) continues to show a declining trend from historical records.</li> <li>NH<sub>3</sub> (average 0.1 mg/L) is close to, or within, non-detection rates;</li> <li>TOC (7 mg/L) is consistent with previous monitoring period reflecting natural conditions;</li> </ul> <p>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.</p> <p>There is no indication of contamination from mining or Bioreactor activities.</p>
MW8D	<p>MW8D is located adjacent to MW8S. Based on the results provided in <b>Table 7.13</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>SWL (average 786.35 m RL) was consistent with long term average since 2004;</li> <li>pH (average 6.88) slightly acidic to neutral consistent with previous reporting period.</li> <li>EC (average 9580 µS/cm) represents brackish water which is consistent with previous readings;</li> <li>SO<sub>4</sub> (average 3650 mg/L) mirrors EC consistent with previous periods;</li> <li>Pb (average 0.0002 mg/L) and Zn (average 24.5 mg/L) are both consistent with previous periods;</li> <li>NH<sub>3</sub> (&lt; 0.1 mg/L) is at non detection rates;</li> <li>TOC (5 mg/L) is consistent with previous monitoring period</li> </ul>

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Parameter	Results/Discussion
	reflecting natural conditions;  All trends indicate fairly stable concentrations with no evidence of contamination from mining or Bioreactor activities.
MW9S	<p>MW9S is located on the northwest side of ED3N. Based on the results provided in <b>Table 7.14</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 786.33) was consistent with previous reporting period;</li> <li>• pH (average 7.04) consistent with previous reporting period;</li> <li>• EC (average 10,900 <math>\mu\text{S}/\text{cm}</math>) remains stable, consistent with previous reporting period for brackish water;</li> <li>• <math>\text{SO}_4</math> (average 5092.5 mg/L) is consistent with previous periods;</li> <li>• Pb (average 0.0002 mg/L) and Zn (average 0.122 mg/L) were both generally consistent with historical results.</li> <li>• <math>\text{NH}_3</math> (&lt; 0.1 mg/L) is at non detection rates;</li> <li>• TOC (5 mg/L) reflecting natural conditions is consistent with historical results;</li> </ul> <p>No significant variations or anomalies were recorded for any analyte tested at this location during this monitoring period.</p>
MW10S	<p>MW10S is located on the northeast side of ED3.</p> <p>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.</p> <p>No data is available to produce tables or graphs for this monitoring point.</p>



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Figure 3.4.7A – Groundwater Levels – MB1 to MB10 and ED3B

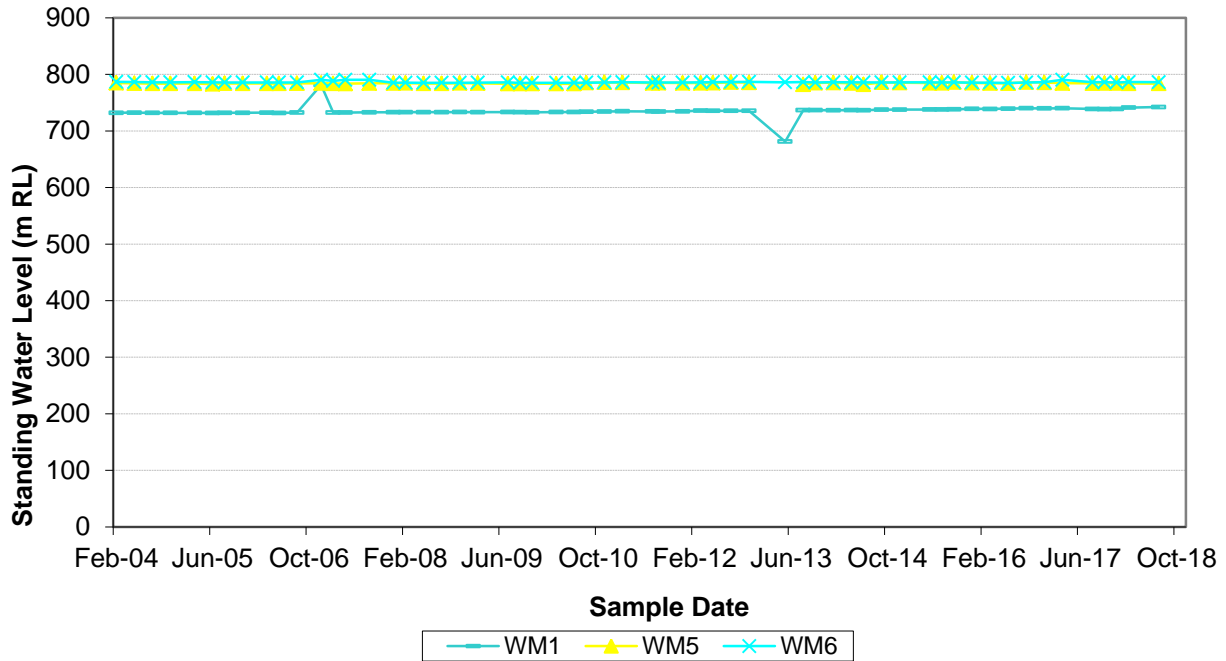


Figure 3.4.7B – Groundwater Levels – WM1 to WM6

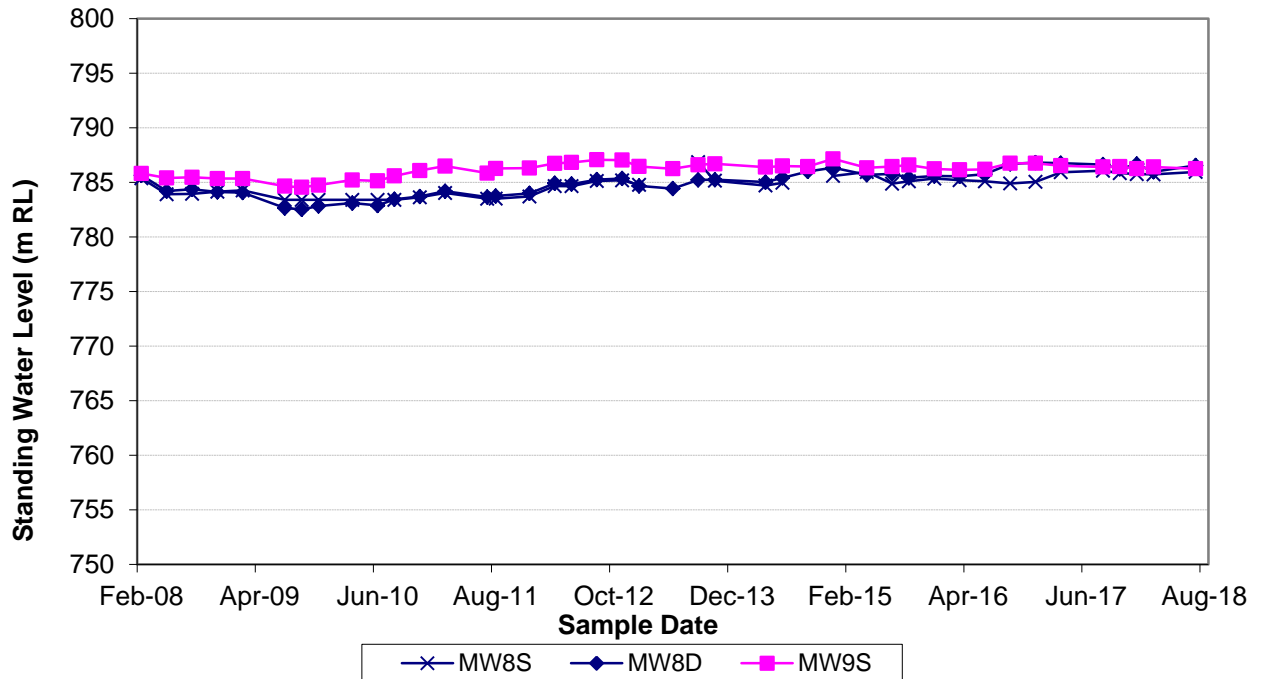


Figure 3.4.7C – Groundwater Levels – MW8S to MW9S

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### 3.4.8 MBT Groundwater Monitoring Results

The ground water monitoring well was installed on 25 January 2017, immediately down gradient of the leachate aeration to enable the monitoring and detection of any leachate migration from the dam to the underlying groundwater.

Following the installation of the monitoring well, one baseline monitoring round was conducted in February 2017 to classify the general characteristics of groundwater encountered at the site prior to operations, as stipulated in the EPL. Four quarterly groundwater quality monitoring at WMBT Point 11 was undertaken in this reporting period as required by the EPL. Results are summarised in **Table 3.4.8** below. Detailed data is provided in Tables **7.15** (refer **Appendix 3**).

The key quality indicators selected are the same as listed in section 3.4.6 to detect any pollutants in groundwater samples are the same as those deemed characteristic for leachate. These key quality indicators are depicted in the trend graphs Figures **3.4.8** (refer **Appendix 4**). 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 **3.4.8A**.

**Table 3.4.8: Bioreactor Groundwater Monitoring Results**

Parameter	Results/Discussion
WMBT Point 11	<p>WMBT Point 11 is located down gradient of the MBT leachate aeration pond. Based on the results provided in <b>Table 7.15</b> (refer <b>Appendix 3</b>), the groundwater quality at this location can be described as:</p> <ul style="list-style-type: none"> <li>• SWL (average 785.75 m RL) was consistent with the previous reporting period. The minimum level measured was 785.4 m RL and maximum level measured was 786.06 m RL.</li> <li>• pH (average 7.8) and is to slightly alkaline, which is consistent with previous reporting period;</li> <li>• EC (average 13875 <math>\mu</math>S/cm) is slightly lower than but generally consistent with previous reporting period readings;</li> <li>• SO<sub>4</sub> (average 541.5 mg/L) is consistent through this reporting period and lower than the average of the previous period;</li> <li>• Pb and Zn (average 0.00045 mg/L and 0.03775 mg/L respectively) are generally consistent with previous period with minor fluctuations.</li> <li>• NH<sub>3</sub> (average 0.1) is consistent with previous reporting periods.</li> <li>• TOC (14 mg/L) is slightly higher than the previous reporting period. This is due to a higher measurement in the first round of this reporting period. TOC concentration reduced to a lower level towards the end of the reporting period.</li> </ul> <p>All trends at this location indicate consistent concentration and there is no indication of contamination from leachate or MBT activities. No significant variations or anomalies were recorded for any analyte tested during this monitoring period.</p>

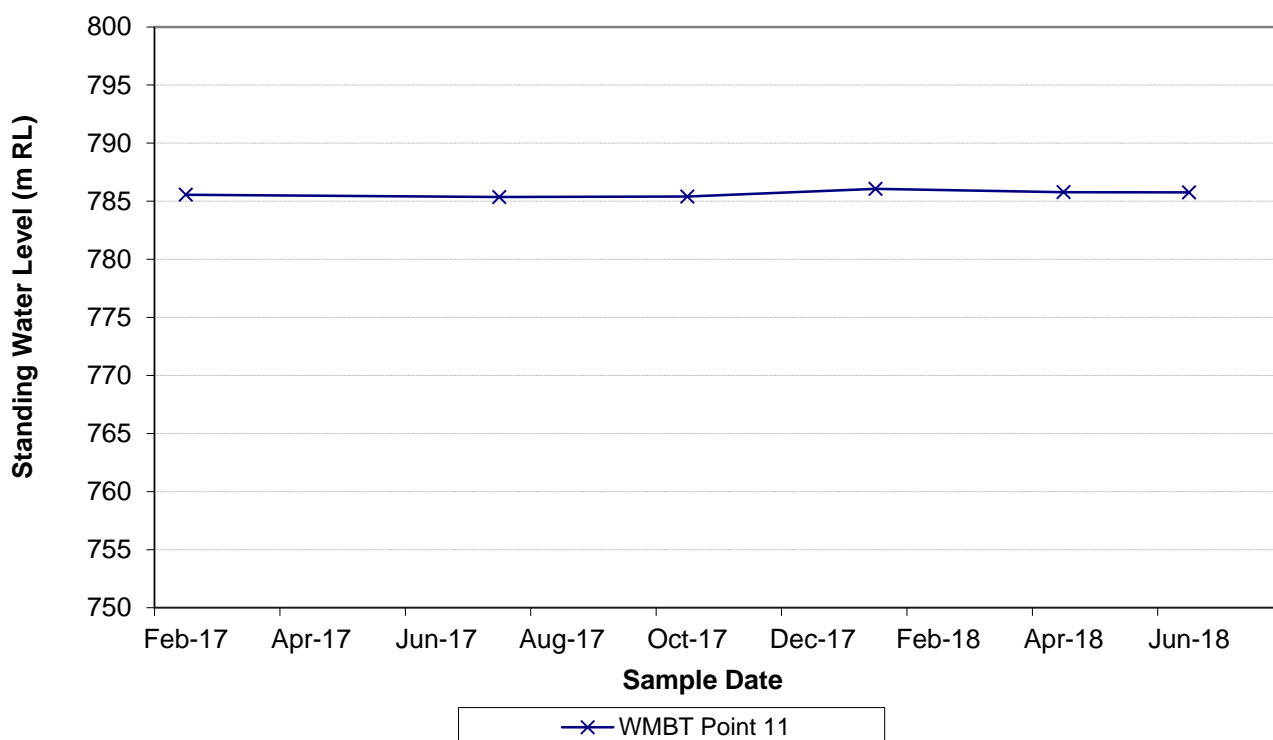


Figure 3.4.8 - Groundwater Levels - WMBT Point 11

### 3.4.9 Bioreactor Piezometers Level Monitoring Results

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

The findings of the monitoring are summarised in Table 3.4.9 below and detailed quarterly levels are provided in Tables 8.1 – 8.5 (refer **Appendix 3**). Standing water levels (SWL) of the piezometers are depicted Figures 3.4.9.1.

Table 3.4.9: Bioreactor Piezometers Level Monitoring Results

Parameter	Results/Discussion
P38A & P38B	<p>P38 is located east of the void. Standing water levels are presented in <b>Table 8.1</b> (refer <b>Appendix 3</b>). This monitoring location was deemed unsafe to access due to a rock slip on the Southern side of the Bioreactor void wall in 2010. An application to remove this monitoring point from the licence was submitted to the EPA and rejected during this reporting period. Following this decision, Veolia engaged a geotechnical consultant and earthmoving company to provide safe access. Monitoring re-commenced immediately.</p> <p>SWL in P38A (shallow aquifer) ) indicated a stable standing water level ranging from 776.18 metres Relative Level (m RL) to 776.23 RL during</p>



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Parameter	Results/Discussion
	<p>this reporting period.</p> <p>SWL in P38B (deep) ranged from 770.90 m RL to 771.11 m RL in this reporting period, consistent with previous reporting periods.</p>
P44 & P45	P44 and P45 were decommissioned at the end of quarter 1 in this reporting period and replaced by P200A and 200B
P200A & P200B	<p>P200 is located east of the void. Standing water levels are presented in <b>Table 8.2</b> (refer <b>Appendix 3</b>).</p> <p>SWL in P200A (shallow) showed a range of 754.46 m RL to 757.23 m RL and is stable.</p> <p>SWL in P200B (deep) showed a range of 754.15 m RL to 756.95 m RL and is stable.</p>
P58A & P58B	<p>P58 is located west of the void. Standing water levels are presented in <b>Table 8.3</b> (refer <b>Appendix 3</b>).</p> <p>SWL in P58A (shallow) showed a range of 763.95 m RL to 764.24 m RL and is stable.</p> <p>SWL in P58B (deep) is similar to previous reporting period fluctuating between 751.85 m RL and 753.68 m RL.</p>
P59A & P59B	<p>P59 is located west of the void and to the south of P58. Standing water levels are presented in <b>Table 8.4</b> (refer <b>Appendix 3</b>).</p> <p>SWL in P59A (shallow) ranged from 784.86 m RL to 786.88 m RL in this reporting period, consistent with previous reporting period.</p> <p>SWL in P59B (deep) ranged between 784.58 m RL and 786.48 m RL, consistent with previous reporting period.</p>
P100A & P100B	<p>P100 is located northeast of the void. Standing water levels are presented in <b>Table 8.5</b> (refer <b>Appendix 3</b>).</p> <p>SWL in P100A (shallow) is consistent with the previous reporting period averaging between 738.10 m RL to 739.46 m RL.</p> <p>P100B (deep) averaged between 711.49 m RL and 722.84 m RL which indicates water above the base level of 698.29 m RL which has been recorded in previous periods.</p> <p>This increase is likely due to the compaction of landfill waste at higher levels within the void preventing water ingress.</p>

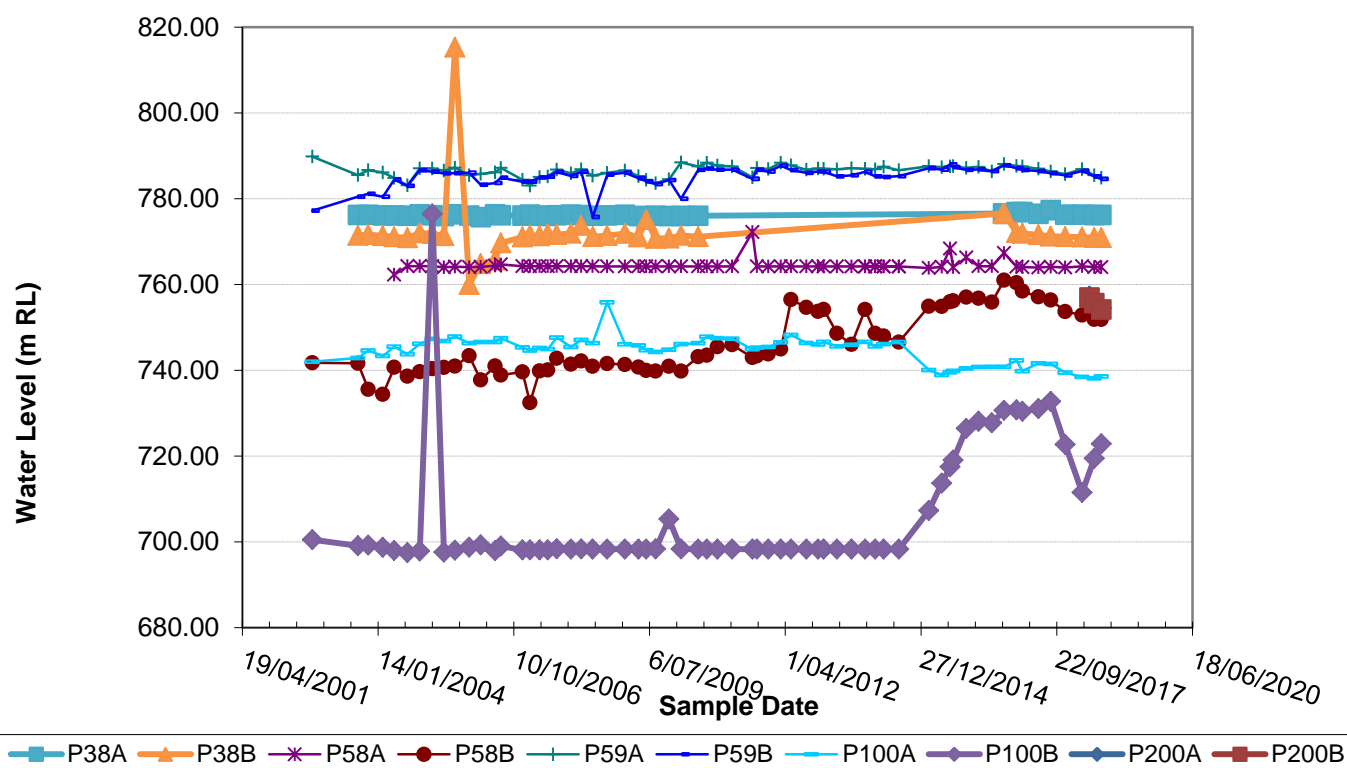


Figure 3.4.9.1 – Piezometer Standing Water Levels – P38 to P200

### 3.4.10 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 all Evaporation Dam 3 (Lagoon systems) below the freeboard level at all times.

Water levels are taken monthly as detailed in Table 3.4.10, which shows that the dam Relative Levels (RL) of ED3S, ED3S-S and ED3N Lagoon 4 remained below their respective freeboard levels at all times during the reporting period.

**Table 3.4.10: Bioreactor Evaporation Dam Volume Monitoring Results (RL - mAHD)**

	ED3 SOUTH		ED3 NORTH			
Date	ED3S	ED3S-S	ED3N Lagoon 1	ED3N Lagoon 2	ED3N Lagoon 3	ED3N Lagoon 4
	RL	RL	RL	RL	RL	RL
Sep-17	790.89	793.47	790.51	791.12	790.64	790.45
Oct-17	790.85	793.6	790.42	791.08	790.60	790.46
Nov-17	790.79	793.52	790.37	791.00	790.51	790.61
Dec-17	790.79	793.49	790.31	791.01	790.49	790.67
Jan-18	790.73	793.31	790.12	791.11	790.29	790.66
Feb-18	790.89	793.25	790.07	791.18	790.24	790.73
Apr-18	790.79	793.11	789.95	791.12	790.14	790.77
Apr-18	790.69	793.01	789.87	790.99	790.04	790.75
May-18	790.67	792.95	789.82	791.05	789.99	790.76
Jun-18	790.69	792.92	789.79	791.20	789.99	790.82
Jul-18	790.69	792.91	789.76	791.15	789.96	790.91
Aug-18	790.69	792.89	789.98	791.09	789.96	790.97
Minimum	790.67	792.89	789.76	790.99	789.96	790.45
Mean	790.76	793.20	790.08	791.09	790.24	790.71
Maximum	790.89	793.6	790.51	791.20	790.64	790.97
Max Freeboard levels	791.2	793.6	791.3	791.1	791	791.3

### 3.4.11 Extraction of Water

Table 3.4.11.1 below provides the volume of the water extracted from the Willeroo Borefield.

**Table 3.4.11.1: Willeroo Bore Field Extraction Volume**

Month	Willeroo Bore Field Usage Volume per month KL
Sep-17	1522.3
Oct-17	824.4
Nov-17	865.7
Dec-17	1341.7
Jan-18	291.8
Feb-18	226.1
Mar-18	232.7
Apr-18	275.2
May-18	267.6
Jun-18	353.2
Jul-18	273.4
Aug-18	131.7
<b>Total</b>	<b>6605.8</b>

Heron commenced dewatering of the mine workings in May 2017 required for Heron Mine project. Water extracted from the mine decline is summarised in Table 3.4.11.2. Extracted water was transferred to ED2.

**Table 3.4.11.2: Water extracted from the mine decline (Heron Resources)**

Month	Heron mine dewatering September 2017 - April 2018 Volume per month KL
Sep-17	2928
Oct-17	11009
Nov-17	4404
Dec-17	14543
Jan-18	17712
Feb-18	7471
Mar-18	Pump turned off
Apr-18	93839

Total Ground water extracted during the reporting period – **103,141 KL**

Leachate extracted from the Bioreactor for the water year (1 July 2017 to 30 June 18) was 85,435 m<sup>3</sup>. Leachate is treated through the existing Leachate Treatment Plant before being transferred to the ED3 dams for evaporation. For the monthly ED3 lagoon system Relative Levels refer to Table 3.4.10.

Additional assisted evaporators were installed in ED3N in February 2018 to reduce the volume of the ED3 dams.

## **3.5 Noise**

### **3.5.1 Noise Monitoring**

Operational activities at the Woodlawn Bioreactor and Crisps Creek IMF were restricted within the approved operating hours described in **Table 3.5.1** as per Conditions of the Consent.

**Table 3.5.1 Approved Hours of Operation**

Activity	Day	Hours
Operations	Monday- Saturday	6:00am-10:00pm
	Sunday & Public Holidays	Nil

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..

### **3.5.2 MBT Noise Monitoring**

Operational activities at the Facility were restricted within the approved operating/construction hours described in **Table 3.5.2.1** as per Schedule 3, Condition 27 of the Consent.

**Table 3.5.2A - Approved Hours of Construction & Operation**

Activity	Day	Hours
Operation Hours	Monday – Saturday	6:00am – 10:00pm
Emergency Hours	Monday – Sunday	Anytime

Note: Operation of BRS Drums and associated infrastructure is permitted over 24 hours.

Noise limits are stipulated in the Consent to ensure the site does not generate nuisance noise emissions as a result of construction or operational activities.

**Table 3.5.2B- Noise Impact Assessment Criteria dB(A)**

Parameter	Performance Measure	Standards	Statutory Requirement
Residences on privately owned land (during construction)	Laeq (15min) = 40dB	NSW Industrial Noise Policy (EPA)	Schedule 3, Condition 25
Residences on privately owned land (during operations)	Laeq (15min) = 35 dB		
Traffic Noise on privately owned land	Laeq (1 hour) = 60dB	Environmental Criteria for Road Traffic Noise (DECC)	Schedule 3, Condition 26

SLR Consulting was engaged to conduct operational noise monitoring to conduct a noise audit of the Woodlawn Mechanical Biological Treatment Facility, to determine if any impact of operational activities on nearby receivers occurs in regards to the emission of nuisance noise.

### **3.5.2.1 Operational Noise**

Ambient noise measurements were conducted at the two locations as identified as the nearest residences on privately owned land, as specified in Condition 25 of the Consent. The results of the operator-attended measurements confirm the noise impact assessment criteria (Refer to Table 3.5.2.2) is complied with at the nearest residences on privately-owned land, with LAeq(15minute) noise levels recorded below 35 dBA at both locations. The operator-attended measurements also recorded levels higher than LAeq(15minute) 35 dBA, and in these instances the ambient noise environment was due to natural sounds such as birds, insects and frogs.

### **3.5.2.2 Traffic Noise**

Traffic noise levels were calculated at the nearest residence to the road between the Crisps Creek Intermodal Terminal and Woodlawn MBT, for comparison with the Traffic Noise Impact Assessment Criteria specified in the approval. The results of the operator-attended measurements and calculation confirm the Project Approval (06\_0239) noise criteria is complied with at the nearest residence on privately-owned land.

A copy of the noise audit report was submitted to the DPE on the 6 December 2017. The performance of the Facility in managing potential noise emissions was also assessed on the receipt of any noise complaints. No noise complaints were received in this reporting period.

## 3.6 Waste

### 3.6.1 Waste Conformance

All waste received as part of the expanded operations was in accordance with the waste types permitted in the Consent and EPL.

Acceptance and screening of waste prior to final disposal was 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. Visual assessments of incoming waste were conducted by operators, as tipping/unloading occurred on the landfill surface.

No records of non-conforming waste were recorded during this reporting period. Incoming waste and the waste was received as per the condition 20, schedule 5 of project approval 10\_0012.

### 3.6.2 Waste Volume Monitoring and Recording

The Consent stipulates that the expanded operations must not exceed the maximum annual input rates in following **table 3.6.2.1**.

**Table 3.6.2.1 Maximum annual input rates for Woodlawn Bioreactor**

Putrescible waste received by rail from Sydney	Received as residual waste from Woodlawn AWT	Putrescible regional waste received by road
900,000 tpa	100,000 tpa	90,000 tpa

All waste received is recorded in the Systems, Applications and Products in Data Processing (SAP) software. SAP also records vehicle registrations, the date and time of delivery, the gross and tare weight of the vehicle, as well as the nature and origin of the waste delivered by each contractor.

**Table 3.6.2.2 Maximum annual input rates for Crisps Creek**

Received by Rail from Sydney	Received by rail from Sydney for processing at the Woodlawn AWT
900,000 tpa	280,000 tpa

The data provided by SAP is used to track and monitor the amount of incoming waste in accordance with the limits of the Consent. **Table 3.6.2.3** indicates that the Woodlawn Bioreactor has remained within the annual waste limit stipulated within the Consent.



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**Table 3.6.2.3 Incoming waste tonnage via rail and road per month for Woodlawn Bioreactor, MBT facility and Crisps Creek (IMF) during 2017/2018 reporting period.**

Monitoring Period	Incoming Waste Received at the Woodlawn Bioreactor Via Crisps Creek IMF (tonnes)	Incoming Waste Received at the MBT Via Crisps Creek IMF (tonnes)	Incoming Waste Volumes received residual as waste from MBT (tonnes)	Incoming regional waste received by road (tonnes)
September 2017	46,809.660	9,516.640	6,281.670	3,723.000
Oct 2017	47,953.910	9,401.820	5,733.480	3847.060
Nov 2017	57,279.010	9,543.020	5,377.480	4844.890
Dec 2017	58,633.830	7,973.580	4,847.100	4615.880
January 2018	56,923.520	8,927.670	7,065.060	3781.840
February 2018	49,225.700	10,826.120	7,304.780	4521.440
March 2018	52,159.200	11021.500	8443.080	5282.990
April 2018	52,666.240	8,926.880	6,226.460	4693.860
May 2018	53,068.850	10,881.130	7,199.540	8808.030
June 2018	47,066.560	10,675.680	7,467.120	8495.380
July 2018	48,193.720	12,048.220	6,635.820	9654.720
August 2018	50,342.900	12,590.980	7,685.120	9328.360
<b>TOTAL</b>	<b>620,323.10</b>	<b>122,333.24</b>	<b>80,266.71</b>	<b>71,597.45</b>

Comparing the Total from Table 3.6.2.3 with the maximum input rates (Table 3.6.2.1 and 3.6.2.2) shows that the waste received at the Woodlawn was with in the allowed limits.

**Table 3.6.2.3 Forecast waste tonnages for the 2018/2019 reporting period.**

Reporting period	Forecast Waste Received at the Woodlawn Bioreactor Via Crisps Creek IMF (tonnes)	Forecast Waste Received at the MBT Via Crisps Creek IMF (tonnes)	Forecast Waste received residual as waste from MBT (tonnes)	Forecast regional waste received by road (tonnes)
2018/19	630,000	143,000	80,000	90,000

### **3.6.3 MBT Waste Volume Monitoring**

#### **3.6.3.1 Waste Acceptance and Screening**

Waste was screened in accordance with the NSW Resource Recovery Screening and Recording of Waste Procedure at the Clyde Transfer Terminal and Banksmeadow Transfer Terminal sites before the loading of waste into containers for the transportation to the Facility. If any waste is detected that is not acceptable through the screening process, it is rejected and cannot be loaded into the containers.

Once the waste is received at the Facility, the operator of the grapple crane inspected the waste as it is discharged from the vehicle, to check for non-conforming waste. In the event that easily extractable, bulk recyclable waste was detected this waste was separated from the general waste stream and set aside for removal from the facility to another facility licensed to receive this type of waste for processing or recycling. This includes waste types identified as less desirable to processing operations. No records of non-conforming waste were recorded during this reporting period.

#### **3.6.3.2 Waste Volume Monitoring**

Schedule 3, Condition 2 of the Consent stipulates that the Facility must not receive or process more than 240,000 TPA of mixed waste and 40,000 TPA of garden waste. Under the Facility operations (Stage 1), the site is approved to accept and treat 184,000 TPA, which includes 144,000 TPA of mixed waste and 40,000 TPA of garden waste. The WRVCP details the Waste Monitoring Program used to monitor and record incoming waste at the Facility. The performance measures for the waste volumes are detailed in **Table 3.6.5.2B**.

Table 3.6.5.2A - Stage 1 Waste Parameters and Performance Measures

Parameter	Performance Measure	Standards	Statutory Requirement
Mixed waste	240,000 TPA	NSW EPA Waste Classification Guidelines	Schedule 3, Condition 2
Garden waste	40,000 TPA		

Veolia utilised the data provided by PWS to track and monitor the amount of incoming waste transported by rail to Crisps Creek Intermodal Facility and transferred to the Facility. **Table 3.6.5.2B** indicates that the Facility has remained within the annual waste limit stipulated within the Consent. Veolia shall continue to monitor incoming waste tonnages at the Facility for the following operational year.

Table 3.6.5.2B - Incoming Waste Tonnages during Operations (Sep 2017 – Aug 2018) at MBT

Source	Waste Type	Total TPA
Banksmeadow Transfer Terminal	Mixed Waste	81,839.56
Clyde Transfer Terminal	Mixed Waste	40,493.68
	TOTAL	122,333.24

### 3.7 Pests and Vermin

The management of pest and vermin at the Bioreactor and IMF were maintained through preventative and responsive mitigation measures as per the Landscaping Management Plan in the LEMP. Such measures included:

- Inspection of the site by a registered pest controller every two months;
- Weekly Site inspections to record site conditions such as evidence of vermin and pests; and
- Placement of rodent bait stations at various locations around the site

No pest and/or vermin complaints or management issues were reported during the operation of the Bioreactor during the reporting period.

### 3.8 Rehabilitation

Rehabilitation of the mine void through landfilling is a continuous process. Final rehabilitation works shall be completed in accordance with the closure and rehabilitation plan. The areas to be rehabilitated include:

- The Bioreactor
- Former Mineral Processing Area - Plant Area
- Evaporation Dam 3

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- Evaporation Dam 1
- Power Station; and
- Office and car park areas

In 2008 to 2010, Veolia commissioned Golder Associates Pty Ltd to do a detailed contamination assessment of the Former Mineral Processing Area. Veolia post this assessment transported the main contaminants to the tailings dam area, which included the lead reverse tailings dam, which was located in the south part. Landscaping and reshaping the current area will begin post construction activities by Heron Resources.

Veolia will consult with OEH on the final rehabilitation plans and plant species to be adopted within the rehabilitation areas, once a suitable rehabilitation design is selected and additional detail is developed.

Other areas of the mine site are subject to a current development approval by Heron Resources Limited Pty Ltd (Heron). Under the approved development, Heron are proposing to undertake further underground mining and reprocessing over various areas of the mine site. Rehabilitation of other areas, will be the responsibility as identified in Heron Mining Operations Plan (MOP).

On the ongoing basis, Veolia has undertaken vegetation monitoring and tree planting programs at the Eco-Precinct site. Tree planting aims to increase native species, which in turn creates new habitats for native fauna. Tree planting programs may include the following activities:

- Identification of suitable locations for planting;
- Assessment of existing vegetation and trees;
- Purchase of native saplings;
- Planting of saplings, generally with local volunteer groups
- Funding of tree planting program
- Installation of sapling tubes / tree guards
- Application of fertiliser and/or mulch as required

Mixed Waste Organic Output produced from the MBT will be focused on rehabilitation of Heron area of operation initially – tailing dams.

## SECTION 4 ENVIRONMENTAL PERFORMANCE

The environmental performance of the expanded operations was assessed through the results of environmental monitoring, internal inspections, as well as external environmental audits.

### 4.1 Non-Compliances and Corrective Actions

#### 4.1.1 Non-Compliance

The Independent Environmental Audit (IEA) carried out for the Bioreactor and IMF in this reporting period (2017-2018) determined non-compliances against the PA. These are summarised as followed in **Table 4.1.1** below and the status of corrective actions to resolve/manage these non-compliances are also provided.

**Table 4.1.1: 2017-2018 period findings and non-compliance against the Consent**

Finding	Consent Condition	Recommendation	Corrective Action	Status
Community Liason Committee	Schedule 7 condition 2 of Project Approval 10_0012	Verify that all current members of the CLC have been endorsed by the DPE	Seek endorsement from DPE	Completed 22/05/2018
Train movements at IMF – Veolia received an official caution on the 13/07/18	Schedule 5 condition 20 of Project Approval 10_0012	Clarify with DPE whether approval is required for continued splitting of the second train each day at Goulburn into two movements to the IMF until the Tarago rail upgrade works are complete	Veolia will seek clarification from DPE if splitting of the second train at Goulburn will trigger any approval requirements.	Tarago Loop Extension works are expected to commence in the second half of 2019. Once these works are completed there will no longer be a need to split Train 2. At this point in time the entire Train 2 will access the IMF at around 11:45am and depart at 4.30pm. Note: splitting of train has not caused any operational interruptions or environmental harm and no complaints have been received at the CC IMF.

There were two non-compliances in this reporting period (2017-2018), which is a reduction from the last reporting period (2016-2017) where there were six non-compliances. The corrective

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actions for which were all completed. The Odour Management is an ongoing activity and with the Evaporation Dam 1 and 2 lining assessment, Veolia completed the Ecological Risk Assessment and Evaporation Plan in the 2017-2018 reporting period.

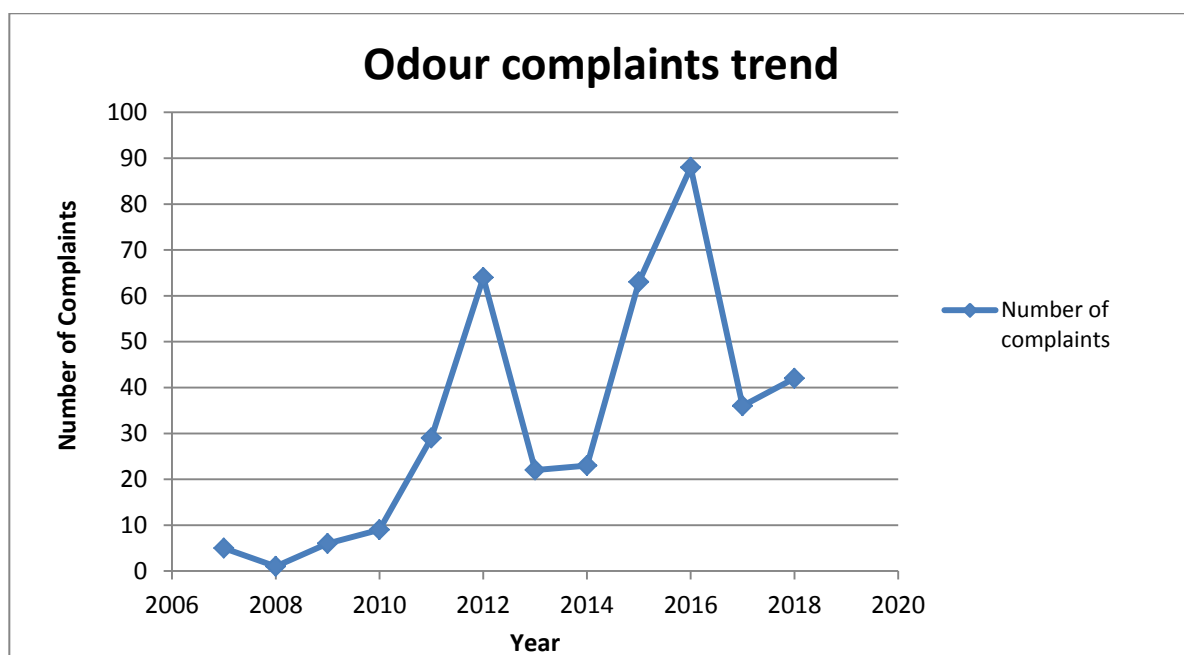
No IEA is yet required to be scheduled for the MBT until the next reporting period.

### 4.2 Complaints

Veolia operates a 24-hour telephone complaints line that enables the receipt of complaints from members of the public, as required under the EPLs. Other complaints that were received off site during this reporting period were logged by the EPA. Veolia recorded a total of 42 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.

In order to engage proactively 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 through either the Community Liaison Committee (CLC) to voice their concerns with the Bioreactor site and at the Tarago & District 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.

Figure 4.2: odour complaints trend



## **SECTION 5 CONCLUSION**

Based on the results of monitoring undertaken at the Bioreactor, IMF and MBT sites in accordance with the respective PA conditions and EPLs, the overall environmental performance of the Woodlawn Eco-Precinct in this reporting period can be demonstrated to be well managed.

### **Bioreactor, IMF and MBT Improvements**

A number of improvements to the environmental management of the Woodlawn Bioreactor have been implemented during this reporting period. These improvements were implemented as a result of the recommendations and findings identified by independent environmental audits, regulatory inspections as well as Veolia's internal assurance program.

Examples of these improvements include:

- Completed Ecological Risk Assessment for Evaporation Dam 1 and 2
- Construction of the Leachate Treatment Plant commenced in December 2017 as part of the Long Term Leachate Treatment Project
- Completed construction of HDPE lined dam within ED1 footprint to store treated effluent from the new Leachate Treatment Plant
- Installed leachate extraction pumps in the areas where LFG extraction is impacted by the leachate
- Designing of the new waste tipping profile and quality assurance of the tipping activity to meet the profile design
- LFG extraction wells extension to the new tipping lift with perforated pipe sections
- Use of matured MWOO for capping inside of the MBT Fermentation Building to improve MWOO composting process
- Increased frequency and use of new cleaning techniques to clean both inside and outside of the MBT facility buildings to ensure litter and leachate is contained

Veolia intend to undertake following to improve the community and environmental performance in the next reporting period:

- Groundwater and surface water assessment around ED1 as part of the Evaporation Dam Seepage Management Strategy for ED1
- Construct a series of buffer/collection ponds in different catchment areas around the void as part of the new storm water management in the Void
- Leachate minimisation strategy
- Commission and operation of the new Leachate Treatment Plant to extract and treat leachate more efficiently
- Further assessment of the west side of the Bioreactor to further improve the groundwater monitoring network as WM4 was decommissioned during the previous reporting period



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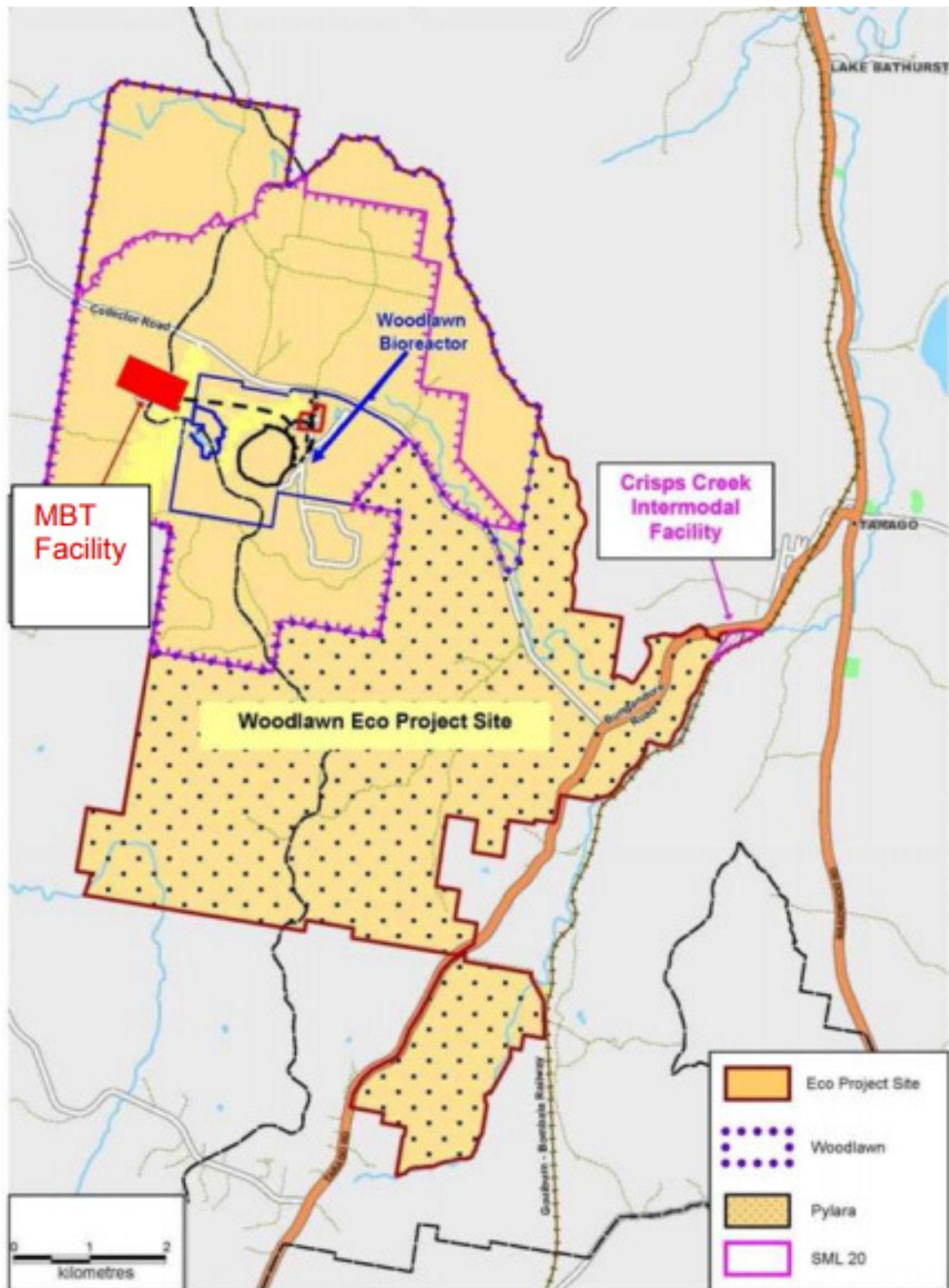
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- MBT odour control system humidification recirculation system to improve moisturisation of biofilter medium and reduce wastewater generation
- Install and commissioning additional aerator inside of MBT aeration pond to improve leachate quality and reduce potential odour
- In consultation with the NSW EPA, re-establish site specific exemption at Woodlawn Eco-Precinct and Woodlawn Mine for the ongoing use of MWO

## REFERENCES

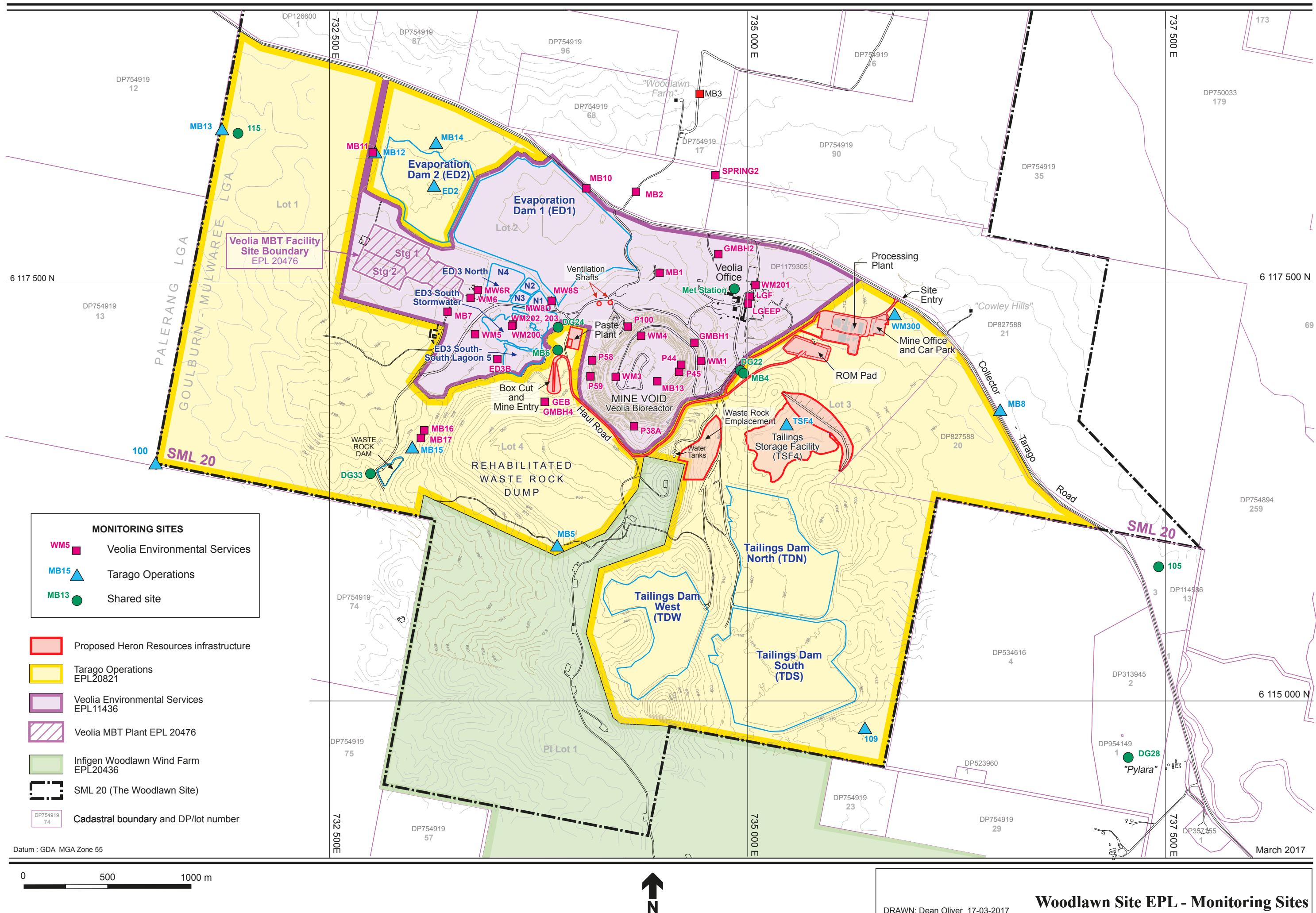
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**APPENDICES**

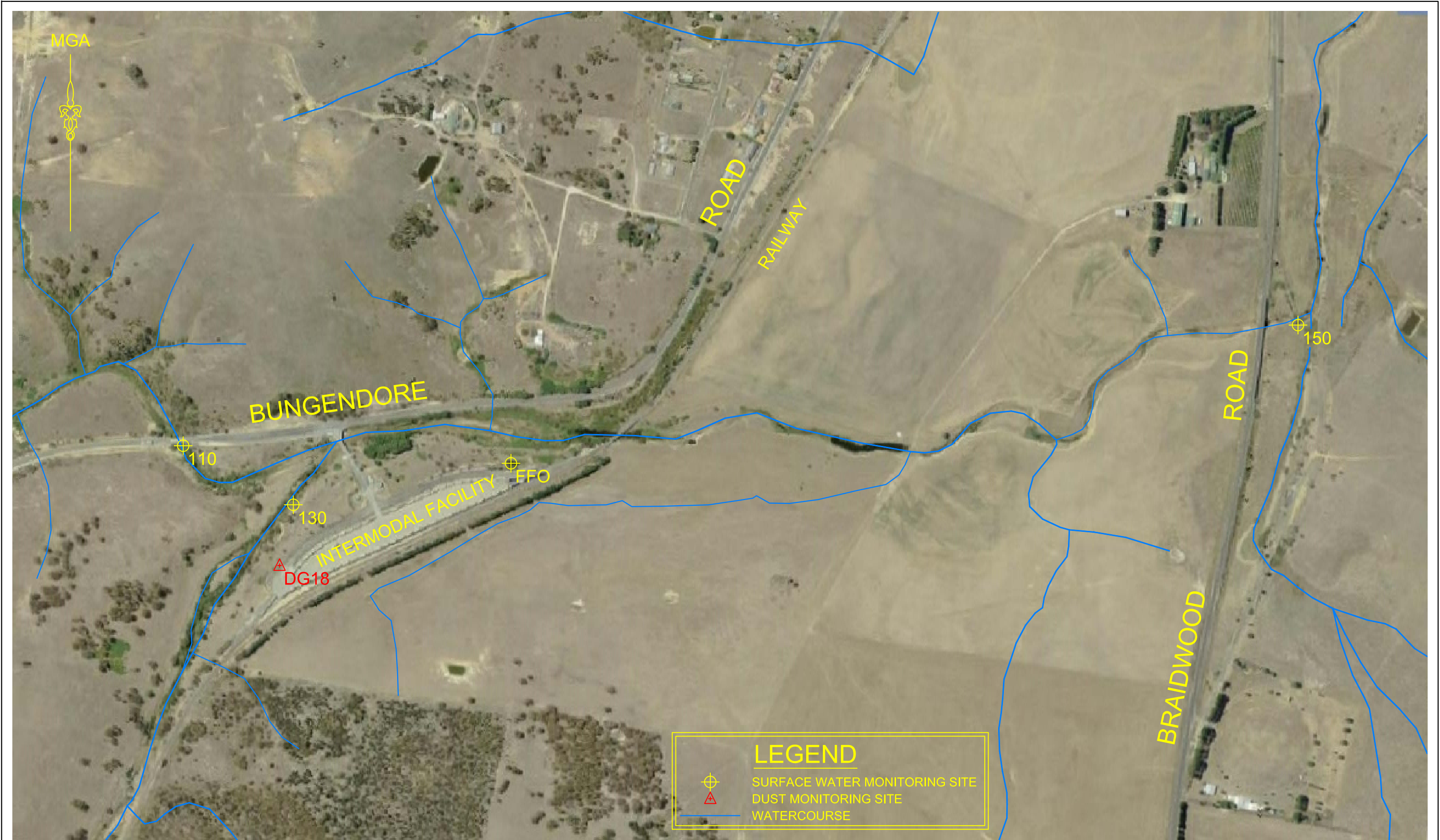


Woodlawn Bioreactor, Crisps Creek Intermdal Facility and MBT Facility Location Plan





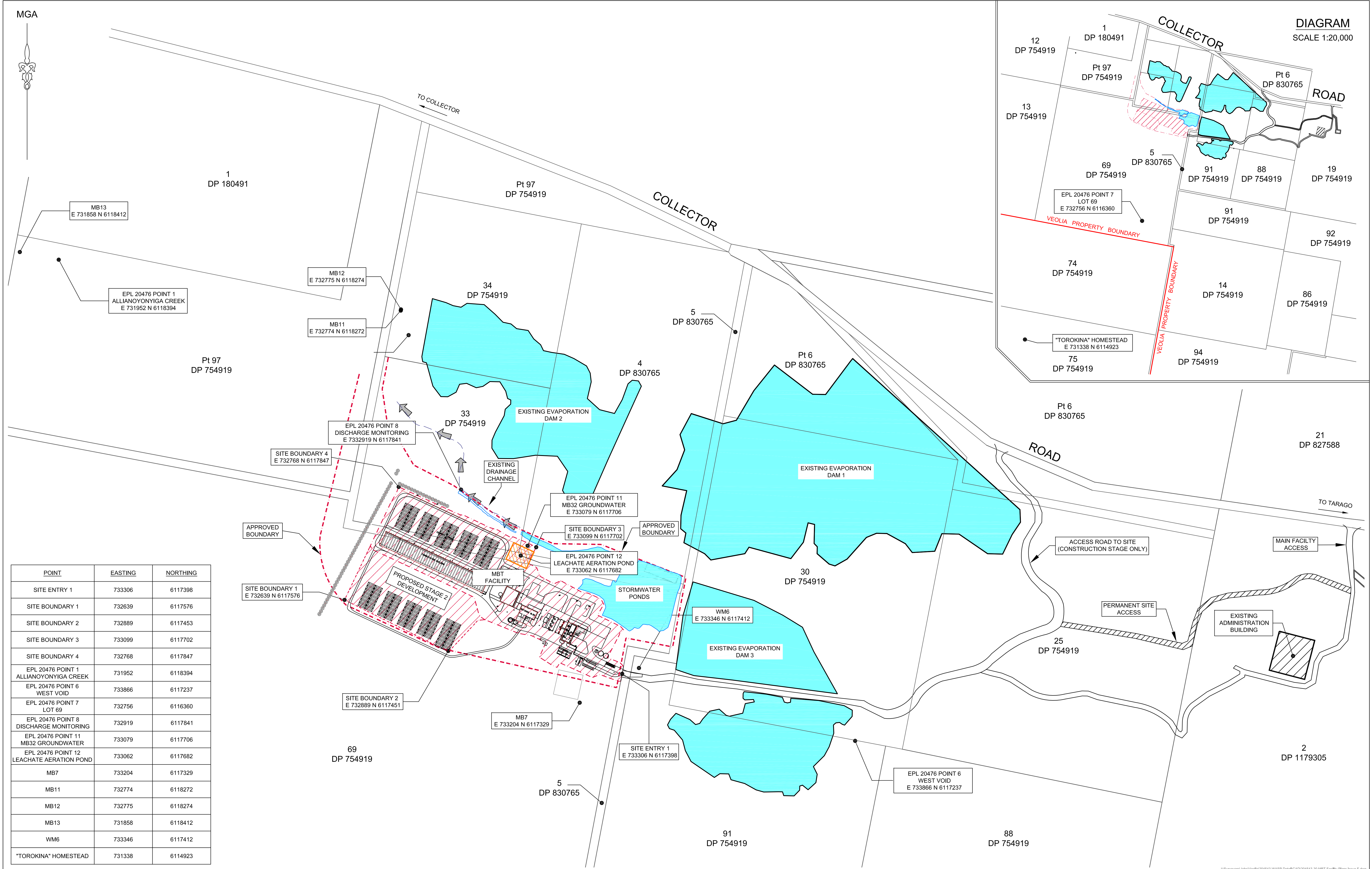




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ISSUE	AMENDMENT	DATE	<div>SCALE 1:6000</div> <div><div></div></div> <div>072144216288360</div> <div>Metres</div> <div><div></div></div> <div>Liability limited by a scheme approved under Professional Standards Legislation.</div> <div>A3</div> <div>SHEET</div>	<div><div></div></div> <div>VEOLIA</div> <div>ENVIRONMENTAL SERVICES</div>		VEOLIA ENVIRONMENTAL SERVICES		DATE: 13/04/2016		
A	INITIAL ISSUE	13/04/2016				<div>PLAN SHOWING</div> <div>MONITORING SITE LOCATIONS</div> <div>VEOLIA INTERMODAL FACILITY</div> <div>BUNGENDORE ROAD, TARAGO</div>		SURVEYED: N/A		ISSUE
				DRAWN: MK						
				CHECKED: JK						
						DRAWING No.		16735-15		
							DATUM	N/A	CONTOUR INTERVAL	N/A





POINT	EASTING	NORTHING
SITE ENTRY 1	733306	6117398
SITE BOUNDARY 1	732639	6117576
SITE BOUNDARY 2	732889	6117453
SITE BOUNDARY 3	733099	6117702
SITE BOUNDARY 4	732768	6117847
EPL 20476 POINT 1 ALLIANONYIGA CREEK	731952	6118394
EPL 20476 POINT 6 WEST VOID	733866	6117237
EPL 20476 POINT 7 LOT 69	732756	6116360
EPL 20476 POINT 8 DISCHARGE MONITORING	732919	6117841
EPL 20476 POINT 11 MB32 GROUNDWATER	733079	6117706
EPL 20476 POINT 12 LEACHATE AERATION POND	733062	6117682
MB7	733204	6117329
MB11	732774	6118272
MB12	732775	6118274
MB13	731858	6118412
WM6	733346	6117412
"TOROKINA" HOMESTEAD	731338	6114923

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SHEET

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0 80 160 240 320 400  
Metres

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ISSUE	AMENDMENT	DRAWN	DATE
A	INITIAL ISSUE	MK	12/09/2014
B	MONITORING POINT AMENDMENTS	MK	17/09/2014
C	GENERAL REVISION & AMENDMENTS	MK	6/02/2017
D	LEACHATE AERATION POND ENHANCED	MK	8/02/2017
E	DISCHARGE MONITORING POINT & MB32 AMENDED	MK	15/02/2017
F	STORMWATER PONDS ADDED	MK	20/02/2017

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VEOLIA ENVIRONMENTAL SERVICES

PLAN SHOWING SITE LAYOUT AND ENVIRONMENTAL MONITORING POINTS  
WOODLAWN MBT FACILITY  
COLLECTOR ROAD, TARAGO

DATUM	N/A	CONTOUR INTERVAL	N/A	DATE	20/02/2017
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WOODLAWN BIOREACTOR AND MBT FACILITY  
COLLECTOR ROAD, TARAGO

DRAWN: MK	ISSUE
CHECKED: JK	F
APPROVED: VEOLIA	
DRAWING No.	

204543-30



**EPL  
11436**

**Table 1 - Landfill Gas Extraction Booster Results**

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
2/06/2016	39	1,250,000	0.50	N/A	1.2	2.4	Attached Document	1814	0.50	57
1/08/2017	36.5	1,270,000	<0.4	N/A	3.6	3	Attached Document	0.7	2500	49.82
25/07/2018	37	1,270,000	<0.4	N/A	3.4	5	Attached Document	0.94	3400	51

**OVERALL**

Minimum	34.8	104.2	0.5	30.17	0.3	2.4	0.09	771.83	0.21	48
Maximum	46.9	1270000	8.5	30.17	3.6	47.8	0.09	5380	3400.00	61.4
Average	39.29	633637.70	6.10	30.17	1.68	36.7	0.09	1952.68	738.04	52.32
StdDev	4.66	N/A	N/A	N/A	1.22	19.12	N/A	1782.81	1386.28	4.98
Count	7	5	4	1	8	8	1	8	8	7

Table 2 - Surface Gas Monitoring Results

Quarter 1 - Surface Gas Results					
12/12/2017					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	7:45:00 AM	6	0.0007	0.0113	0.0050
2		8	0.0016	0.0205	0.0060
3		10	0.0021	0.0112	0.0051
4		11	0.0015	0.0205	0.0081
5		11	0.0006	0.0116	0.0058
6		11	0.0027	0.0154	0.0072
7		11	0.0021	0.0185	0.0078
8		11	0.0004	0.0133	0.0065
9		11	0.0009	0.0247	0.0092
10		11	0.0023	0.0223	0.0107
11		11	0.0007	0.0507	0.0182
12	▼	15	0.0006	0.0188	0.0084
13		8	0.0009	0.0118	0.0049
14		7	0.0006	0.0129	0.0043
15	14:30:00 PM	5	0.0001	0.0106	0.0030
Total Measurements		135	0.000	0.051	0.008

Quarter 3 Surface Gas Results					
22/06/2018					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	1:45:00 PM	5	0.0023	0.0272	0.0088
2		7	0.0089	0.0238	0.0154
3		11	0.0026	0.0170	0.0083
4		10	0.0013	0.0320	0.0098
5		9	0.0013	0.0360	0.0110
6		8	0.0010	0.0116	0.0041
7		9	0.0007	0.0167	0.0056
8		12	0.0014	0.0133	0.0063
9		12	0.0011	0.0315	0.0090
10		11	0.0013	0.0109	0.0054
11		11	0.0006	0.0272	0.0054
12	▼	14	0.0008	0.0790	0.0147
13		10	0.0014	0.0380	0.0126
14		9	0.0023	0.0171	0.0084
15	4:30:00 PM	7	0.0017	0.0078	0.0047
Total Measurements		145	0.001	0.079	0.009

Quarter 2 - Surface Gas Results					
4/04/2018					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	7:45:00 AM	5	0.0022	0.0136	0.0060
2		8	0.0012	0.0205	0.0060
3		10	0.0031	0.0180	0.0068
4		11	0.0018	0.0279	0.0098
5		11	0.0051	0.0290	0.0144
6		11	0.0045	0.0335	0.0149
7		5	0.0081	0.0423	0.0215
8		11	0.0017	0.0296	0.0099
9		11	0.0017	0.0365	0.0114
10		11	0.0006	0.0294	0.0059
11		11	0.0009	0.0224	0.0079
12	▼	15	0.0012	0.0603	0.0116
13		10	0.0007	0.0426	0.0083
14		9	0.0007	0.0068	0.0031
15	14:30:00 PM	7	0.0011	0.0054	0.0026
Total Measurements		146	0.001	0.060	0.009

Quarter 4 - Surface Gas Results					
28/08/2018					
Transect	Time	No of measurements	Min Methane (%)	Max Methane (%)	Average Methane (%)
1	1:45:00 PM	4	0.0012	0.0823	0.0289
2		5	0.0033	0.0790	0.0233
3		9	0.0006	0.0215	0.0072
4		11	0.0004	0.0120	0.0031
5		11	0.0007	0.0083	0.0035
6		11	0.0005	0.0113	0.0052
7		10	0.0012	0.0172	0.0056
8		10	0.0023	0.0128	0.0073
9		10	0.0017	0.0788	0.0214
10		11	0.0005	0.0105	0.0052
11		11	0.0012	0.0268	0.0094
12	▼	14	0.0012	0.0193	0.0068
13		10	0.0013	0.0201	0.0073
14		9	0.0013	0.0118	0.0055
15	4:30:00 PM	8	0.0017	0.0134	0.0047
Total Measurements		144	0.000	0.082	0.010

2017/2018 Surface Gas Results Summary			
	Minimum	Maximum	Average
Methane (%)	0.000	0.082	0.009

Table 3.1 - Landfill Gas Engine Results - Generator 1

EPL  
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						EPL Limit		EPL Limit						EPL Limit
						450		100						5
Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides SO3	Sulphur Dioxide	Temperat ure	Velocity	Volatile Organic Compound s	Volumetri c Flowrate	Hydrogen Sulphide
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
3/04/2009	11.6	962	1.35	5.6	30.2	318	8.2	6.58	21	455	50.5	3.62	1.71	0.31
10/02/2010	13.3	1073	1.36	5.3	30.472	400	8.2	10.4	3	475	46.4	1.74	1.59	0.37
30/06/2011	10.4	1011	1.34	3.3	30.032	382	9.2	8.13	56	418	42.9	4.14	1.6	0.34
20/06/2012	11.6	997	1.35	8.3	30.172	385	8.2	11.3	214	447	45	0.09	1.49	0.326
11/06/2013	Generator 1 was not available													
25/03/2015	Generator 1 was not available													
2/06/2016	9.3	898	1.33	4.7	29.9	407	9.5	18.9	72	463	47.8	3.9	1.64	0.35
1/08/2017	11.6	670	1.35	8.8	30.3	360	8	4.3	110	460	50	1.4	1.7	0.0074
25/07/2018	Generator 1 was not available													

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

OVERALL	Minimum	9.3	670	1.33	3.3	29.9	318	8	4.3	3	418	42.9	0.09	1.49	0.0074
	Maximum	13.3	1073	1.36	8.8	30.472	407	9.5	18.9	214	475	50.5	4.14	1.71	0.37
	Average	11.30	935.17	1.35	6.00	30.18	375.33	8.55	9.94	79.33	453.00	47.10	2.48	1.62	0.28
	StdDev	1.35	142.12	0.01	2.13	0.20	32.47	0.63	5.07	76.03	19.48	2.93	1.64	0.08	0.14
	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6

Table 3.2 - Landfill Gas Engine Results - Generator 2

EPL  
11436

						EPL Limit		EPL Limit						EPL Limit
						450		100						5
Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides SO3	Sulphur Dioxide	Temperat ure	Velocity	Volatile Organic Compound s	Volumetri c Flowrate	Hydrogen Sulphide
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
8/12/2008	9.3	674	1.31	6.2	29.4	449	10	7.88	10	437	44.7	4.17	1.55	
23/06/2010	13.4	799	1.36	5.4	30.48	411	8.4	4.23	3	368	41.7	0.086	1.61	0.36
30/06/2011	11.4	750	1.35	4.8	30.152	402	8.2	8.89	109	415	43.6	4.1	1.59	0.33
20/06/2012	9.8	1011	1.34	8.1	29.944	384	9	7.9	255	432	44.7	0.18	1.52	3.354
11/06/2013	10.1	981	1.34	5	29.976	296	9	5	136	464	45	3.71	1.51	0.35
25/03/2014	9.7	766	1.33	5.9	29.9	414	8.6	6.95	410	471	46.2	4.178	1.53	0.354
25/03/2015	Generator 2 was not available													
2/06/2016	Generator 2 was not available													
1/08/2017	Generator 2 was not available													
25/07/2018	11.4	1000	1.35	9.4	30.3	380	8.4	2.4	100	455	48	7.9	1.6	<0.01

OVERALL	Minimum	9.30	674.00	1.31	4.80	29.40	296.00	8.20	4.23	3.00	368.00	41.70	0.09	1.51	0.33
	Maximum	13.40	1011.00	1.36	8.10	30.48	449.00	10.00	8.89	410.00	471.00	46.20	4.18	1.61	3.35
	Average	10.62	830.17	1.34	5.90	29.98	392.67	8.87	6.81	153.83	431.17	44.32	2.74	1.55	0.35
	StdDev	1.54	135.17	0.02	1.20	0.35	51.91	0.64	1.82	155.96	37.28	1.53	2.02	0.04	1.34
	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	5

Table 3.3 - Landfill Gas Engine Results - Generator 3

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						EPL Limit		EPL Limit						EPL Limit
						450		100						5
Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides SO3	Sulphur Dioxide	Temperat ure	Velocity	Volatile Organic Compound s	Volumetri c Flowrate	Hydrogen Sulphide
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
8/04/2010	7.5	304	1.35	6	30.138	322	14.7	6.25	3	345	46.2	0.09	1.89	0.288
30/06/2011	10.5	869	1.34	3.8	30.04	317	9	11.1	120	438	48.7	25	1.75	0.33
20/06/2012	10.6	926	1.34	3.8	30.032	359	8.3	5.65	266	421	45.8	3.87	1.65	0.34

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Table 3.4 - Landfill Gas Engine Results - Generator 4

						EPL Limit		EPL Limit						EPL Limit
						450		100						5
Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperat ure	Velocity	Volatile Organic Compound s	Volumetri c Flowrate	Hydrogen Sulphide
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
20/06/2012	10.3	686	1.34	5.7	29.964	391	8.3	9.64	278	425	45.3	3.77	1.6	0.327
11/06/2013	9.4	784	1.33	4.6	29.884	267	9.5	5.72	121	436	52.9	3.87	1.87	0.29
25/03/2014	9.7	878	1.34	5.8	29.9	368	8.8	7.08	411	458	51.7	0.099	1.73	0.345
25/03/2015	Generator 4 was not available													
2/06/2016	Generator 4 was not available													
1/08/2017	Generator 4 was not available													
25/07/2018	Generator 4 was not available													

OVERALL Minimum  
Maximum  
Average  
StdDev  
Count

9.40	686.00	1.33	4.60	29.88	267.00	8.30	5.72	121.00	425.00	45.30	0.10	1.60	0.29
10.30	878.00	1.34	5.80	29.96	391.00	9.50	9.64	411.00	458.00	52.90	3.87	1.87	0.35
9.80	782.67	1.34	5.37	29.92	342.00	8.87	7.48	270.00	439.67	49.97	2.58	1.73	0.32
0.46	96.01	0.01	0.67	0.04	65.96	0.60	1.99	145.17	16.80	4.09	2.15	0.14	0.03
3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 3.5 - Landfill Gas Engine Results - Generator 5

						EPL Limit		EPL Limit						EPL Limit
						450		100						5
Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperat ure	Velocity	Volatile Organic Compound s	Volumetri c Flowrate	Hydrogen Sulphide
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
25/03/2014	Generator 5 was not available													
25/03/2015	Generator 5 was not available													
2/06/2016	Generator 5 was not available													
1/08/2017	Generator 5 was not available													
25/07/2018	Generator 5 was not available													

OVERALL Minimum  
Maximum  
Average  
StdDev  
Count

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.6 - Landfill Gas Engine Results - Generator 6

						EPL Limit		EPL Limit						EPL Limit
						450		100						5
Date	Carbon Dioxide	Carbon Monoxide	Dry Gas Density	Moisture Content	Molcular Weight Of Stack Gases	Nitrogen Oxides	Oxygen	Sulfuric Acid Mist & Sulfur Trioxides S03	Sulphur Dioxide	Temperat ure	Velocity	Volatile Organic Compound s	Volumetri c Flowrate	Hydrogen Sulphide
	%	mg/m3	kg/m3	%	gr/gr mole	mg/m3	%	mg/m3	mg/m3	Deg C	m/sec	mg/m3	m3/sec	mg/m3
23/03/2015	Generator 6 was not available													
2/06/2016	Generator 6 was not available													
1/08/2017	Generator 6 was not available													

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Note: A TAN  
coloured cell

indicates that the indicated value is LESS THAN (<)	25/07/2018	Generator 6 was not available
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**11436**

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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	CA1705530-001	Sep-17	4.2	0.6	14	0.2	4.8	4.8
DG22	CA1706016-001	Oct-17	3.48	0.4	51	0.2	3.9	3.9
DG22	CA1706590-001	Nov-17	4.69	0.5	50	0.2	5.2	5.2
DG22	CA1800087-001	Dec-17	1.36	0.4	70	0.6	1.8	2.4
DG22	CA1800771-001	Jan-18	3.42	1.9	66	0.2	5.3	5.3
DG22	CA1801653-001	Feb-18	2	0.4	86	0.2	2.4	2.4
DG22	CA1802174-001	Mar-18	3.14	0.6	11	0.2	3.7	3.7
DG22	CA1802844-001	Apr-18	7.32	1.3	13	0.2	8.6	8.6
DG22	CA1803432-001	May-18	1.61	0.2	12	0.2	1.8	1.8
DG22	CA1804079-001	Jun-18	1.35	0.2	31	0.2	1.6	1.6
DG22	CA1804681-001	Jul-18	0.57	0.2	10	0.2	0.7	0.7
DG22	CA1805443-001	Aug-18	3.72	0.4	11	0.2	4.1	4.1
		Min	0.57	0.2	10	0.2	0.7	0.7
		Avg	3.07	0.59	35.42	0.23	3.66	3.71
		Max	7.32	1.9	86	0.6	8.6	8.6
		stDev	1.86	0.51	27.82	0.12	2.19	2.15

**Table 4.2 - Dust Deposition Results - DG34 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
DG34	CA1705530-002	Sep-17	0.55	0.2	17	0.2	0.8	0.8
DG34	CA1706016-002	Oct-17	2.1	0.9	57	0.4	3	3.4
DG34	CA1706590-002	Nov-17	1.53	0.4	57	0.2	1.9	1.9
DG34	CA1800087-002	Dec-17	1.32	0.6	71	0.2	1.9	1.9
DG34	CA1800771-002	Jan-18	3.66	1	51	0.2	4.7	4.7
DG34	CA1801653-002	Feb-18	1.42	1.4	83	0.2	2.8	2.8
DG34	CA1802174-002	Mar-18	0.41	0.3	14	0.2	0.7	0.7
DG34	CA1802844-002	Apr-18	0.95	0.4	15	0.2	1.3	1.3
DG34	CA1803432-002	May-18	0.38	0.6	14	0.2	1	1
DG34	CA1804079-002	Jun-18	0.08	<0.2	36	0.2	0.2	0.2
DG34	CA1804681-002	Jul-18	0.07	0.2	10	0.2	0.2	0.2
DG34	CA1805443-002	Aug-18	0.74	0.3	40	0.2	1	1
		Min	0.07	0.2	10	0.2	0.2	0.2
		Avg	1.10	0.57	38.75	0.22	1.63	1.66
		Max	3.66	1.4	83	0.4	4.7	4.7
		stDev	1.02	0.38	25.07	0.06	1.33	1.37

**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	CA1705530-004	Sep-17	1.01	1.1	19	0.2	2.1	2.1
DG28	CA1706016-003	Oct-17	0.54	0.5	56	0.2	1	1
DG28	CA1706590-003	Nov-17	0.33	0.5	62	0.2	0.8	0.8
DG28	CA1800087-003	Dec-17	0.2	0.2	71	0.2	0.4	0.4
DG28	CA1800771-003	Jan-18	0.84	1	67	0.2	1.8	1.8
DG28	CA1801653-003	Feb-18	0.13	1	91	0.2	1.1	1.1
DG28	CA1802174-003	Mar-18	0.2	0.2	15	0.2	0.4	0.4
DG28	CA1802844-003	Apr-18	1.39	1.3	12	0.2	2.7	2.7
DG28	CA1803432-003	May-18	0.73	0.9	12	0.2	1.6	1.6
DG28	CA1804079-003	Jun-18	1.5	1.7	33	0.2	3.2	3.2
DG28	CA1804681-003	Jul-18	0.63	0.5	10	0.2	1.1	1.1
DG28	CA1805443-003	Aug-18	5.06	1.5	43	0.2	6.6	6.6
		Min	0.13	0.2	10	0.2	0.4	0.4
		Avg	1.05	0.87	40.92	0.20	1.90	1.90
		Max	5.06	1.7	91	0.2	6.6	6.6
		stDev	1.34	0.49	27.98	0.00	1.72	1.72

Dust Gauge	Summary Total Insoluble Solids (g/m2/month)		
	Minimum	Maximum	Average
DG22	0.7	8.6	3.7
DG34	0.2	4.7	1.8
DG28	0.4	6.6	1.9

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Table 5.1 - Surface Water Results - Site 115																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			27/10/2017	Site 115	11:50am	HP/ZR						Dry					
2017/18	Minimum						6.55	880.10	14.64	7.95	332.70			0.10	5.00	1080.00	7.74
	Maximum						6.55	880.10	14.64	7.95	332.70			0.10	5.00	1080.00	7.74
	Average						6.55	880.10	14.64	7.95	332.70			0.10	5.00	1080.00	7.74
	StdDev						#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Count						1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00

Table 5.2 - Surface Water Results - Spring 2																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			9/10/2017	Spring 2	2:30pm	HP/ZR	7.1	675.8	17.99	9.93	480	cloudy	CA1705557-001	0.3	4	782	7.35
2017/18	Minimum						7.10	217.50	14.06	7.73	300.10			0.10	4.00	263.00	6.87
	Maximum						7.66	675.80	18.83	9.93	480.00			0.40	8.00	782.00	7.36
	Average						7.34	420.43	16.72	9.07	348.48			0.25	5.50	521.50	7.23
	StdDev						0.24	192.45	2.14	1.05	87.79			0.13	1.73	212.83	0.24
	Count						4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00

Table 5.3 - Surface Water Results - Site 105																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			10/10/2017	Site 105	1:40pm	ZR/HP						Dry					
2017/18	Minimum						5.75	900.70	13.08	7.11	436			0.00	3.00	1140.00	7.54
	Maximum						6.63	1745.60	13.60	7.82	458.70			0.00	4.00	2190.00	7.65
	Average						6.19	1323.15	13.34	7.47	447.35			#DIV/0!	3.50	1665.00	7.60
	StdDev						0.62	597.43	0.37	0.50	16.05			#DIV/0!	0.71	742.46	0.08
	Count						2.00	2.00	2.00	2.00	2.00			0.00	2.00	2.00	2.00

Table 5.4 - Surface Water Results - Raw Water Dam (WM200)																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			3/10/2017	WM200	10:20am	HP/ZR	5.22	1359	17.14	9.55	547	Clear	CA1705432-002	0.1	2	1660	7.87
2017/18	Minimum						5.22	1359.00	17.14	8.18	190.90			0.10	2.00	1630.00	7.87
	Maximum						8.18	1629.60	21.82	9.55	547.00			1.30	2.00	1680.00	8.34
	Average						7.05	1519.07	20.07	8.79	349.47			0.45	2.00	1655.00	8.15
	StdDev						1.60	141.94	2.55	0.70	181.22			0.57	0.00	20.82	0.20
	Count						3.00	3.00	3.00	3.00	3.00			4.00	4.00	4.00	4.00

Table 5.5 - Surface Water Results - Entrance Road Culvert (WM201)																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			4/10/2017	WM201	3PM	HP/ZR						Dry					
2017/18	Minimum						7.19	74.90	7.53	8.83	99.30			0.10	2.00	74.00	7.09
	Maximum						8.05	505.80	15.71	9.33	460.90			0.20	44.00	753.00	7.58
	Average						7.68	324.17	11.23	9.11	220.93			0.13	16.00	386.50	7.32
	StdDev						0.44	223.27	4.15	0.25	207.82			0.06	24.25	339.26	0.20
	Count						3.00	3.00	3.00	3.00	3.00			3.00	3.00	4.00	4.00

Table 5.6 - Surface Water Results - Evaporation Dam 3 South-South (ED3SS- Lagoon 5)																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			4/10/2017	ED3S-S	12:05PM	HP/ZR	8.4	23362	23.39	1.8	356.7	leachate	CA1705489-001	1260	317	24600	8.47
2017/18	Minimum						7.71	20336.60	16.29	0.16	-142.70			835.00	35.00	24000.00	8.29
	Maximum						8.40	26038.90	26.58	3.61	421.80			1260.00	317.00	24600.00	8.47
	Average						8.16	22713.15	21.20	1.61	166.10			962.50	138.00	24200.00	8.39
	StdDev						0.31	2561.47	4.65	1.50	268.31			199.38	123.38	270.80	0.09
	Count						4.00	4.00	4.00	4.00	4.00			4.00	4.00	4.00	4.00

Table 5.7 - Surface Water Results - Evaporation Dam 3 North (WM203)																	
EPL 11436	Statistics		Field Information														
			Analytical Information														
			Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH
					AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH
			3/10/2017	WM203	11am	HP/ZR	6.33	25784.5	15.84	4.27	461.2	leachate	CA1705432-003	728	11	32700	8.12
2017/18	Minimum						6.33	25784.50	15.84	2.30	150.80			612.00	11.00	24100.00	8.12
	Maximum						7.99	35344.70	22.43	6.46	461.20			877.00	51.00	35000.00	8.36
	Average						7.26	31453.07	20.13	4.34	333.57			747.00	31.00	31275.00	8.23
	StdDev						0.85	5021.70	3.72	2.08	162.38			109.64	16.51	4881.51	0.12
	Count						3.00	3.00	3.00	3.00	3.00			4.00	4.00	4.00	4.00

Statistics		Table 5.8 - Surface Water Results - Pond 3																	
		Field Information								Analytical Information									
		Date	Site Code	Time	Sampler	pH	Conductivity	Temperature	Dissolved Oxygen	Redox	Flow	Laboratory Sample Code	Nitrogen (ammonia)	Biochemical Oxygen Demand	Conductivity	pH	Total Dissolved Solids	Total Organic Carbon	Total Potassium
				AM/PM	Initials	pH	µS/cm	°C	mg/L	mV			mg/L	mg/L	µS/cm	pH	mg/L	mg/L	mg/L
EPL 11436																			
		4/10/2017	Pond 3	3pm	HP/ZR					Dry-no flow									
		6/11/2017	Pond 3	11:15AM	ZR	4.54	4016.9	13.77	6.81	322.2	muddy	CA1706099-002	100	218	5060	4.55	5270	130	4.2
		25/02/2018	Pond 3		HG							CA1801368-001	5.2	2	937	3.67	753	4	1.8
		23/04/2018	Pond 3		HP/ZR						dry								
		28/06/2018	Pond 3	11:20am	HP/ZR	5.72	1500.2	9.9	9.48	251.5	Slightly turbid	CA1804008-001	8.7	2	2300	3.18	2150	3	2
2017/18	Minimum				4.54	4016.90	13.77	6.81	322.20			5.20	2.00	937.00	3.67	753.00	4.00	1.80	
	Maximum				4.54	4016.90	13.77	6.81	322.20			100.00	218.00	5060.00	4.55	5270.00	130.00	4.20	
	Average				4.54	4016.90	13.77	6.81	322.20			52.60	110.00	2998.50	4.11	3011.50	67.00	3.00	
	StdDev				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			67.03	152.74	2915.40	0.62	3194.00	89.10	1.70	
	Count				1.00	1.00	1.00	1.00	1.00			2.00	2.00	2.00	2.00	2.00	2.00	2.00	



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**Table 8.1 - Piezometer Water Level Results - P38A & P38B**

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P38A	39.03	776.28	HP&AD
		28/03/2018	P38A	39.04	776.27	HP&AD
		25/06/2018	P38A	39.13	776.18	HP&AD
		16/08/2018	P38A	39.11	776.20	HP&AD
2017/18	Minimum			39.03	776.18	
	Maximum			39.13	776.28	
	Average			39.08	776.23	
	StdDev			0.049917	0.049917	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P38B	44.20	771.11	HP&AD
		28/03/2018	P38B	44.25	771.06	HP&AD
		25/06/2018	P38B	44.41	770.90	HP&AD
		16/08/2018	P38B	44.41	770.90	HP&AD
2017/18	Minimum			44.20	770.90	
	Maximum			44.41	771.11	
	Average			44.32	770.99	
	StdDev			0.108743	0.108743	
	Count			4	4	

**Table 8.2 - Piezometer Water Level Results - P58A & P58B**

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P58A	42.3	763.95	HP&AD
		28/03/2018	P58A	42	764.25	HP&AD
		25/06/2018	P58A	42.20	764.05	HP&AD
		16/08/2018	P58A	42.20	764.05	HP&AD
2017/18	Minimum			42	763.95	
	Maximum			42.3	764.25	
	Average			42.175	764.075	
	StdDev			0.125831	0.125831	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P58B	52.57	753.68	HP&AD
		28/03/2018	P58B	53.4	752.85	HP&AD
		25/06/2018	P58B	54.40	751.85	HP&AD
		16/08/2018	P58B	54.40	751.85	HP&AD
2017/18	Minimum			52.57	751.85	
	Maximum			54.40	753.68	
	Average			53.69	752.56	
	StdDev			0.88	0.88	
	Count			4	4	

**Table 8.3 - Piezometer Water Level Results - P59A & P59B**

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P59A	18.98	785.72	HP&AD
		28/03/2018	P59A	17.82	786.88	HP&AD
		25/06/2018	P59A	19.23	785.47	HP&AD
		16/08/2018	P59A	19.84	784.86	HP&AD
2017/18	Minimum			17.82	784.86	
	Maximum			19.84	786.88	
	Average			18.9675	785.7325	
	StdDev			0.845986	0.845986	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P59B	19.28	785.42	HP&AD
		28/03/2018	P59B	18.22	786.48	HP&AD
		25/06/2018	P59B	19.52	785.18	HP&AD
		16/08/2018	P59B	20.12	784.58	HP&AD
2017/18	Minimum			18.22	784.58	
	Maximum			20.12	786.48	
	Average			19.285	785.415	
	StdDev			0.793032	0.793032	
	Count			4	4	

**Table 8.4 - Piezometer Water Level Results - P100A & P100B**

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P100A	36.97	739.46	HP&AD
		28/03/2018	P100A	38	738.43	HP&AD
		25/06/2018	P100A	38.33	738.10	HP&AD
		16/08/2018	P100A	37.88	738.55	HP&AD
2017/18	Minimum			36.97	738.1	
	Maximum			38.33	739.46	
	Average			37.795	738.635	
	StdDev			0.581979	0.581979	
	Count			4	4	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		23/11/2017	P100B	53.73	722.70	HP&AD
		28/03/2018	P100B	64.94	711.49	HP&AD
		25/06/2018	P100B	56.98	719.45	HP&AD
		16/08/2018	P100B	53.59	722.84	HP&AD
2017/18	Minimum			53.59	711.49	
	Maximum			64.94	722.84	
	Average			57.31	719.12	
	StdDev			5.32	5.32	
	Count			4	4	

**Table 8.5 - Piezometer Water Level Results - P200A & P200B**

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		21/05/2018	P200A	32.77	757.23	HP & HG
		25/06/2018	P200A	34	756.00	HP&AD
		16/08/2018	P200A	35.54	754.46	HP&AD
2017/18	Minimum			32.77	754.46	
	Maximum			35.54	757.23	
	Average			34.10333	755.8967	
	StdDev			1.387888	1.387888	
	Count			3	3	

EPL 11436	Statistics	Date	Site Code	Depth to Water m	RL water level	Sampler
		21/05/2018	P200B	33.05	756.95	HP & HG
		25/06/2018	P200B	34.34	755.66	HP&AD
		16/08/2018	P200B	35.85	754.15	HP&AD
2017/18	Minimum			33.05	754.15	
	Maximum			35.85	756.95	
	Average			34.41	755.59	
	StdDev			1.40	1.40	
	Count			3	3	

Table 9.1 - IMF Surface Water Results - Site 110

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Table 9.2 - IMF Surface Water Results - Site 130

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Table 9.3 - IMF Surface Water Results - Site 150

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**Table 9.4 - IMF Surface Water Results - First Flush System**

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**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	Sep-17	CA1705530-004	0.48	0.20	17	0.2	0.7	0.7
DG18	Oct-17	CA1706016-004	0.52	0.40	68	0.2	0.9	0.9
DG18	Nov-17	CA1706590-004	0.49	0.40	75	0.2	0.9	0.9
DG18	Dec-17	CA1800087-004	0.31	0.30	68	0.2	0.6	0.6
DG18	Jan-18	CA1800771-004	0.84	0.60	114	157	1.4	158
DG18	Feb-18	CA1801653-004	0.78	0.30	103	0.2	1.1	1.1
DG18	Mar-18	CA1802174-004	0.23	0.2	16	0.2	0.4	0.4
DG18	Apr-18	CA1802844-004	0.77	0.20	10	0.2	1	1
DG18	May-18	CA1803432-004	0.29	0.2	10	0.2	0.4	0.4
DG18	Jun-18	CA1804079-004	0.26	0.2	28	0.2	0.4	0.4
DG18	Jul-18	CA1804681-004	0.34	0.2	10	0.2	0.5	0.5
DG18	Aug-18	CA1805443-004	0.55	0.2	35	0.2	0.7	0.7

**2017/2018**

Min	0.23	0.2	10	0.2	0.4	0.4
Max	0.84	0.6	114	157	1.4	158
Avg	0.49	0.28	46.17	13.27	0.75	13.80
stDev	0.21	0.13	37.85	45.26	0.32	45.41



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**Table 11 - Dust Deposition Results - DG33**

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
DG 33	CA1705530-005	Sep-17	0.21	0.2	18	0.2	0.4	0.4
DG 33	CA1706016-005	Oct-17	0.25	0.20	47	0.2	0.5	0.5
DG 33	CA1706590-005	Nov-17	0.2	0.20	43	0.2	0.4	0.4
DG 33	CA1800087-005	Dec-17	0.42	0.50	80	0.2	0.9	0.9
DG 33	CA1800771-005	Jan-18	0.67	0.30	47	0.2	1	1
DG 33	CA1801653-005	Feb-18	0.81	0.60	105	0.2	1.4	1.4
DG 33	CA1802174-005	Mar-18	0.71	0.7	10	0.2	1.4	1.4
DG 33	CA1802844-005	Apr-18	1.66	0.7	14	0.2	2.4	2.4
DG 33	CA1803432-005	May-18	0.11	0.2	17	0.2	0.3	0.3
DG 33	CA1804079-005	Jun-18	0.05	0.2	32	0.2	0.2	0.2
DG 33	CA1804681-005	Jul-18	0.15	0.2	10	0.2	0.3	0.3
DG 33	CA1805443-005	Aug-18	0.64	0.3	40	0.2	0.9	0.9

**2017/2018**

Min	0.05	0.2	10	0.2	0.2	0.2
Max	1.66	0.7	105	0.2	2.4	2.4
Avg	0.49	0.36	38.58	0.20	0.84	0.84
stDev	0.45	0.21	29.33	0.00	0.65	0.65

Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
30/08/2018	6:00:00 PM	Letter	Mulwaree Street, Tarago	The complainant reported to the Environmental line through EPA that there was a “strong rubbish odour.”	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
28/08/2018	8:28:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that “It is a horrible rubbish and chemical smell and he first noticed the odour at approx. 6:30am and it was still continuing at the time of his call.”	2 hours	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
5/08/2018	9:12:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that the odour “was a foul waste type odour and it started at 21:50 on Saturday 4/8/18 and was still present at the time of his call on 5/8/18 at 09:12.”	12 hours	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.

Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
12/07/2018	8:50:00 PM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that “the odour was an issue at 8.50 pm 12/7/2018”	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
12/07/2018	8:56:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that Rotten garbage smell rating 7/10 and would like to have other options – maybe email instead. Want to be contacted regarding this.	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
12/07/2018	6:30:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that “a stench of odour from the Woodlawn Bio Reactor, Tarago”.	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.

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Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
10/07/2018	8:49:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that the smell last night was 7/10 and this morning was 8/10.	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
10/07/2018	6:30:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that "this odour has been occurring every day and caller is sick of the odours".	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
9/07/2018	7:00:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that "the smell began at 7 am Monday 9/7/2018, rated as 4/6 and stated that the odour triggered an asthmatic attack on the complainant's spouse. Spouse sought medical attention on Tuesday 10/7/2018 because asthmatic attack could not settle."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.

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Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
4/07/2018	6:27:00 PM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that "It stinks. I cannot explain it, it just stinks. He said the odour started at 18:00".	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
3/07/2018	9:30:00 AM	Call	Cullulla Road, Tarago	Complainant contacted the Community feedback line and complained that the trucks exiting the Crisps Creek Intermodal Facility are slow going up the hill towards the Bioreactor which makes him late for work, and that some drivers don't wait for him to pass before exiting out of the slip lane.	Not specified.	Veolia has advised contractors to give way to vehicles when exiting the Crisps Creek Intermodal Facility.
3/07/2018	8:46:00 AM	Letter	Goulburn Street, Tarago	The complainant reported to the Environmental line through EPA that "he is affected by a strong offensive odour coming from Woodlawn landfill starting from 8:30am. He rated the odour at 5/6 and said the wind condition is calm".	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.

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Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
3/07/2018	8:45:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line "the smell is very bad, 10/10; it is a very foggy morning".	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
22/06/2018	9:20:00 AM	Letter	Leahys Lane, Tarago	The complainant reported to the Environmental line through EPA a "sour milk and rotten garbage smell, first noticed the odour at about 6:30am, there was no wind at this time".	3 hours	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
21/06/2018	7:10:00 PM	Letter	Leahys Lane, Tarago	The complainant reported to the Environmental line through EPA a "sour milk and rotten garbage smell, first noticed the odour at about 7pm"	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.

## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
21/06/2018	10:05:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the Environmental line through EPA that his partner "first noticed the odour at about 5:30 am on their way to work, he went outside about 10am for a break and felt so nauseous from the odour he had to go inside again."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
28/05/2018	10:15:00 AM	Letter	Willandra Lane, Tarago	The complainant reported to the community feedback line that it "Smells like rubbish, usual tip smell we get coming into the house, the smell was about a 5 on a scale of 1-5. It feels as if nothing is changing and it is getting worse. Not fair, I feel money throwing at Goulburn Council is not enough to get rid of the smell".	15 minutes	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
26/05/2018	9:00:00 AM	Letter	Rosebury Street, Tarago	The complainant reported to the Environmental line through EPA that he experienced a "strong pungent odour suspected of coming from the Woodlawn Bioreactor, first noticed the odour when I went outside the house at 8:45am. He said it was a waste type odour and it was a cold morning with only a slight breeze."	Not specified	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void's wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.



Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
22/05/2018	9:45:00 PM	Letter	Tarago	The complainant reported to the community feedback line that he “smelt an odour in town last night on the way home, the smell was about a 2 as per the ranking in the odour diaries”	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also used to manage any fugitive gas between the void’s wall and waste mass. We are constantly reviewing our tipping sequence in an attempt to further improve gas collection.
19/04/2018	9:30:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that it “smelt like rotten garbage, same as before, as I was leaving my house”	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void’s wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.
19/04/2018	9:00:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that it “smells like rotten garbage at my house”	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia’s water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void’s wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.

## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
5/04/2018	7:57:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that she "Left home about 8:10am and smelt it when I came out my back door, it smelt like rotten garbage and it usually does not smell past mid-morning and does not stick around"	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour complaint.
29/03/2018	11:46:00 AM	Letter	Cullulla Road Tarago	The complainant reported to the community feedback line that she "First smelt faint odour at 7:15am at Cullulla road, Tarago and again at 7:25am at corner of King/Mulwaree st but stronger. Smell was an absolute stench at 8:55am at the corner of Collector / Tarago road. Smell was tolerable when she arrived back home at 9:10am"	2 hours	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour being detected by the complainants.
29/03/2018	8:40:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that she "went outside and the smell is particularly strong, worse than earlier in the week."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour being detected by the complainants.

## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
27/03/2018	7:26:00 AM	Letter	Cullulla Road Tarago	The complainant reported to the community feedback line that she "First detected the smell at 7:26am at the corner of King/Mulwaree st (bus depot), was a faint odour-smelt of rubbish/gas. The strongest odour was at 8:55am at the corner of Collector and Tarago road- Had to spray bus with glen40 as kids felt ill, odour was stronger than first smelt at 9:10am"	2 hours	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour being detected by the complainants.
27/03/2018	10:02:00 AM	Letter	Goulburn Street, Tarago	The complainant reported to the EPA that they "first noticed the odour last night at about 8pm and closed up the house at that time, so couldn't say how long the odour lasted however they said it was still present at 7.30am this morning when they first went outside. They said the strength of the odour varied between 4/6 (strong) – 6/6 (overpowering)."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour being detected by the complainants.
27/03/2018	9:49:00 AM	Letter	Mulwaree Street, Tarago	The complainant reported to the EPA that "she first noticed the odour when she went outside this morning at about 8.30-9am. She said the odour is affecting the whole town. She said the odour is overpowering and rated its strength as a 6/6."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour being detected by the complainants.

## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
27/03/2018	8:54:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the community feedback line that she was experiencing a "slight smell wafting over her property that seems to be getting stronger."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We are also reviewing our tipping sequence in an attempt to further improve gas collection. The gas extraction system was operating at an efficient state and no power station or gas extraction related issues occurred during the lead up to the odour being detected by the complainants.
28/02/2018	8:25:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the EPA that she was experiencing a "strong rotting garbage smell coming from the Veolia Bioreactor on 28/2/18 at 08:00."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Construction for the new Leachate Treatment Plant is on target. Following a heavy storm event (25/2/2018, greater than 80mm) Veolia is currently in the process of managing excess storm water in the Void. A bio-filter is also now used to manage any fugitive gas between the void's wall and waste mass. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor, this assessment is expected to start in March 2018. We are also reviewing our tipping sequence in an attempt to further improve gas collection. We also advise that compared to this time last year gas collection has increased significantly which is an outcome of all the improvements we have implemented to date.
8/02/2018	8:47:00 PM	Letter	Rosebury Street, Tarago	The complainant reported to the EPA that he was experiencing a "strong stench/odour and it smells like rotten rubbish."	Not specified.	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia has commenced the civil work on the new Leachate Treatment Plant.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor this assessment is expected to start in March 2018.</p>

## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
18/01/2018	8:27:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the EPA that "a foul rotting rubbish smell is coming from the Woodlawn Bioreactor. She noticed the smell when she went outside of her house at approx 8am and said she had not detected any odours recently, but this morning's odour was particularly bad and said it was a 10 out of 10 for strength and intensity."	Not specified.	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia have provided the final supporting information to the Department of Planning and looking forward to the approval process being finalized, so construction can begin.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.</p>
13/12/2017	8:55:00 AM	Letter	King Street, Tarago	The Complainant reported to the EPA that he first "noticed an odour of rotting garbage when he went outside at approx. 8am and was still present at the time of his call at 8.55am. He said the strength was strong = 4/6"	55 minutes	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia have provided the final supporting information to the Department of Planning and looking forward to the approval process being finalized, so construction can begin.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.</p>
13/12/2017	8:39:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the EPA that "there was a bad odour at the residence from approx 8am, this is an ongoing issue and he is concerned about the impact the odours are having on the quality of water in his water tank."	39 minutes	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia have provided the final supporting information to the Department of Planning and looking forward to the approval process being finalized, so construction can begin.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.</p>

## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
3/12/2017	9:14:00 PM	Letter	Rosebery Street, Tarago	The complainant reported to the EPA that "there was a bad odour at the residence from approx 9pm, the smell was so strong that he vomited up his dinner. He advised that the smell was a rubbish smell."	14 minutes	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia have provided the final supporting information to the Department of Planning and looking forward to the approval process being finalized, so construction can begin.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.</p>
28/10/2017	8:45:00 AM	Letter	Rosebery Street, Tarago	The complainant reported to the EPA that there was "a bad odour at his residence that smelt like "a dump/tip smell" from about 8:15am that morning".	30 minutes	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia have provided the final supporting information to the Department of Planning and looking forward to the approval process being finalized, so construction can begin.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.</p>
8/10/2017	6:25:00 PM	Letter	Roseview Road Tarago	The complainant reported to the EPA that "the odour was quite bad at his property from 15:00hrs that day, but that the issue was an ongoing one"	3 hours	<p>Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia have provided the final supporting information to the Department of Planning and looking forward to the approval process being finalized, so construction can begin.</p> <p>Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.</p>



## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
21/09/2017	8:38:00 AM	Letter	Tarago	The complainant reported to the EPA that there was an odour of "rotting food waste started at around 8:15am today. The weather is dry and calm, with a slight westerly breeze. The odour strength is around 4-5/6, quite strong today. This is an ongoing issue at the site."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.
19/09/2017	9:30:00 PM	Letter	Braidwood Road, Tarago	The complainant reported to the EPA that "Excessive rotting rubbish smell coming from the Veolia Woodlawn Bio Reactor, Collector Road, Tarago. Odour started on 19/7/17 at 21:30 and was ongoing overnight."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.
18/09/2017	4:00:00 PM	Letter	Rosebery Street, Tarago	The complainant reported to the EPA that "There is a nauseating odour coming from Veolia. The odour started on 18/09/17 at 16:00."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.



## Woodlawn Bioreactor Complaints Register



Date	Complaint lodged	Response	Location	Description	Duration	Response/action taken to resolve the complaint
17/09/2017	7:15:00 AM	Letter	Roseview Road, Tarago	The complainant reported to the EPA that "The smell of rotting garbage from the Veolia Tarago Landfill was extreme on 17/9/17 from 07:15. This has been an ongoing issue for a long time with many complaints made by local residents over that time and no resolution to the odour issue. The odour started overnight."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.
10/09/2017	7:40:00 AM	Letter	Roseview Road, Tarago	The complainant reported to the EPA that "the smell from the Veolia Woodlawn Landfill, Collector Road, Tarago, has been extreme since the early hours of the morning and is still present now at 07:48."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.
10/09/2017	7:30:00 AM	Letter	Braidwood Road, Tarago	The complainant reported to the EPA that there was an "extremely pungent odour in the air coming from the Veolia Woodlawn Landfill, Collector Road, Tarago."	Not specified.	Veolia continues to address the challenges of water management within the Bioreactor and is attempting to address this with the development and implementation of a longer term treatment solution being advanced by Veolia's water division. Veolia Woodlawn have implemented a contoured waste profile that allows for better control of storm water flows on the waste surface to minimise the ability for surface storm water to enter the waste. Due to leachate levels within the waste mass a new perforated well design has been implemented. This has been installed to maximise the opportunity for gas collection when compared with that of solid wells. This approach is proving successful as gas collection and power generation has increased substantially when compared with this time last year. A bio-filter trial has also been undertaken in an attempt to manage any fugitive gas between the void's wall and waste mass. This has shown to demonstrate some positive results and subsequently is now part of our normal operations. We have also engaged the University of Canberra to undertake a study on fugitive gas emissions/odour and its behaviour to further improve gas collection at the Woodlawn Bioreactor.