ANNUAL ENVIRONMENTAL MONITORING REPORT

26 AUGUST 2017 TO 25 AUGUST 2018

OBERON WASTE FACILITY

EPL 20289

PREPARED FOR:

OBERON COUNCIL

OCTOBER 2018

GEOLYSE

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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Introduction

1.1 BACKGROUND

The Oberon Waste Facility (OWF) is located in the Oberon Local Government Area and is owned by Oberon Council. The 11 hectare property exists approximately 4 km north of the town of Oberon and comprises Lot 1 DP 350774, Lot 1 DP 598525, Lot 1 DP 844887 and Lot 36 DP 263034. The OWF is accessed via Lowes Mount Road.

The landfill site is approximately 620 metres north-south by 430 metres east-west, with the northern extent of the site narrower than the south (refer **Drawing 05C_EV02**).

The landfill is currently screened by rows of established native trees. The established trees provide visual screening on the northern, eastern and southern boundaries of the landfill. Rows of native trees are also being established on the western side of the site.

The land adjacent to the site is predominantly rural land used for grazing and some cropping, with timber processing also conducted approximately 2.5 km to the south-east.

Landfilling operations at the site are known to have commenced prior to the 1960s, and anecdotal evidence would suggest the site may have been established in the 1940s.

The OWF services the town of Oberon, which has a population of approximately 2,500 people. The landfill receives municipal kerbside waste, municipal delivered waste, commercial and industrial waste and building and demolition waste. It also has facilities for recycling drop off and green waste separation.

1.2 LICENCE REQUIREMENTS

The OWF currently operates under Environment Protection Licence 20289 (EPL 20289), issued under Section 55 of the Protection of the Environment Operations Act 1997 (The Act). This licence governs the design, construction, operation, monitoring and rehabilitation of the facility in accordance with The Act.

Management and operation of the centre is also undertaken in accordance with the Landfill Environmental Management Plan (LEMP) (OSC, 2013).

Section 5 of EPL 20289 provides instructions on environmental monitoring requirements. Specifically, Condition M2.1 describes the requirements to monitor the concentration of pollutants discharged to groundwater, surface water and accumulated building gas.

Annual reporting requirements that are outlined in Condition R1.1 state:

> *R1.1 "The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:*
>
> *a) a Statement of Compliance; and*
>
> *b) a Monitoring and Complaints Summary.*

The deadline for the Annual Return that is outlined in Condition R1.5 states:

> *The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').*

Condition R1.8 'Monitoring Report' states:

> *The licensee must supply, with the Annual Return, a report which provides:*
>
> *a) an analysis and interpretation of monitoring results from samples collected at the premises over the reporting period;*
>
> *b) actions to correct any identified adverse trends;*
>
> *c) a summary of the results of landfill gas monitoring undertaken at the premises in accordance with condition M2.2.*
>
> *d) a summary of pollution complaints resulting from activities undertaken at the premises during the reporting period.*
>
> *e) a statement regarding the attainment of the achieved compaction rate of landfilled waste (excluding cover material) in accordance with condition O6.9.*
>
> *f) a statement regarding the remaining disposal capacity (in cubic metres) of the landfill in accordance with condition M6.1.*

This Annual Environmental Management Report (AEMR) is a response to Condition R1.9. The reporting period for this AEMR is from 26 August 2017 to 25 August 2018. Collection of environmental data by Geolyse began at the OWF in November 2013.

1.3 REPORT STRUCTURE

Section 1 presents a brief introduction and background to the report;

Section 2 provides an overview of the environmental monitoring program undertaken at the facility during the reporting period;

Section 3 presents the data and discussion of data collected during the reporting period;

Section 4 presents all monitoring data that falls outside of the scope of environmental monitoring for the annual return year, including records of public complaints and quantities of waste deposited;

Section 5 presents a summary of all monitoring undertaken as described in detail in Section 3 and Section 4; and

Section 6 presents the conclusions and recommendations resulting from monitoring undertaken during the reporting period.

Environmental Monitoring Program

2.1 OVERVIEW

Environmental monitoring undertaken at the OWF during the reporting period included that required for groundwater and surface water. The requirement for accumulated building gas was identified in August 2014 and subsequently commenced in September 2014. This section summarises all environmental monitoring undertaken during the reporting period (**Table 2.1**).

Table 2.1 – 2017-2018 Schedule of Environmental Monitoring

Date	Groundwater (Biannually)	Surface Water (Monthly During Discharge)	Accumulated Building Gas
Sep 2017			✓
Oct 2017			✓
Nov 2017	✓		✓
Dec 2017		✓	✓
Jan 2018		✓	✓
Feb 2018			✓
Mar 2018			✓
Apr 2018			✓
May 2018	✓		✓
Jun 2018			✓
Jul 2018			✓
Aug 2018			✓

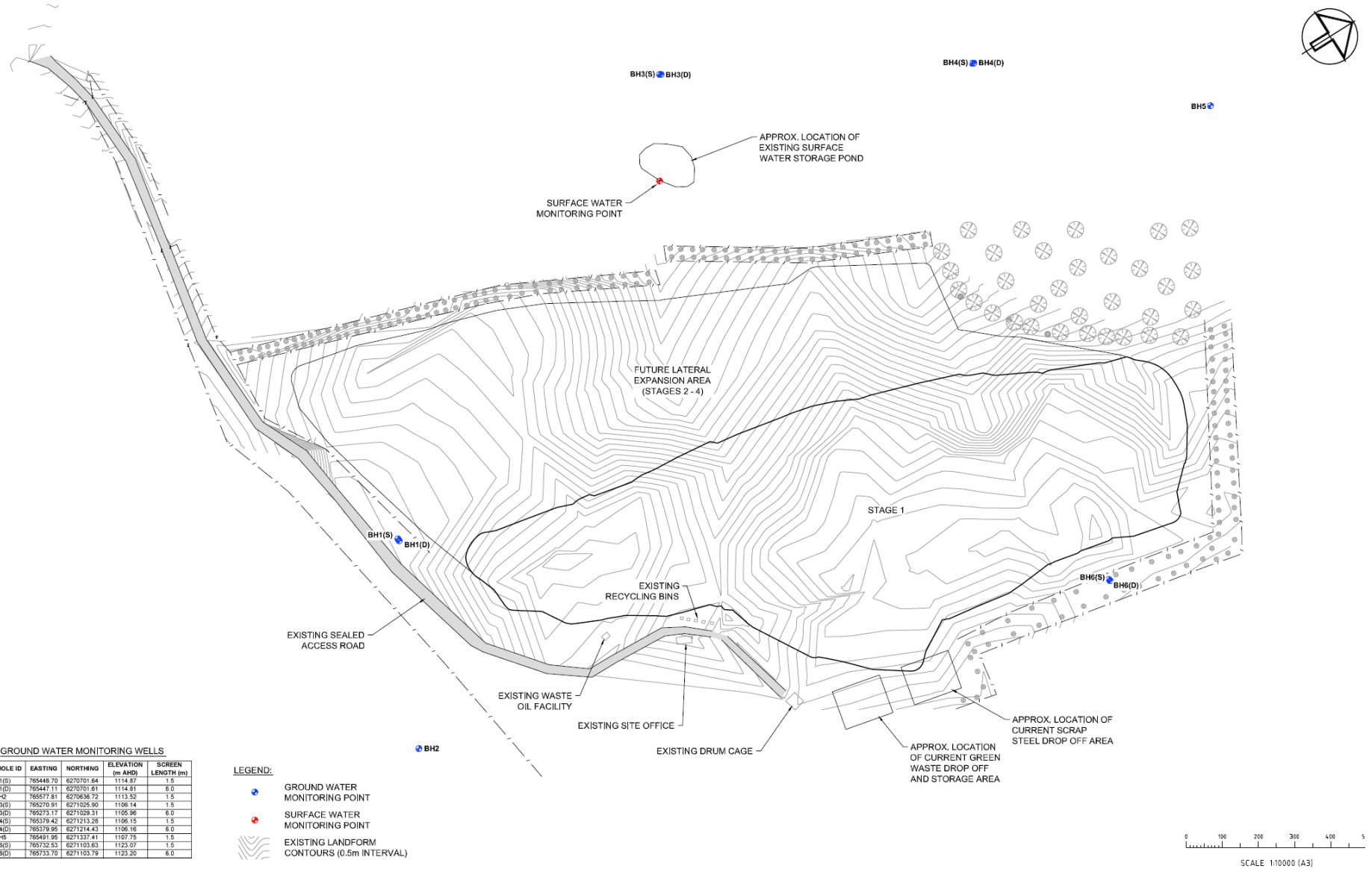
2.2 SURFACE WATER

Surface water monitoring is conducted at EPL Point 1, identified as SW1. The monitoring point is illustrated in **Drawing 05C_EV02**. In accordance with EPL 20289, this point is required to be sampled monthly during discharge. A rising stage sampler is installed to assist with event sample collection.

Table 2.2 identifies the list of surface water parameters and their analysis frequency during the reporting period.

Table 2.2 – Surface Water Monitoring Parameters and Frequency

Discharge Parameter	December 2017	January 2018
Conductivity	✓	✓
Oil & Grease	✓	✓
pH	✓	✓
Total Suspended Solids	✓	✓



GROUND WATER MONITORING WELLS

BOREHOLE ID	EASTING	NORTHING	ELEVATION (m AHD)	SCREEN LENGTH (m)
BH1(S)	765448.70	6270701.64	1114.87	1.5
BH1(D)	765447.11	6270701.61	1114.81	6.0
BH2	765577.81	6270636.72	1113.52	1.5
BH3(S)	765270.91	6271025.90	1106.14	1.5
BH3(D)	765273.17	6271029.31	1105.96	6.0
BH4(S)	765379.42	6271213.28	1106.15	1.5
BH4(D)	765379.95	6271214.43	1106.16	6.0
BH5	765491.95	6271337.41	1107.75	1.5
BH6(S)	765732.53	6271103.63	1123.07	1.5
BH6(D)	765733.76	6271103.79	1123.20	6.0

Drawing 05C_EV02 – Oberon Landfill Monitoring Points

2.3 GROUNDWATER

The groundwater monitoring network was designed by CMJA (2012) and comprises six shallow (screened 3.5 – 5.0 m) and four deep (screened 24 – 30 m) monitoring wells. **Drawing 05C_EV02** shows the configuration of the groundwater monitoring network. The four deep monitoring wells are installed as pairs to the correspondingly numbered shallow wells.

The groundwater monitoring points are identified as BH1S, BH1D, BH2, BH3S, BH3D, BH4S, BH4D, BH5, BH6S and BH6D, corresponding to EPL Points 2 through 11.

Groundwater level measurement and sampling are undertaken on a biannual basis in accordance with EPL 20289. Monitoring commenced in November 2013. The four deep piezometers are sampled annually and the six shallow piezometers are sampled biannually.

The November 2017 biannual monitoring round was able to collect samples from three piezometers, whilst five samples were able to be collected from the May 2018 monitoring round.

Monitoring for the following analytes was able to be undertaken for sample collected throughout the reporting period:

- Alkalinity
- Aluminium
- Arsenic
- Barium
- Benzene
- Cadmium
- Calcium
- Chloride
- Chromium (total)
- Cobalt
- Conductivity
- Copper
- Ethylbenzene
- Fluoride
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- Nitrogen (Ammonia)
- Nitrogen (Nitrate)
- Nitrogen (Nitrite)
- Organochlorine Pesticides
- Organophosphorus Pesticides
- pH
- Phosphorus (total)
- Polycyclic Aromatic Hydrocarbons
- Potassium
- Sodium
- Standing Water Level
- Sulfate
- Toluene
- Total Dissolved Solids
- Total Organic Carbon
- Total Petroleum Hydrocarbons
- Total Phenolics
- Xylene
- Zinc

Environmental Monitoring Results

3.1 INTRODUCTION

Monitoring results are presented in this section for all environmental monitoring undertaken during the reporting period. The laboratory data are presented, along with an interpretation of trends, variability and anomalies for groundwater and surface water. Any deficiencies in monitoring, environmental incidents and remedial actions undertaken to correct any problems or deficiencies are also discussed.

Monitoring data is summarised in the following figures and in the tables of **Appendix A**. All laboratory reports and chain-of-custody documentation are included in **Appendix B**.

3.2 SURFACE WATER

EPL 20289 requires surface water quality monitoring monthly during discharge from the surface water monitoring point SW1 (EPL point 1). The first discharge event in the reporting period was recorded in December 2017, and a subsequent discharge event was recorded in January 2018.

Samples are collected by Council contractors via rising stage samplers prior to overland flow and any off-site discharge, receiving further filtration through vegetation. All results are presented in **Appendix A**, **Table A1**.

3.2.1 QUALITY

Surface water pH concentrations are presented in **Figure 1**.

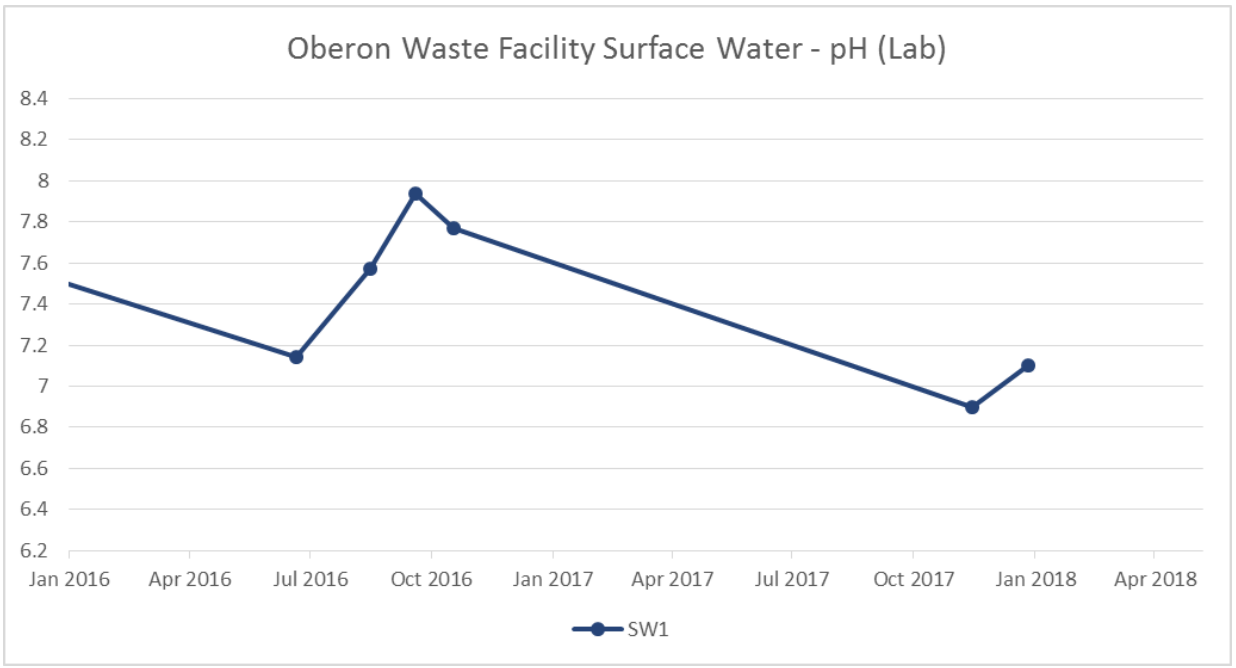


Figure 1: Surface Water pH – OWF, 2017 – 2018

Surface water pH was near-neutral during the measurements recorded in the reporting period, with levels ranging from 6.9 in December 2017 to 7.1 in January 2018. All values were within EPL 100 percentile discharge limit range of 6.5 – 8.5.

Surface water electrical conductivity levels are presented in **Figure 2**.

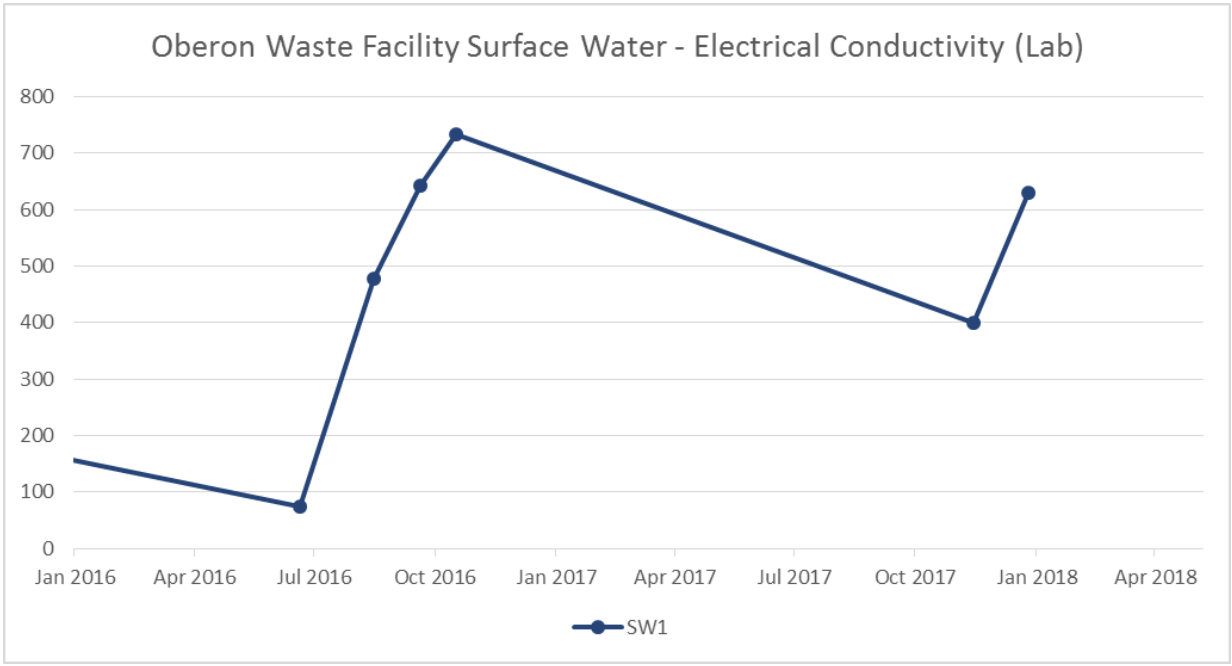


Figure 2: Surface Water EC – OWF, 2017 – 2018

EC levels in the reporting period ranged from 400 µS/cm in December 2017 to 630 µS/cm in January 2018. Corresponding TDS concentrations ranged from 268 mg/L to 422 mg/L, and were considered suitable for consumption by the most susceptible livestock category, poultry (<3000 mg/L, ANZECC & ARMCANZ, 2000).

Surface water total suspended solid (TSS) concentrations are presented in **Figure 3**.

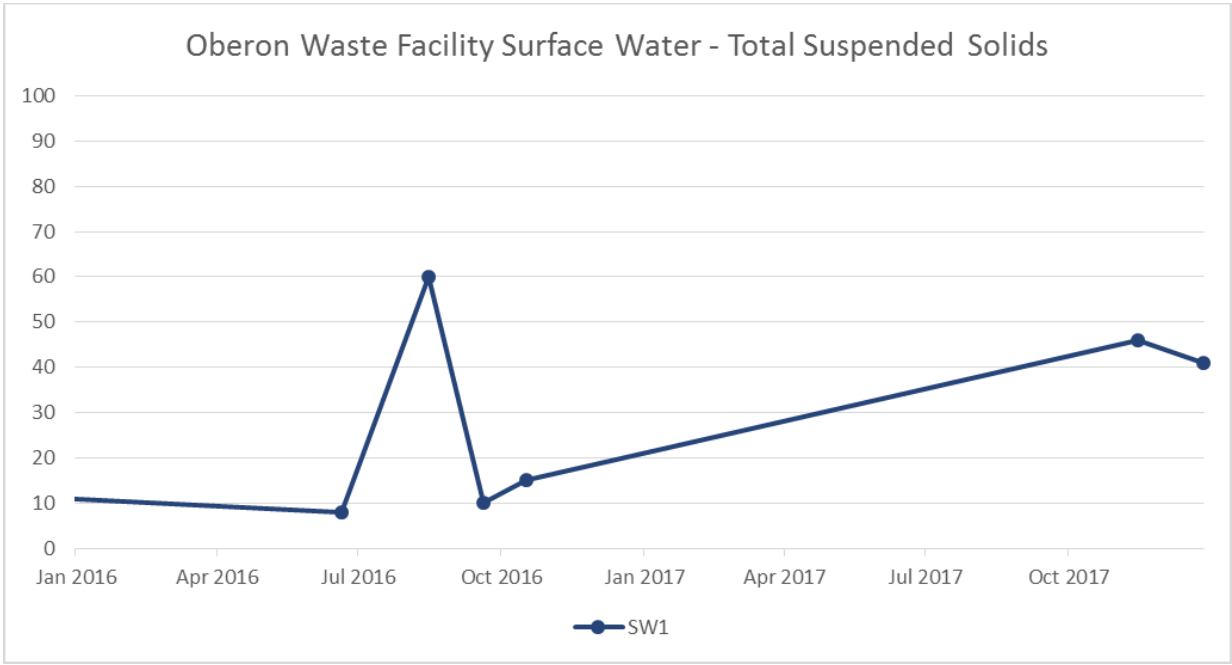


Figure 3: Surface Water TSS – OWF, 2017 – 2018

Total suspended solid results ranged from 46 mg/L in December 2017 to 41 mg/L in January 2018. The EPL 100 percentile limit of 50 mg/L was not exceeded in either discharge event.

Surface water oil and grease levels are presented in **Figure 4**.

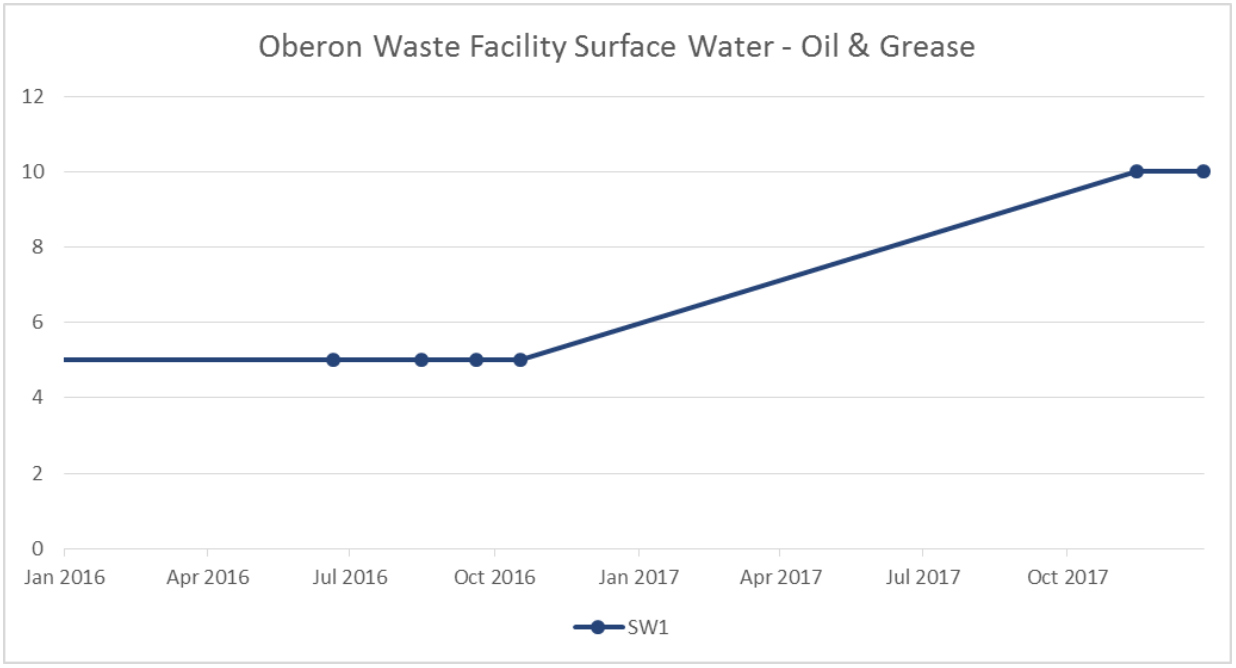


Figure 4: Surface Water Oil & Grease – OWF, 2017 – 2018

Oil and grease was recorded at 10 mg/L in the surface water sample collected in December 2017, and less than the laboratory limit of reporting (LOR) of 10 mg/L in the surface water sample collected in January 2018 (the oil & grease LOR was raised in the January 2018 sampling event due to a lower volume than required being collected in the rising stage sampler).

The EPL 100 percentile discharge limit of 10 mg/L was not exceeded for any sample collected.

3.3 GROUNDWATER

Groundwater monitoring is to consist of biannual water level measurements at all 10 piezometers, with samples being collected twice annually from the shallow piezometers and once annually from the deep piezometers.

Groundwater is intermittently present in the monitoring wells at the facility, and sampling of groundwater cannot consistently be conducted.

The November 2017 biannual monitoring round was able to collect samples from three piezometers, and five samples were able to be collected from the May 2018 monitoring round

3.3.1 GROUNDWATER LEVELS

Groundwater level measurements are presented for all monitoring stations in **Appendix A**, **Table A2** and are illustrated below in **Figure 5**.

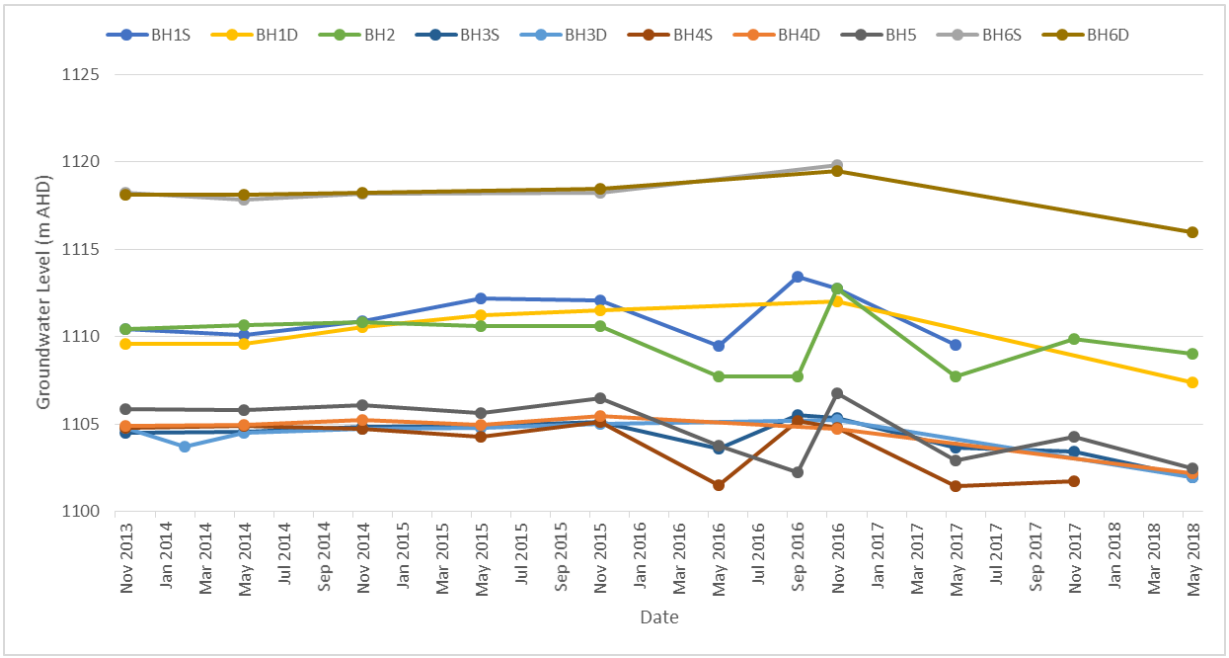


Figure 5: Groundwater Levels – OWF, 2017 – 2018

Comparative reduced groundwater levels indicated that piezometer BH6 is the most up-gradient monitoring point and the western piezometers at BH3 (pair), BH4 (pair) and BH5 are the most down-gradient. The range across the site in November 2017 was observed to be 8.12 m and the range across the site in May 2018 was observed to be 14.06 m. The largest variation recorded between the 2 monitoring rounds in the reporting period (i.e. from November 2017 to May 2017) was a decrease of 1.82 m at BH5, noting that no water was present in piezometers BH1S, BH4S or BH6S in May 2018.

It is noted that monitoring piezometer BH3D (EPL Point 6) was re-established in January 2014 following an inability to sample in November 2013. The piezometer has not been resurveyed following re-establishment and as such the reduced standing water level may be slightly inaccurate.

3.3.2 GROUNDWATER QUALITY

Analytical results for each groundwater monitoring station sampled in the reporting period are presented in **Appendix A**, **Table A3**.

Physical Parameters

Laboratory measured pH ranged from 5.9 pH units at BH2 (November 2017) to 7.1 pH units at BH5 (November 2017). The pH values of groundwater at BH1D, BH3S, BH4D, BH5 and BH6D were considered suitable for livestock drinking water; within the guideline range of 6.5 to 8.5 pH units (Markwick, 2007).

Electrical conductivity ranged from 100 µS/cm at BH1D (May 2018) to 1,200 µS/cm at BH5 (November 2017).

Total dissolved solids were found to range from 89 mg/L at BH1D (May 2018) to 660 mg/L at BH5 (November 2017), and within previously recorded ranges. All values were considered suitable for consumption by the most susceptible livestock category, poultry (<3000 mg/L, ANZECC & ARMCANZ, 2000).

Total alkalinity concentrations ranged from 24 mg$CaCO_3$/L at BH1D (May 2018) to 460 mg$CaCO_3$/L at BH5 (November 2017). All values were consistent with historical results, however alkalinity recorded at BH5 (November 2017) exceeded the guideline hardness value for potential fouling of waters (350 mg/L, ANZECC & ARMCANZ, 2000).

Chemical Properties

Exchangeable Ions

Chloride concentrations ranged from 4.7 mg/L at BH4D (May 2018) to 69 mg/L at BH2 (November 2017 and May 2018). All concentrations were significantly lower than the guideline value for irrigation to moderately tolerant crops (700 mg/L, ANZECC & ARMCANZ, 2000).

Sulfate concentrations ranged from below the laboratory LOR of 1 mg/L at BH2 (November 2017 and May 2018), to 160 mg/L at BH5 (November 2017). All concentrations were significantly lower than the 1,000 mg/L guideline value for livestock drinking water (ANZECC & ARMCANZ, 2000).

Fluoride concentrations ranged from below the laboratory LOR of 0.1 mg/L at BH1D (May 2018) and BH2 (May 2018), 0.25 mg/L at BH4D (May 2018). These values are lower than the livestock drinking water guideline value (2.0 mg/L, ANZECC & ARMCANZ, 2000).

Calcium concentrations ranged from 1.4 mg/L at BH2 (November 2017) to 13 mg/L at BH4D (May 2018). All concentrations were significantly lower than the livestock drinking water guideline value of 1,000 mg/L (ANZECC & ARMCANZ, 2000).

Magnesium concentrations ranged from 4 mg/L at BH1D (May 2018) to 74 mg/L at BH5 (November 2017).

Potassium concentrations ranged from 0.3 mg/L at BH2 (November 2017) to 2.9 mg/L at BH1D (May 2018).

Sodium concentrations were recorded to be highest at 5 at 170 mg/L (November 2017), whilst BH1D recoded the lowest sodium concentration in groundwater at 10 mg/L (May 2018). These values are below the guideline for irrigation of moderately tolerant crops (460 mg/L, ANZECC & ARMCANZ, 2000), and the conservative aesthetic guideline for human drinking water (180 mg/L, NHMRC & NRMMC, 2011).

Nutrients

Ammonia was low across the facility, ranging from below the LOR of 0.01 mgN/L at BH3D (May 2018), to 0.07 mgN/L at BH2 (May 2018). All values were below the conservative aesthetic guideline for ammonia in human drinking water (0.41 mgN/L, NHMRC & NRMMC, 2011).

Nitrite was recorded at below the laboratory LOR (<0.01 mgN/L) in all groundwater samples. Results were significantly lower than the livestock drinking water guideline value of 9.12 mgN/L (ANZECC & ARMCANZ, 2000).

Nitrate was lowest at BH3S, below the laboratory LOR of 0.05 mgN/L (November 2017) and most elevated at BH2 at 17.0 mgN/L (November 2017). These results are lower than the livestock drinking water guideline value for nitrate (90.29 mg/L, ANZECC & ARMCANZ, 2000).

Total phosphorus was recorded to range from velow the laboratory LOR of 0.02 mg/L at BH1D (May 2018) to 1.7 mg/L at BH3S (November 2017). While all values were below the upper limit of the short-term crop irrigation range, only groundwater sampled from BH1D was considered suitable for long-term irrigation (ANZECC & ARMCANZ, 2000).

Organics

Total organic carbon in groundwater was recorded to range from 0.5 mg/L at BH4D (May 2018), to 7.3 mg/L at BH5 (November 2017).

Total phenolics were not detected in any groundwater sample collected during the reporting period (<0.014 mg/L).

Organochlorine and organophosphorus pesticides were not detected in any annual sample (<0.010 mg/L and <0.014 mg/L respectively).

Polychlorinated biphenyls (PCBs) were not detected in any annual sample (<0.001 mg/L).

Polynuclear aromatic hydrocarbons (PAHs) were not detected in any annual sample (<0.0005 mg/L).

Total petroleum (TPH) and total recoverable hydrocarbons (TRH) were not detected in any annual sample (<0.2 mg/L).

Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN) were not detected in any annual sample (BTEX <0.001 mg/L and naphthalene <0.005 mg/L).

Metals

Aluminium was not recorded at concentrations above the laboratory LOR of 5 µg/L at any piezometers. All concentrations were below the long-term crop irrigation value and livestock drinking water guideline value (5 mg/L, ANZECC & ARMCANZ, 2000).

Arsenic concentrations ranged from below the LOR of 1 µg/L at multiple piezometers, to 15 µg/L at BH4D (May 2017). No exceedances of the long-term crop irrigation and livestock drinking water guidelines (respectively 100 µg/L and 500 µg/L, ANZECC & ARMCANZ, 2000) were recorded for arsenic in groundwater.

Barium concentrations in groundwater ranged from 12 µg/L at BH6D (May 2018) to 420 µg/L at BH2 (May 2018). This was lower than the conservative health guideline for human drinking water (2,000 µg/L, NHMRC & NRMMC, 2011).

Cadmium was only detected above the laboratory LOR in groundwater at BH2 at a of 0.0001 µg/L (November 2017), which was below the conservative human health drinking water guideline (0.002 µg/L, NHMRC & NRMMC, 2011) and the long-term crop irrigation and livestock drinking water guidelines (0.01 mg/L, ANZECC & ARMCANZ, 2000).

Chromium was only detected above the laboratory LOR in groundwater at BH2 at a concentration of 0.2 µg/L (May 2018) and was below the conservative human health drinking water guideline (50 µg /L, NHMRC & NRMMC, 2011) and the long-term crop irrigation and livestock drinking water guidelines (10 µg/L, ANZECC & ARMCANZ, 2000).

Copper in groundwater was detected up to 1 µg/L at BH2 (May 2018), which was below the conservative human health drinking water guideline (2,000 µg /L, NHMRC & NRMMC, 2011), and the long-term crop irrigation and livestock drinking water guidelines (respectively 200 µg /L and 400 µg /L, ANZECC & ARMCANZ, 2000).

Cobalt ranged from below the LOR of 1 µg/L at BH3D (May 2018) and BH4D (May 2018), to 2 µg/L at BH1D (May 2018) and BH2 (May 2018). All recorded concentrations of cobalt in groundwater were below the long-term crop irrigation and livestock drinking water guidelines (respectively 50 µg/L and 1,000 µg/L, ANZECC & ARMCANZ, 2000).

Iron was observed to range from below the LOR of 5 µg/L at BH2 (May 2018) to 3,400 µg/L at BH4D (May 2018). While all values were below the short-term irrigation guideline value of 10,000 µg/L, groundwater at piezometers BH1D, BH2 and BH3D were considered suitable for long-term irrigation (ANZECC & ARMCANZ, 2000) based on iron concentrations being below 200 µg/L.

Lead was not detected in groundwater samples from any piezometer at a concentration greater than the laboratory LOR of 1 µg/L. Lead in groundwater was below the long-term crop irrigation and livestock drinking water guidelines (respectively 2,000 µg/L and 100 µg/L, ANZECC & ARMCANZ, 2000) and below the conservative human health drinking water guideline (10 µg/L, NHMRC & NRMMC, 2011).

Manganese concentrations ranged from 3 µg/L at BH3D (May 2018) to 620 µg/L at BH6D (May 2018). Samples collected from monitoring stations BH4D and BH6D exceeded the long-term (<100 years) crop irrigation guideline value of 200 µg/L. All concentrations were below the short-term (<20 years) guideline value of 10,000 µg /L (ANZECC & ARMCANZ, 2000).

Mercury was below the LOR (<0.0001 mg/L) in all groundwater samples and below relevant guideline values.

Zinc concentrations in groundwater ranged from 6 µg/L at BH3D (May 2018), to 26 µg/L at BH2 (May 2018). All recorded zinc concentrations in groundwater were below the conservative human health aesthetic guideline (3,000 µg/L, NHMRC & NRMMC, 2011) and the long-term crop irrigation and livestock drinking water guidelines (respectively 2,000 µg/L and 20,000 µg/L, ANZECC & ARMCANZ, 2000).

3.4 LANDFILL GAS

Monitoring of accumulated building gas was conducted monthly throughout the reporting period. No gas in buildings was detected in in any monitoring event.

Other Monitoring Data

4.1 PUBLIC CONCERNS AND COMPLAINTS

There were no environmental, operational or pollution complaints received for the Oberon Waste Facility during the annual reporting period.

4.2 SOLID WASTE QUANTITIES

The Oberon Waste Facility is licensed to receive general solid waste (non-putrescible and putrescible), waste tyres, and asbestos waste. The total quantity of waste received into the landfill for the reporting period was 10,007.6 tonnes. This quantity is less than the limit set under Licence Condition L3.1, which states that the total amount of general solid waste (putrescible and non-putrescible), asbestos and waste tyres disposed of at the premises must not exceed 15,000 tonnes per annum.

4.3 EFFECTIVE COMPACTION

The licence for Oberon Waste Facility requires a minimum waste compaction of 0.65 t/m^3 (EPL Condition O6.9), and is calculated by dividing the tonnage received by the volume utilised. A volumetric survey of the facility at the end of the reporting period was completed, and compared to the volumetric survey conducted at the commencement of the 2016-2017 reporting period. A total of 29,500 m^3 of void space was consumed in this 24 month period (refer to **Appendix C**).

In addition to the 10,007.6 tonnes received at the Oberon Waste Facility in the 2017-2018 period, 12,271.8 tonnes of waste were recorded as received in the prior 2016-2017 period, totalling 22,279.4 tonnes of waste received in the period between the two volumetric surveys. Accordingly, the compaction rate has been calculated to be 0.76 tonnes/m^3, greater than the minimum requirement of the EPL.

All exposed landfilled waste is generally covered daily to a minimum depth of 150 mm and compacted at the end of each day prior to ceasing operations. Compaction is achieved using a 28 tonne bulldozer and/or a 25 tonne excavator.

Summary

This section provides a summary of the monitoring results presented in **Section 3** and **Section 4.**

5.1 MONITORING

5.1.1 SURFACE WATER

Discharge samples from SW1 as required by to be collected by EPL occurred in December 2017 and January 2018.

No exceedances of the EPL discharge limits (licence condition L2.4) were recorded for TSS, EC, pH or oil & grease.

5.1.2 GROUNDWATER

Comparative reduced groundwater levels indicated that piezometer BH6 is the most up-gradient monitoring point and the western piezometers at BH3 (pair), BH4 (pair) and BH5 are the most down-gradient. The range across the site in November 2017 was observed to be 8.12 m and the range across the site in May 2018 was observed to be 14.06 m. The largest variation recorded between the 2 monitoring rounds in the reporting period (i.e. from November 2017 to May 2017) was a decrease of 1.82 m at BH5, noting that no water was present in piezometers BH1S, BH4S or BH6S in May 2018.

It is noted that monitoring piezometer BH3D (EPL Point 6) was re-established in January 2014 following an inability to sample in November 2013. The piezometer has not been resurveyed following re-establishment and as such the reduced standing water level may be slightly inaccurate.

Organic contaminants, including PCBs, pesticides, phenolics, PAHs and petroleum hydrocarbons, were not detected in any groundwater sample. No significant changes were observed between the monitoring rounds.

5.1.3 LANDFILL GAS

Monitoring of accumulated building gas was conducted monthly throughout the reporting period. No gas in buildings was detected in in any monitoring event.

5.1.4 COMPLAINTS

There were no environmental, operational or pollution complaints received for the Oberon Waste Facility during the annual reporting period.

5.2 SOLID WASTE QUANTITIES

The total quantity of waste received into the landfill for the reporting period was 10,007.6 tonnes. This quantity is below the limit set under Licence Condition L3.1.

5.3 WASTE COMPACTION

A total of 22,279.4 tonnes of waste was received at the Oberon Waste Facility in the period between volumetric surveys conducted in 2016 and 2018, which identified an increase of 29,500 m^3 in volume. The compaction rate has been calculated to be 0.76 tonnes/m^3, greater than the minimum requirement of the EPL.

All exposed landfilled waste is generally covered daily to a minimum depth of 150 mm and compacted at the end of each day prior to ceasing operations. Compaction is achieved using a 28 tonne bulldozer and/or a 25 tonne excavator.

Conclusion and Recommendations

6.1 CONCLUSION

The results of the groundwater sampling indicated relatively consistent groundwater conditions at the Oberon Waste Facility, indicating little to no evidence of adverse impact arising from the landfill.

No exceedances of the EPL discharge limit for surface water were recorded.

The waste quantity landfilled was below the EPL limit, and the average compaction rate was calculated to be greater than the minimum requirement of the EPL.

6.2 RECOMMENDATIONS

It is recommended that environmental monitoring be continued at the Oberon Waste Facility in accordance with existing monitoring requirements of EPL 20289 and the Oberon Waste Facility LEMP.

References

Australia and New Zealand Environment and Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ) 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

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Appendix A

MONITORING DATA

Appendix B

LABORATORY REPORTS