



## **MACKA'S SAND ANNUAL REVIEW JANUARY 2017 – DECEMBER 2017**

March 2018



## **MACKAS SAND ANNUAL REVIEW JANUARY 2017 – DECEMBER 2017**

### **FINAL**

Prepared by  
**Umwelt (Australia) Pty Limited**  
on behalf of  
**Mackas Sand Pty Ltd**

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Report No. 1646/R77/Final  
Date: March 2018



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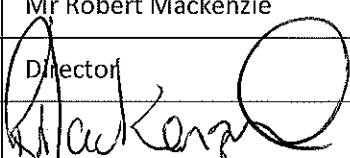
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## Annual Review Title Block

Name of operation	Macka's Sand
Name of operator	Macka's Sand Pty Ltd
Development Consent / Project Approval No.	PA 08_0142 MOD 2
Name of holder of development consent / project approval	Macka's Sand Pty Ltd
Mining lease No.	No Mining Lease applicable to site under the <i>Mining Act</i> (1992).
Name of holder of mining lease	N/A
Water licence #	N/A
Name of holder of water licence	N/A
MOP/RMP start date	N/A
MOP/RMP end date	N/A
Annual Review start date	1 January 2017
Annual Review end date	31 December 2017
<p><b>I, Robert Mackenzie, certify that this audit report is a true and accurate record of the compliance status of Macka's Sand Pty Ltd for the period 1 January 2017 to 31 December 2017 and that I am authorised to make this statement on behalf of Macka's Sand Pty Ltd.</b></p> <p><i>Note.</i></p> <p>a) <i>The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents – maximum penalty 2 years imprisonment or \$22,000, or both.</i></p>	
Name of authorised reporting officer	Mr Robert Mackenzie
Title of authorised reporting officer	Director
Signature of authorised reporting officer	
Date	29-03-2018

# 1.0 Statement of Compliance

Macka's Sand Pty Limited (Macka's Sand) operations on Lot 218 and Lot 220 are located approximately 25 kilometres (km) north-east of Newcastle near Salt Ash in the Port Stephens local government area (LGA), in New South Wales (NSW). Macka's Sand directors have operated sand extraction operations in the area since 1992. Lot 218 and Lot 220 are owned by the Worimi Local Aboriginal Land Council and operated under agreement by Macka's Sand.

This Annual Review has been prepared to provide a summary of the performance of Macka's Sand Lot 218 and Lot 220 quarry operations over the period 1 January to 31 December 2017 (referred to hereafter as the reporting period). The compliance status of the operation against relevant approvals was managed during the report period by Macka's Sand and is summarised in **Table 1.1**.

The statement of compliance status in **Table 1.1** is based on compliance information provided by Macka's Sand. Umwelt (Australia) Pty Limited (Umwelt) has relied on this information in combination with other information sources such as; environmental monitoring documentation, discussions with Macka's Sand personnel, site inspection(s) and our general understanding of the operation. In preparing this report Umwelt has not sought to undertake a full compliance audit, including secondary verification of the collated documentary evidence with relevant government agency staff, construction personnel or operational staff, site records etc.

The following section provides a statement of compliance in regards to the operations undertaken at Lot 218 and Lot 220. There was no audit undertaken by, or on behalf of the Department of Planning and Environment (DPE) during the 2017 report period. An Independent Environmental Audit (IEA) was commenced during 2017. The third party auditor was approved by DPE and engaged by Macka's Sand during December 2017, however the site audit did not commence until January 2018 and therefore the results of the audit will be included in the 2018 Annual Review.

It was determined that non-compliances occurred with two PA 08\_0142 Mod 2 conditions regarding extraction depth, and two PA 08\_0142 Mod 2 conditions regarding Biodiversity Offset Security and Groundwater Monitoring during the reporting period. The non-compliances recorded during the reporting period have been ranked according to the risk matrix included in **Table 1.2** and a brief description of each is provided in **Table 1.3**.

**Table 1.1 Statement of Compliance**

Relevant approval	All conditions complied with?
Development consent DA 08_0142	No – refer to <b>Table 1.3</b>
Environment Protection Licence EPL 13218	No – refer to <b>Table 1.3</b>
EPBC Approval 2011/6214	Yes

The non-compliances for the 2017 reporting period are detailed below in **Table 1.3**.

**Table 1.2 Compliance Status Key (NSW Government, 2015)**

Risk Level	Colour Code	Description
<b>High</b>	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
<b>Medium</b>	Non-compliant	Non-compliance with: Potential for serious environmental consequences, but is unlikely to occur Potential for moderate environmental consequences, but is likely to occur.
<b>Low</b>	Non-compliant	Non-compliance with: Potential for moderate environmental consequences, but is unlikely to occur Potential for low environmental consequences, but is likely to occur.
<b>Administrative non-compliance</b>	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

**Table 1.3 Non-compliances during the 2017 report period**

Relevant Approval	Condition No.	Condition Description (Summary)	Compliance Status	Comment	Where addressed in Annual Review
PA 08_0142 MOD 2	Schedule 2, Condition 7 and Schedule 3, Condition 2	Extraction will comply with approved maximum depth map.	Non-Compliant	Extraction depth surveying undertaken in 2016 and 2017 has confirmed that the site was non-compliant with the approved extraction depth limits allowed in the Project Approval and in the EPL 13218 at both Lots 218 and Lot 220 during the 2017 report period.	Section 11
	EPL 13218 Condition L5.1	<p>The Licensee must not undertake any sand extraction:</p> <ul style="list-style-type: none"> <li>• within 0.7 metres of the maximum predicted groundwater level on Lot 220; and</li> <li>• within 1.0 metres of the maximum predicted groundwater levels on Lot 218, or within 0.7 metres of the maximum predicted groundwater subject to soil/sand testing.</li> </ul>		<p>Lot 220 was shown to be non-compliant for a period of approximately 6 weeks, from November 2016 until 9 January 2017.</p> <p>Lot 218 was non-compliant between 28 October 2016 and 4 August 2017. Surveys completed for October 2017 and December 2017 show the site as compliant.</p> <p>A study completed by Contaminated Land specialists in November 2017 found no evidence of environmental harm at either Lot 218 or Lot 220 as a result of operating below the approved depth.</p>	

Relevant Approval	Condition No.	Condition Description (Summary)	Compliance Status	Comment	Where addressed in Annual Review
PA 08_0142 MOD 2	Schedule 3, Condition 28B	<b>Long Term Security of Biodiversity Offset</b>  Prior to the end of December 2014, or as otherwise agreed by the Secretary, the Proponent shall make suitable arrangements to provide appropriate long-term security for the Biodiversity Offset Area, to the satisfaction of the Secretary.	Non - Compliant	A draft of the Voluntary Conservation Agreement (VCA) was discussed with OEH on 25 and 27 October 2017. As a result of these discussions changes to the VCA were required, including the development of an official surveyors plan for the site. The VCA will be resubmitted as a final to OEH during 2018.	Section 6.4
	Schedule 3 Condition 22	<b>Groundwater Monitoring Program</b>  It is a requirement of the approved groundwater monitoring program that quarterly groundwater monitoring is undertaken including monitoring of groundwater level at each of the required bores.	Non-compliant	Groundwater level monitoring was not completed for Bore SP1 for the third quarterly monitoring round during 2017. This occurred due to a dip meter fault. The dip meter was replaced prior to the next round of monitoring.	Section 7.2

## 2.0 Introduction

Macka's Sand operations on Lot 218 and Lot 220 are located approximately 25 km north-east of Newcastle near Salt Ash in the Port Stephens LGA, in NSW (refer to **Figure 2.1**). Macka's Sand has operated sand extraction operations in the area since 1992. Lot 218 and Lot 220 operational areas are owned by the Worimi Local Aboriginal Lands Council and operated under agreement by Macka's Sand.

Macka's Sand was granted Project Approval (PA) No. 08\_0142 on 20 September 2009 by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to operate sand extraction operations at Lot 220 and Lot 218. It is estimated that in excess of 21 million tonnes of sand resource will be extracted from Lot 218 and Lot 220, with Lot 218 having an indefinite extraction life due to the ongoing movement of sand from the adjoining mobile dunes.

A modification to PA 08\_0142 (MOD1) was approved on 30 September 2013 by the NSW Planning Assessment Commission (PAC) under delegation of the Minister for the former Planning and Infrastructure (DPI), now Department of Planning and Environment (DPE). The modification included a temporary reduction in extraction level and the approval of an alternate route to access Lot 218. The alternate route connects directly from Lot 218, northward to Nelson Bay Road, as depicted within **Figure 2.1**.

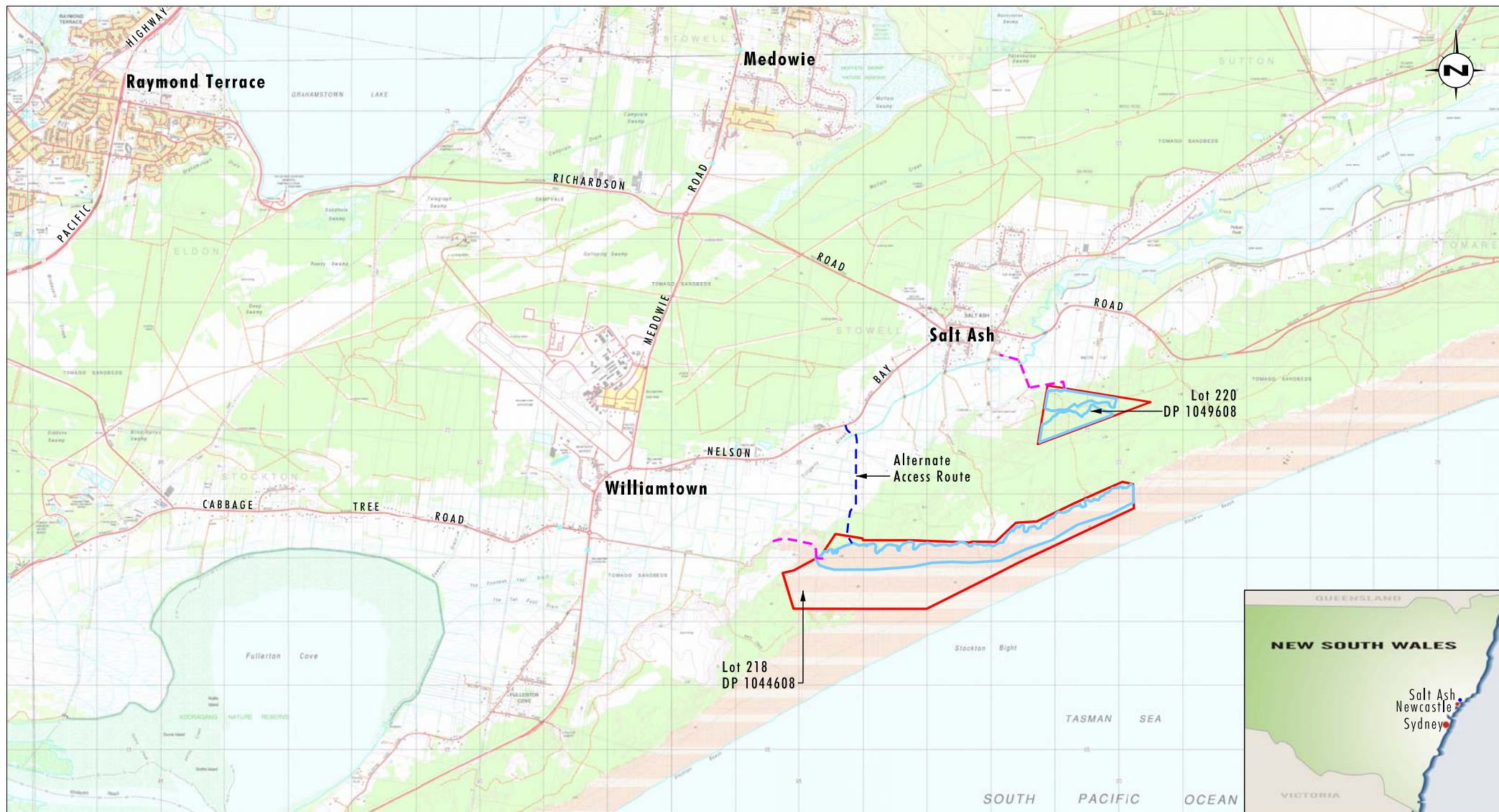
A second modification to PA 08\_0142, (MOD2), was approved by the PAC on 16 March 2016. The modification allows for an increase in maximum hourly truck movements from Lot 218 via the approved alternate access road.

Macka's Sand has engaged Umwelt to assist in the preparation of this Annual Review for the 2017 report period to meet the requirement of PA 08\_0142 MOD 2, Schedule 5 Condition 4. The report has been produced in accordance with the NSW Government *Annual Review Guideline: Post-approval requirements for State significant mining developments* (October, 2015). Requirements for the Annual Review under PA 08\_0142 MOD 2 are presented in **Table 2.1**.

**Table 2.1 Project Approval Conditions for the Annual Review**

Project Approval Condition	Section of Document
4. By the end of March each year, or other timing agreed by the Secretary, the Proponent shall review the environmental performance of the Project to the satisfaction of the Secretary. This review must:	Whole Document
a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the next year	<b>Section 4.0, Section 8.0</b>
b) include a comprehensive review of the monitoring results and complaints records of the project over the past calendar 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>• requirements of any plan, program or strategy required under this approval</li> <li>• monitoring results of previous years</li> <li>• relevant predictions in the EA and the EA (MOD 1).</li> </ul>	<b>Section 6.0</b>

Project Approval Condition	Section of Document
c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance	<b>Section 11.0</b>
d) identify any trends in the monitoring data over the life of the project	<b>Section 6.0</b>
e) identify any discrepancies between the predicted and the actual impacts of the Project, and analyse the potential cause of any significant discrepancies	<b>Section 6.0</b>
f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the Project.	<b>Section 6.0, Section 12.0</b>



Source: Department of Lands, 2006

0 1 2 4 km  
1:85 000

#### Legend

- Lot Boundaries
- Approval Areas
- Approved Site Access (not constructed)
- Approved Alternate Access Route (constructed & utilised)

FIGURE 2.1  
Locality Plan

## 2.1 Quarry Contacts

The Macka's Sand Quarry Manager is responsible to the regulatory authorities for all aspects of environmental compliance at the site including day-to-day site environmental management and reporting such as monitoring and supervision of environmental works. The details of the Quarry Manager are listed in **Table 2.2**.

**Table 2.2 Personnel Responsible for Rehabilitation and Environmental Management at Macka's Sand during 2017**

Name	Position	Company	Contact Phone No.
Robert Mackenzie	Quarry Manager	Macka's Sand Pty Ltd	(w) 02 4982 6227 (m) 0408 490 911

## 3.0 Approvals

The operations at Macka's Sand on Lot 218 and Lot 220 were subject to a range of statutory approvals during the report period and these are summarised below and discussed in further detail in the following sections:

- PA 08\_0142 MOD 2
- approval under the *Hunter Water Regulations 2015* Clause 15(1) and the corresponding Operations Management Procedure
- Environment Protection Licence (EPL) 13218 and the corresponding Pollution Incident Response Management Plan (PIRMP)
- Department of Environment Approval EPBC 2011/6214 and the corresponding EPBC Landscape Rehabilitation Management Plan
- Macka's Sand Environmental Management Strategy (EMS) and related documentation prepared in accordance with the requirements of the Project Approval. These were updated in accordance with PA 08\_0142 MOD 2, Schedule 5 Condition 1. These include:
  - Noise Management Plan (NMP)
  - Air Quality Management Plan (AQMP)
  - Soil and Water Management Plan (SWMP)
  - Unexploded Ordinance Management Plan (for operations in Lot 218) (OMP)
  - Landscape Management Plan (LMP)
  - Aboriginal Cultural Heritage Management Plan (ACHMP)
  - Non-Indigenous Heritage Management Plan (HHMP)
  - Drivers Code of Conduct (DCoC).

Macka's Sand continues to operate under existing versions of the respective plans until such time as updated versions of the plans are approved by the Department. Current approved versions of Macka's Sands Environmental Management Plans are uploaded to the Macka's Sand website.

### 3.1 Status of Development Consents/Project Approval

#### 3.1.1 Project Approval (PA 08\_0142)

Macka's Sand was granted Project Approval (PA) No. 08\_0142 on 20 September 2009 by the Minister for Planning under Part 3A of the EP&A Act to operate sand extraction operations at Lot 218 and Lot 220. It is estimated that in excess of 21 million tonnes of sand resource will be extracted from Lot 218 and Lot 220, with Lot 218 having an indefinite extraction life due to the ongoing movement of sand from the adjoining mobile dunes.

### 3.1.2 Modification 1 of the Project Approval (PA08\_0142)

A modification to PA 08\_0142 (MOD 1) was approved on 30 September 2013 by the NSW Planning Assessment Commission (PAC) under delegation of the Minister for the former Planning and Infrastructure DPI, now DPE. The modification includes a temporary reduction in extraction level and the approval of an alternate route to access Lot 218. The alternate route connects directly from Lot 218, northward to Nelson Bay Road, as depicted within **Figure 2.1**, and permits access with reduced impacts upon nearby residents.

### 3.1.3 Modification 2 of the Project Approval (PA08\_0142)

Macka's Sand sought a second modification (MOD 2) in 2014. MOD 2 was approved by the PAC on 16 March 2016. Under this modification, the operation increased its laden truck movements from Lot 218 between the hours of 7am and 10pm Monday to Friday and 7am and 4pm on Saturdays. This approval did not alter truck movements on Sundays and public holidays, or from Lot 220. Further, the licensed extraction limit of the operation will remain the same.

An overview of the Development Consent history for Macka's Sand is included in **Table 3.1** below.

**Table 3.1 Development Consent History for Macka's Sand**

Approval No.	Development	Consent Granted/ Endorsed	Duration of Consent
08_0142	Macka's Sand Project	20 September 2009	31 December 2029
08_0142 MOD 1	Access road and extraction depth	30 September 2013	31 December 2029
08_0142 MOD 2	Increased hourly truck movements	16 March 2016	31 December 2029

## 3.2 Status of Licences and Permits

### 3.2.1 Environment Protection Licence

The operations at Macka's Sand at Lots 218 and 220 are regulated under EPL No. 13218. Originally issued in 2012, EPL No. 13218 was reviewed and updated during 2014 to conform with the EPA's risk based licensing system. EPL No. 13218 was also updated in July 2016 to accommodate a range of additional monitoring and operating requirements associated with ongoing sand extraction activities.

### 3.2.2 EPBC Referral 2011/6214

Macka's Sand was awarded Federal Approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), to construct an alternative haul road from Lot 218 to Nelson Bay Road in November 2013. This approval prescribes specific conditions for the construction of the alternative access road, effective until 31 December 2029. The construction of the alternate access road was completed prior to the 2017 report period.

### 3.2.3 Hunter Water Regulation (2015) Permit

The *Hunter Water Regulation 2015* is a regulation under the *NSW Hunter Water Act 1991* that applies to the Chichester, Grahamstown, Nelson Bay, North Stockton and Tomago Catchment Areas. Macka's Sand lies within the North Stockton Catchment. Under Clause 15 (1) of the Regulation, a person can only engage in an extractive industry with an approval given by the Secretary of the Department of Trade and Investment.

A Permit has been issued by the Director General of DPI – Water (formerly NSW Office of Water) under the *Hunter Water Regulation (2015)* that consents to the undertaking of sand extraction from Lots 218 and 220 in accordance with the Project Approval. In accordance with Part 3, Clause 9 of the Hunter Water Regulation 2015 Permit, Macka's Sand has prepared an Operations Report detailing compliance with the Hunter Water Regulation 2015 Permit, refer to **Appendix 1**.

### 3.2.4 Water Licences

Macka's Sands Operations do not require Water Licences as no water extraction is undertaken at the facility at lot 218 and 220.

## 4.0 Operations Summary

A summary of the operations undertaken at Macka's Sand Quarry during the report period are included in the following sections.

### 4.1 Mining Operations

During the report period, sand extraction was undertaken within both Lot 218 and Lot 220. An overview of the operations within each lot is below with Macka's Sand production during the report period for Lot 218 and Lot 220 detailed within **Table 4.1**.

#### Lot 218

Sand extraction operations in Lot 218 commenced during February 2015 following the construction of an alternate haul route, as approved by Modification 1 of the Project Approval. Sand extraction continued throughout the 2017 report period and involved a front end loader excavating sand which is then sieved before being loaded onto haul trucks within the extraction area.

A summary of sand production during the 2017 report period is provided in **Table 4.1**.

#### Lot 220

Sand extraction operations in Lot 220 commenced during November 2009 and continued throughout the 2017 report period. A mobile screen and stockpiler remained in operation to process sand excavated by front end loader before being transported offsite by haul truck.

**Table 4.1 Production Summary 2017 (Lot 218 and Lot 220)**

Material	Approved Limit (Source – DA )	2016 Reporting Period (Actual Tonnes)	2017 Reporting Period (Actual Tonnes)	2018 Reporting Period (Forecast Tonnes)
Total Saleable Product from Lot 218	1,000,000 tonnes from Lot 218	999,299.70	996,663.82	1,000,000
Total Saleable Product from Lot 220	1,000,000 tonnes from Lot 220	871,779.35	994,496.26	1,000,000
Total Saleable Product from Lot 218 and 220 combined	2,000,000 tonnes of product in a calendar year (1,000,000 tonnes from Lot 218; 1,000,000 tonnes from Lot 220).	1,871,079.05	1,991,160.08	2,000,000

A summary of the non-compliances relating to extraction depth that occurred during 2017 is provided in **Section 11.0**.

### 4.1.1 Hours of operations

Sand extraction and haulage activities at Macka's Sand complies with the operating hours in **Table 4.2** and the conditions specified by Schedule 3, Condition 9 of the Project Approval (MOD 2). This Condition also states that Macka's Sand may undertake:

(a) quarrying operations within 250 metres of residence R27 if the Proponent has an agreement with the owner of the residence to extend the hours of operation; and/or

(b) transportation outside the hours in **Table 4.2**, to a maximum of 5.00am to 10.00pm Monday to Saturday, and 8.00am to 12.00pm on Sundays and Public Holidays, if the Proponent has agreements to extend the hours of transportation with the following:

- all owners of privately-owned land with frontage to Lavis Lane (between the site and Nelson Bay Road), for transportation from Lot 218 using the Lavis Lane access road; and/or
- all owners of 2344, 2353 and 2368 Nelson Bay Road, for transportation from Lot 218 using the Alternate access road; and/or
- all owners of privately-owned land with frontage to Oakvale Road (between the site and Nelson Bay Road), for transportation from Lot 220; and
- Macka's Sand has advised the Department in writing of the terms of these agreements.

Macka's Sand advised that they continued to operate within the operating hours specified by Schedule 3, Condition 9 of the Project Approval (MOD 2) throughout the report period.

**Table 4.2 Macka's Sand Approved Operating Hours (Project Approval Mod 2)**

Activity	Day	Time
Quarrying Operations (other than Transportation)	Any day	Any time
Quarrying Operations on Lot 220 (other than transportation), when operating less than 250 metres from residence R27	Monday to Friday	7.00 am to 6.00 pm
	Weekends and Public Holidays	None
Transportation	Monday to Friday	6.00 am to 6.00 pm (EST)
		6.00 am to 7.00 pm (DST)
	Saturday	7.00 am to 4.00 pm
	Sundays and Public Holidays	None

## **4.2 Construction Activities**

During 2017, the remaining unsealed sections of internal haul roads at Lot 218 and Lot 220 were bitumen sealed. No other construction activities were undertaken during the report period.

## **4.3 2018 Report Period Extraction Operations**

The 2018 report period will see continuation of sand extraction in both Lot 218 and Lot 220 in accordance with statutory approvals. A replacement sand screen has been ordered for Lot 218 operations for commissioning in 2018. Mackas Sand has also been forced to order 2 new Front-End-Loaders due to extremely harsh operating conditions in dry sand caused by the development consent requirements to operate above modelled maximum groundwater levels based on pre-mining conditions, that don't reflect actual groundwater levels in the working area.

Macka's Sand will continue with current rehabilitation practices during the 2018 report period.

## 5.0 DPE Annual Review Response

### 5.1 2016 Annual Review Actions

The Annual Review was submitted to DPE in accordance with Condition 4 of Schedule 5 of the Project Approval on 31 March 2017. DPE approved the Macka's Sand 2016 Annual Review in a letter dated 20 October 2017. The actions required as a result of DPE's response are outlined in the table below and reference is given to where these requirements are addressed in this document.

**Table 5.1 2016 Annual Review Actions from DPE**

Action required by The Department	Reference
<i>a) Include wind rose data and temperature data (Schedule 5, Condition 4(b))</i>	Refer to <b>Appendix 4</b>
<i>b) In Section 6.4.1, include a discussion on the results of the biodiversity offset monitoring in relation to whether the performance criteria will be achieved and the effectiveness of the Strategy (Schedule 3, Condition 28A (c)); and</i>	Refer to <b>Section 6.4</b>
<i>c) Include details in the 2017 Annual Review of the non-compliances relating to extraction depth (including depths and timeframes), incident reporting and truck movements, including enforcement actions and voluntary undertakings.</i>	Refer to <b>Section 11.0</b>

## 6.0 Environmental Performance

The following sections provide a summary of environmental monitoring and management undertaken during the 2017 report period. In accordance with the Annual Review Guideline (NSW Government, 2015) this report contains a summary of environmental monitoring data where it is required to explain trends or environmental performance during the report period. It is noted that environmental monitoring data has also been published on the Macka's Sand website (<http://www.Mackassand.com.au>) in accordance with Condition 9B of Schedule 5 of the Project Approval.

A summary of the environmental performance of Macka's Sand is included in **Table 6.1** below with further contextual information included within the following **Sections 6.1 to 6.7**.

**Table 6.1 Summary of Environmental Performance during 2017**

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Noise (Refer to Section 6.1)	Schedule 3, Conditions 4 -10 of Project Approval and L3 of EPL 13218.  Macka's Sand will ensure that the noise generated by the project does not exceed the prescribed criteria.	Compliant.  At time of noise monitoring on 11 September 2017 and 29 September 2017, Macka's Sand was found to comply with Industrial noise assessment criteria and traffic noise assessment criteria.	Ongoing noise assessment at sensitive receivers showed generally similar levels to those previously measured.	The annual attended noise monitoring program will continue in accordance with the Project Approval and EPL 13218.
Air Quality (Refer to Section 6.2)	Schedule 3, Condition 11 of Project Approval.  Total Suspended Particulate (TSP) matter < 90 ug/m <sup>3</sup> , averaged annually.	Installation of TEOM is dependent upon written approval from resident at R27. At this time, the resident at R27 does not permit air quality monitoring on their property.	No monitoring undertaken as monitoring equipment has not been installed.	Macka's Sand will liaise with the DPE and EPA regarding the installation of a TEOM air quality monitoring unit at this residence, if required.

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Air Quality (Refer to Section 6.2)	<p>Schedule 3, Condition 11 of Project Approval.</p> <p>Particulate matter <math>&lt;10 \text{ ug/m}^3</math> (PM10) <math>&lt;30 \text{ ug/m}^3</math>, averaged annually.</p> <p>Schedule 3, Condition 11 of Project Approval.</p> <p>PM10 <math>&lt;50 \text{ ug/m}^3</math>, averaged 24hrs.</p>	<p>It is considered that HVAS or other monitoring of PM<sub>10</sub> or TSP near Lot 218 is not considered necessary at this time as:</p> <ul style="list-style-type: none"> <li>Extraction operations at Lot 218 are in excess of 1.5 kilometres from residential receivers</li> <li>Trucks do not travel past dwellings adjacent to the formerly approved haul road that accessed Lavis Lane due to the approval and subsequent utilisation of the alternate haul route to Lot 218</li> <li>The most northern 200 metres of the alternate access road closest to residential receivers on Nelson Bay Road has been sealed.</li> </ul>	Letter provided to EPA from Macka's Sand.	N/A
Air Quality (Refer to Section 6.2)	<p>Schedule 3, Condition 11 of Project Approval.</p> <p>Deposited dust <math>&lt;4 \text{ g/m}^2/\text{month}</math> or <math>&lt;2 \text{ g/m}^2/\text{month}</math> increase, averaged annually.</p>	<p>Compliant.</p> <p>12 of 12 samples collected during report period. The samples obtained cover the 12 months of the report period. Dust monitoring was undertaken for all locations for the entire report period.</p>	Deposited dust sampling undertaken in accordance with AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.	Undertake air quality monitoring in accordance with regulatory requirements.

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>Air Quality</b> (Refer to Section 6.2)	Schedule 3, Condition 12 of the Project Approval. Macka's Sand shall ensure any visible air pollution generated by operations is assessed regularly and that operations are relocated, modified, and/or stopped appropriately to minimise impacts upon privately-owned land.	Compliant. Macka's Sand did not receive any complaints relating to visible dust production during the report period.	Macka's sand utilised a water cart for dust control on unsealed surfaces as required. During 2017, the remaining unsealed sections of haul roads providing access to Lot 218 and Lot 220 were sealed.	Continued implementation of existing controls.
<b>Meteorological</b> (Refer to Section 6.3)	Schedule 3, Condition 14 of the Project Approval. During the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the <i>Approved Methods for Sampling of Air Pollutants in New South Wales</i> guideline.	Compliant.	Meteorological data obtained as required during the report period.	Macka's Sand Operations utilise the Bureau of Meteorology Meteorological Station situated at the nearby Williamstown RAAF base for all weather data.
<b>Soil and Water Management – Groundwater</b> (Refer to Section 7.0)	Schedule 3, Condition 22 of the Project Approval. Macka's Sand shall ensure that it has sufficient water for all stages of the project, and adjust the scale of operations to match supply.	Compliant.	All water supplied to site by licensed external contractor as required.	Continued implementation of existing controls.

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Soil and Water Management – Groundwater (Refer to Section 7.0)	Schedule 3, Condition 22 of the Project Approval and M2.2 of EPL 13218. Macka's Sand must monitor groundwater depth levels and specific groundwater quality parameters on a quarterly basis for comparison against previously developed baseline trigger criteria for investigating impacts.	Non-compliant with Soil and Water Management Plan. Groundwater depth for SP1 was not monitored during the June 2017 quarterly monitoring round as a result of a faulty dip meter. The dip meter was replaced prior to the following monitoring round.	All groundwater quality parameters were within trigger values set by the operation. All groundwater depth levels were taken as part of monitoring with the exception of depth for bore SP1 in June 2017.	Groundwater depth levels and specific groundwater quality was monitored at all approved sites on a quarterly basis during the report period, with monitoring to continue to be undertaken during the 2017 report period.
Soil and Water Management – Groundwater (Refer to Section 7.0)	Schedule 2, Condition 7 of the Project Approval. Sand extraction shall not be undertaken within: <ul style="list-style-type: none"> <li>0.7m of maximum predicted groundwater level on Lot 220</li> <li>1.0m of maximum predicted groundwater level on Lot 218, unless the core sample testing program demonstrates that extraction to within 0.7m of the maximum predicted groundwater level can be undertaken without disturbing acid sulphate soils.</li> </ul>	Non-compliant. It was identified that areas of Lot 218 were below the extraction depth from October 2016 to August 2017. Lot 220 was shown to be non-compliant for a 6 week period from November 2016 to 9 January 2017. Results of quarterly surveying undertaken show that Lot 220 was compliant for the remainder of the report period.	Extraction depth surveying undertaken in 2017 has confirmed that the site was non-compliant with the approved extraction depth limits allowed in the Project Approval and in the EPL 13218 at Lot 218 and Lot 220 during the 2017 report period.	Non-compliance information is provided in <b>Section 11</b> .

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Soil and Water Management – Groundwater (Refer to Section 7.0)	<p>Section 1.9.1, Appendix 2 of the Project Approval.</p> <p>Macka's Sand will install table drains and flow dissipation structures along on-site access roads as required in accordance with the Erosion and Sediment Control Regional Policy (PSC Stephens Council, 2002) and the Code of Practice for Managing Urban Stormwater – Soils and Construction (Landcom, 2004).</p>	Compliant.	No environmental impacts identified.	Continued implementation of erosion and sediment controls.
Ecology (Refer to Section 6.4)	<p>Schedule 3, Condition 28 of Project Approval.</p> <p>Macka's Sand must prepare and implement a Biodiversity Offsets Strategy for a Biodiversity Offset Area in consultation with OEH that includes performance criteria, management measures and a monitoring strategy.</p> <p>Ecological monitoring undertaken every 3 years (last monitoring undertaken during 2014).</p>	<p>A Voluntary Conservation Agreement is currently being prepared for the Macka's Sand biodiversity offset area.</p> <p>Ecological monitoring on Lot 218 Biodiversity Offset Area was undertaken in August and September 2017, and a Rehabilitation Inspection was undertaken on Lot 220 in August 2017.</p>	Macka's Sand will secure the proposed offset area.	The draft Voluntary Conservation Agreement will be submitted to OEH for review in 2018.

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Heritage (Aboriginal and Non-Aboriginal) (refer to Section 6.5)	Schedule 3, Conditions 29 and 30 of the Project Approval.  Macka's Sand shall manage both Aboriginal and Non-Aboriginal Heritage items in accordance with approved management plan and in consultation with OEH and relevant Aboriginal community.	Meetings of the Aboriginal Cultural Heritage Management Group (AHMG) occurred on 14 and 21 September 2017 accordance with the ACHMP.  In accordance with the ACHMP, Macka's Sand undertook archaeological investigations to confirm that extractive activities through the remnant soil profile did not result in non-compliance.	N/A	Continued AHMG meetings and record keeping as appropriate.
Traffic and Transport	Schedule 3, Condition 4B of the Project Approval.  Macka's Sand shall ensure vehicle movements on the Alternate access road are within prescribed limits, vehicles do not obstruct traffic, and vehicles are maintained to a satisfactory level that will prevent deposit of material onto public roads.	Compliant.  Truck movement data for 2016 period indicated exceedances in number of trucks exiting the site hourly via the Alternate Access road during the report period. This was due to errors in the weighbridge software system, however these errors were rectified prior to the commencement of the 2017 reporting period. Monthly truck movements are reviewed each month. There have not been any identified non-compliances relating to truck movements during the 2017 reporting period.	Discussion regarding the 2016 non-compliances and actions taken to address the non-compliance are provided in <b>Section 6.9.2</b> and <b>Section 11.0</b>	Further information discussed in <b>Section 11.0</b>

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
Traffic and Transport	Schedule 3, Condition 33A of the Project Approval.  Macka's Sand shall prepare a Drivers' Code of Conduct in consultation with Roads and Maritime and PSC prior to 14 April 2016.	Compliant.  A Drivers' Code of Conduct was submitted to DPE on 13 April 2016 following consultation with Roads and Maritime and PSC. The Code of Conduct was updated in 2017 approved by DPE in December 2017.	Heavy vehicle contractors are required to sign-off on having read and understood the requirements of the Drivers Code of Conduct, including updates which specify exiting site immediately after moving off the weighbridge.	Code of Conduct will be provided to all contract heavy vehicle drivers and external contracting truck operators.
Rehabilitation (refer to Section 8)	Schedule 2, Condition 7A of the Project Approval (MOD 1).  The final rehabilitated ground surface level on Lot 218 and Lot 220 is at least 1.0m above the maximum predicted groundwater level.	No areas have been fully rehabilitated given stage of operations.  Based on survey plans provided by Centurion Survey, completed extraction areas of Lot 220 rehabilitation are compliant with final required levels.	N/A	Rehabilitation to be undertaken where land is available for rehabilitation. Further information on rehabilitation is provided in <b>Section 8.0</b> .
Rehabilitation (refer to Section 8)	Schedule 3, Condition 24 of the Project Approval (MOD 1).  Macka's Sand shall progressively rehabilitate the site in a manner that is generally consistent with the final landform in the EA (Umwelt, 2012).	Compliant.	Progressive rehabilitation measures undertaken during the report period.  Refer to <b>Section 8.0</b> .	Rehabilitation completed for the 2017 report period is detailed in <b>Section 8.0</b> .

## 6.1 Operational Noise

The Project Approval (MOD 2) and EPL 13218 define noise impact assessment criteria for sensitive receivers during the following stages of operations:

- Noise generated by the Project – Industrial noise (**Table 6.2**)
- Noise generated along the Alternate Access Road (where agreements have not been signed with relevant owner/s of residence/s) (**Table 6.3**)
- Traffic noise generated by offsite haulage (**Table 6.4**).

In accordance with the approved Macka's Sand NMP and EPL 13218, noise compliance monitoring was undertaken over two days, being 11 and 29 September 2017, at locations representative of locally sensitive receivers (**Figure 6.1** and **Table 6.5**). Criteria for the monitoring locations are listed in **Table 6.2**, **Table 6.3** and **Table 6.4**. Results from the compliance monitoring are discussed in **Section 6.1.2**.

### 6.1.1 Noise Criteria

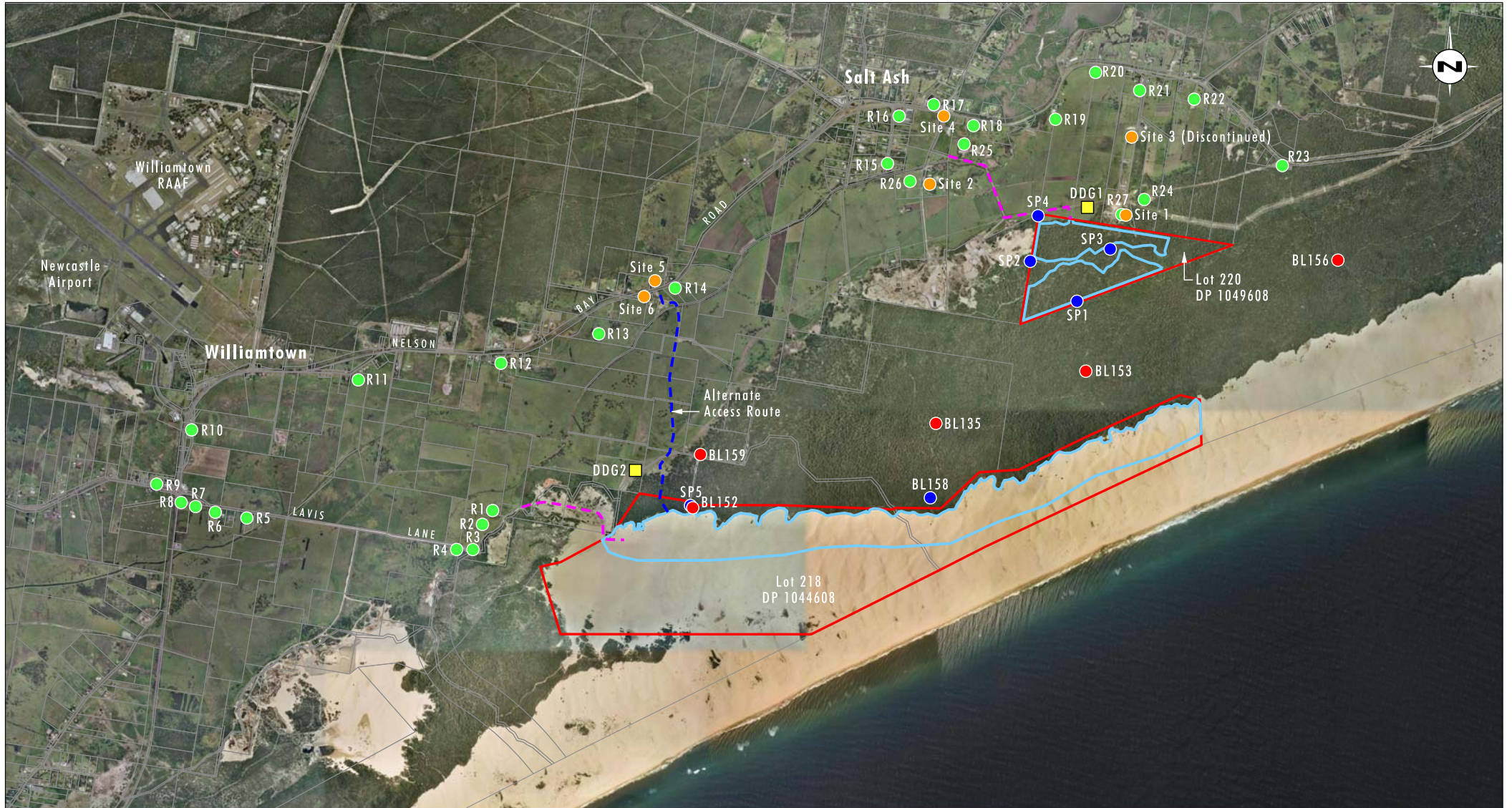
**Table 6.2 Industrial Noise Impact Assessment Criteria, dB(A)**

Location	Day <sup>1</sup> LAeq, 15 min	Evening <sup>1</sup> LAeq, 15 min	Night <sup>1</sup> LAeq, 15 min	Night <sup>1</sup> LA1, 1 min
R18 – 300 Nelson Bay Road	39	39	40	45
R1 – Lavis Lane residence	39	39	39	45
R19 – 316 Nelson Bay Road	36	36	37	45
R26 – Residence opp. Oakvale Farm	36	36	35	45
R27 – Hufnagl residence	36	35	35	45
R17 – 287 Nelson Bay Road	35	35	36	45
All other residences	35	35	35	45

**Table 6.3 Alternate Access Road Noise Impact Assessment Criteria dB(A)**

Location	Shoulder <sup>1</sup> LAeq, 15 min	Day <sup>1</sup> LAeq, 15 min	Evening <sup>1</sup> LAeq, 15 min
2344 Nelson Bay Road, Williamtown	38	40	40
2353 Nelson Bay Road, Williamtown	39	41	41
2367 Nelson Bay Road, Williamtown	36	38	38
2368 Nelson Bay Road, Williamtown	38	40	40
All other residences	35	35	35

Note 1: Day time is 7.00am to 6.00pm Monday to Saturday and 8.00 am to 6.00 pm Sundays and Public Holidays, evening is 6.00pm to 10.00pm (NSW Industrial Noise Policy (INP) EPA, 2000). Shoulder is the period from 5am to 7am on Monday to Friday, but only for the use of the Alternate access road (see condition 4A of schedule 3 of Project Approval 08\_0142 MOD 2).



Source: Department of Lands (2003)

0 0.5 1 2 km  
1:45 000

#### Legend

- Lot Boundaries
- Approval Area
- Approved Site Access
- Alternate Access Route
- Noise Monitoring Location
- Dust Monitoring Location
- Groundwater Monitoring Location
- Hunter Water Groundwater Monitoring Location
- Residential Receivers

File Name (A4): R71\_V1/1646\_475.dgn

FIGURE 6.1

Mackas Sand Monitoring Locations

**Table 6.4 Traffic Noise Impact Assessment Criteria, dB(A)**

Road	Day/Evening	Night - Shoulder
Lavis Lane, Oakvale Drive	60 LAeq (1 hour)	55 LAeq (1 hour)
Nelson Bay Road	60 LAeq (15 hour)	55 LAeq (9 hour)

**Table 6.5 Noise Monitoring Locations**

Monitoring ID	Location
Site 1	Private residence (R27 – Hufnagl residence, 10 Janet Parade, Salt Ash) MGA E = 399542, MGA N = 6370639
Site 2	Private residence R26 – 6 Oakvale Drive, Salt Ash (adjacent to Oakvale Farm) MGA E = 397917, MGA N = 6370880
Site 4	Private residence, Lot 2, DP 818198, 2642 Nelson Bay Road, Salt Ash (situated on the corner of Oakvale Drive and Nelson Bay Road) MGA E = 398078, MGA N = 6371444
Site 5	Private residence (2353 Nelson Bay Road, Williamtown) MGA E = 395690, MGA N = 6370097
Site 6	Private residence (2344 Nelson Bay Road, Williamtown) MGA E = 395639, MGA N = 6370005

Note 1: R24 to R27 descriptors are from 'Noise Management Plan for Sand Extraction Operations' (Umwelt 2016c).

Note 2: As agreed with DPE, Site 3 has been removed from the noise monitoring program.

## 6.1.2 Monitoring Data

During the attended noise monitoring program the ambient noise levels surrounding the Macka's Sand site were recorded with particular attention paid to the contribution of the Macka's Sand site operations.

### 6.1.2.1 Industrial Noise

Results of the attended industrial noise monitoring program conducted on 11 and 29 September 2017 and detailed in **Table 6.6**, **Table 6.7**, **Table 6.8** and **Table 6.9**, indicate Macka's Sand was complying with the industrial noise assessment criteria as outlined in the Macka's Sand Major Project Approval 08\_0142 MOD 2 and EPL 13218 for the meteorological conditions experienced at the time of monitoring.

A comparison of industrial noise data collected over 2014, 2015, 2016 and 2017 indicating compliance for all periods is provided in **Appendix 3**.

**Table 6.6 Night Time Industrial Noise Levels – Sand Extraction Activities versus Noise Criteria, dB(A)**

Location	LAeq, 15 minute		LA1,1 minute	
	Noise criteria	Macka's Sand noise level contribution	Noise criteria	Macka's Sand noise level contribution
Site 1	35	<32	45	<41
Site 2	35	<32	45	<45
Site 4 <sup>1</sup>	35	<32	45	<45
Site 5 <sup>2</sup>	35	Not Audible	45	Not audible
Site 6	35	Not Audible	45	Not audible

Note <sup>1</sup>: Based on noise levels measured at Site 2

Note <sup>2</sup>: Based on noise levels measured at Site 6

**Table 6.7 Day Time Industrial Noise Levels – Sand Extraction Activities versus Noise Criteria, dB(A)**

Location	LAeq, 15 minute	
	Noise criteria	Macka's Sand noise level contribution
Site 1	36	<25 (11/09/2017)
Site 2	36	<30 (11/09/2017)
Site 4 <sup>1</sup>	35	Not audible
Site 5 <sup>2</sup>	35	Not audible
Site 6	35	Not audible

Note <sup>1</sup>: Based on noise levels measured at Site 2

Note <sup>2</sup>: Based on noise levels measured at Site 6

**Table 6.8 Evening Industrial Noise Levels –Sand Extraction Activities versus Noise Criteria, dB(A)**

Location	LAeq, 15 minute	
	Noise criteria	Macka's Sand noise level contribution
Site 1	35	<20
Site 2	36	<35
Site 6	35	Not audible

**Table 6.9 Industrial Noise Levels – Alternate Access Road to Lot 218**

Location	Period	LAeq, 15 minute	
		Noise criteria	Macka's Sand noise level contribution
Site 5	Day Time (07:16 – 07:31)	41	<40
Site 6	Day Time (07:16 – 07:31)	40	<40
Site 5 <sup>1</sup>	Night Time/Shoulder (05:51 – 06:06)	39	N/A
Site 6	Night Time/Shoulder (05:51 – 06:06)	38	N/A
Site 5 <sup>1</sup>	Evening (18:05 – 18:20)	41	<38
Site 6	Evening (18:05 – 18:20)	40	<38

Note <sup>1</sup>: Based on noise level measured at Site 6

As noted in **Tables 6.6 to 6.9** above, and as identified in Macka's Sand Environmental Noise Monitoring Report (Umwelt, September 2017), measurements of industrial noise levels at Site 6 are taken to be representative of industrial noise levels received at Site 5, as Site 5 is slightly farther than Site 6 from Lot 218 and from the Alternative Access Road, therefore compliance with the criteria at Site 6 also indicates compliance at Site 5. Similarly, since Site 4 is farther from Lot 220 than Site 2, industrial noise levels from Lot 220 received at Site 4 would be less than industrial noise levels measured at Site 2. Therefore compliance with the criteria at Site 2 also indicates compliance at Site 4. This approach is consistent with the approved Macka's Sand Noise Management Plan monitoring approach.

### 6.1.2.2 Traffic Noise

Results of the road traffic noise monitoring program are detailed in **Table 6.10** below. The program was conducted from 6.00 am to 7.00 am and 7.00 am to 8.00 am, 11 September 2017 at the private residence on the corner of Oakvale Drive and Nelson Bay Road, as well as at 2353 Nelson Bay Road. The results indicate that Macka's Sand was complying with the road traffic noise assessment criteria as outlined in the Macka's Sand Major Project Approval 08\_0142 MOD 2 and EPL 13218 for the meteorological conditions experienced at the time of monitoring.

A comparison of industrial noise data collected over 2014, 2015, 2016 and 2017 indicating compliance for all periods is provided in **Appendix 3**.

**Table 6.10 Macka's Sand 1 hour Night and Day Time Road Traffic Noise Level Contribution versus Noise Criteria, dB(A)**

Road	Period	Noise criteria LAeq, 1hour	Noise level contribution LAeq,1hour	
			Cnr Oakvale Dr and Nelson Bay Rd (Site 4)	2353 Nelson Bay Road (Site 6)
Lavis Lane, Oakvale Drive as measured at corner of Oakvale and Nelson Bay Road	Night	55	52	51
	Day	60	54	46

## 6.2 Air Quality

In accordance with Condition 13 of Schedule 3 of Project Approval 08\_0142 (MOD 2), Macka's Sand have prepared and implemented an AQMP for its operations.

Condition 11 of Schedule 3 of Project Approval 08\_0142 (MOD 2) sets out air quality impact criteria for Macka's Sand. These criteria are used to assess the potential impacts of operations at nearby residential receivers. Criteria which apply to operations are specified in **Tables 6.11, 6.12 and 6.13** below. Dust monitoring locations are identified in **Figure 6.1**.

**Table 6.11 Long term Impact Assessment Criteria for Particulate Matter**

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 $\mu\text{g}/\text{m}^3$
Particulate matter < 10 $\mu\text{m}$ (PM <sub>10</sub> )	Annual	30 $\mu\text{g}/\text{m}^3$

**Table 6.12 Short term Impact Assessment Criterion for Particulate Matter**

Pollutant	Averaging period	Criterion
Particulate matter < 10 $\mu\text{m}$ (PM <sub>10</sub> )	24 hour	50 $\mu\text{g}/\text{m}^3$

**Table 6.13 Long term Impact Assessment Criteria for Deposited Dust**

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 $\text{g}/\text{m}^2/\text{month}$	4 $\text{g}/\text{m}^2/\text{month}$

The status of air quality monitoring for PM<sub>10</sub> and TSP is discussed in **Section 6.2.1** below.

### 6.2.1 Management Measures

Total Suspended Particulate (TSP) monitoring is not currently undertaken by Macka's Sand as the installation of High Volume Air Sampling (HVAS) or Tapered Element Oscillating Microbalance (TEOM) units close to Lot 218 and Lot 220 is subject to certain constraints. Installation of a unit near Lot 220 is dependent upon receiving written approval from the nearest sensitive receiver (R27) for installation of a TEOM air quality monitoring station on their property. At time of writing, resident R27 has not provided such permission, however this would be revised should a written request be received by the resident. The opportunity to have a HVAS unit installed will be offered annually to the resident at R27, unless a written statement nullifying this requirement from the resident at R27 is received.

Extraction operations at Lot 218 are distant from residential receivers (in excess of 1.5 kilometres) and unlikely to cause unacceptable levels of dust, with the main source of dust being from product transport on unsealed haul roads. With the approval of the alternate haul route to Lot 218, trucks have not travelled past dwellings adjacent to the formerly approved haul road that accessed Lavis Lane. In addition, the internal haul roads (from public road to pit) were sealed following works completed during the reporting period. Taking these factors into account, in addition to the operational controls in place and described in the AQMP, Macka's Sand consider that HVAS or other monitoring of PM<sub>10</sub> or TSP near Lot 218 is not necessary at this time.

## 6.2.2 Dust Monitoring Data

Dust Deposition at DDG1 (Lot 220) recorded Total Insoluble Matter levels varying between 0.3 g/m<sup>2</sup>/month and 9.7 g/m<sup>2</sup>/month during the report period. There were no significant changes to operations on Lot 220 during 2017. The results of samples received indicate that operations on Lot 220 comply as there has been an increase of less than 2 g/m<sup>2</sup>/month annual average from the previous report period and total dust deposition of less than 4 g/m<sup>2</sup>/month, refer to **Table 6.14**.

**Table 6.14** indicates that 12 samples were taken during the reporting period (one for each month), as required under the Project Approval.

Air quality monitoring was undertaken during the report period for all locations on both Lot 218 and Lot 220, and in compliance with the sample timeframes within the NSW Air Sampling Methods. This applies to both Lot 218 and Lot 220.

**Table 6.14 Total Dust Deposition Levels at DDG 1 – Lot 220 (g/m<sup>2</sup>/month)**

Sample date:	Ash Content	Total Insoluble Matter
	g/m <sup>2</sup> .month	g/m <sup>2</sup> .month
29/01/2017	0.5	0.9
02/03/2017	0.6	1.2
04/04/2017	7.9	9.7
06/05/2017	0.7	1
06/06/2017	0.4	0.5
01/07/2017	0.2	0.4
10/08/2017	0.1	0.3
06/09/2017	0.4	0.6
10/10/2017	0.4	0.6
12/11/2017	0.3	1.4
9/12/2017	1.3	3.1
22/12/2017	1.8	3.8
	<b>Annual Average</b>	<b>2.0</b>

Results from dust deposition samples at DDG2 (Lot 218) recorded readings of Total Insoluble Matter ranging from 0.4 g/m<sup>2</sup>/month to 6.2 g/m<sup>2</sup>/month during the report period. While there were no significant operational changes during the report period, previous observations of sand movement on the mobile dune system have demonstrated that during high wind conditions significant volumes of sand can be transported over large distances. Baseline monitoring has confirmed that this area can, on occasions, be a high sand deposition environment where deposition levels naturally exceed the criteria set out in Condition 11 of Schedule 3 of Project Approval 08\_0142 (MOD 2) of 4 g/m<sup>2</sup>/month. Results indicate that operations on Lot 218 are complying with an increase of less than 2 g/m<sup>2</sup>/month annual average and total dust deposition of less than 4 g/m<sup>2</sup>/month refer to **Table 6.15**.

**Table 6.15** represents Total Dust Deposition Levels at DDG 2 – Lot 218 as a 12 month average for the report period.

**Table 6.15 Total Dust Deposition Levels at DDG 2 – Lot 218 (g/m<sup>2</sup>/month)**

Sample date:	Ash Content	Total Insoluble Matter
	g/m <sup>2</sup> .month	g/m <sup>2</sup> .month
29/01/2017	0.9	1.5
02/03/2017	4.1	5.5
04/04/2017	5.1	6.2
06/05/2017	1.1	1.3
06/06/2017	1.0	1.3
01/07/2017	0.7	1.2
10/08/2017	0.2	0.4
6/09/2017	3.1	3.5
10/10/2017	3.6	4
12/11/2017	0.9	1.4
9/12/2017	0.4	0.9
22/12/2017	1.6	2.2
	<b>Annual Average</b>	<b>2.5</b>

Dust results show no exceedances of criteria and no potential impacts to nearby residences. Dust deposition monitoring will continue on a monthly basis at DDG1 and DDG2 to detect any impacts due to sand extraction operations at Lot 220 and Lot 218.

### 6.2.3 Trends in Data

Annual averages for dust deposition during 2017 are compared with monitoring data from the previous 5 years, refer to **Table 6.16**.

**Table 6.116 Annual averages for dust deposition 2012 -2017**

Year	Total Insoluble Solids (g/m <sup>2</sup> /month)	
	DDG1	DDG2
2017	2.0	2.5
2016	1.3	1.6
2015	1.7	10.0*
2014	1.4	2.1
2013	1.4	2.7
2012	2.6	1.7

\*High value during 2015 was due to an extreme storm event during April 2015 . Refer to 2015 Annual Review for further details.

The annual averages for deposited dust recorded at each of the monitoring locations during 2017 are consistent with average dust levels recorded in recent years.

## 6.2.4 Proposed Improvements 2018

Previous years have demonstrated that Aeolian transport of the dune sands during periods of high winds result in conditions where deposition levels naturally exceed the criteria set out in Condition 11 of Schedule 3 of Project Approval 08\_0142 (MOD 2) of 4 g/m<sup>2</sup>/month thereby producing false positive exceedance results. Results for 2017 were compliant with approval conditions, as a result no improvements are proposed to the current system. As discussed above, sealing of internal haul roads during 2017 has reduced the development of potential wind-blown dust from Lot 218 and Lot 220.

## 6.3 Meteorological Monitoring

Meteorological monitoring data is collected from the Bureau of Meteorology station located at the nearby Williamtown RAAF Base (Station 061078), refer to **Figure 6.1**. The results of the meteorological monitoring for 2017 are presented in the following sections. Refer to **Appendix 4** for temperature and wind speed and direction data collected during the reporting period.

### 6.3.1 Rainfall monitoring

Rainfall data has been sourced from the records of the Williamtown RAAF Base meteorological station and is summarised in **Table 6.16**.

**Table 6.17 Monthly Rainfall and Number of Rain Days during 2017**

Month	Rainfall (mm)	Rain Days (>0.2 mm)
January	62.2	8
February	59	12
March	232.4	20
April	118.6	15
May	11.6	5
June	236.6	15
July	30.8	2

Month	Rainfall (mm)	Rain Days (>0.2 mm)
August	27.4	7
September	13.8	2
October	96.2	10
November	57.6	8
December	41.6	10
<b>TOTAL</b>	<b>987.8</b>	<b>114</b>

## 6.4 Ecology

Long term biodiversity offset ecological monitoring is required to be undertaken every 3 years and was undertaken during 2017.

Ecological monitoring on Lot 218 Biodiversity Offset Area was undertaken in August and September 2017, and a Rehabilitation Inspection was undertaken on Lot 220 in August 2017. A Voluntary Conservation Agreement is currently being prepared for the Macka's Sand biodiversity offset area.

### 6.4.1 Biodiversity Offset Monitoring

#### 2015

The results of the 2015 monitoring surveys indicated that the condition of the Biodiversity Offset Area had remained similar to the baseline surveys in 2014 (Umwelt, 2015b).

#### 2016

Surveys in 2016 refined monitoring methods to assist processes that detect a change to the habitat and vegetation structure of the Biodiversity Offset Site. The results demonstrate a more robust and strategic approach whilst still incorporating previous monitoring methodologies and the relevance of previously collected data (Umwelt, 2016k). The methods employed in 2016 are consistent with those requested by OEH.

The results of the 2016 monitoring surveys indicate the condition of the Biodiversity Offset Area has remained relatively similar to previously conducted surveys in 2014 and 2015. Survey timing is imperative for maximising the rate of detection where peak flowering periods may offer a small window of opportunity, 2016 surveys were therefore conducted as close as possible to the dates of the previous survey. Annual fluctuations are expected given nature and response of these species to a specific range of conditions.

### 6.4.2 Lot 218 Biodiversity Offset Area Monitoring

Ecological monitoring of Lot 218 was undertaken in August and September 2017 by Umwelt in accordance with monitoring methods as refined in 2016 in consultation with OEH.

The Biodiversity Offset Area is 1 hectare in area and supports known and potential habitat for a number of threatened fauna and flora species.

The ecological monitoring included the following assessments:

- Habitat Assessment – including dominant flora species in each stratum, groundcover, evidence of disturbance and dieback, presence of standing and fallen dead timber and hollow-bearing trees.
- Vegetation Structure Assessment – Two permanent 50 metre transects have been established at the eastern section of the Lot and are surveyed to monitor structural change to vegetation assemblage and habitat surrounding areas populated by two threatened orchids (sand doubletail (*Diuris arenaria*) and Newcastle doubletail (*Diuris praecox*)).
- Photo Monitoring – Five photo monitoring points have been established to monitor structural development in vegetation assemblage.
- Threatened Orchid Monitoring – Two surveys were conducted two weeks apart to ensure peak flowering was observed. Surveys involved walking transects and collecting data on the location, plant health of each individual identified.
- Exotic Species Monitoring and Management – As part of the monitoring program, manual weed removal was undertaken during the site visit. Any exotic species identified during the site visits were documented and removed where appropriate. The whiskey grass infestation previously identified by OEH in 2016 was also mapped to monitor progression of the infestation.

The results of the 2017 Biodiversity Offset Area monitoring indicate that the condition of the Biodiversity Offset Area has remained relatively similar to previous monitoring surveys, with no measurable changes identified in habitat quality or vegetation structure. Targeted orchid surveys identified an increase in Newcastle doubletail (*Diuris praecox*) stems, while sand doubletail (*Diuris arenaria*) stem number decreased slightly. Small fluctuations, such as these, are common when monitoring cryptic species and occur generally in response to a range of natural variable. These fluctuations in flowering are likely to be attributed to relatively warm and dry winter and spring conditions, which aren't typically favourable for orchids flowering within this period.

The following recommendations were made by Umwelt in response to the results of these surveys and to assist in achieving the performance criteria for the Offset Area:

- Evidence of past grazing is still present however ground vegetation was observed to be recovering and grazing may be detrimental to the long term survivability of the threatened species present. Methods such as periodic slashing are recommended to control the spread of exotic species, ensuring the regime occurs outside of the growing and flowering period of the two threatened orchid species.
- A management period from autumn to early winter is recommended to target the encroaching weed species (such as whiskey grass) and assist in maintaining the habitat requirements for these orchid species. It is recommended that the any actions to manage weeds be assessed and undertaken during autumn – spring 2018.

### 6.4.3 Lot 218 Biodiversity Offset Area Security

A draft of the Voluntary Conservation Agreement (VCA) was discussed with OEH on 25 and 27 October 2017. As a result of these discussions changes to the VCA were required, including the development of an official surveyors plan for the site. The VCA will be resubmitted as a final to OEH during 2018 including the formal plan of survey.

## 6.5 Aboriginal Heritage

### 6.5.1 Aboriginal Cultural Heritage Management Measures

Macka's Sand operated in accordance with the approved ACHMP during the report period.

### 6.5.2 Aboriginal Site Impacts

During 2017, monitoring inspections were undertaken on disturbed extraction areas on both Lots 218 and Lot 220. Screen reject inspections found 4 stone artefacts in Lot 218, and one stone and several shell pieces found in Lot 220. Visual inspection of bagged materials from Lot 218 was undertaken. The AHMG indicated no need to bag materials from Lot 220. Artefacts previously found on both sites were returned during 2017.

During the second meeting on 21 November, the following activities were identified by AHMG as completed:

- Establishment of management group
- Impact on existing sites
- Roads crossing archaeological protection area in Lot 220
- Construction of access route
- Clearance procedures at Lot 220
- Analysis and interpretation of materials
- Rehabilitation activities (AHMG consulted)

## 6.6 Non-Aboriginal Heritage

No actions or impacts in relation to non-Aboriginal heritage occurred during the report period.

## 6.7 Erosion and Sediment Control

No additional erosion and sediment control works were completed during 2017.

## 6.8 Waste Management

The current waste management program utilises licensed waste contractors to incorporate recycling, in addition to the disposal of wastes in accordance with the waste provisions of the *Protection of the Environment Operations (Waste) Regulation 2014 (NSW EPA, 2014)*. There were no changes to the waste management system at Macka's Sand during the report period.

Macka's Sand imported Excavated Natural Material (ENM) during 2017 for the creation of trafficable surfaces and extension of the haul route within pit in Lot 218. This allows for heavy vehicle movements and minimises trucks being bogged in the dune sand environment.

## 6.9 Traffic

### 6.9.1 Drivers' Code of Conduct

Condition 33A of Schedule 3 of Project Approval 08\_0142 (MOD 2) sets out the requirements for a Drivers' Code of Conduct (DCoC) which is applicable to drivers of all project-related vehicles, including trucks that haul sand from Macka's Sand operations on Lot 218 and Lot 220.

The updated DCoC was approved by DPE in 2017. This action was in accordance with the Voluntary Undertaking for Macka's Sand in response to exceedances of number of vehicles exiting the site per hour during 2016.

The DCoC details:

- potential safety issues on site and when on public road haulage routes,
- times of heavy traffic
- school bus travel times and bus stop locations
- potential interactions with traffic and fauna on roads
- emergency and accident contact details (including details for care of injured fauna)
- local road condition updates
- measures to minimise truck noise impacts and
- measures to minimise movement to site prior to 5am weekdays.

Updates made to the DCoC during 2017 detailed measures to cover loads prior to entering the weighbridge, and ensuring drivers are exiting site immediately after moving off the weighbridge in order to avoid delays in times of trucks leaving site which may affect numbers of truck movements per hour.

All haulage contractors are required to read and understand the DCoC before gaining access to the site.

### 6.9.2 Vehicle Movements

Condition 4B of Schedule 3 of Project Approval 08\_0142 sets out the operating conditions relating to maximum truck movements to and from site. Modification 2 (MOD 2) of the Project Approval was granted on 15 March 2016 and an increase in hourly truck movements was established. Non-compliances of hourly truck movements were identified under Modification 1 (MOD 1) and MOD 2 of the Project Approval for the 2016 report period. Further information on the truck movement non-compliances is provided in **Section 11.1**.

During 2017, vehicle movements were reviewed monthly to confirm whether any truck movements occurred that were non-compliant with Condition 4B of Schedule 3.

The review has confirmed that there were no non-compliant truck movements during the reporting period. Further information regarding the truck movement non-compliances that occurred during 2016 has been included at DPE request in **Section 11.0**.

### **6.9.3 Traffic Restrictions**

Condition 32 of Schedule 3 sets out the restrictions on traffic movements (in plus out) on Oakvale Road and states that there is a maximum of 10 traffic movements per hour during the night time period and on Sundays and public holidays.

Macka's Sand have advised that during 2017, they are not aware of any non-compliances with Condition 32 of Schedule 3. Weighbridge records do not show any non-compliances with Condition 32 of Schedule 3.

### **6.9.4 Road Haulage**

Condition 33 of Schedule 3 of Project Approval 08\_0142 (MOD 2) states that all vehicles entering and leaving the site are covered and that all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site.

Macka's Sand have advised that during 2017, there were no non-compliances with Condition 33 of Schedule 3. It is noted that covering loads is also a requirement of RMS.

#### **Fauna Strike Monitoring**

Conditions 33B and 33C of Schedule 3 of Project Approval 08\_0142 (MOD 2) details the requirement for the DCoC to be assessed in each Annual Review. This shall include details of all fauna injured or killed by vehicle strikes, time and date of any such strike, species involved, action taken immediately following the strike and any consequent measures put in place to prevent or minimise a recurrence of fauna strikes.

Macka's Sand advise that there were no reports made to Macka's Sand management of any fauna injured or killed during the 2017 reporting period.

## 7.0 Water Management

### 7.1 Surface Water

There are no surface flow or drainage lines on either Lot 218 or Lot 220 due to the high permeability of the underlying sand. As a result, there is no surface water that can be monitored to establish baseline conditions other than in low-lying areas that may intermittently be inundated during high rainfall events. Water within these low-lying areas dissipates quickly following rainfall. As this water is intermittent and directly connected to the groundwater, it is considered that these areas would have water quality that is consistent with that recorded in the groundwater of the site as discussed in **Section 7.2** below.

### 7.2 Groundwater

#### 7.2.1 Groundwater Monitoring

Groundwater monitoring was undertaken on a quarterly basis during the report period in accordance with Condition M2 of the EPL 13218. Bore locations are shown in **Figure 6.1**. Groundwater level measurements are shown in **Appendix 2**. Note that the report period is highlighted in blue within all tables and charts.

In accordance with the Project Approval 08\_0142 (MOD 2), Schedule 5 Condition 4 (b), the Annual Review must include a comprehensive review of the monitoring results and predictions within the Environmental Assessment (EA). A comparison between predicted and recorded groundwater levels from the SWMP is provided in **Table 7.1**, and a summary of trigger values developed in analysis of previous data and the Australian Drinking Water Guidelines (NHMRC, NRMCC 2011) is presented in **Table 7.2**.

During 2017, all groundwater monitoring undertaken at the site was conducted in accordance with the requirements of the site Groundwater Monitoring Program. A total of 4 monitoring events were undertaken at an approximate quarterly basis during 2017.

Macka's Sand have advised that groundwater level was not monitored at bore SP1 during the June 2017 monitoring event due to a fault associated with dipping equipment during sampling. The dip meter was replaced, and all monitoring has been undertaken as required for subsequent quarterly monitoring events.

Noting the discussion within **Section 7.1** regarding the SWMP and **Table 7.2**, it is considered that recorded groundwater levels are consistent with the requirements within the SWMP.

**Table 7.1 Recorded and predicted groundwater levels (mAHD) for duration of operations**

Monitoring Point	Recorded Maximum	Approximate Predicted Maximum	Difference
SP1	2.51	3.6	-1.09
SP2	3.43	2.8	0.63
SP3	2.7	2.6	0.1
SP4	1.03	1.25	-0.22
SP5	3.41	3.6	-0.19
SP6	2.99*	3.6	-0.61
BL158	3.13	3.7	-0.58

\*Recorded maximum groundwater level occurred during the report period. SP6 groundwater level was recorded during the 16 June 2017 sampling event following extreme rainfall in the days prior to sample collection.

It is further considered that recorded groundwater levels are broadly consistent with relevant predictions within the EA (Umwelt, 2012) and other documentation (e.g. Umwelt (2011) *Determination of Maximum Predicted Groundwater Level and Maximum Extraction Level at Lot 218 and Lot 220, Salt Ash*) however some variability from the predicted maximum groundwater level was observed in the reporting period across all monitoring sites.

Groundwater levels generally decreased over the 2017 report period which can be attributed to the lower rainfall volumes, particularly in the second half of the year. Refer to rainfall data in **Section 6.3.1**.

**Table 7.2 Groundwater Investigation Trigger Values**

Parameter	Units	Minimum	Maximum
pH	pH Unit	4.5**	8.5*
Conductivity	uS/cm	NA	600**
Turbidity	NTU	NA	50**
Arsenic	mg/L	NA	0.01*
Manganese	mg/L	NA	0.1*
Iron	mg/L	NA	5.70**

\*These values are based on NHMRC, NRMCC 2011.

\*\*These values are based on long term groundwater monitoring from a previous operation in the local area.

It is considered that recorded groundwater quality results are generally consistent with the requirements within the SWMP. All analytes tested for these bores during 2017 monitoring events were within criteria, with the exception of the March 2017 result for Iron. The result of 5.8 mg/L for SP4 was slightly above the trigger level value of 5.7 mg/L. In accordance with Section 5.4 of the SWMP, the Iron exceedance was within 10% of the maximum trigger value and therefore did not require further contingency management actions. As shown in **Appendix 2**, the Iron levels within SP4 have decreased during the report period and the remaining results for SP4 were within criteria for 2017.

It is considered that recorded groundwater quality results are generally consistent with previous monitoring results, refer to **Appendix 2**.

## 8.0 Rehabilitation

### 8.1 Rehabilitation of Disturbed Land

In accordance with Schedule 3, Condition 24 of the Project Approval (MOD 2), progressive rehabilitation of disturbed areas is being undertaken in a manner that is generally consistent with the final landform in the EA, in alignment with statutory conditions and requirements within plans.

Rehabilitation efforts on Lot 218 include the establishment of a vegetative bund on the western edge of the extraction area as the site is governed by the natural movement of sand into the extraction area. As active quarrying occurred within the western portion of the pit during 2017, the bund has not yet been constructed and vegetated. The objective of the bund is to provide a physical barrier between the mobile sand and native vegetation on the landward side of the mobile dunes.

Rehabilitation at Lot 220 is being undertaken progressively as sand extraction proceeds. Ongoing short term rehabilitation strategies are primarily focused on maximising the availability and viability of biological resources for use in rehabilitation activities, including the salvage and reuse of material for habitat enhancement and the management of topsoil.

Initial works including revegetation and weed control have commenced on boundary bunds and within an approximately 2 hectare area where extraction is complete. Other works include the utilisation of vegetative material cleared ahead of quarrying operations. The vegetative material is utilised as perimeter bunding to control erosion of the active faces of the quarry. No additional rehabilitation was undertaken during the report period.

**Table 8.1** shows the status of rehabilitation at Macka's Sand.

### 8.2 Annual Rehabilitation Inspection

The annual rehabilitation inspection of extracted areas within Lot 220 was undertaken during spring 2017. Key observations included:

- Approximately half of the rehabilitation established to date in Lot 220 contains a mix of native shrubs, juvenile trees and ground cover species that are indicative of the surrounding vegetation community type. However, the rehabilitation observed is low quality and not considered to be trending towards the structural or floristic composition of the community required to be present in the final landform.
- The remaining half of the Lot 220 rehabilitation area was dominated by weed species such as including red natal grass (*Melinis repens*), kikuyu grass (*Pennisetum clandestinum*), bitou bush (*Chrysanthemoides monilifera*), farmer's friend (*Bidens pilosa*), Large-leaved Pennywort (*Hydrocotyle bonariensis*) and *Acanthospermum australe*.

Following the rehabilitation inspection, site personnel completed a campaign of weed spraying and hand removal of selected weeds as well as removal of certain eucalypt species that were not part of the final approved landform vegetation species list. Additional tubestock plantings were undertaken during late 2016/early 2017; primarily forest red gum (*Eucalyptus tereticornis*) has been planted in the western portion of the rehabilitation area. A summary of the rehabilitation status is provided in **Table 8.1**.

**Table 8.1 Summary of Rehabilitation Status at Macka's Sand (Lot 220)**

	2016 Report Period (ha)	2017 Report Period (ha)	2018 Report Period (ha) (forecast)
Pit Area	20.9	24.9	29
Area cleared for Extraction	3.5	4	4
Rehabilitation commenced	3.9	3.3	3
Rehabilitation Completed	0	0	2.5

## 8.3 Rehabilitation Trials and Research

No rehabilitation trials were undertaken during the report period.

## 8.4 Actions for the 2018 Report Period

During the 2018 report period, Macka's Sand will maintain the current rehabilitated area in Lot 220 and seek to continue salvage tree hollows and continue weed monitoring and maintenance activities and native tree planting in rehabilitation areas as per recommendations provided within the 2017 rehabilitation inspection report. An additional 3 ha of rehabilitation is proposed in the southwestern portion of the site during 2018.

## 9.0 Community

### 9.1 Community Complaints

Macka's Sand has advised that there were no community complaints received in the 2017 reporting period.

### 9.2 Community Liaison

The Macka's Sand Community Consultative Committee (CCC) met twice during the report period, as agreed by the CCC. The CCC meetings were held on 5 April 2017 and 1 November 2017. Members of the Macka's Sand CCC are included in **Table 9.1** below.

**Table 9.1 Macka's Sand CCC Members for the 2017 Report Period**

Name	Organisation
Ms Margaret Macdonald-Hill	Chairperson
Mr Robert Mackenzie	Macka's Sand
Ms Julie Towers	Community Representative
Mr Cliff Johns	Port Stephens Council representative
Mr Stephen Hufnagl	Community Representative
Mr Kent Sampson	Community Representative
Mr Andrew Smith	Worimi Aboriginal Land Council
Mr Brendan Rice / Mr Daniel Sullivan	Umwelt (Australia) Pty. Ltd. – Consultant

## 10.0 Independent Audits

There were no independent audits undertaken during the 2017 reporting period. An independent Audit has been completed during Quarter 1 2018. The outcomes of the audit will be reported in the 2018 Annual Review with the audit report and associated actions plan to also be placed on the Mackas Sand website.

## 11.0 Non-Compliances during the 2017 Report Period

A summary of non-compliances during the 2017 Report Period is detailed in **Table 11.1** below.

**Table 11.1 2017 Report Period non-compliances**

Date	Description of Non-Compliance/Incident	Corrective Action Taken/Status
November 2016 to 9 January 2017	<p><b>Exceedance of Lot 220 extraction depth non-compliance</b></p> <p>As reported in the 2016 Annual Review, Survey mapping of Lot 220 pit floor identified that extraction of material breached maximum approved depth in both Lot 220 for a period of approximately six weeks from November 2016.</p>	<ul style="list-style-type: none"> <li>• Corrective actions continued into 2017</li> <li>• Remediation works involved minor earthworks to relevel the pit floor height utilising surrounding site sands from the extraction area.</li> <li>• Spot survey completed on 9 January 2017 confirmed that the Lot 220 site had been returned to compliant levels</li> <li>• Further information in <b>Section 11.2</b>.</li> </ul>
28 October 2016 to 4 August 2017	<p><b>Exceedance of Lot 218 extraction depth non-compliance</b></p> <p>Survey mapping of Lot 218 pit floor has identified that extraction of material breached maximum approved depth in Lot 218 during 2016/2017.</p>	<ul style="list-style-type: none"> <li>• Remediation works involved minor earthworks to relevel the pit floor height utilising surrounding site sands from the extraction area (i.e. product sand)</li> <li>• Site survey completed 4 August 2017 confirmed site compliance for Lot 218. Subsequent quarterly surveys confirm compliance</li> <li>• Physical markers were placed on the ground to assist in maintenance of site levels.</li> <li>• Weekly checks of pit floor depth are undertaken by loader operators based on visual inspection / GPS.</li> <li>• Further information in <b>Section 11.2</b>.</li> </ul>

As required as a response to the completion of the 2016 Annual Review by DPE, a summary of the truck movement non-compliances that occurred during 2016 has been provided, refer to **Section 11.1** for further information.

### 11.1 2016 Truck Movement Non-Compliance Summary

As requested by DPE, a summary of the truck movement non-compliances during 2016 and resulting enforcement action that occurred during 2017 is provided below.

### 11.1.1 Non-Compliance Details

A number of truck movement non-compliances were identified to have occurred during 2016. All of the non-compliances, with one exception, occurred in the period 4 January to 19 September 2016. The last identified non-compliance occurred on 18 November 2016.

**Table 6.7** contains a summary of the non-compliances under this condition for exceedances under MOD 1 prior to 15 March 2016 and exceedances under MOD 2 for the remainder of the 2016 report period.

**Table 11.2 Non-compliances for 2016 period under Schedule 3, Condition 4B of Project Approval**

Project Approval	Schedule 3, Condition 4B	No. of Days	No. of Additional Trucks	No. of Non-compliances
<b>MOD 1</b> <b>(1 Jan – 14 Mar 2016)</b>	c) <i>Truck movements (in plus out) do not exceed 10 per hour during the shoulder period</i>	32	95	37
	d) <i>Truck movements (in plus out) do not exceed 16 per hour between 7am and 10pm</i>	23	65	29
<b>MOD 2</b> <b>(15 March – 31 December 2016)</b>	c) <i>laden truck movements exiting the site do not exceed 14 per hour during the period from 5am to 6am, Monday to Friday (except for Public Holidays)</i>	17	32	17
	d) <i>laden truck movements exiting the site do not exceed 8 per hour during the period from 6am to 9am, Monday to Friday (except for Public Holidays)</i>	107	741	197
	f) <i>laden truck movements exiting the site do not exceed 5 per hour between 5am and 6am on Saturdays (except for Public Holidays)</i>	7	10	7
	g) <i>laden truck movements exiting the site do not exceed 9 per hour between 6am and 7am on Saturdays (except for Public Holidays)</i>	12	45	12
<b>TOTAL:</b>		<b>198</b>	<b>988</b>	<b>299</b>

Under MOD 1, a total of 66 non-compliances occurred between 4 January and 14 March 2016. Where the criteria were exceeded, an additional 160 truck movements occurred on 55 individual days above the allowable limit during this time.

A total of 233 non-compliances occurred under MOD 2 of the Project Approval in 2016. These events occurred between 17 March 2016 and 18 November 2016 over 143 individual days. Where the criteria were exceeded, 828 additional trucks exited the site above the allowable limit during this period.

The cause of the non-compliances was found to relate to a software error within the automated weighbridge management system. The automated weighbridge management system did not limit truck movements as required by accordance with Condition 4B of Schedule 3 of the Project Approval. The error was fixed on 21 September 2016. An additional non-compliance occurred on 18 November 2016 as a result of a separate weighbridge system error. This error was resolved early in 2017 and there have been no identified non-compliances following the non-compliance on 18 November 2016.

The resulting impacts were limited in that:

- Noise monitoring undertaken during the period of non-compliant truck movements found no non-compliances with noise criteria.
- No complaints were received from the community, RMS or road users.
- No safety incidents involving trucks exiting the site occurred as a result of the non-compliant truck movements.

Umwelt, on behalf of Macka's Sand, have undertaken a detailed review of the truck movement log for the site on a monthly basis during 2017, the review has identified no further non-compliances with the truck movement criteria. The last identified non-compliance occurred on 18 November 2016.

### 11.1.2 Non-Compliance Reporting and Enforcement Action

A timeline of the non-compliance reporting process and enforcement action taken are provided in **Table 11.3**.

**Table 11.3 Timeline of Reporting and Enforcement Action Relating to 2016 Truck Movement Non-Compliance**

Timing	Item
20 July 2017	Truck movement non-compliances identified and reported to DPE via phone and email.
27 July 2017	Written Truck Movement Incident Report provided to DPE, explaining non-compliances identified and corrective actions taken to ensure the truck weighbridge software limited trucks as required.
15 August 2017	Show Cause Notice received regarding truck movement non-compliances.
12 September 2017	Macka's Sand Response to Show Cause report provided to DPE
16 October 2017	Penalty Notice received by Macka's Sand for truck movement non-compliances. A Voluntary Undertaking provided by DPE detailed actions that were <u>not</u> agreed to by Macka's Sand.
6 November 2017	A letter providing alternative measures to the Voluntary Undertaking sent to DPE. The alternative action of revising the Macka's Sand Drivers Code of Conduct is suggested as a proposed measure.
13 November 2017	Letter received by Macka's Sand from DPE accepting Macka's Sand response to the Voluntary Undertaking. DPE approved the proposed action to revise Macka's Sand Drivers Code of Conduct and resubmit to DPE.
5 December 2017	Revised Drivers Code of Conduct submitted to DPE
20 December 2017	Revised Drivers Code of Conduct approved by DPE

## 11.2 2016 / 2017 Extraction Depth Non-Compliance Summary

### 11.2.1 Non-Compliance Details

Extraction depth surveying undertaken in December 2016 confirmed that the site was non-compliant with the approved extraction depth limits allowed in the Project Approval and in the EPL 13218 at both Lots 218 and Lot 220 during the 2016 report period. These extraction depth non-compliances and the resulting corrective actions continued into 2017. The following information regarding the incidents has been extracted from a report provided in response to the Show Cause Notice regarding the extraction depth non-compliance.

#### Lot 220

The pit floor depth at Lot 220 was identified to be non-compliant for a period of less than 6 weeks during late 2016 to early January 2017. Lot 220 was below the approved extraction depth limit in the south-eastern portion of the site that was attributed to current operations in the vicinity of the active extraction face. The areas of non-compliance were primarily 0.6 metres to 0.7 metres above maximum predicted groundwater level, indicating a minor non-compliance with the extraction depth limit defined by Condition 7a of Schedule 2 of PA 08\_0142 (i.e. 0.3 m to 0.4 m below the approved extraction depth).

Resurvey confirmed that the pit floor was compliant on 9 January 2017. Centurion has advised that the non-compliance at Lot 220 was identified in 20 December 2016 and a spot survey undertaken on 9 January 2017 confirmed that the site had returned to level. Site trimming works are undertaken on a regular basis and as such, Centurion have advised that the non-compliant period for Lot 220 is restricted to the area shown on the survey plan for 20 December 2016 and was limited to a period of approximately 6 weeks or less, as the previous survey spot checks from 28 November showed compliance with the approved extraction depth limit.

Centurion has advised that ongoing quarterly surveys have identified that Lot 220 has maintained compliance with approved extraction limits since this time.

#### Lot 218

On 28 October 2016, Centurion identified that areas of Lot 218 were below the approved extraction limit. Following the identification of the non-compliance, Centurion notified Robert Mackenzie (Director of Macka's Sand) following which Macka's Sand progressed consideration of a review of its systems to improve site operational procedures and management measures to attempt working at a height above the approved limit. Site survey completed on 28 October 2016 indicates extraction depths of the site ranged from Project Approval compliant levels to up to 1.3 metres below the approved extraction depth of 1 metre above the maximum predicted groundwater level.

Throughout summer, particularly during low rainfall periods, site operators continued to find trafficability difficult on the sand, due to dry and soft conditions, and, despite measures implemented (including removal of tread on tyres), found that releveling of the site to lower depths was required in order to operate efficiently. Damage to machinery and equipment has also occurred as a result of operating above the approved extraction limit.

An additional site survey of Lot 218 was conducted in December 2016 and mapping indicated the extraction depth was below the approved extraction limit. The site levels shown on the site survey for 20 December 2016 showed extraction depths ranging from compliant levels to up to 2 metres below the approved extraction depth limit.

A survey of Lot 218 conducted on 1 March 2017 confirmed that areas of the site remained non-compliant with the approved extraction limit. The site levels shown on the site survey for 1 March 2017 show extraction depths ranging from compliant levels to up to 2 metres below the approved extraction limit.

Areas of Lot 218 were below compliance levels until commencement of treatment activities in July 2017. Treatment activities were completed in August 2017 and site surveys show the site to be at compliant levels on 4 August 2017.

Activities undertaken to remediate the site involved filling of the pit with surrounding site sands (i.e. product sand), to compliant levels. Subsequent soil and groundwater sampling undertaken by RCA (Australia) Pty Limited (RCA) found no evidence of environmental harm as a result of the operations being undertaken below the approved depths.

The key findings from this investigation are as follows:

- The material comprising the backfill and undisturbed sands were of consistent type.
- No observations of potentially contaminated material were identified during fieldwork.
- Sample analysis results indicate the absence of contaminated material.
- The concentrations of hydrocarbons, asbestos and the majority of metals for all samples was below the level of detection. Manganese and Iron concentrations above the level of detection were recorded at 10 of the 39 samples analysed. These concentrations are however considered representative of the sand material and were also below relevant ecological and human health criteria.
- No acid sulphate soils were encountered.

The quarterly surveys completed by Centurion Surveying for October and December 2017 show the site to be compliant with extraction depth levels.

## 11.2.2 Non-Compliance Reporting and Enforcement Action

A timeline of the non-compliance reporting process and enforcement action taken in regard to the extraction depth non-compliances are provided below in **Table 11.4**.

**Table 11.4 Timeline of Reporting and Enforcement Action Relating to 2016/2017 Extraction Depth Non-Compliances**

Timing	Item
<b>31 March 2017</b>	Macka's Sand Annual Review submitted to DPE providing details of Lot 218 and Lot 220 extraction depth non-compliances.
<b>22 June 2017</b>	Show Cause Notice received by Macka's Sand from DPE
<b>4 August 2017</b>	Macka's Sand Response to Show Cause report provided to DPE
<b>4 September 2017</b>	Penalty Notice regarding extraction depth non-compliance received by Macka's Sand. Voluntary Undertaking provided by DPE detailed actions that were agreed to by Macka's Sand.
<b>29 November 2017</b>	Soil testing report completed by RCA and submitted to DPE. The soil testing report required by DPE Voluntary Undertaking completed.

## 12.0 Activities Proposed in the 2018 Annual Review Period

Anticipated activities for Macka's Sand during the 2018 report period include:

- continuation of extraction operations in Lot 218 and Lot 220
- continuation of rehabilitation activities as detailed in **Section 9**
- completion of the Independent Environmental Audit and any required actions as a result of the audit.
- continued liaison with OEH regarding the Biodiversity Offsets Strategy and approval of the Voluntary Conservation Agreement.

## 13.0 References

Aquas (2015) *2014 Independent Environmental Audit of Macka's Sand Quarry*. Prepared for Macka's Sand Pty Limited.

NHMRC, NRMCC (2011) *Australian Drinking Water Guidelines Paper 6 – National Water Quality Management Strategy*.

NSW Government (2015) *Annual Review Guideline: Post-approval requirements for State significant mining developments*.

Umwelt (Australia) Pty Limited (2012) *Environmental Assessment of Modifications to Macka's Sand Extraction Operations on Lot 218 and Lot 220, Salt Ash*. Prepared for Macka's Sand Pty Limited.

Umwelt (Australia) Pty Limited (2014) *Macka's Sand Ecological Monitoring Program for Lot 220 DP 1049608, Salt Ash*. Prepared for Macka's Sand Pty Limited.

Umwelt (Australia) Pty Limited (2011) *Determination of Maximum Predicted Groundwater Level and Maximum Extraction Level at Lot 218 and Lot 220, Salt Ash*. Prepared for Macka's Sand Pty Limited.

NSW Environment Protection Agency (NSW EPA) (2014) *Protection of the Environment Operations (Waste) Regulation 2014*.



## APPENDIX 1

### DPI Water Report

## Project Background

Macka's Sand Pty Ltd (Macka's Sand) was granted Major Project Approval 08\_0142 in September 2009 by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* to operate sand extraction operations at Salt Ash, approximately 25 kilometres north-east of Newcastle, in the Port Stephens local government area of New South Wales (NSW) (refer to **Figure 2.1**).

Macka's Sand has approval to extract and process sand from Lot 218 and Lot 220 as shown on **Figure 2.1**. Lot 220 has an identified resource of 9.6 million tonnes however Lot 218 has a potentially indefinite extraction life due to the ongoing movement of sand from the mobile dunes into the approved extraction area.

At the time of preparing this report, sand extraction was being undertaken on both Lot 220 and Lot 218.

## Scope

This report has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of Macka's Sand. The reporting requirements for Macka's Sands are outlined in the DPI – Water (formerly New South Wales Office of Water (NOW)) Approval to undertake extraction works within the North Stockton Catchment Area.

In accordance with Condition 3 of Clause 9 of the NOW Approval under Clause 10(1) of the *Hunter Water Regulation 2015* (the 'NOW Approval') Macka's Sand is required to submit the following to Hunter Water Corporation (HWC) and NOW:

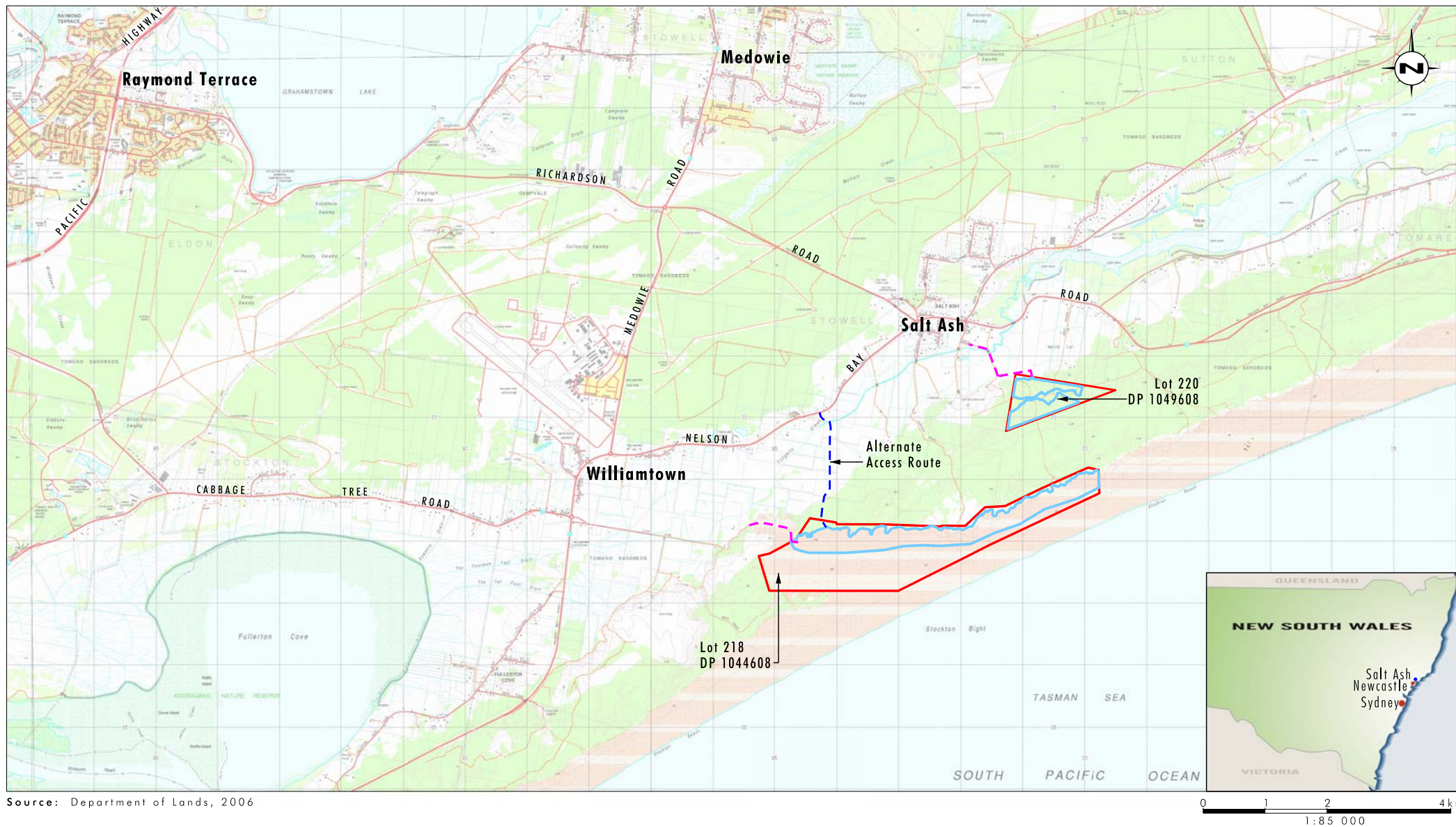
'...a written report (Operations Report) addressing whether the Approval Holder has achieved compliance with:

- i. the requirements for the method of Extractive Operations in Clause 3 of the Schedule;
- ii. the Operations Management Procedure;
- iii. the Hydrocarbon Spill Procedure; and
- iv. the requirement for the progressive replacement of topsoil provided in Clause 6(3) of the Schedule'

In addition, in accordance with Condition 4 of the NOW Approval, the Operations Report must:

- '4a) identify any non-compliance during the previous year; and
- 4b) Identify what actions were, or are being, taken to ensure compliance.'

The details of compliance with the above conditions are detailed in the sections below.



## **Requirements for the Method of Extractive Operations**

### **Laser Level Monitoring**

As part of a May 2015 audit of Macka's Sand operations, DPE identified that extraction of material breached the maximum approved depth level in both Lot 218 and Lot 220 voids of Macka's Sand Quarry. As a result, Macka's Sand has since undertaken laser level monitoring to demarcate extraction limits using GPS equipment installed on machinery and physical markers on the ground where possible. In addition to laser level monitoring, Macka's Sand completed analysis of exposed material for contamination before returning the floor to approved AHD depth level using clean product material. Macka's Sand have also identified a breach of extraction depth during 2016/2017 report period at both Lot 218 and Lot 220. Further testing completed by RCA during 2017 identified no evidence of environmental harm. Physical markers have been installed to assist in the identification of the appropriate extraction depth level at the site.

Macka's Sand will continue regular quarterly surveying of the site in accordance with the Operational Management Practices and outcomes of the voluntary undertaking with DPE.

### **Machinery and Equipment**

Macka's Sand has advised that during the report period that all site machinery and equipment was maintained in a proper and efficient condition. Clause 3 (2) of the NOW approval states that 'the approval holder must remove all machinery used in the Extractive Operations from the Land at the end of each day's operation'. Macka's Sand has approval to operate for 24 hours a day. However, all mobile machinery not anticipated to be in active use is to be removed from Lot 218 or Lot 220. Vehicle storage locations are located outside of the North Stockton Catchment Area.

### **Storage of Contaminants**

Macka's Sand has advised that during the report period, no hydrocarbon materials or other potential contaminants were stored on either Lot 218 or Lot 220, within the North Stockton Catchment Area.

### **Refuelling**

Macka's Sand has advised that during the report period, all refuelling was undertaken by a registered contractor. Refuelling of mobile equipment occurs at the Macka's Sand and Soil administration and maintenance facility, or at the vehicle storage area at the northern end of the Alternate Access Route, as appropriate. Macka's Sand uses sieves and/or stockpilers at Lot 220 and Lot 218 that have limited mobility, being moved once or twice a year. Offsite refuelling of plant with limited mobility is not considered feasible. As such, refuelling of plant with limited mobility occurs within the extraction areas via the usage of mobile refuelling equipment. In order to minimise the risk of fuel spills, and the impact of spills should they occur, refuelling equipment consists of a fuel tank, spill catch tray and spill kit. An additional mobile spill kit is located within the extraction area to enable prompt clean up in the event of an accidental spill during refuelling activities.

### **Operations Management Procedure**

The Operations Management Procedure outlines the standard methods and practices of utilisation of plant and equipment at the site. Macka's Sand has advised that the works at the site were undertaken in accordance with the Operations Management Procedure during 2017.

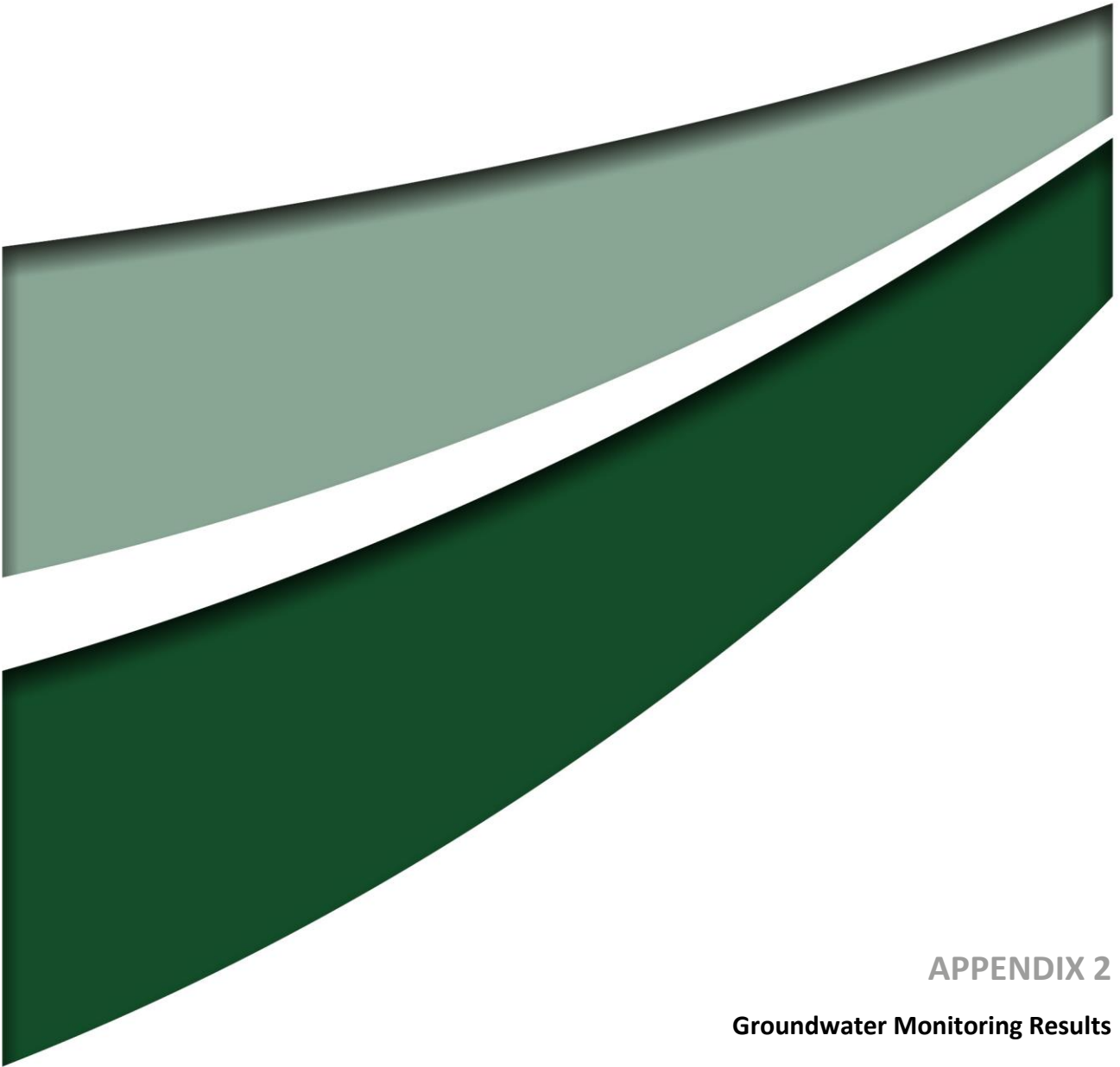
## **Hydrocarbon Spill Procedure**

Macka's Sand has advised that the works at the site were undertaken in accordance with the Hydrocarbon Spill Procedure during 2017. No spills were recorded during 2017.

Any spills, should they occur, will be managed in accordance with Section 4.3.3 of the Operational Management Procedure to prevent fuel from contaminating the North Stockton groundwater source. Any contaminated material to be disposed of will be done so in accordance with relevant waste management requirements.

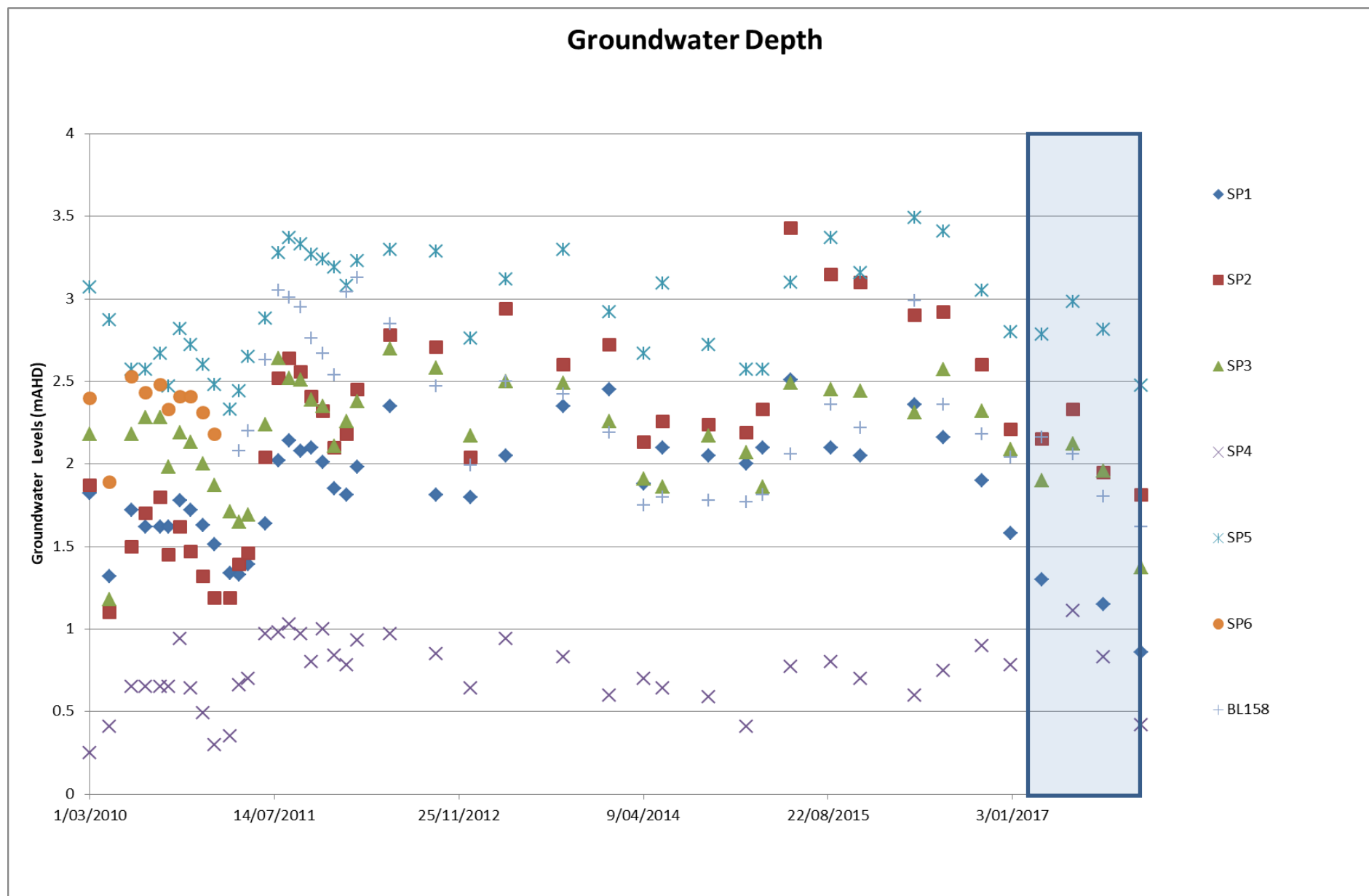
## **Rehabilitation**

No topsoil was emplaced at Lot 220 as part of rehabilitation works during 2017.

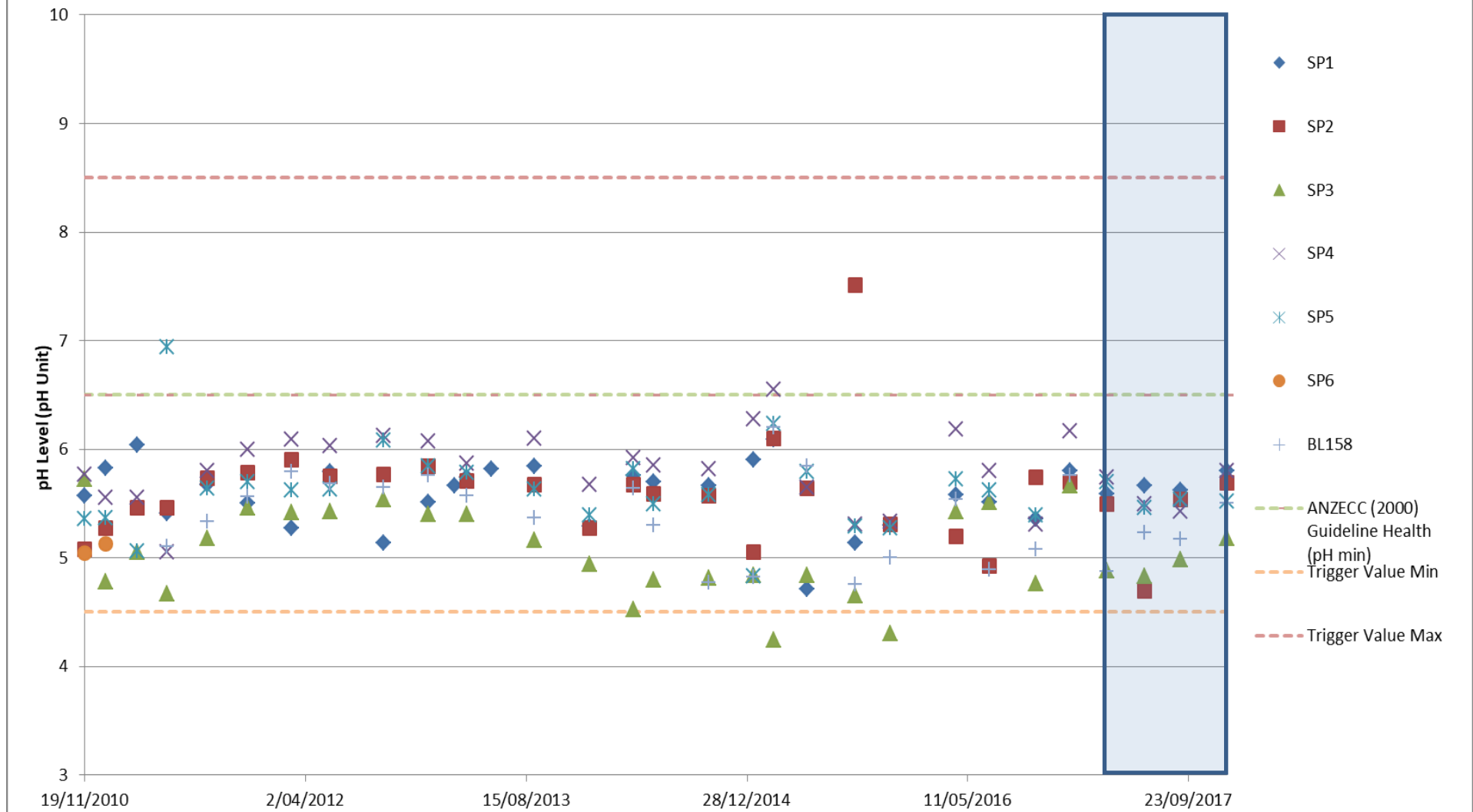


## APPENDIX 2

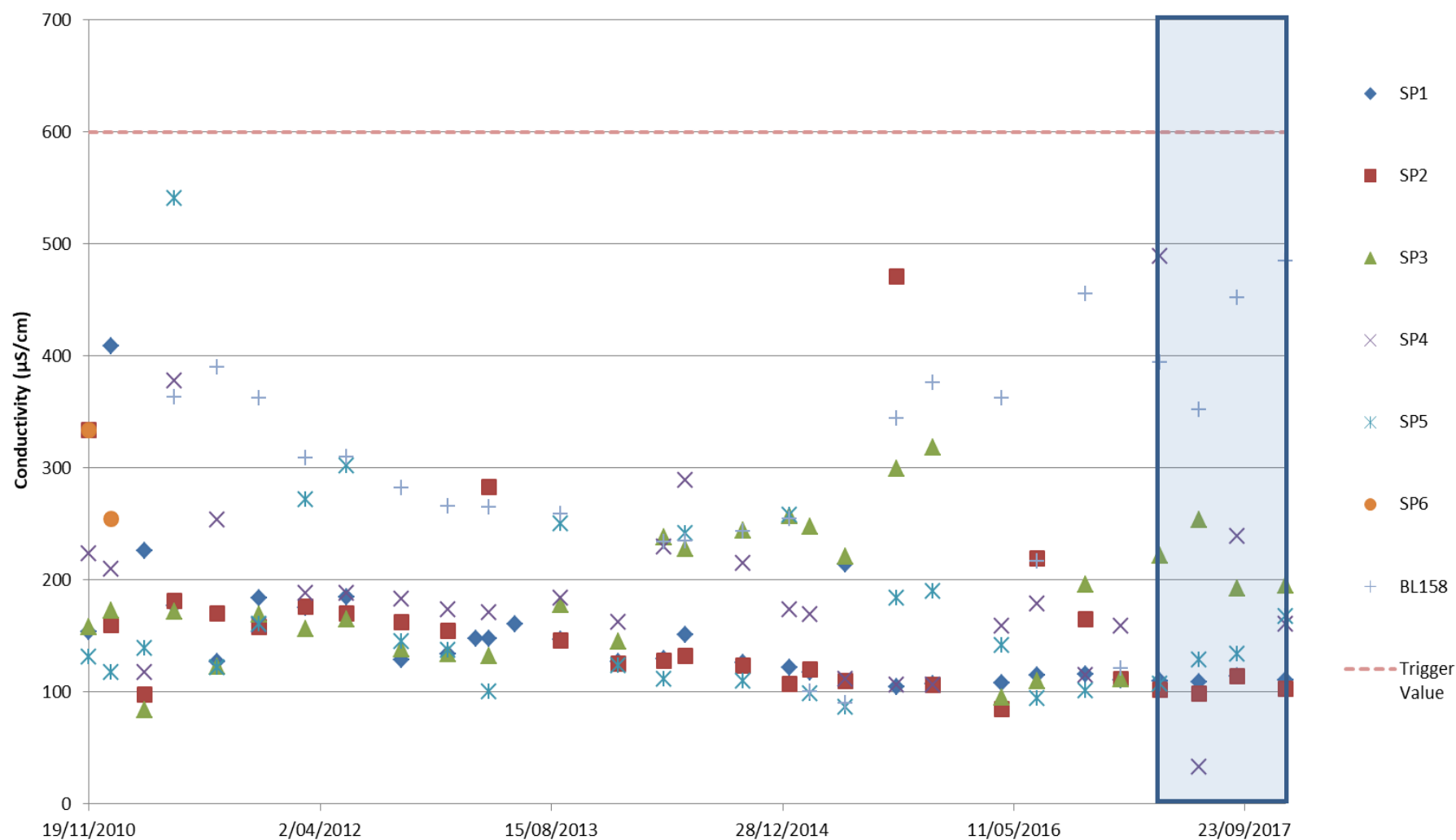
### Groundwater Monitoring Results



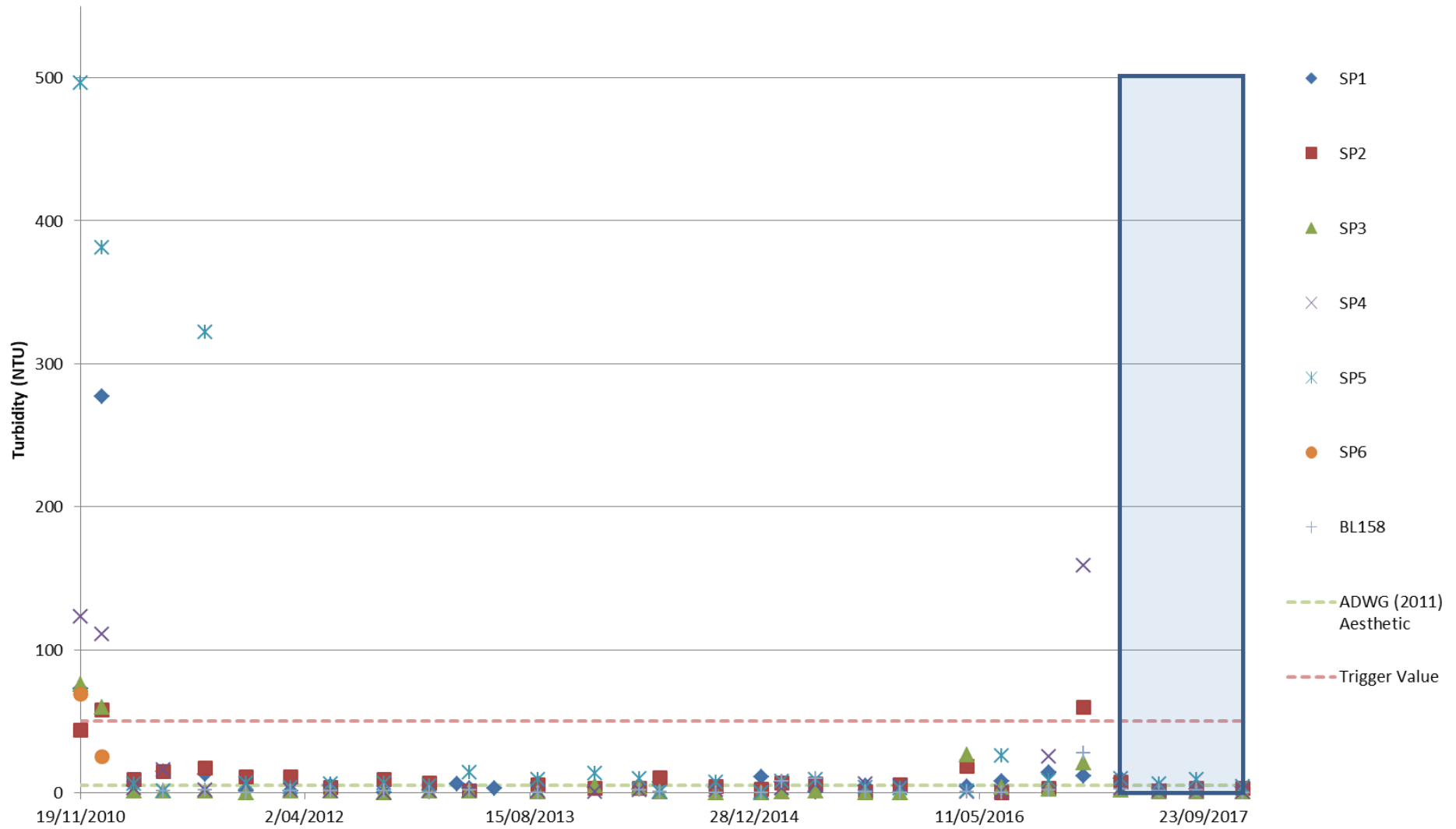
pH Level

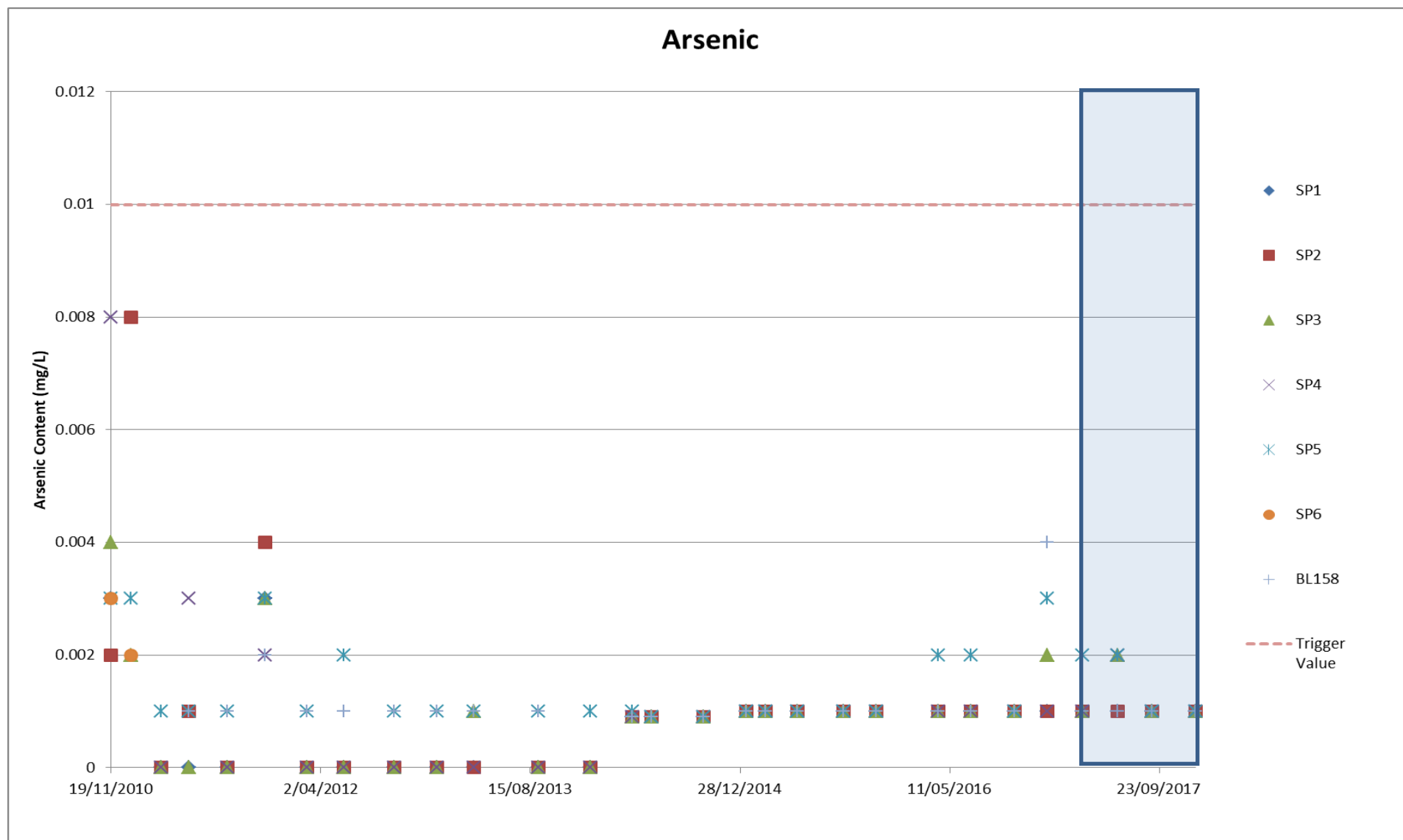


# Electrical Conductivity

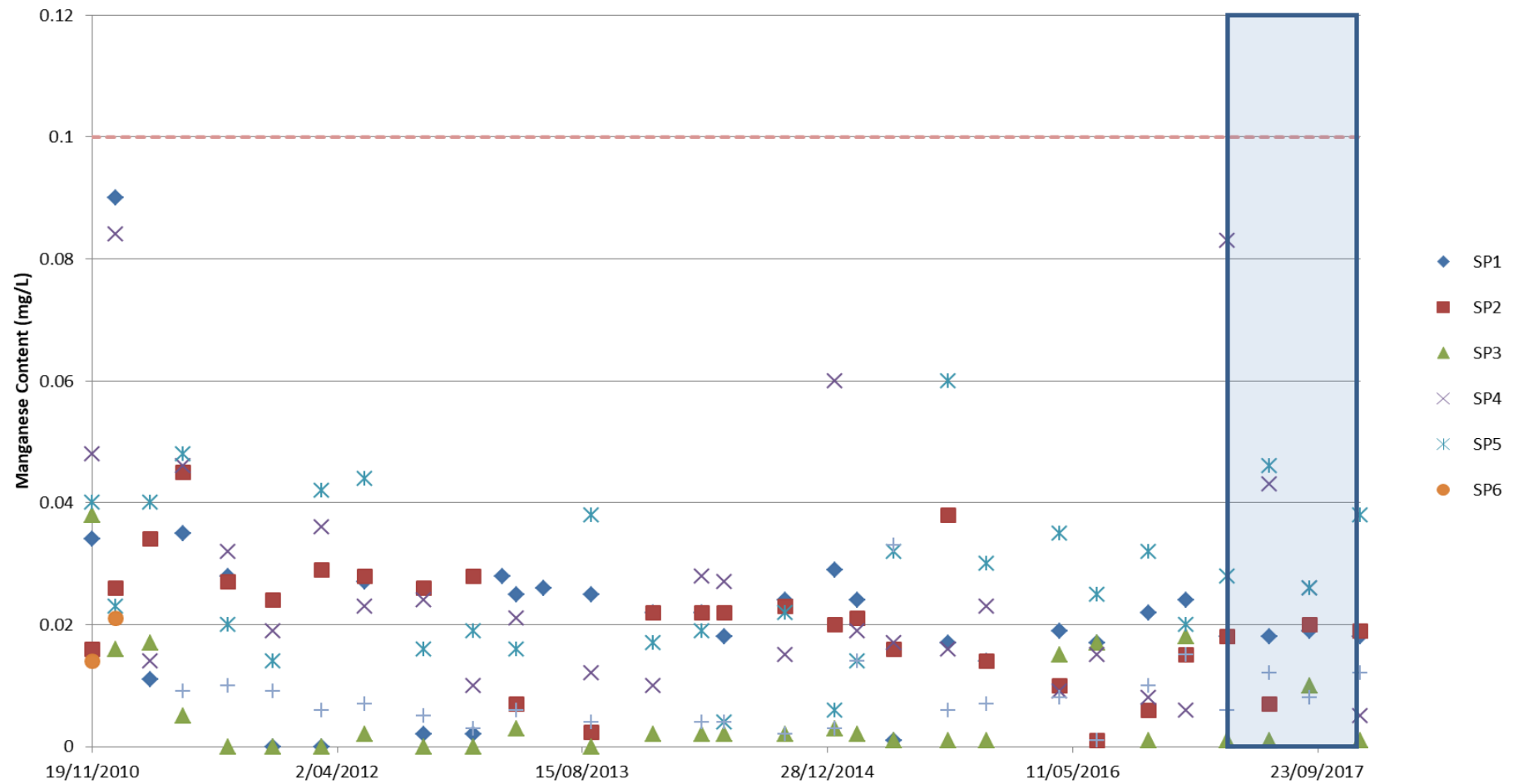


# Turbidity

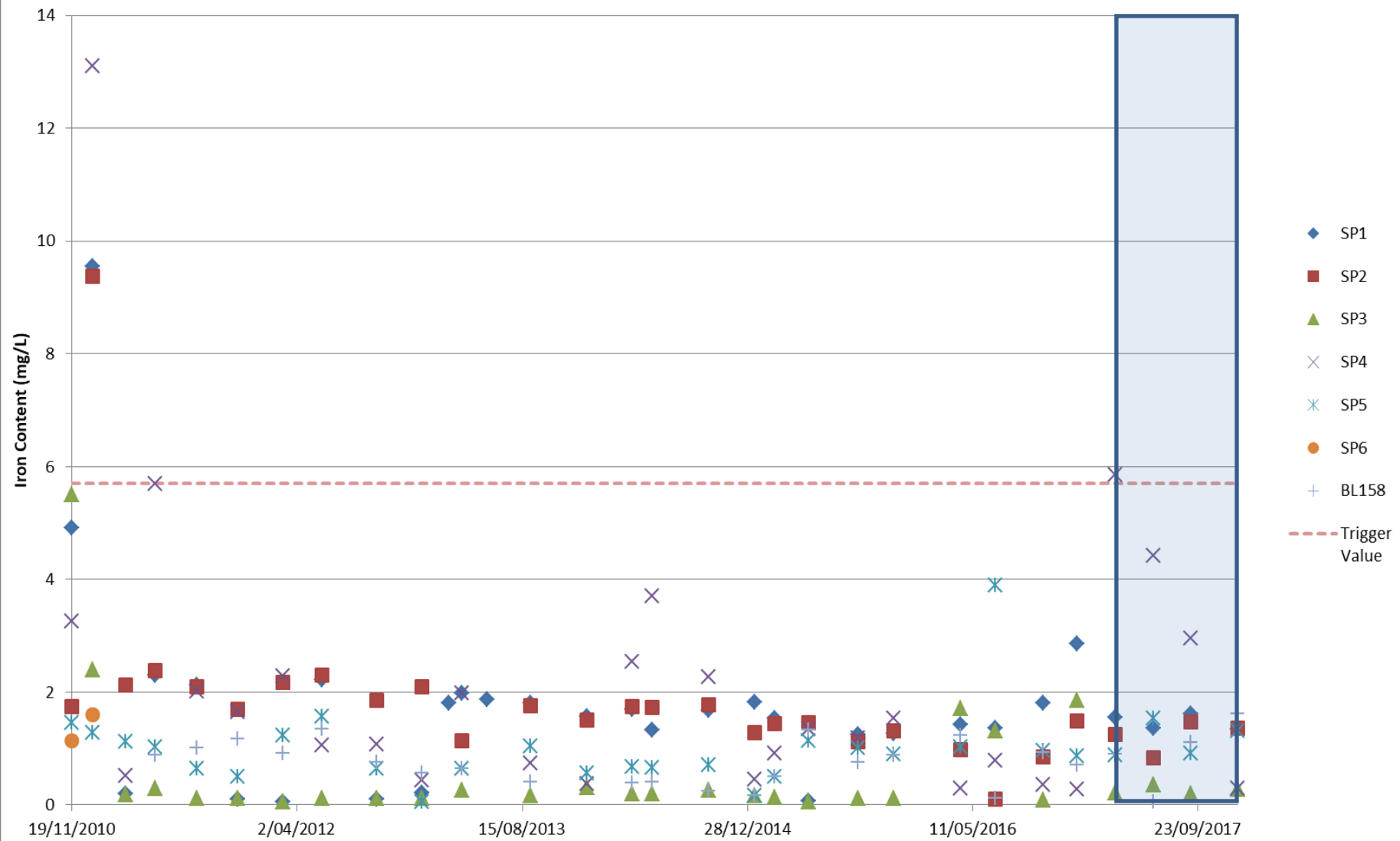


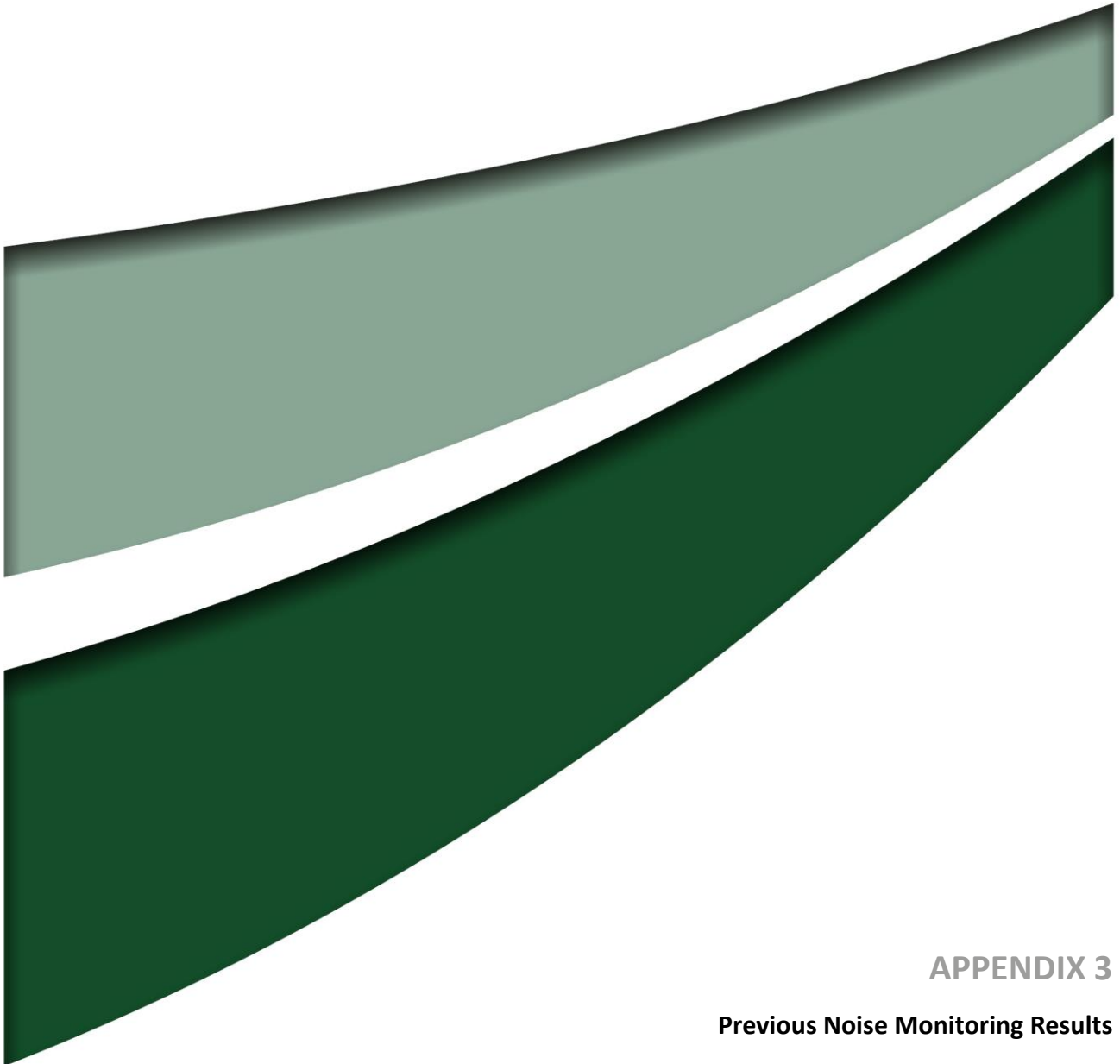


# Manganese



# Iron





## APPENDIX 3

### Previous Noise Monitoring Results

## Compliance results – Attended Industrial Noise Monitoring – Night Time Period 2014, 2015 & 2016

Location	Year	Monitoring period	Measure	Measured noise level	Estimated contribution from Macka's Sand	Meteorological conditions	Compliant
Site 1	2014	6:30am	LA90, 15 min	50	- 2	Calm, 8°C, 98%	Yes
			LAeq, 15 min	53	< 35		Yes
			LA1, 1 min	67	< 45		Yes
	2015	06:23 – 06:38	LA90, 15 min	47.8	-	Calm conditions; few clouds; 5.9°C; 93% RH	Yes
			LAeq, 15 min	50.0	< 35		Yes
			LA1, 1 min	62.7	< 35		Yes
	2016	06:25 – 06:40	LA90, 15 min	47.4	-	Calm conditions, 0/8 okta, 8°C, 95% RH	Yes
			LAeq, 15 min	49.5	< 35		Yes
			LA1, 1 min	59.7	< 35		Yes
Site 2	2014	6:00am	LA90, 15 min	48	- 2	Calm, 6°C, 94%	Yes
			LAeq, 15 min	50	< 30		Yes
			LA1, 1 min	54	< 45		Yes
	2015	06:49 – 07:04	LA90, 15 min	49.6	-	Calm conditions; few clouds; 4.4°C; 94% RH	Yes
			LAeq, 15 min	54.9	<35		Yes
			LA1, 1 min	71.1	<35		Yes
	2016	06:54 – 07:09	LA90, 15 min	52.4	-	Calm conditions, 0/8 okta, 8°C, 95% RH	Yes
			LAeq, 15 min	60.0	< 35		Yes
			LA1, 1 min	77.4	< 35		Yes
Site 6	2014	-	-	-	-	No measurements conducted during night period	-
			-	-	-		-
			-	-	-		-
	2015	5:50-6:05	LA90, 15 min	50.6	-		Yes
			LAeq, 15 min	55.7	<35 sand extraction 37 Alternate Access Road		Yes
			LA1, 1 min	63.5	<35		Yes

Location	Year	Monitoring period	Measure	Measured noise level	Estimated contribution from Macka's Sand	Meteorological conditions	Compliant
Site 6	2016	05:51 – 06:06	LA90, 15 min	57.2	-	Calm conditions, 0/8 okta, 5°C, 90% RH	Yes
			LAeq, 15 min	60.1	Sand extraction operations not audible < 38 Alternate Access Road		Yes
			LA1, 1 min	66.7	Sand extraction operations not audible		Yes

## Compliance results – Attended Industrial Noise Monitoring – Day Period 2014, 2015 & 2016

Location	Year	Monitoring period	Measure	Measured noise level	Estimated contribution from Macka's Sand	Meteorological conditions	Compliant
Site 1	2014	7am	LA90, 15 min	50	-	Calm, 8°C, 97%	Yes
			LAeq, 15 min	53	<30		Yes
			LA1, 1 min	66	N/A		Yes
	2015	10:04-10:19	LA90, 15 min	50.1	Not audible	Wind at 0.4m/s to 0.6m/s, gusting to 0.9m/s from the WSW to W; few clouds; 17.3°C;58% RH	Yes
			LAeq, 15 min	58.7	Not audible		Yes
			LA1, 1 min	78.1	Not audible		Yes
	2016	08:35-8:50	LA90, 15 min	39.4	<35	Wind at 0.5 to 0.8m/s, gusting to 1.1m/s from the NNW, 0/8 okta, 14°C, 85% RH	Yes
			LAeq, 15 min	43.4	<35		Yes
			LA1, 1 min	64.5	<35		Yes
Site 2	2014	7:57am	LA90, 15 min	47	-	1.8 m/s, SW, 10°C, 91%	Yes
			LAeq, 15 min	49	<30		Yes
			LA1, 1 min	63	N/A		Yes
	2015	10:46-11:01	LA90, 15 min	40.8	Not audible	Wind at 0.6m/s to 1.3m/s, gusting to 2.1m/s from the ESE to SSE; few clouds; 18.1°C; 56% RH	Yes
			LAeq, 15 min	46.6	Not audible		Yes
			LA1, 1 min	57.2	Not audible		Yes
	2016	09:04 – 09:19	LA90, 15 min	42.3	Not audible	Wind at 0 to 0.4m/s, gusting to 2.3m/s from the NNW; 0/8 okta; 18°C; 70% RH	Yes
			LAeq, 15 min	54.7	Not audible		Yes
			LA1, 1 min	74.6	Not audible		Yes
Site 4	2014	Location not measured during this time					
	2015	11:14-11:29	LA90, 15 min	46.6	Not audible	Wind at 0.9m/s to 1.6m/s, gusting to 2.4m/s from the ESE to SSE; few clouds; 17°C; 52% RH	Yes
			LAeq, 15 min	58.8	Not audible		Yes
			LA1, 1 min	78.4	Not audible		Yes
	2016	09:26-09:41	LA90, 15 min	51.1	Not audible	Wind at 0.8 to 1.6m/s, gusting	Yes

Location	Year	Monitoring period	Measure	Measured noise level	Estimated contribution from Macka's Sand	Meteorological conditions	Compliant	
			LAeq, 15 min	57.7	Not audible	to 2.3m/s from the NNW; 0/8 okta; 18°C; 70% RH	Yes	
			LA1, 1 min	69.8	Not audible		Yes	
Site 5	2014	Location not measured during this time						
	2015	09:32-09:47	LA90, 15 min	56.1	Not audible	Wind at 0.4m/s to 0.8m/s, gusting to 1.1m/s from the NW; sky clear; 15.6°C; 64% RH	Yes	
			LAeq, 15 min	66.2	Not audible		Yes	
			LA1, 1 min	78.5	Not audible		Yes	
	2016	07:49 – 08:04	LA90, 15 min	57.2	Sand extraction operations not audible; <40 Alternate Access Road	Calm, gusting to 0.6m/s from the NW; 0/8 okta; 12°C; 85% RH	Yes	
			LAeq, 15 min	65.8			Yes	
			LA1, 1 min	76			Yes	
	Site 6	2014	Location not measured during this time					
		2015	09:04-09:19	LA90, 15 min	50.7	Not audible	Calm conditions' sky clear; 18.4°C; 55% RH	Yes
LAeq, 15 min				58.2	Not audible	Yes		
LA1, 1 min				67	Not audible	Yes		
2016		07:23 – 07:38	LA90, 15 min	55.2	Sand extraction operations not audible; <40 Alternate Access Road	Calm, gusting to 0.6m/s from the N; 0/8 okta; 12°C; 85% RH	Yes	
			LAeq, 15 min	58.5			Yes	
			LA1, 1 min	64.7			Yes	

## Compliance results – Comparison of traffic noise results in 2014, 2015 and 2016

Macka's Sand 1 hour Night and Day Time Road Traffic Noise Level Contribution versus Noise Criteria, dB(A)

Road	Period	Noise criteria LAeq, 1hour	Noise level contribution LAeq,1hour				
			2642 Nelson Bay Rd	Cnr Oakvale Dr and Nelson Bay Rd		2353 Nelson Bay Rd	
			2014	2015	2016	2015	2016
Lavis Lane, Oakvale Drive, Nelson Bay Road	Night	55	44	36	<46	34	<54
	Day	60	50	38	<40	30	<56
	<b>Compliant</b>		Yes	Yes	Yes	Yes	Yes



## APPENDIX 4

Temperature & Wind Rose Data

Temperature data has been sourced from the records of the Williamtown RAAF Base meteorological station and is summarised in **Table A1** below.

**Table A1 Average Monthly Temperature Data 2017**

Month	Temperature (°C)
January	31.5
February	31.0
March	26.5
April	23.5
May	21.3
June	18.0
July	19.0
August	19.8
September	25.0
October	25.5
November	24.9
December	30.4

## Wind Roses

Wind rose data has been sourced from the records of the Williamtown RAAF Base meteorological station and is summarised in **Figure A1** below.



# SEASONAL WIND SPEED ANALYSIS

## Williamtown Airport

Wind Speed (m/s)

0.5 to < 0.9

0.9 to < 1.7

1.7 to < 3.0

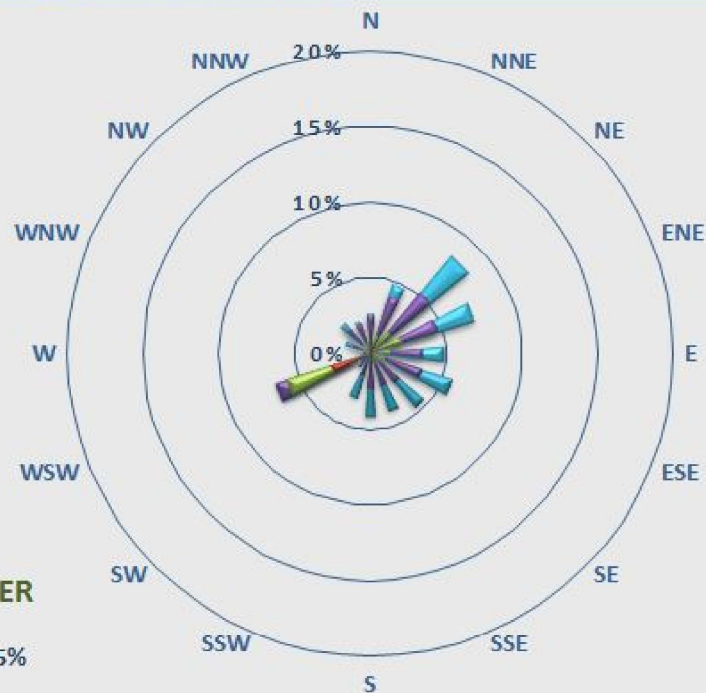
3.0 to < 4.5

4.5 to < 6.0

Data Source: Williamtown Airport 01 Jan 2017 to 01 Jan 2018

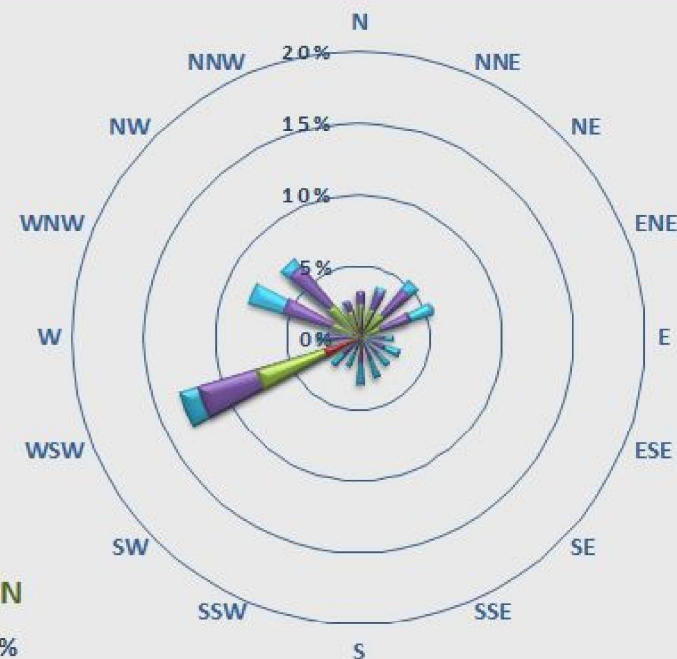
### SUMMER

Calm 7.5%



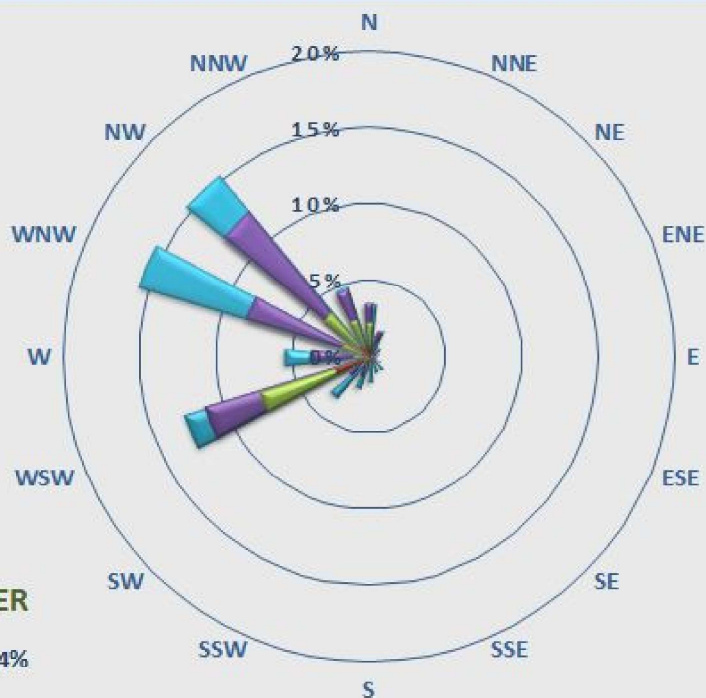
### AUTUMN

Calm 10.0%



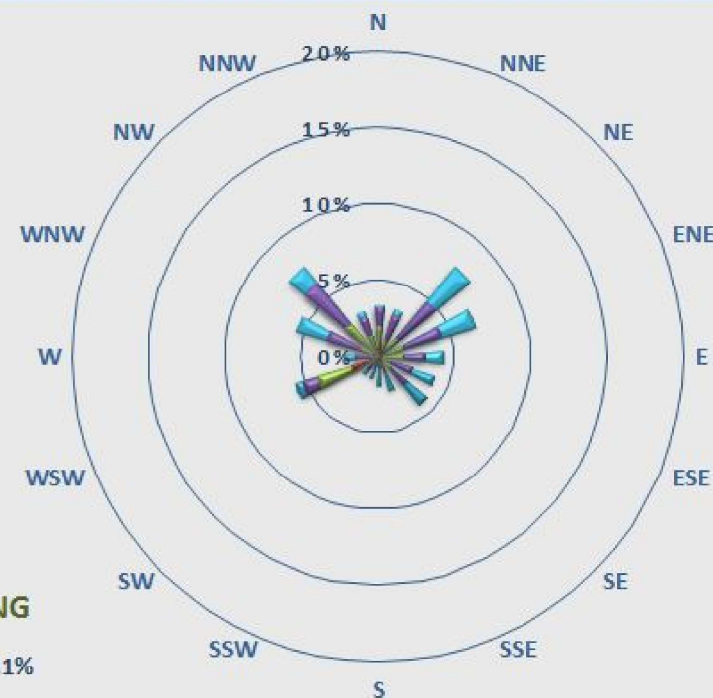
### WINTER

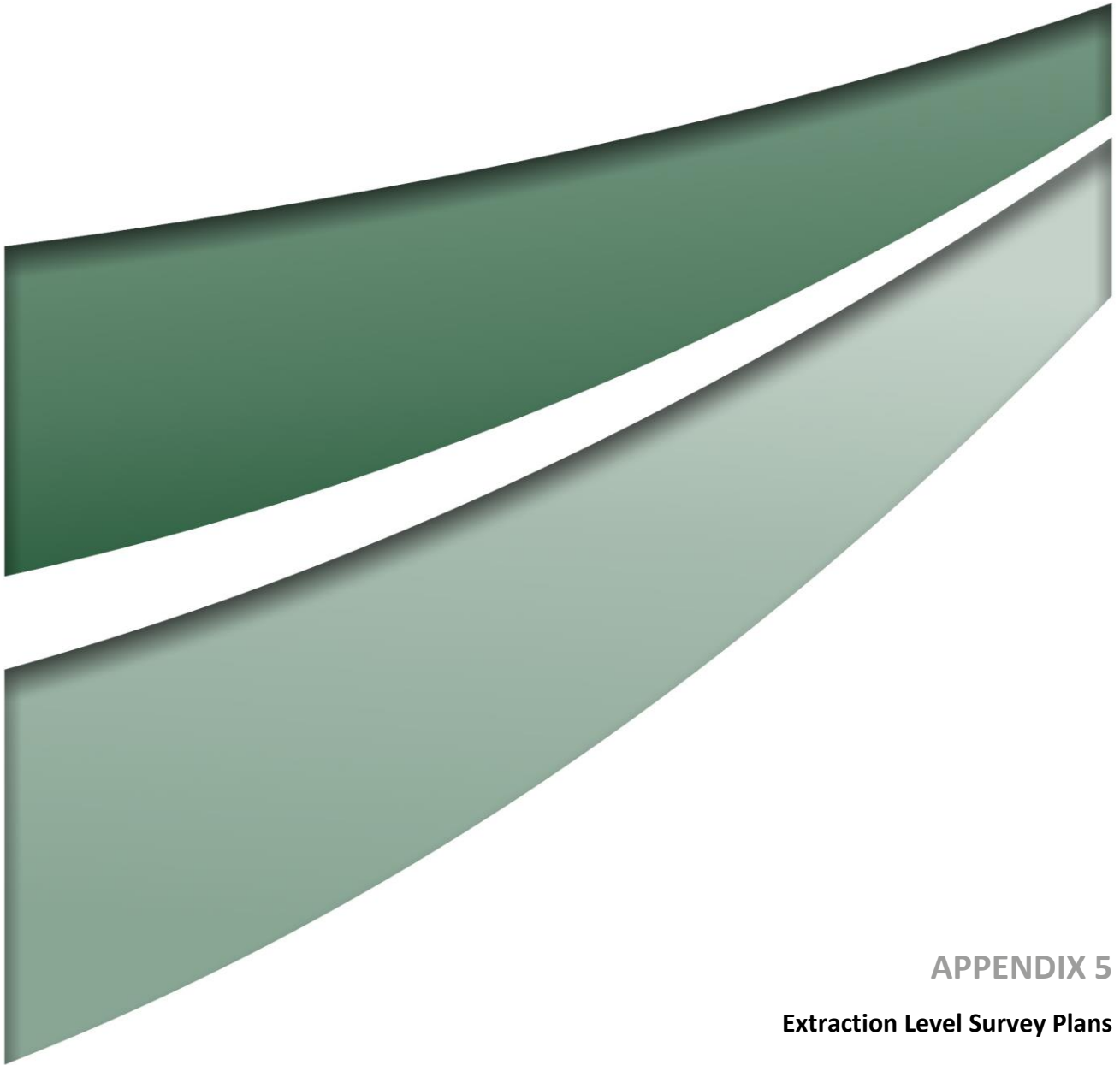
Calm 6.4%



### SPRING

Calm 7.1%





## APPENDIX 5

### Extraction Level Survey Plans



**CENTURION  
SURVEY**

SITE ENTRY

LOT 218 BOUNDARY

4.50

4.50

4.75

5.00

4.75

CONTOURS 1M ABOVE MAXIMUM  
PROBABLE WATER TABLE LEVEL

5.00

## CURRENT EXTRACTION FLOOR LEVELS 01/03/2017

5.00

LOT 218 BOUNDARY

EXTRACTION BOUNDARY

SITE PLAN

DEPTH BELOW 1M ABOVE MAXIMUM  
PROBABLE WATER TABLE LEVEL

Lower_value	Upper_value	Colour
-2.0	to -1.3 m	
-1.3	to -0.45 m	
-0.45	to -0.35 m	
-0.35	to -0.3 m	
-0.3	to -0.2 m	
-0.2	to -0.1 m	
-0.1	to 0.0 m	
0.0	to 0.1 m	
0.1	to 0.2 m	
0.2	to 2.0 m	

SITE:

**LOT 218 DP 1044608**

**2**

DRAWING NO.

**0014**

PROJECT NO.

**01/03/2017**

DATE.

TITLE:

**CURRENT EXTRACTION LEVELS**

**NOT TO SCALE**

SCALE AT A4.

**CEJ**

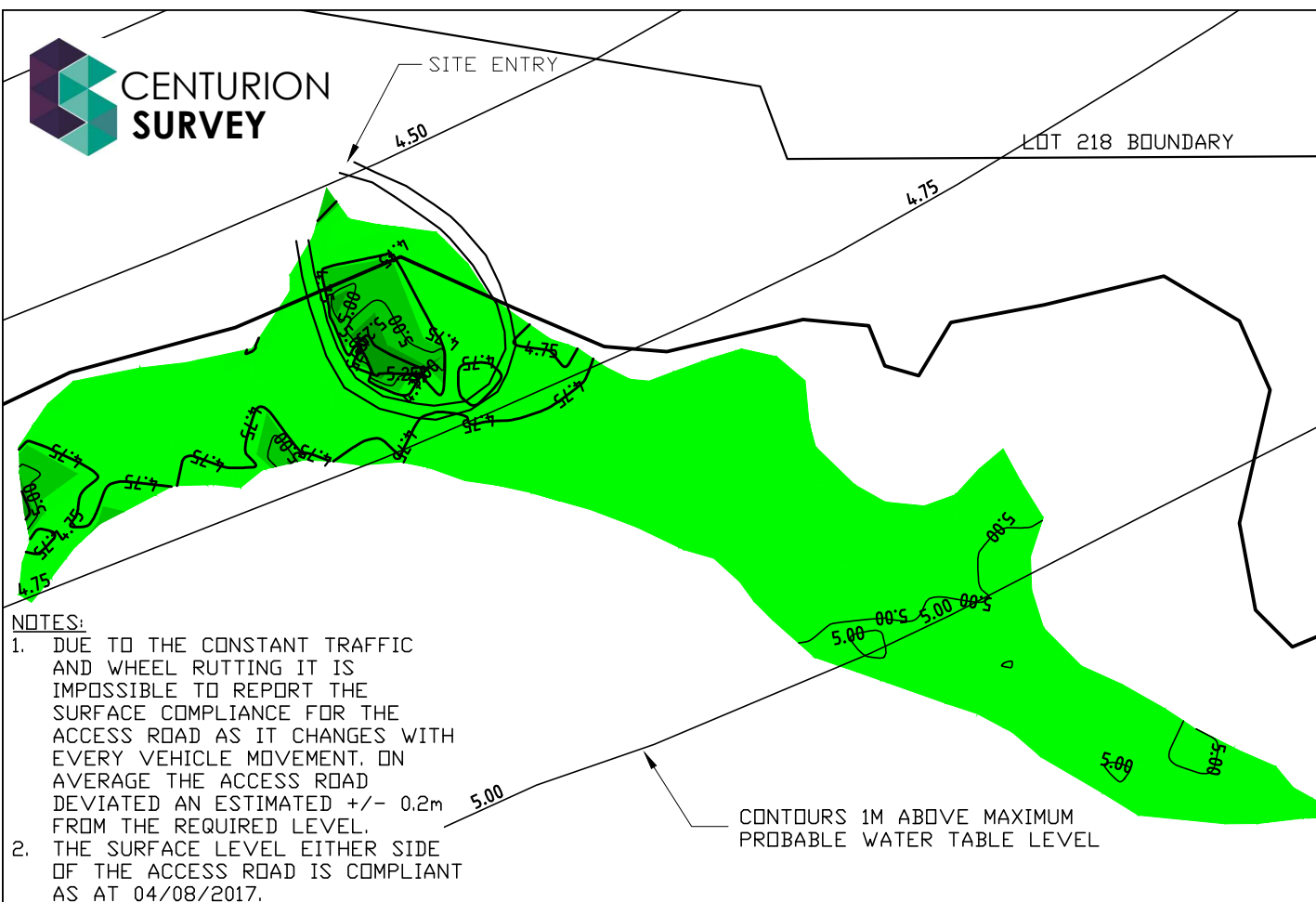
DRAWN.

**MH**

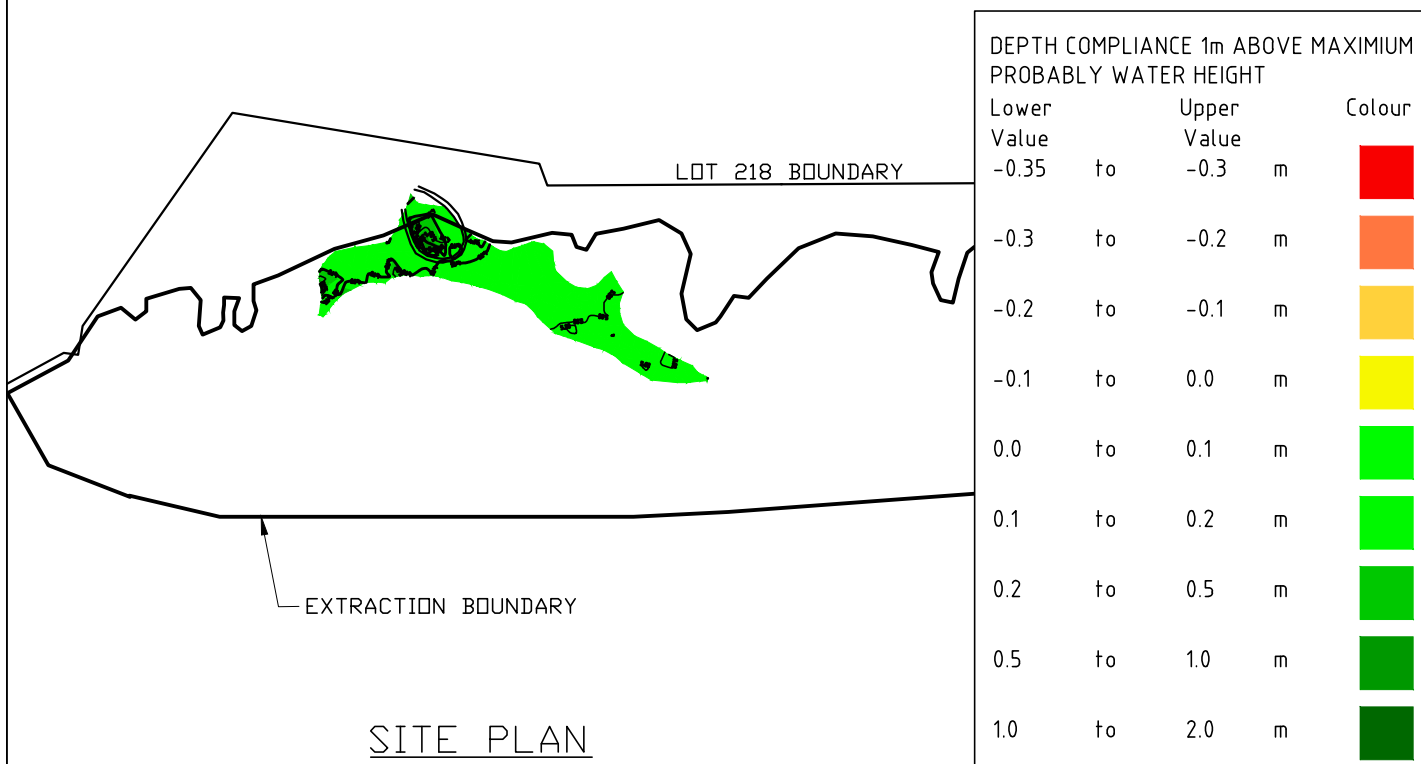
CHECKED.

**A**

REVISION.













## CURRENT EXTRACTION FLOOR LEVELS 04/08/2017

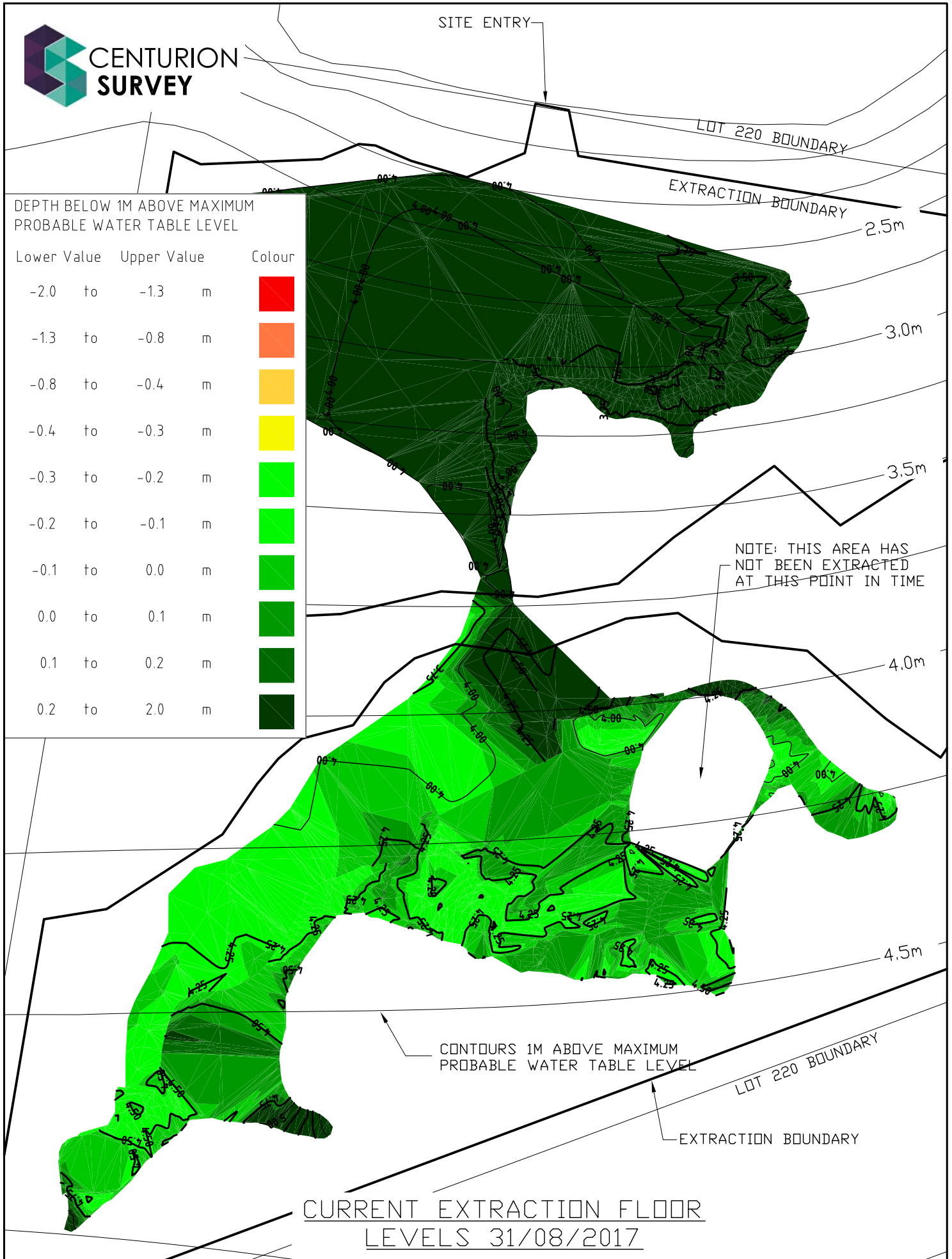


SITE PLAN

SITE: <b>LOT 218 DP 1044608</b>	<b>1</b> DRAWING NO.		<b>0014</b> PROJECT NO.	<b>04/08/2017</b> DATE.
TITLE: <b>CURRENT EXTRACTION LEVELS</b>	<b>NOT TO SCALE</b> SCALE AT A4.	<b>CEJ</b> DRAWN.	<b>MH</b> CHECKED.	<b>A</b> REVISION.

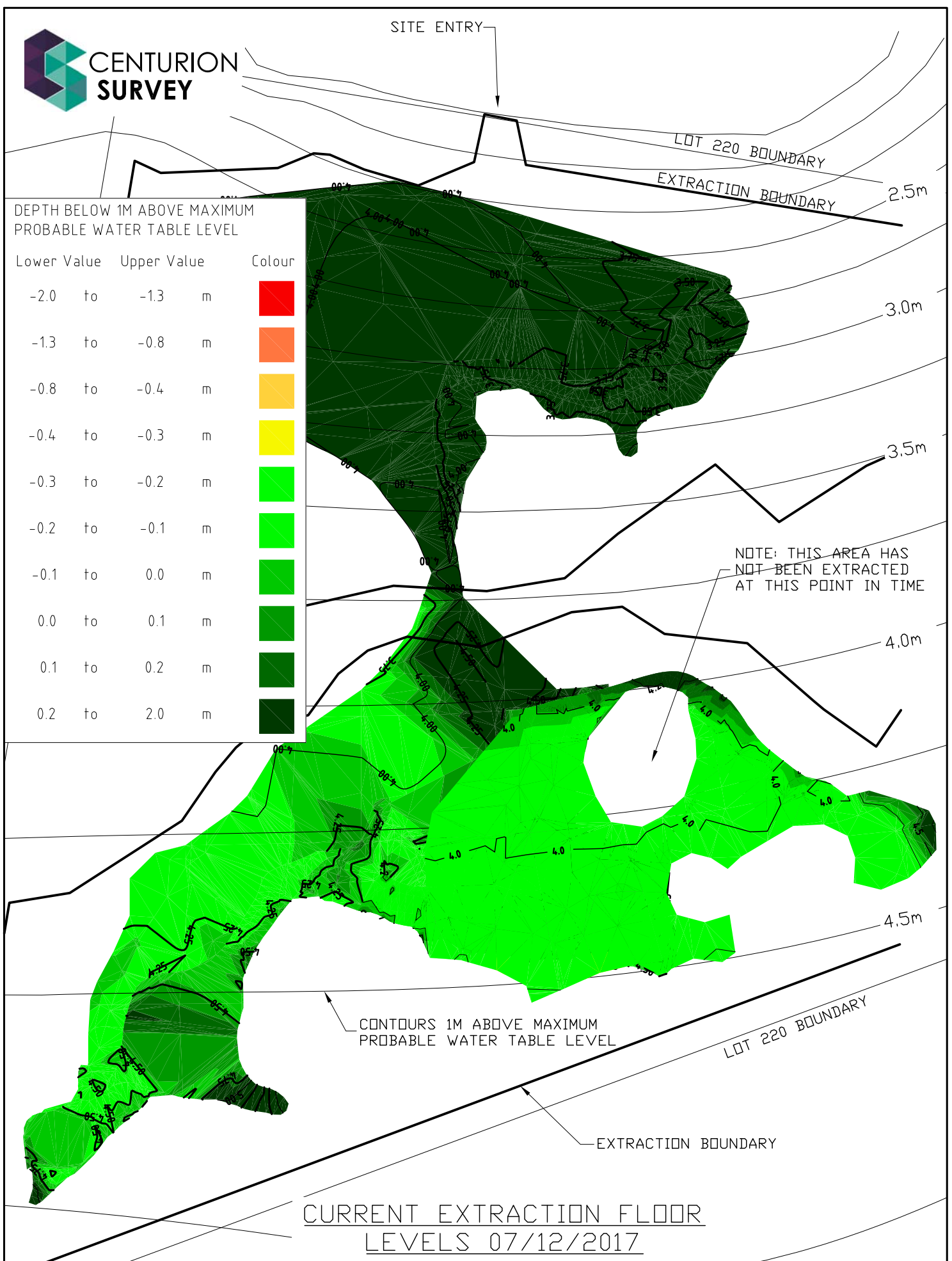
DEPTH BELOW 1M ABOVE MAXIMUM  
PROBABLE WATER TABLE LEVEL

Lower Value		Upper Value		Colour
-2.0	to	-1.3	m	
-1.3	to	-0.8	m	
-0.8	to	-0.4	m	
-0.4	to	-0.3	m	
-0.3	to	-0.2	m	
-0.2	to	-0.1	m	
-0.1	to	0.0	m	
0.0	to	0.1	m	
0.1	to	0.2	m	
0.2	to	2.0	m	

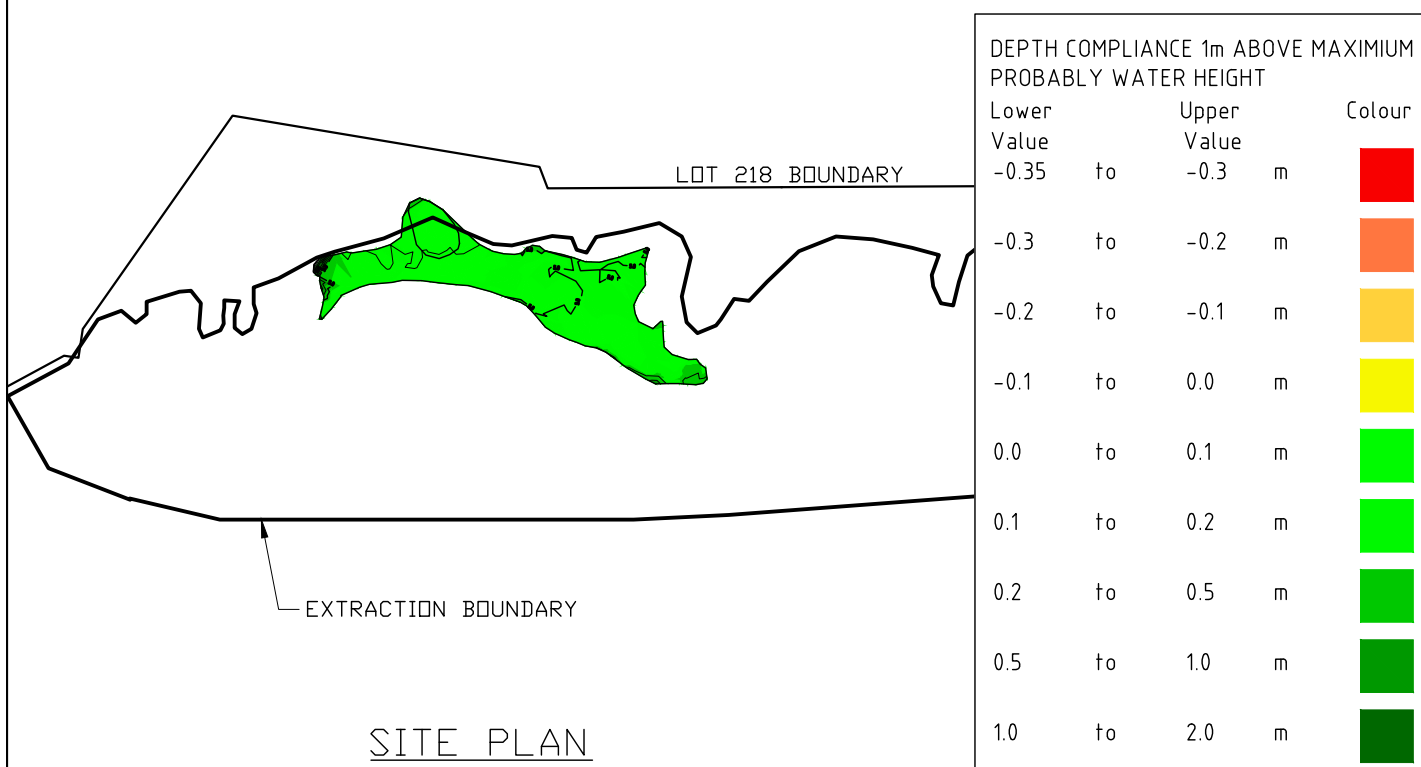
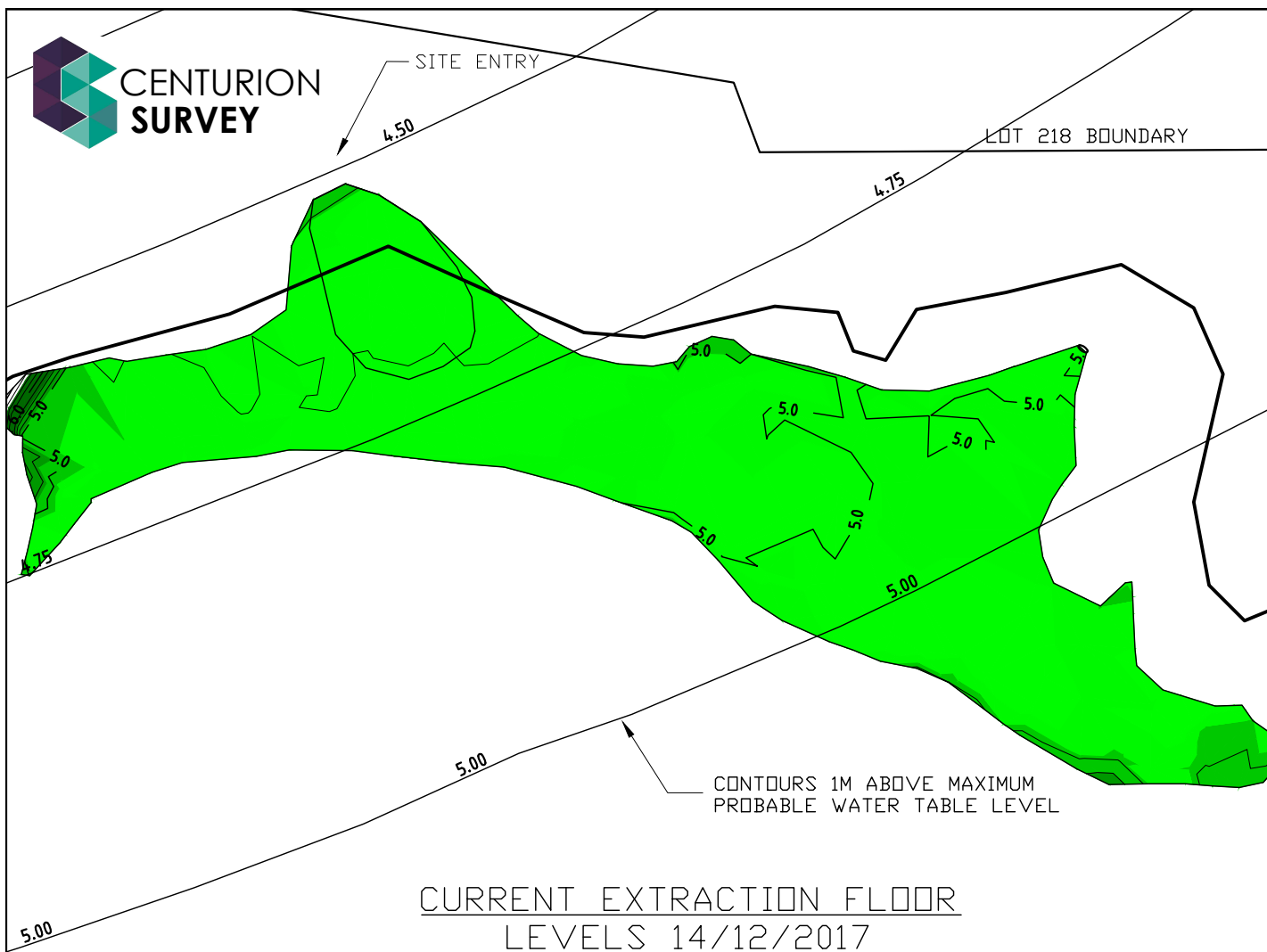


SITE:	LOT 220 DP 1049608	1 DRAWING NO.		0014 PROJECT NO.	31/08/2017 DATE.
TITLE:	CURRENT EXTRACTION LEVELS	NOT TO SCALE SCALE AT A4.	CEJ DRAWN.	MH CHECKED.	A REVISION.

DEPTH BELOW 1M ABOVE MAXIMUM PROBABLE WATER TABLE LEVEL				Colour
Lower Value	to	Upper Value		
-2.0	to	-1.3	m	
-1.3	to	-0.8	m	
-0.8	to	-0.4	m	
-0.4	to	-0.3	m	
-0.3	to	-0.2	m	
-0.2	to	-0.1	m	
-0.1	to	0.0	m	
0.0	to	0.1	m	
0.1	to	0.2	m	
0.2	to	2.0	m	



SITE: <b>LOT 220 DP 1049608</b>		<b>220DEC2017</b> DRAWING NO.		<b>0014</b> PROJECT NO.	<b>07/12/2017</b> DATE.
TITLE: <b>CURRENT EXTRACTION LEVELS</b>		<b>NOT TO SCALE</b> SCALE AT A4.	<b>CEJ</b> DRAWN.	<b>MH</b> CHECKED.	<b>A</b> REVISION.



SITE: <b>LOT 218 DP 1044608</b>	<b>218DEC2017</b> DRAWING NO.	<b>0014</b> PROJECT NO.	<b>14/12/2017</b> DATE.
TITLE: <b>CURRENT EXTRACTION LEVELS</b>	<b>NOT TO SCALE</b> SCALE AT A4.	<b>CEJ</b> DRAWN.	<b>MH</b> CHECKED. <b>A</b> REVISION.



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