

PF FORMATION



## HITCHCOCK ROAD SAND EXTRACTION AND REHABILITATION PROJECT, MAROOTA

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT  
**2015 - 2016**



# PF Formation

## HITCHCOCK ROAD MAROOTA

### Sand Extraction and Rehabilitation Project

# ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

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## Executive Summary

South East Environmental has been engaged by PF Formation to prepare this Annual Environmental Management Report as per the Project Approval Conditions. This document reviews the project criteria and reports on the project performance and compliance from July 2015 until June 2016.

The Hitchcock Road Sand Extraction and Rehabilitation Project was approved in 2009 with an expected and approved life span of 20 years. The 100 hectare site has a yearly extraction approval of 400,000 tonnes per annum. Total sales from the site for the reporting period was 275,924 tonnes, far less than the approved extraction tonnage.

Sand extracted from the Hitchcock Road Project is washed and sold from the Patricia Fay Drive Sand Processing Plant (Lot 198) directly to wholesalers and the public.

### Noise

Noise compliance testing and reporting was conducted by Koikas Acoustics Pty Ltd during the 2015-2016 period. The report concluded that the project complied with the nominated noise levels set by the EPA for the project approval. Natural noises and other un-natural noises, such as traffic, were the main contributing factors to noise at the monitoring sites.

No noise complaints were received in 2015-2016.

### Air

Air quality testing was undertaken by Boral Materials Testing and Environmental Services throughout 2015-2016. All monitoring sites were well under the nuisance criterion annual monthly average of  $4 \text{ g/m}^2/\text{month}$ .

No dust complaints were received in 2015-2016.

### Water

Ground water levels are monitored continuously throughout the year at 4 separate licenced bore locations using a Solinst datalogger. Due to the above average rainfall in the Maroota area during the year 2015-2016 the bore levels have shown an increased response to water table level. Pumping did occur from 2 licenced bores on lot 198 throughout the year however the annual allocation of 60ML was not exceeded. Water pumping also took place from licenced spring POR 167 however the annual allocation of 50ML from this spring was within normal amounts.

The ground water analysis met all requirements necessary for the year 2015-2016 and showed no abnormalities.

### Rehabilitation

Rehabilitation of the site is in line with the targets previously set for the long term success of the project, although targeted weeding is recommended for continued success.

### Social Impacts

The Community Consultative Council met twice during the reporting period of 2015-2016 with no significant matters arising concerning social impacts on the community at large.

### Overall

The Hitchcock Road Sand Extraction Project is currently working within the existing approvals based on the project conditions. Targeted weed management within the rehabilitation areas has been recommended for the next 12 month period to improve the success of the project.

PF Formation aim to maintain or enhance the sand extraction projects environmental performance at Hitchcock Road in the following 12 month period in order to uphold their exceptional record of compliance.



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- 1. Project approval**
- 2. EPA Licence Annual Return**
- 3. Monthly Environmental Operational Procedures Checklist**
- 4. Annual Environmental Operational Procedures**
- 5. Location Weather Chart**
- 6. Site Current Photos**
- 7. Site plan**
- 8. Weighbridge Verification Certificate**
- 9. Noise Management Report**
- 10. Air Quality Report**
- 11. Ground Water Report**
- 12. Surface Water Monitoring Results**
- 13. Rehabilitation Report**
- 14. CCC Meeting Minutes**
- 15. 2014 Audit**
- 16. NSW Department of Planning and Environment Compliance Audit Report**
- 17. PF Formation Compliance Audit Action Plan**

## Chapter One

### INTRODUCTION

PF Formation operate a sand quarry positioned between Hitchcock Road, Old Northern Road and Wisemans Ferry Road located in Maroota which is within The Hills District of the Sydney Basin in New South Wales. The Hitchcock Road Sand Extraction and Rehabilitation Project has approval to extract 400,000 tonnes of sand per annum over a period of 20 years across the 100 hectare site.

Following the lodgement of a Development Application (DA) and associated Environmental Assessment (EA) under Part 3A of the *Environmental Planning and Assessment Act 1979*, the present development was approved by the Minister for Planning on 3 February 2009 (**Attachment 1**). The conditions attached to the approval required, among other things, the preparation of five management plans/monitoring programs:

- Environmental Strategy – results in Chapter 3
- Noise Management Plan – results in Chapter 5
- Air Quality Monitoring Program – results in Chapter 6
- Water Management Plan – results in Chapter 7
- Landscape Management Plan – results in Chapter 8

The first revision of these Plans occurred in 2011 and the Department of Planning and Environment (DPE) approved the revised Plans on 15 November 2011. The Plans have since been updated with the most recent approval given on the 21<sup>st</sup> of July 2016.

Each of these documents sets out the various monitoring programs required to comply with the requirements of the approval conditions. The monitoring results are summarised in an annual report known as the Annual Environmental Management Report (AEMR). This is submitted 12 months from the date of approval and every year thereafter to the Director-General, relevant agencies and the Community Consultative Committee (CCC).

This AEMR will:

- identify the standards and performance measures that apply to the project
- describe the works that will be carried out in the next 12 months
- include a summary of the complaints received during the past year and compare this to complaints received in previous years
- include a summary of the monitoring results for the project during the past year from July 1 to 30 June
- include an analysis of these results against the relevant
  - impact assessment criteria/limits
  - monitoring results from previous years

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### ➤ predictions in the EA

- identify any trends in the monitoring results over the life of the project
- identify any non-compliance during the previous year; and
- describe what actions were, or are being, taken to ensure compliance.

The Approval requires the project to have an Independent Environmental Audit within 12 months of the date of approval and every three years thereafter. The audit will:

- be conducted by a suitably qualified, experienced and independent person(s) whose appointment has been approved by the Director-General;
- include consultation with the relevant agencies;
- assess the environmental performance of the project and its effects on the surrounding environment;
- assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and
- review the adequacy of any strategy/program required under this approval and, if necessary, recommend measures or actions to improve the environmental performance of the project and/or any strategy/plan/program required under this approval.

Further information on the Independent Environmental Audit can be found in Chapter 10 of this Annual Environmental Management Report.

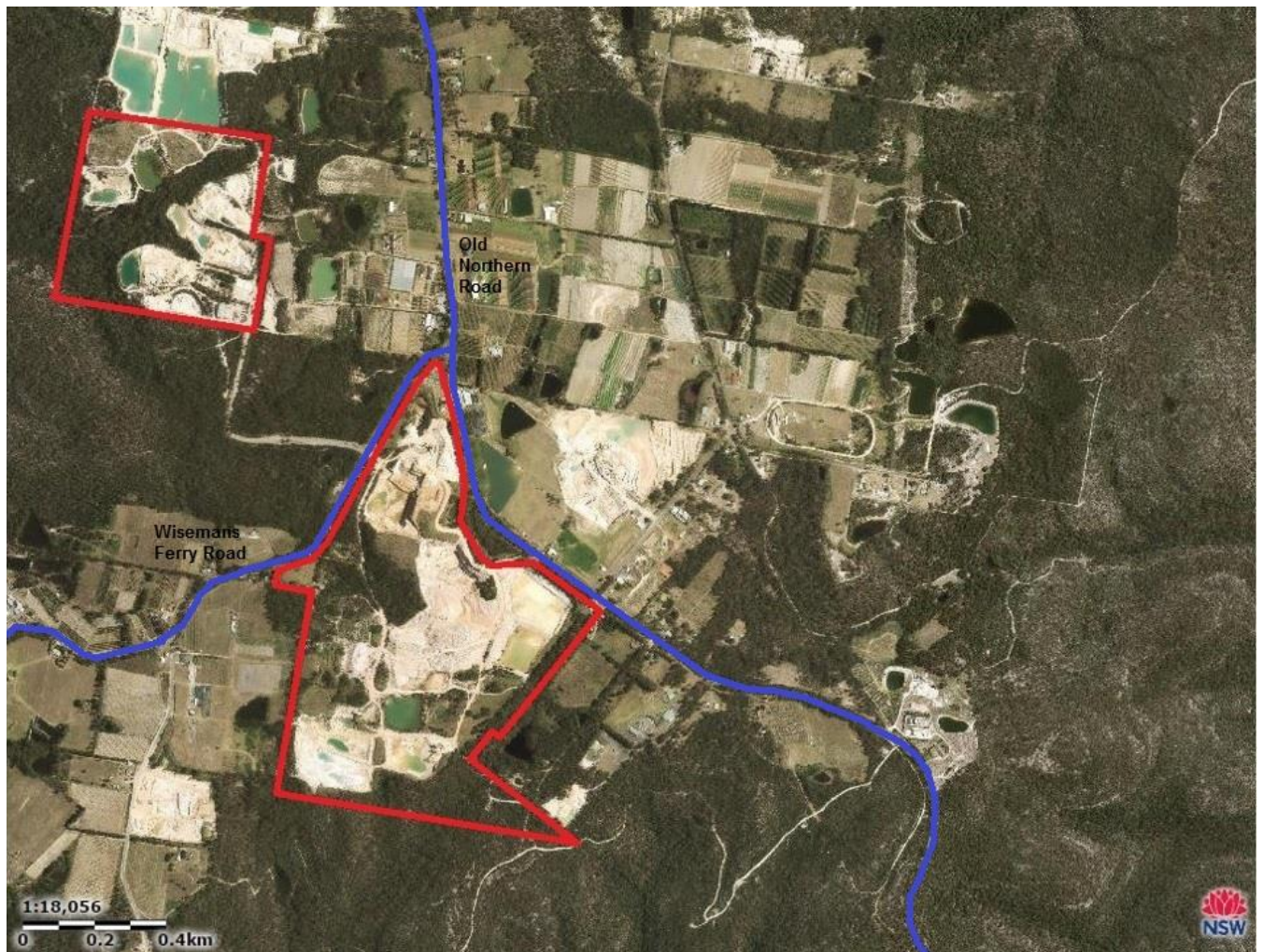


Chapter Two

STATUS OF THE PROJECT

The site survey plan attached as **Attachment 7** shows the current status of the development. The location of the Hitchcock Road Sand Extraction Project is shown in **Figure 1** with **Figure 2** demonstrating the lots entailed in the project.

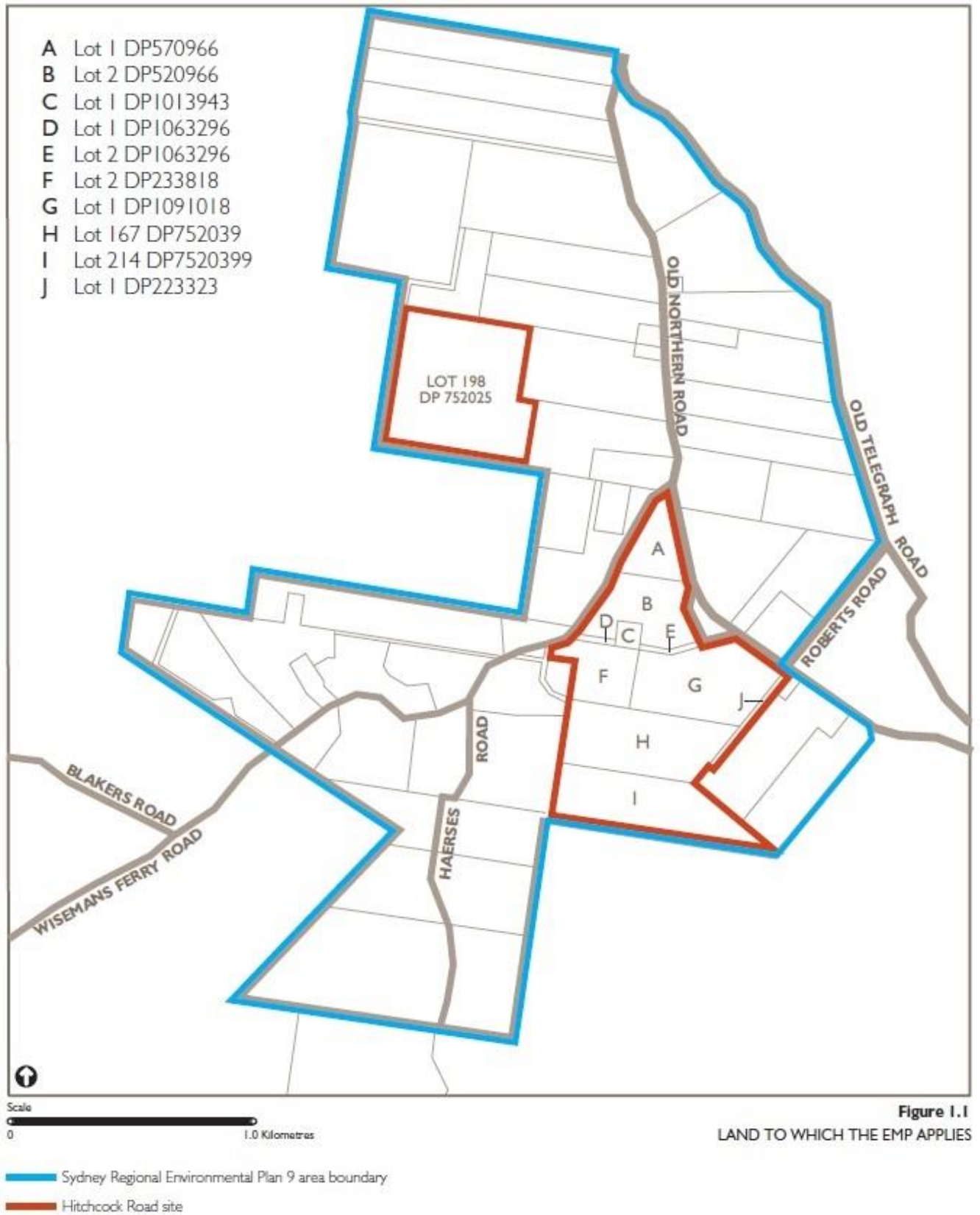
The total amount of processed material derived from the Hitchcock Road site over the 12 months to June 2016 was 275,924 tonnes, well within the limit of 400,000 tonnes of processed material allowed under Condition 7 of Schedule 2 for the Hitchcock Road Project Approval. This production amount was included in the data provided to the DPI.



**Figure 1.** Hitchcock Road Sand Extraction Project location

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**Figure 2.** Lots within the Hitchcock Road Sand Extraction Project

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### Works Carried Out in Last 12 Months and Planning for Next 12 months

- Limited extraction has continued in Lot 214 DP7520399 in 2016 on the western side of the property (**Attachment 6 – Photo 3**). The majority of the sand from this site has now been extracted and extraction should be completed in 2017. Tailing ponds on the eastern side of the property are currently being used on the site as part of the rehabilitation process. (**Attachment 6– Photo 6**)
- Extraction on the north-western side of the site on Lot 2 DP570966 continued in 2016 but will continue to be the secondary extraction area in 2016 - 2017
- Removal of significant overburden heading north through Lot 1 DP1091018 to Lot 2 DP570966 has continued as part of the long-term extraction of this area. This area includes the clearing of the Sydney Hinterland Transitional Woodland (SHTW) in the middle of the site. This will be the main long-term extraction area. (**Attachment 6 – Photo 1 & 2**)
- Tailings Ponds 9, 10 and 12 were tailings ponds in use in the system during 2016 (**Attachment 6 – Photo 6**). They are filling up gradually and are then spelled to let the silt settle
- Pond 1 and 2 (Lot 214 DP 7520399) will be the primary tailings pond in the 2016 period (**Attachment 6 – Photo 5**).
- Capping of Tailings Pond 5 in the middle of the site is complete. This area is now in preparation for revegetation with naturally occurring rehabilitation already evident (**Attachment 6 – Photo 4**).
- Former tailings Pond 7 and 8 and that area in the middle of the quarry are used as overburden stockpile area. (**Attachment 6 – Photo 4**)
- Continued monitoring and supplemental planting of revegetation in the completed areas of Lot 2 DP233818 (**Attachment 6 – Photo 8**). More than 4 hectares of SHTW has been planted on the site at this stage.
- No further planting of vegetation has occurred along the northern end of Old Northern Road. The electricity infrastructure company has cleared the area under the powerlines. Monitoring of this site continues (**Attachment 6 – Photo 7**)

These activities will be initiated or continued over the next 12 months.

There have been no complaints during the year.

### Other Matters

Annual EPA Licence – it is required to lodge an annual return with the EPA. A copy is enclosed in **Attachment 2** for the year ended 29 September 2015.

The weighbridge is required to be verified under the Fair Trading Rules every two years. The last verification was done on 10 June 2014 and a copy of the verification can be viewed in **Attachment 8**.



### Chapter Three

## ENVIRONMENTAL MONITORING PROGRAM & RESULTS

### Operational Monitoring Program

Based on all the Management Plans and Environmental Strategy the Environmental Operational Procedures have been determined and set out in the appendix to the Environmental Strategy.

The Environmental Operational Procedures detail actions and responsibilities, performance indicators, monitoring and reporting requirements.

To document the adherence to this environmental monitoring from an operational viewpoint:

- Monthly, the Environmental Manager has a checklist that is reviewed and signed, see **Attachment 3**.
- Annually, the actions required by the Environmental Operational Procedures are reviewed and signed, see **Attachment 4**.
- The specific monitoring of Noise Management is detailed in **Chapter 5**, Air Quality in **Chapter 6**, Water Management in **Chapter 7** and Landscape Management in **Chapter 8**

### Analysis of Monitoring Results

All monitoring indicated that quarry operations were within any defined limits and no indicators of new potential issues were identified.

From the procedures conducted there are no trends identified as yet and no areas of non-compliance.

## Chapter Four

### DEPARTMENT OF PLANNING & ENVIRONMENT COMPLIANCE AUDIT

In 2015 the NSW Department of Planning & Environment (DP&E) conducted a compliance audit campaign targeting 19 state approved sand quarries. The objective of the audit was to assess compliance on project approval conditions, in particular land management and groundwater management. The Hitchcock Road Sand Extraction Project was one of the 19 sand quarries included in this audit campaign.

The DP&E measured the level of non-compliance issues using a risk analysis matrix (figure 3). The following explains the risk analysis based on the matrix table:

*"A non-compliance assessed as 'high' is of considerable environmental significance and therefore must be dealt with and resolved as a matter of priority. A 'moderate' assessment for non-compliance is still a significant risk of harm to the environment, however it can be given a lower priority than a red risk assessment. A non-compliance assessed as 'low' suggests that it could receive a lower priority but still must be attended to.*

*There are also a number of conditions of consent, such as those relating to administration and reporting requirements that do not have a direct environmental /community significance, but are still important to the integrity of the regulatory system. Non-compliance with these conditions is given an 'Administrative' rating."*

<i>Likelihood of impact occurring</i>	<i>Estimated level of impact</i>			
	<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>Administrative, non-compliance</i>
<i>Almost certain</i>	High	High	Moderate	
<i>Likely</i>	High	Moderate	Low	
<i>Unlikely</i>	Moderate	Low	Low	
				Administrative non-compliance

**Figure 3.** Risk Analysis Matrix (Table 1 from the Draft Guidelines – Independent Environmental Audits of Mining Projects (DP&E 2014))

The onsite inspection of the compliance audit was undertaken on the 5<sup>th</sup> of August 2015 with feedback received from the DP&E in the form of a report in December 2015. From the checklist of three hundred and one conditions the DP&E had found the Hitchcock Road project had seven low-risk non-compliances and fifteen administrative non-compliance conditions. Two hundred and twenty seven conditions were found to be

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compliant while 40 were not applicable. The report found the project to adequately meet the requirements of the consent conditions required to operate as a sand extraction quarry. The complete report can be found as **Attachment 16**.

PF Formation has addressed all the necessary non-compliance issues to date as can be seen in their action plan response (see **Attachment 17**).



## Chapter Five

### NOISE MANAGEMENT

The Project Approval for the Hitchcock Road development requires the preparation and implementation of a Noise Management Plan in order to demonstrate that compliance with the relevant noise impact assessment listed in the approval has been achieved

The objectives of the Annual Environmental Management Report on noise issues are therefore;

- identify the environmental noise emission criteria nominated in the relevant approval documents
- document the results of environmental noise monitoring conducted in the 12 months ended June
- assess the measured noise emissions levels against the relevant criteria; and
- nominate existing noise emission monitoring methodology and establish routine measurement procedures.

#### Noise emission criteria

The Noise Management Plan requires the noise criteria set out in **Table 5.1** to be applied to the impact assessment. These assessment locations as shown in the Noise report, found in **Attachment 9**, were selected because they are representative or closer to the quarry than the Noise Assessment Locations identified in Table 1 of Schedule 3 to the Notice of Project Approval.

**Table 5.1 Noise impact assessment monitoring locations**

Noise assessment location	Other locations covered	Day	Night <sup>1</sup>	
		LAeq (15 minute)	LAeq (15 minute)	LA1 (1 minute)
1. R9 – Young, Hitchcock Road	R10- Tornatola	39	35	45
2. R5 - Pignataro	R6 Camilleri	42	35	45
3. R3 – Firestation/Jurd	R1 Hammond & R2 Hitchcock	40	35	45
4. R7 – Maroota Public School	R6 Camilleri & R8 Portelli	36(LAeq(1 hour))	N/A	N/A

Note 1: Night time is defined as the period between 10.00pm and 7.00am. Activities on the site start at 6.00am and are completed by 6.00pm. There is no activity on the site during the evening period

The following noise parameters are measured at the nominated monitoring locations.

- LAeq(15 minute) noise level measured at an appropriate free-field location close to the façade of the relevant residence or other building during day time and evening hours.

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- LAeq(1 minute) noise level measured at an appropriate free-field location close to the façade of the relevant residence during night time hours.

### Operator-attended noise survey results

In accordance with the Noise Management Plan PF Formation conducted its quarterly operator attended daytime noise surveys at each of the four test locations. An external Noise Consultant was employed to prepare a report to assess and review the results against the noise criteria. The report prepared by Koikas Acoustics Pty Ltd is attached as **Attachment 9**.

Chart 5.2 – Daytime noise results

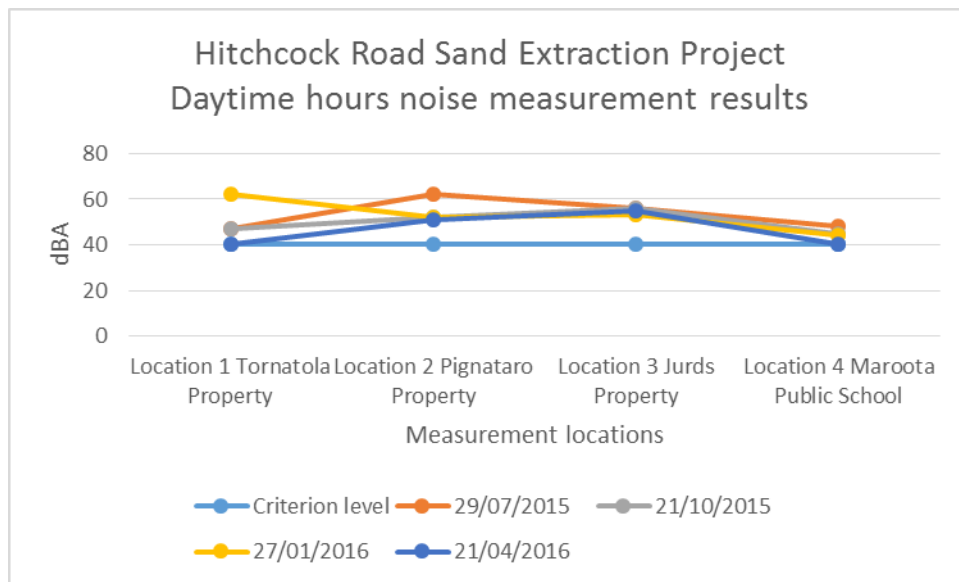
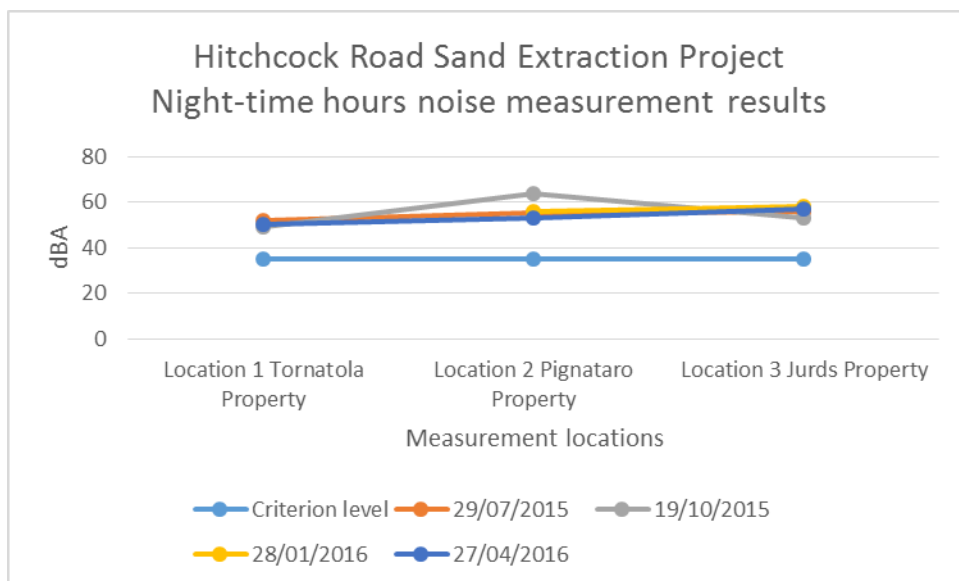


Chart 5.3 – Night-time noise results



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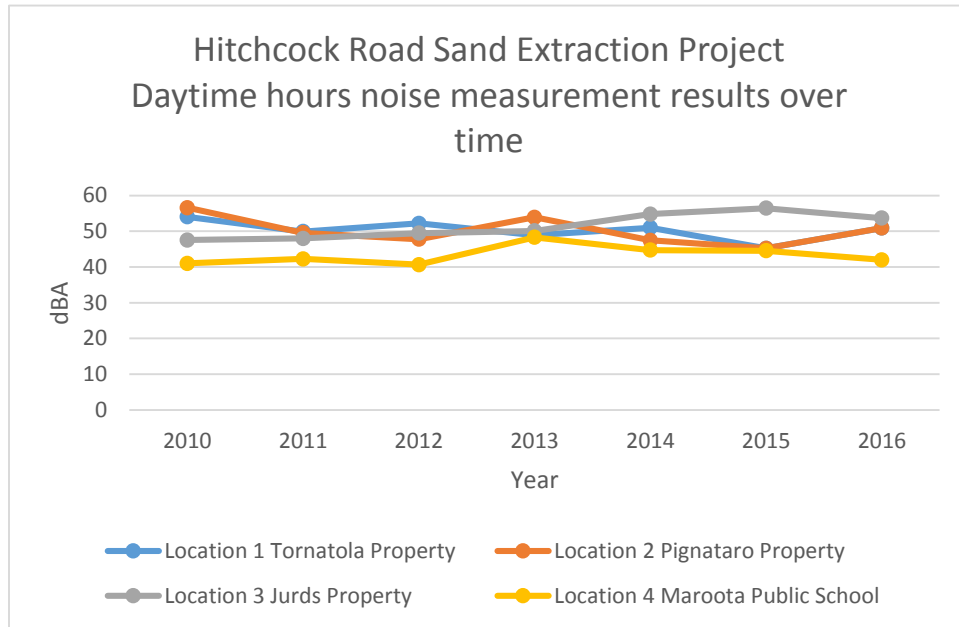
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Noise results showed a higher than criterion level dBA at the source however in each case this was attributed to dominant noise sources such as traffic, birds, insects and other environmental noises. Quarry noise was often audible between lulls in traffic noise however it was not measurable.

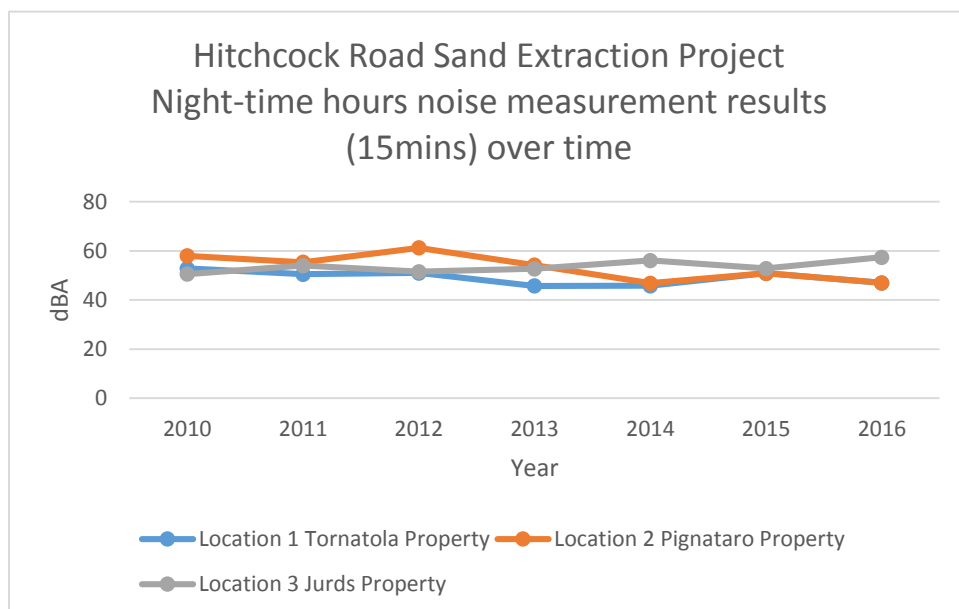
No noise complaints have been received in the 2015-2016 period.

Over time the noise results have not significantly changed. The average annual measurements at each monitoring location are shown in **Chart 5.4**, **5.5** and **5.6**.

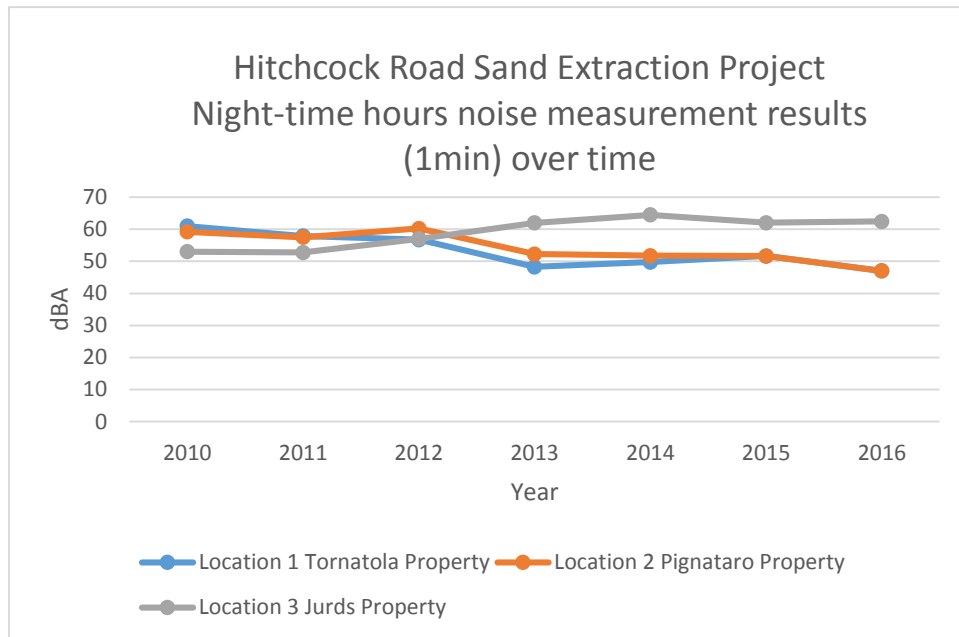
**Chart 5.4 – Daytime noise average over time**



**Chart 5.5 – Night time noise average over time (15mins)**



**Chart 5.6 – Night time noise average over time (1min)**



## Conclusion

Koikas Acoustics concluded that at most sites the quarry noise was either just audible or inaudible. Therefore the site complies with the nominated noise criteria.

The measurement locations all exceed the recommended dBA levels outlined by the EPA as acceptable background noise levels for a rural area. This is mostly due to road traffic which is higher in the local area than expected for a rural location.

## Chapter Six

## AIR QUALITY

The Project Approval for the Hitchcock Road development required the preparation and implementation of an Air Quality Monitoring Program. The objectives of the Annual Environmental Management Report on air quality issues are therefore:

- identify the dust deposition criteria nominated in the relevant approval documents and listed in the Air Quality Monitoring Program;
- document the results of dust deposition monitoring conducted in the 12 months ended June;
- assess the measured dust deposition levels against the relevant amenity criteria; and
- nominate existing dust deposition monitoring methodology and establish routine measurement procedures.

## Dust impact assessment criteria

The proponent will ensure that dust generated by the project does not cause exceedances of the criteria listed in **Tables 6.1** and **6.2** at any residence or on more than 25 per cent of any privately owned land.

Table 6.1 Impact Assessment Criteria for Particulate Matter		
Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90µg/m <sup>3</sup>
Particulate matter < 10µm (PM <sub>10</sub> )	Annual	30µg/m <sup>3</sup>
	24 hour	50µg/m <sup>3</sup>

Table 6.2 Impact Assessment Criteria for deposited dust			
Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2g/m <sup>2</sup> /month	4g/m <sup>2</sup> /month

## Notes

*Deposited dust is assessed as insoluble solids as defined by Standards Australia 1991 AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric*

## Dust monitoring

PF Formation maintained a program of continuous monthly dust deposition monitoring. This is in compliance with the requirements of the Air Quality Monitoring Program. The locations of the monitoring stations are shown in the Air Quality Report found in **Attachment 10**.

Analysis of the dust composition measurements was carried out independently by Boral Materials Testing and Environmental Services. The analysis procedure was in accordance with AS3580.10.1-1991 *Methods for Sampling and Analysis of Ambient Air Method 10.1: Determination of Particulate Deposited Matter – Gravimetric Method*.

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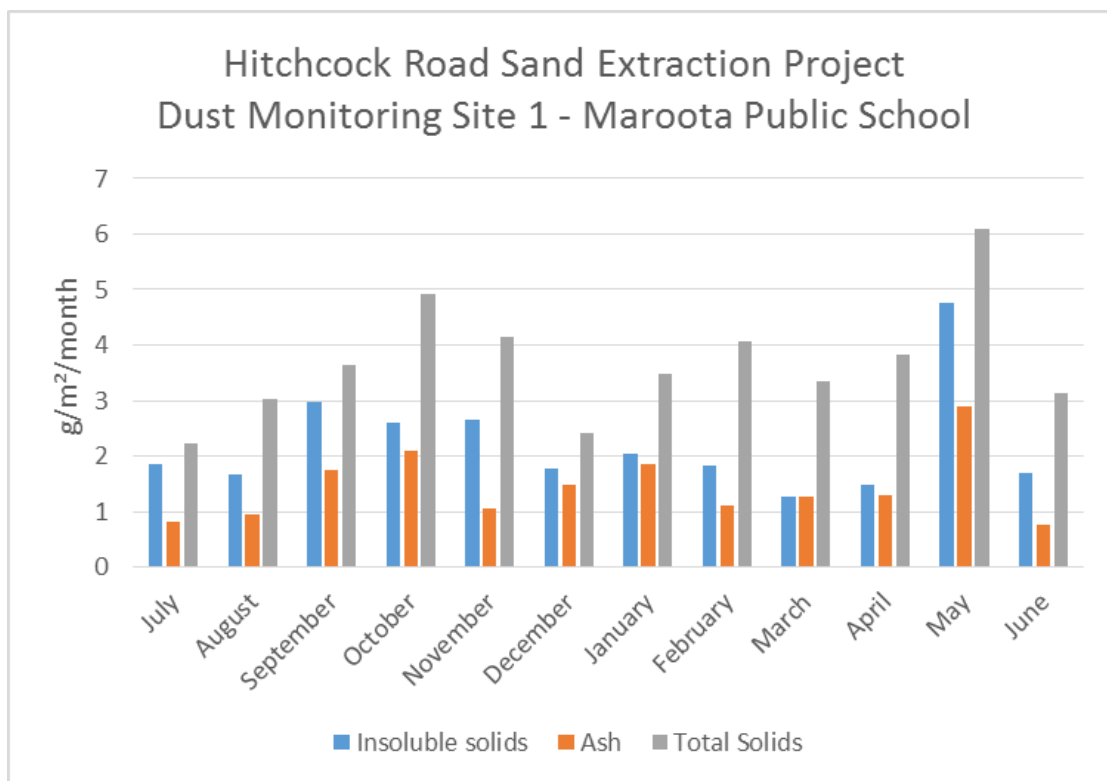
### Monitoring results

A summary of the monthly dust deposition monitoring results is provided in chart 5.1, 5.2 and 5.3. The detailed measurement and analysis results by month as prepared by Boral Materials Testing and Environmental Services are summarised in **Attachment 10**. Location 4 in the Test Reports is not relevant to the Hitchcock Road site.

In general, dust monitoring procedures were guided by the requirements of AS2724.1-1984

*Ambient Air Particulate Matter, Part 1 – Determination of Deposited Matter Expressed as Insoluble Solids, Ash, Combustible Matter, Soluble Solids and Total Solids.*

Chart 6.1 – Dust monitoring results site 1





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Chart 6.2 – Dust monitoring results site 2

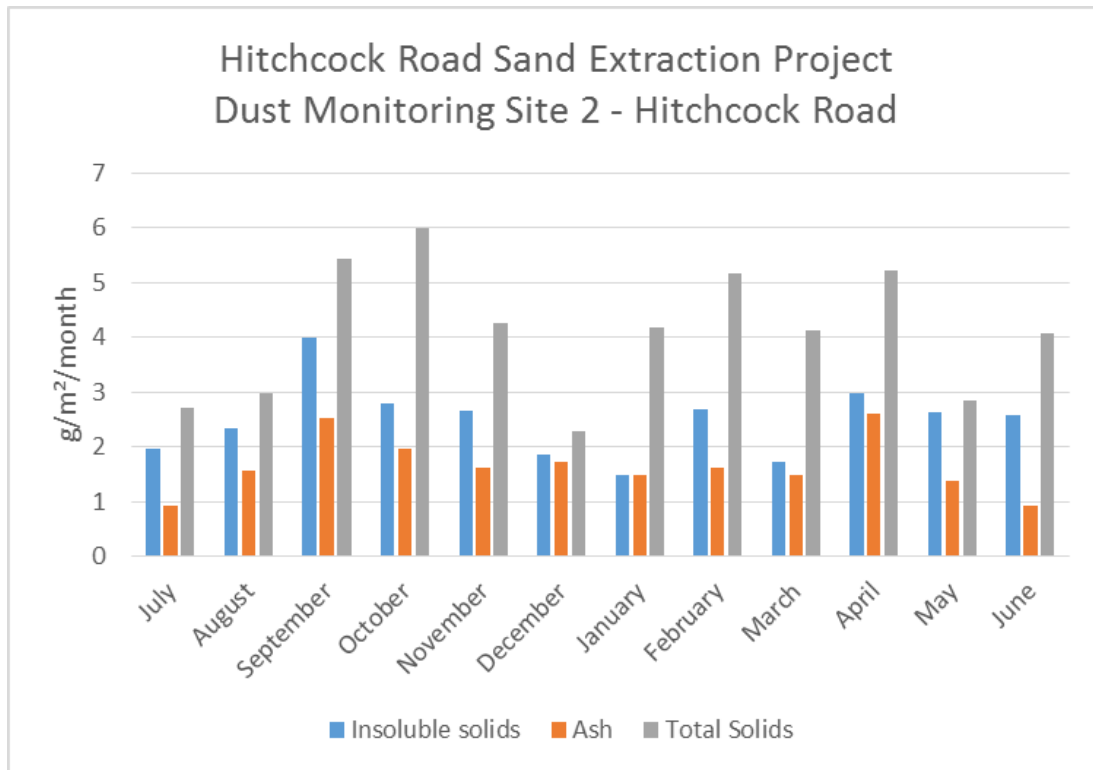


Chart 6.3 – Dust monitoring results site 3

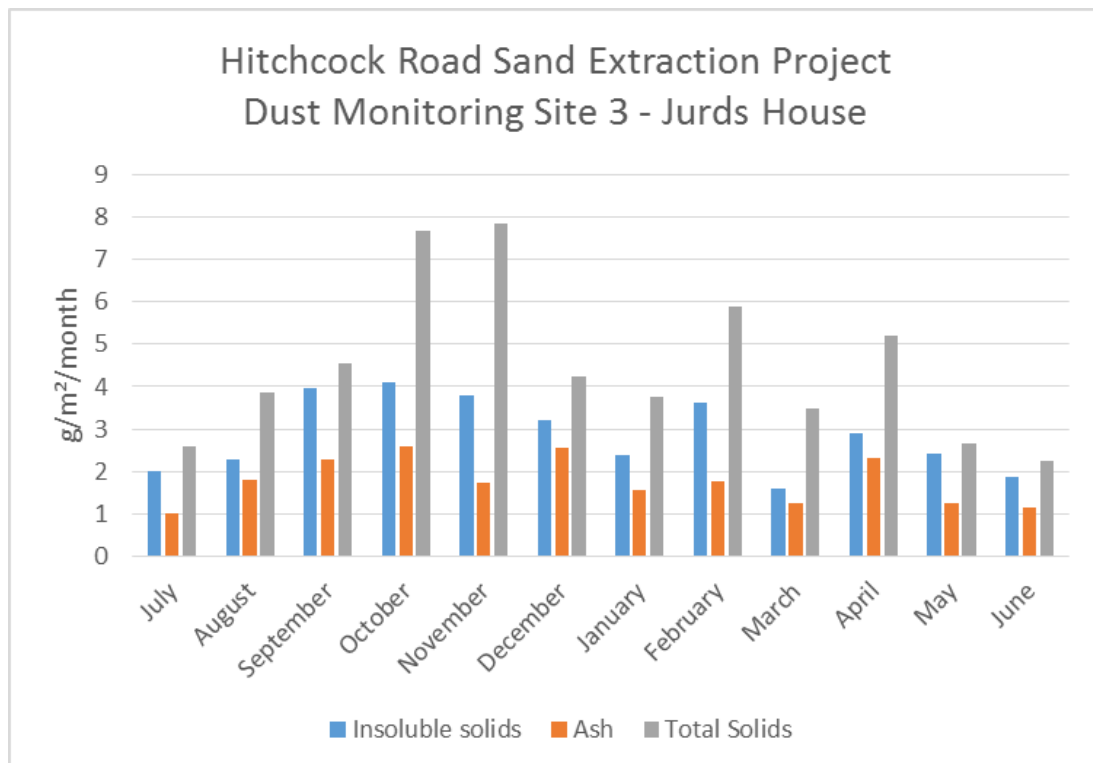
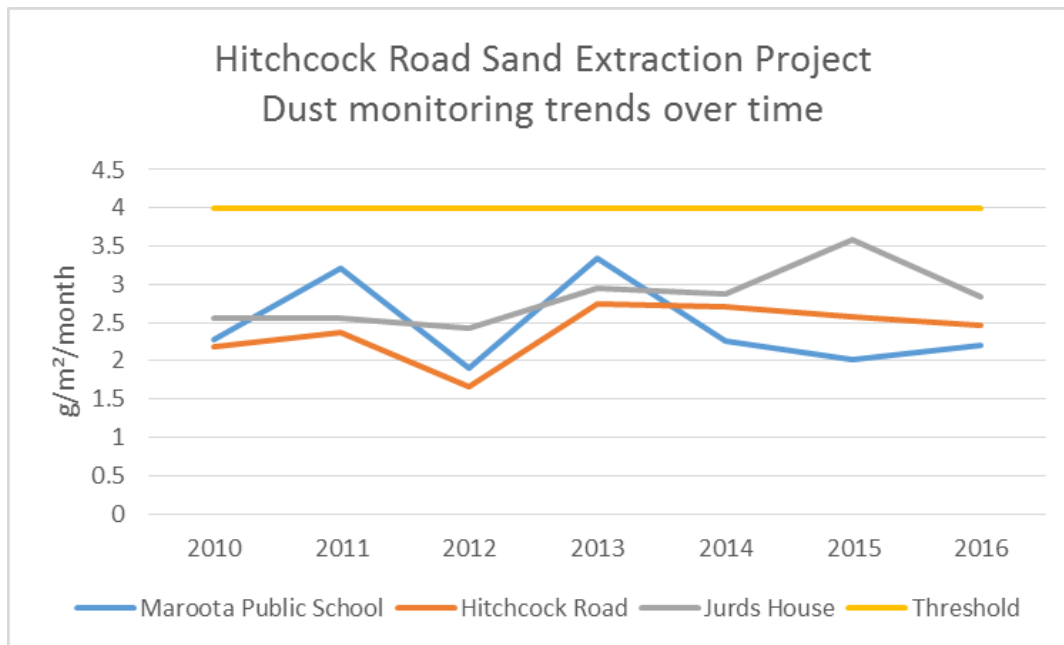


Chart 6.4 – Dust monitoring trends over time



The following information can be derived from these results in relation to the dust nuisance criterion.

- The insoluble solids portion of deposited dust is expected to be mineral matter with the ash content indicating the level of solid dust particles of inorganic origin such as soil/dust that could be derived from a source such as sand extraction and processing operations.
- The monitoring results are characterised by generally low average levels over extended periods with an occasional spike when high levels are experienced. As the operations from the site are very consistent the dust generated from the site is consistent subject to weather impacts. Spikes are usually caused by factors unrelated to the quarry such as lawn mowing or horticultural activities near the monitoring station or regional issues such as bush fires.
- The annual average ambient dust deposition rate (insoluble solids) considered a nuisance criterion is 4 g/m<sup>2</sup>/month. All monitoring sites had an annual average reading well below this level with only two readings over the entire monitoring period exceeding the monthly criteria.
- Trends over time have indicated that there has been no significant change to air quality in the local area since operations at the Hitchcock Road Sand Excavation Project have commenced in 2009. The average monthly dust deposition rates have consistently stayed below the nuisance criterion threshold of 4g/m<sup>2</sup>/month since monitoring begun in 2010.
- PF Formation and Dixon Sand (a neighbouring operator) have an agreement whereby if the rolling 24-hour PM<sub>10</sub> average recorded by the TEOM reaches 42.5 µg/m<sup>3</sup>, PF Formation would be notified. The wind direction would then be assessed and measures to reduce any dust impacts affecting the TEOM readings

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would be implemented. At no time in the last 12 months have the results derived from the TEOM reached the designated trigger.

- There have been no complaints concerning dust generation over the past year.
- A summary of the weather conditions recorded on-site are in **Attachment 5**.

### Conclusions

In accordance with the requirements of the Project Approval, PF Formation has implemented a program of dust deposition monitoring. The results of the regular monthly dust deposition monitoring conducted over the past year and analysed externally by Boral Materials Testing and Environmental Services show that deposition rates from all sources are below the maximum levels criteria. Spikes in dust deposits which have raised the annual averages are thought to be caused by other external sources such as mowing and periods of high wind however the annual monthly average remains consistently well below the nuisance criterion threshold of 4g/m<sup>2</sup>/month.

## Chapter Seven

# GROUND & SURFACE WATER MANAGEMENT

The groundwater monitoring program included in the Water Management Plan approved by the Director-General of the Department of Planning and Environment includes:

- provision of additional monitoring bores around the periphery of the site;
- detailed baseline data on groundwater levels, flows and quality in the region and particularly any groundwater bores, springs and seeps (including spring and seep fed dams) that may be affected by operations on site;
- groundwater assessment criteria including trigger levels for investigating any potentially adverse groundwater impacts;
- a program to monitor:
  - groundwater levels and quality in new and existing monitoring bores;
  - impacts of the project on any groundwater bores, springs and seeps (including spring and seep fed farm dams) on privately-owned land and any groundwater dependent ecosystems; and
- a protocol for further groundwater modelling to confirm the limits to excavation depth across the site permitted in accordance with **Condition 9** of **Schedule 2**.

This chapter addresses the surface and groundwater aspects of the sand extraction operations at the site.

## Groundwater management

The groundwater component of the report has been prepared by Earth2Water and their full report follows in **Attachment 11**.

URS Australia had previously prepared the map of the wet weather groundwater level for the site based on all available site specific groundwater monitoring data they have reviewed over the years. This map is located in the Groundwater Report found in **Attachment 11**.

From the wet weather groundwater levels URS Australia has prepared the Maximum Extraction Depth Map for the project and this is located in the Groundwater Report found in **Attachment 11**.

The 2 metre extraction limit above the established ground water table has been maintained in all areas of the sand extraction project as has been discussed in the Groundwater Report.

## Surface water management

### **Current site conditions**

The location of the current extraction areas, tailings ponds and sediment basins is shown on the figure at **Attachment 7**. No significant changes have occurred in these areas in the last year as discussed in Chapter 2.

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The following points respond, where appropriate, to the specific surface water issues listed in the Water Management Plan.

### Treatment of sediment-laden water

Sediment-laden water is treated by the use of a series of tailings ponds which enable the sediment to progressively settle out of suspension with the resulting clean water returned to the processing cycle.

Stormwater runoff from disturbed areas flows to these ponds and other sediment basins across the site to maximise reuse of all water. Prior to overflow and discharge from the spillways and the site, the stormwater runoff is treated where necessary.

The clean water supply dam, located close to the southern boundary of the southern catchment, comprises the final sediment basin before any discharge of stormwater from the Hitchcock Road site. It is included in the process water cycle and, at the time of the inspection, was estimated to be using about 67 percent of its calculated capacity of 25,000 cubic metres.

The clean water supply dam is connected by pipe to the clean water dam on Lot 198 DP 752025 below the central processing plant (sand washplant). A sediment trap system has been built in front of the dam to pump the washplant sediment back into the washplant. The system is working well and minimal operational sediment now enters the clean water dam. The capacity is 50,000 cubic metres and was estimated to be using 75% at the time of inspection. Water can be balanced between the two sites as necessary.

Past extraction in the northern extraction area has created a temporary excavation, the capacity of which significantly exceeds that required as a sediment basin for the northern catchment section of the site. A minimum capacity of 7,800 cubic metres will be maintained following final trimming of this basin. Inspection indicates a current freeboard to the spillway of about 4 metres with no indication of any discharge from the site during the year.

### Maintaining/monitoring current surface water quality

The site does not have any permanently flowing surface waters. Existing surface water is limited to a supply sump in an area of previous extraction and a number of small farm dams. The existing tailings ponds and sediment basins will maintain the quality of the intermittent surface water flows experienced on the site.

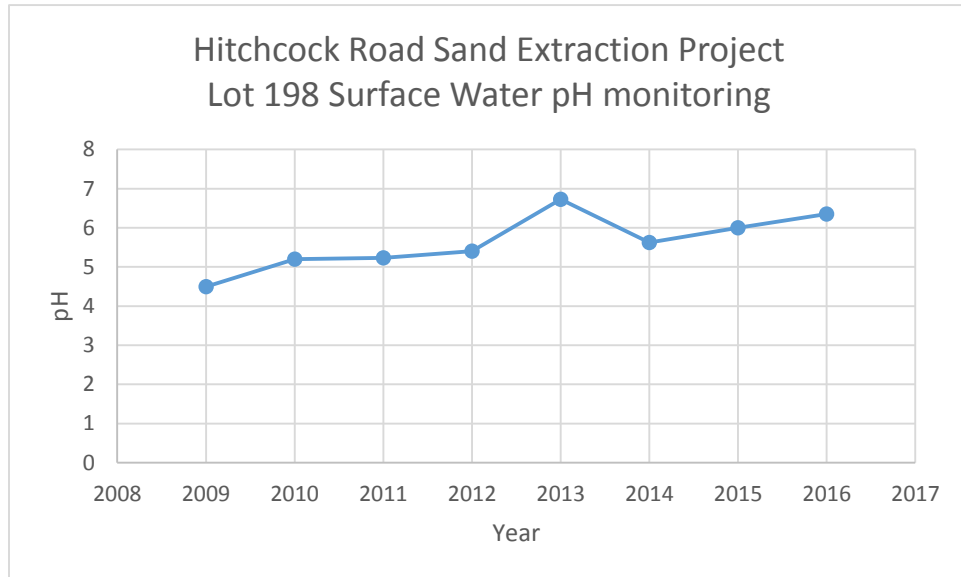
Monitoring of surface water quality will be achieved by the visual inspection of waters within the sediment basins allowing treatment to take place if necessary prior to overflow and discharge from the site.

No discharges from the site occurred but quarterly samples were taken from an existing monitoring site on the creek below Lot 198 DP 752025. The results from these samples are in **Attachment 12**. The PH, electrical conductivity and oil and grease results were all within the expected ranges. Long term monitoring results can be seen in **Chart 7.1, 7.2 and 7.3**.

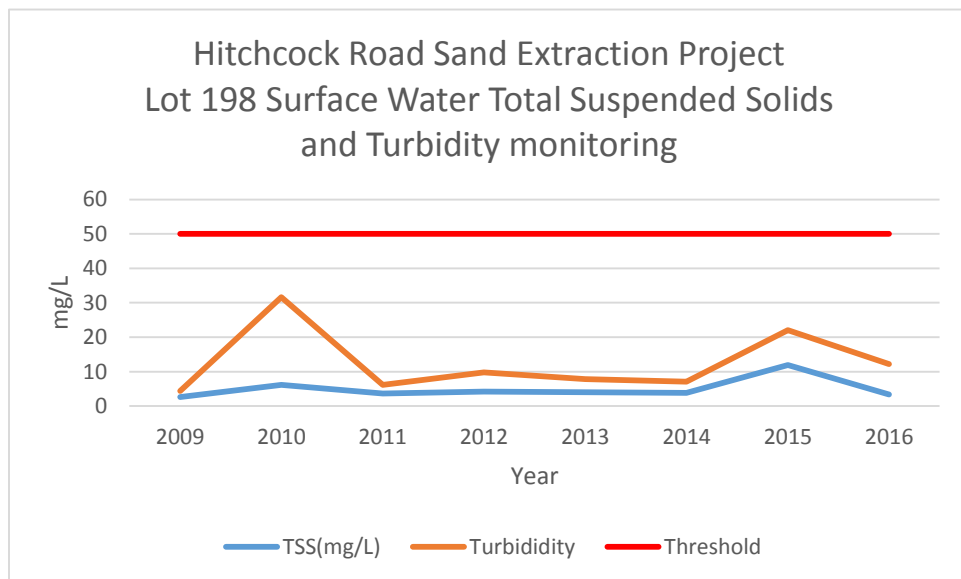
## ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2015 - 2016

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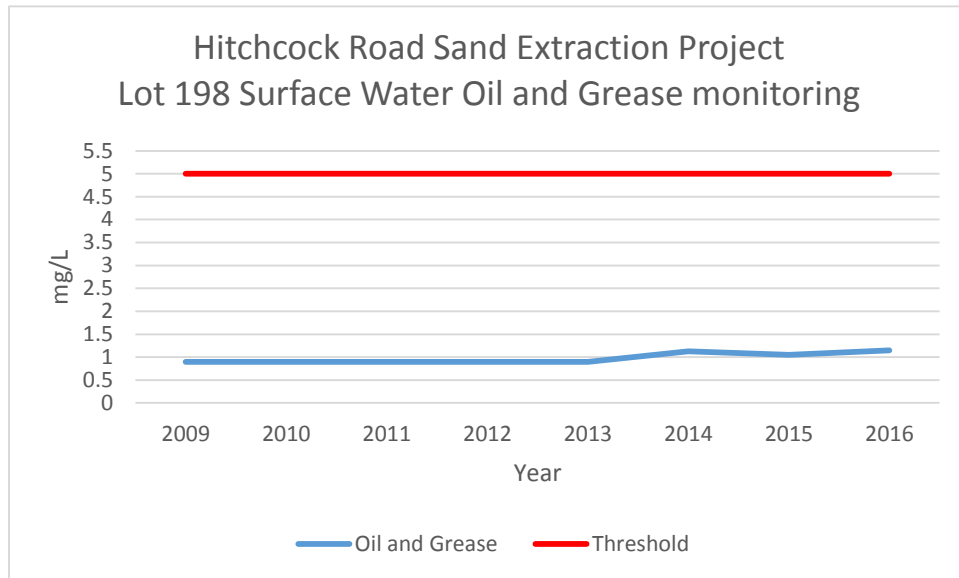
**Chart 7.1 – Lot 198 Surface Water pH results over time**



**Chart 7.2 – Lot 198 Surface Water Total Suspended Solids and Turbidity results over time**



**Chart 7.3 – Lot 198 Surface Water Oil and Grease monitoring over time**



## Dewatering of water pits

Of the commissioned ponds, Numbers 1 and 2 are currently in the tailings stream cycle. Ponds 9, 10 and 12 are not currently being used allowing the sediment to settle in preparation for capping.

All other tailings ponds have been fully capped.

Decant water from the tailings ponds flows to the clean water supply dam and then to the slurry plant and the processing/wash plant on Lot 198.

## Destination points for waters collected within the extraction areas

In the southern catchment, the collected waters flow to the tailings ponds and the clean water dam (southern sediment basin) and thence to the slurry plant and the main process plant on Lot 198.

In the northern part of the Hitchcock Road site they flow to the northern sediment basin and thence (if not recovered and reused) via the overflow spillway, and two further minor sediment traps to the Wisemans Ferry Road surface drains. There are no indications that any surface water has been discharged from the Hitchcock Road site and all available water is used in the processing cycle.

## On-site reuse of collected waters

All collected waters are reused in the processing cycle during the operational stage of the extraction works.



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### Water levels within the existing water sump

Water levels and volumes within the sump are detailed in the Ground Water Report **Attachment 11**. The sump (dam) is located at the lowest point- in the south-eastern corner of the existing pit on Portion 167 on the eastern side of the clean water dam. The capacity of this area is essentially the full extent of the existing pit and would greatly exceed that calculated in the Rehabilitation Plan as necessary for the total capture of runoff from the 100 year time of concentration storm event (19,400 m3).

### Significant site features, recharge areas and natural areas

The main extraction area changes within the site but only impacts internal water flows. Groundwater recharge areas, outside the current extraction areas remain essentially unaltered and the groundwater management plan has concluded that there has been no apparent impact on the sustainability of the groundwater. (see **Attachment 11**)

### Conclusion

Groundwater and surface water levels have been monitored and water samples tested with no abnormalities noted.

## Chapter Eight

### REHABILITATION

A Landscape Management Plan has been prepared in compliance with the requirements of the current Project Approval and was approved by the Department of Planning. The following section therefore describes the current phase of site rehabilitation. Reference is also made to the biodiversity offset strategy which is described in more detail in the Landscape Management Plan.

#### Earth bunding and rehabilitation

Bund construction and planting work has been completed in most areas, mainly sections of the northern and southern boundaries of the triangular shaped, northern portion of the site bounded by Old Northern Road and Wisemans Ferry Road.

Sections along Hitchcock Road were referred to in the Independent Environmental Audit as an area where improvement is required. The screen planting and bunding could be improved in this area notwithstanding it adjoins another quarry.

#### Visual assessment

Because extraction has occurred and will continue to occur in the high areas of the site it has become more visible from surrounding areas. Boundary planting has occurred but the visual restriction impact is limited as these areas are substantially lower than the extraction area. The area along Old Northern Road will continue to be the main area of focus for rehabilitation.

#### Conclusion

The works as proposed ensure that satisfactory screening and rehabilitation of the boundary areas of the Hitchcock Road site is achieved. The proposed method of earth bunding and planting will, in time, ameliorate the visual impacts of the site operations but there is increasing visual accessibility of the quarry from a distance because of the extraction of the higher levels in the middle of the site. In conjunction with further rehabilitation work, the site can be returned to a natural state on the completion of sand extraction.

#### Rehabilitation Issues

##### Rate of rehabilitation

Rehabilitation of the site is taking place generally in phase with the overall staging program. The removal of material from the first phases has been completed and extraction has continued as shown on the Site Plan at **Attachment 7**.

Rehabilitation of the project is dependent on three main factors:

- Material for backfilling does not become available until topsoil and overburden are removed from later phases as similar material from the first phase area is used to form peripheral mounds and the earthworks required for the tailings dams.

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- Substantial parts of the operational area are occupied by a series of basins required substantial parts of the operational area are occupied by a series of basins required for surface water treatment. These require capping prior to any major rehabilitation-taking place in the area. This cannot be undertaken until new basins are developed as part of the next phase development which in turn serve the whole project. In addition, capping cannot take place until the ponds are sufficiently dry to accommodate heavy vehicles with safety. This can take up to three years.

The timing of the rehabilitation of the initial phases is therefore dependent on a substantial start being made on the next phase. Activity to date has focussed on the provision of the peripheral mounds which are required for acoustic and visual reasons. These have been constructed, so far, in those areas particularly sensitive to these impacts. This work has now been completed.

A number of the early tailings dams have been capped and the area is in the process of rehabilitation. This is particularly the case in the western part of the site immediately to the south of the former Crown Road where several silt ponds have been capped and the ground contours reconfigured. 4 hectares of the eastern part has been seeded under the guidance of Greening Australia and Parsons Brinckerhoff.

#### Final Landform (**Strategy A**)

Two options for the final landform were incorporated in the planning documents. Strategy B was based on final landforms if PF Formation was unable to get approval from the Director General to disturb the Sydney Hinterland Transition Woodland (SHTW) in the middle of the site. On 15 March 2013 the NSW Department of Planning and Infrastructure gave approval to proceed with the clearing of the SHTW. Therefore the final landform will be based on Strategy A from the planning documents.

#### Maintenance of vegetated conservation zones and rehabilitated areas

Conservation zones identified in the Landscape Management Plan are regularly inspected as required in the Environmental Strategy (**Strategy 7.1**). These areas are signposted and the areas suitably protected. All existing vegetation around the periphery of the site will be protected within setbacks and buffer zones.

The peripheral bunds constructed to date have been planted. These are regularly inspected and the area maintained.

#### Retention and protection of vegetation within buffer zones

All existing vegetation within the defined buffer zones will be retained and protected. A setback with a minimum depth of 30 metres is being maintained along Hitchcock Road and all existing vegetation within this area will be retained.

### Integration of the site rehabilitation with the surrounding terrain

Operations have been undertaken on the Hitchcock Road site under consent since 2009. These have inevitably concentrated on the site works required for the development including retention basins and the construction of the peripheral bunds. It is too early in the life of the development, with more than 10 years of life remaining, to consider the establishment of the final landform in any detail. The area in the south has been reformed with final batter slopes which give an indication of the way in which the final landform will integrate with the surrounding area.

The final landform of the Hitchcock Road site will be influenced by the depth of extraction, the location of commercially available resource and the volume of overburden, mainly clay, available for re-contouring the extracted areas. Sand has been extracted from part of the site to the depth allowed in the previous consent and part of this area has been rehabilitated. The existing topography and setbacks is also shown on the Site Survey Plan. The final landform has been developed in response to the requirements of the proposed biodiversity offset strategy.

The final landform (Strategy A) comprises a large gently sloping basin with steeper side slopes along the boundary to Old Northern Road. Some of the levels have been amended to reflect changes in the extraction areas to minimise vegetation removal.

### Vegetative cover

In 2010 Greening Australia were commissioned to prepare a plan of management for the rehabilitation area of 2.4 hectares previously planted and for the additional area of 1.6 hectares to be rehabilitated. Based on that plan of management the additional area was planted in spring 2011 to give an area subject to SHTW rehabilitation exceeding 4 hectares.

### Flora and fauna monitoring program

Regular monitoring of flora and fauna is a requirement of the Environmental Strategy. Results to date are encouraging. A recent report prepared by Parson Brinkerhoff was completed in December 2015 and is appended as **Attachment 13**. The report states that 'the rehabilitation of the area is progressing well and is generally meeting or exceeding the targets set with the exception of 2011'.

### Conservation of threatened species, populations and ecological communities

It is a requirement of the Environmental Strategy that all those areas to be retained and defined as needing protection will be clearly identified. Signs have been placed at intervals around the areas needing protection.

### Construction of acoustic and visual bunding

Construction of the peripheral bunds has already been noted. Visual screening of the extraction site and slurry plant appears to be satisfactory.

### Compliance with current environmental laws, standards and practices

All the necessary management controls and related actions are in conformity with all relevant current laws, standards and practices as indicated in the document.

### Conclusion

The site rehabilitation is necessarily more in focus in the latter stages of the development. 4.2 hectares of Sydney Hinterland Transition Woodland has been planted on site. Parsons Brinckerhoff last monitored this area in

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December 2015 by reviewing plant species within six fixed (20 x 20 metre) quadrants and their report is in **Attachment 13**. In general the revegetation areas appear to be progressing well and is meeting or exceeding the targets set with the exception of the 2011 rehabilitation site which requires weed control over the next 2 year monitoring period. Supplementary planting may be necessary in this area although weed control may allow for further success in native recruits.

*Chapter Nine*

**SOCIAL IMPACT MANAGEMENT**

Community representatives participate in the Community Consultative Committee which has met twice during the year 2015-2016. Minutes of these meetings are included as **Attachment 14**.



## Chapter Ten

### INDEPENDENT AUDIT REPORTS

Sand extraction projects are subject to regular audits as per the project approval. The Department of Planning and Environment conduct these audits to ensure sand quarries operating in NSW are working within the conditions of their project approval and legislative requirements.

The Hitchcock Road Sand Extraction Project had its most recent audit in 2014 - 2015. The project was found to be operating in general compliance however some administrative and sub elements were identified as needing action. To date the non-compliance issues have been addressed and rectified.

#### 2014 Independent Environmental Audit

The most recent 3 yearly Independent Environmental Audit Report of the Hitchcock Road Sand Project audit was received in April 2014. A copy of the Report is appended in **Attachment 15** and the Audit Conclusions were:

*Full cooperation was obtained from PF Formation staff during the audit with full access granted to records and copies made of records if requested. No obstacles were encountered during the audit and subsequent queries. Based on the audit findings the audit conclusions are as follows.*

*Based on completion of the environmental audit tasks (section 3), audit evidence and environmental monitoring results (section 4), consultation with agencies (section 5) and assessment of the compliance tables and audit findings (section 6) the environmental performance of the sand project is satisfactory with some non-conformances. The project is generally complying with the relevant standards, performance measures and statutory requirements including project approval conditions, project approval commitments and Environment Protection Licence conditions with some non-conformances that can be rectified. There is a need to improve on some environmental commitments and record keeping.*

*The effects of the Hitchcock Road sand project on the surrounding environment appear to be relatively minor and generally acceptable and manageable with some improvements and corrective actions needed. This assumes that the environmental management measures continue to be implemented by PF Formation.*

*All strategies/plans/programs required under the project approval to date are adequate with some corrective actions proposed.*

#### Independent Audit Recommendations

Audit recommendations were outlined in Section 8 of the Audit Report and the PF Formation response to each of the matters raised was reported to the Department of Planning in the letter dated 12 June 2014. All matters referred to in PF Formation 'Comments on Independent Environment Report' dated 12 June 2014 have now been completed.

Points 1 of the Audit Recommendations refer to changes/updates to be made to the Environmental Strategies. These Plans have been updated and forwarded to the DPE in 2014 and 2016 and have since received approval by on the 21<sup>st</sup> of July 2016.

The next independent audit will be conducted in 2017.

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### *Chapter Eleven*

## CONCLUSION

The results of the Annual Environmental Management Report have determined that PF Formation has demonstrated commitment to effectively manage the environmental impacts associated with sand extraction. The Hitchcock Road Sand Extraction Project has met all the necessary reporting criteria as per the consent agreement.

During the year 2015 – 2016 the Hitchcock Road Sand Extraction Project worked within the acceptable limitations of all environmental monitoring assessments.

Rehabilitation of the site continues with the monitoring of weed species a priority for the 2016 – 2017 reporting period. Further tailing ponds are likely to be completely capped within this period for future planning to be undertaken towards the final landform of the site at the termination of the project in 2028.

# **PF FORMATION**

## **ANNUAL ENVIRONMENTAL MANAGEMENT REPORT**

**2016**

### **ATTACHMENTS**

1. Project approval
2. EPA Licence Annual Return
3. Monthly Environmental Operational Procedures Checklist
4. Annual Environmental Operational Procedures
5. Location Weather Chart
6. Site Current Photos
7. Site plan
8. Weighbridge Verification Certificate
9. Noise Management Report
10. Air Quality Report
11. Ground Water Report
12. Surface Water Monitoring Results
13. Rehabilitation Report
14. CCC Meeting Minutes
15. 2014 Audit
16. Compliance Audit 2015

**ATTACHMENT 1**

**PROJECT APPROVAL**

# Project Approval

## Section 75J of the *Environmental Planning and Assessment Act 1979*

I approve the project referred to in Schedule 1, subject to the conditions set out in Schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for on-going environmental management of the project.



Hon Kristina Keneally MP  
Minister for Planning

Sydney

3 February 2009

### SCHEDULE 1

<b>Project Application:</b>	06_0104
<b>Proponent:</b>	PF Formation
<b>Approval Authority:</b>	Minister for Planning
<b>Land:</b>	See Appendix 1
<b>Project:</b>	Hitchcock Road Sand Project

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## DEFINITIONS

AEMR	Annual Environmental Management Report
Council	The Hills Shire Council
Day	The period from 7.00am to 6.00pm on Monday to Saturday, and
NSW Government Department of Planning	

8.00am to 6.00pm on Sundays and Public Holidays

DECC Department of Environment and Climate Change

Department Department of Planning

Director-General Director-General of the Department of Planning, or delegate

DPI Department of Primary Industries

DWE Department of Water and Energy

EA Environmental Assessment for the project titled *Hitchcock Road Sand Extraction and Rehabilitation Project Environmental Assessment and Appendices* (3 volumes), dated November 2007, prepared by DFA

Consultants, including the response to submissions and preferred project report

EP&A Act *Environmental Planning and Assessment Act 1979*

EP&A Regulation *Environmental Planning and Assessment Regulation 2000*

EPL Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997*

Evening The period from 6.00pm to 10.00pm

Extraction Area The land described as the extraction area in Appendix 1

Land Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval

Minister Minister for Planning, or delegate

Night The period from 10.00pm to 7.00am on Monday to Saturday, and 10.00pm to 8.00am on Sundays and Public Holidays

Privately owned land Land not owned by a public agency or the Proponent or its related companies

Preferred Project Report The Proponent's Preferred Project Report dated September 2008, prepared by DFA Consultants, as modified in the Proponent's email to the Department of 18 November 2008

Project The development as described in the EA

Proponent PF Formation, or its successors in title

Response to Submissions The Proponent's response to issues raised in submissions, dated March 2008, prepared by DFA Consultants, and subsequent submissions to the Department dated 27 August 2008

RTA	Roads and Traffic Authority
SHTW	Sydney Hinterland Transition Woodland
Site	Land to which the project application applies
Statement of Commitments	The Proponent's commitments in Appendix 3
Strategy A, Strategy B	The alternative rehabilitation proposals described in the preferred project report
Vegetation Offset	The conservation and enhancement program described in the preferred project report, to occur on the land shown on the plan in Appendix 5
VENM	Virgin Excavated Natural Material, as defined in the <i>Protection of the Environment Operations Act 1997</i>

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## SCHEDULE 2 ADMINISTRATIVE

### Obligation to Minimise Harm to the Environment

1. The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

### Terms of Approval

2. The Proponent shall carry out the project generally in accordance with the:
  - (a) EA;
  - (b) preferred project report; (c) statement of commitments; and (d) conditions of this approval.

*Notes:*

- The layout of the project is shown in the figure in Appendix 2; and
- The statement of commitments is included in Appendix 3.

3. If there is any inconsistency between the above:
  - (a) the preferred project report shall prevail over the EA; (b) the conditions of this approval shall prevail generally, to the extent of the inconsistency.
4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
  - (a) any reports, plans, programs or correspondence that are submitted in accordance with the conditions of this approval; and
  - (b) the implementation of any actions or measures contained in these reports, plans, programs or correspondence.

### Existing Sand Mining Consent

5. Subject to an agreement in accordance with condition 7 below, the Proponent may accept material extracted from Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998 to be transported across the site and to the slurry plant on Lot 1 DP 570966 via the slurry pipeline and processed on Lot 198 DP 752025.

#### **Limits on Approval**

6. Extraction and processing operations may take place until 30 November 2028.

*Note: Under this approval, the Proponent is required to rehabilitate the site and provide offsets to the satisfaction of the Director-General. Consequently this approval will continue to apply in all other respects other than the right to conduct extraction and processing operations until the site has been rehabilitated and the offset provided to a satisfactory standard.*

7. The quantity of processed material produced at the site, together with material produced on Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998, shall not exceed 400,000 tonnes a year.

Prior to the commencement of any processing of extractive material (under the above consent) from activities on Lot 2 DP 555184 or Lot 1 DP 34599, the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has reached an agreement with the owners of those Lots regarding the proportion of the extraction limit as it applies to each Lot.

8. The Proponent shall restrict total laden truck movements associated with the project to:
- (a) 200 per day, for the Proponent's combined operations at Maroota;
  - (b) 20 per day, for trucks importing VENM to the site; and
  - (c) 10 per day, for trucks entering/exiting the site between 6.00am and 7.00am.

*Note: For the avoidance of doubt, 200 is the maximum laden truck movement volume allowed on any one day, including the VENM and early morning truck movements.*

9. The Proponent shall not undertake any extraction within 2 metres of the established wet weather groundwater level.

*Note: The wet weather groundwater level shall be established in accordance with condition 3 of Schedule 3.*

10. The Proponent shall not disturb any SHTW vegetation (as shown on the plan in Appendix 5) on site without the prior written approval of the Director-General. In seeking this approval the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has established at least 3.7 hectares of SHTW on the site, to a standard that meets the criteria in Appendix 6.

*Note: This demonstration must include an assessment by a suitably qualified and independent ecologist.*

#### **Management Plans / Monitoring Programs**

11. With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

#### **Demolition**

12. The Proponent shall ensure that all demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures*, or its latest version.

#### **Protection of Public Infrastructure**

13. The Proponent shall:

- (a) repair, or pay all reasonable costs associated with repairing, any public infrastructure that is damaged by the project; and
- (b) relocate, or pay all reasonable costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.

#### **Operation of Plant and Equipment**

14. The Proponent shall ensure that all plant and equipment used at the site is:

- (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient condition.

#### **Crown Land**

15. The Proponent shall not commence any development authorised by this approval on Crown land without the prior approval of the Department of Lands.

#### **Section 94 Contributions**

16. The Proponent shall pay a monthly contribution to the Council for the upgrade and maintenance of roads in accordance with Baulkham Hills Shire Council's section 94 plan in force at the date of this approval.

### **SCHEDULE 3 ENVIRONMENTAL PERFORMANCE**

#### **GENERAL EXTRACTION AND PROCESSING PROVISIONS**

##### **Identification of Boundaries**

1. Within 3 months of the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall:

- (a) engage an independent registered surveyor to survey the boundaries of the approved limit of extraction and the approved ancillary work areas;
- (b) submit a survey plan of these boundaries to the Director-General; and
- (c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

*Note: The limit of extraction and ancillary areas is shown conceptually on the layout plans in Appendix 2, as amended/clarified by the conditions below.*

## General Limits of Extraction

2. Notwithstanding the layout plans in Appendix 2, the Proponent shall not undertake extraction within:

- (a) 30 metres of Hitchcock Road; and
- (b) 10 metres of the property boundary of Lot 2 DP 555184, unless sand extraction has commenced on that lot, and extraction in this buffer has been agreed by the Director-General.

## Maximum Extraction Depth Map

3. The Proponent shall:
  - (a) establish the wet weather groundwater level for the site based on all available (and at least 12 months) site specific groundwater monitoring data;
  - (b) engage a suitably qualified and experienced expert to establish the maximum extraction depths to which extraction can be undertaken on site, to comply with condition 9 of Schedule 2;
  - (c) submit a Maximum Extraction Depth Map (contour map or similar) for the project to the Director-General within 3 months of the date of this approval; and (d) comply with the extraction depths specified in the map, to the satisfaction of the Director-General.
4. Within 3 months of the completion of the Independent Environmental Audit (see condition 6 of Schedule 5), the Proponent shall review and update the Maximum Extraction Depth Map for the project to the satisfaction of the Director-General.

## NOISE

### Operational Noise Assessment Criteria

5. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence or on more than 25 per cent of any privately-owned land.

Noise Assessment Location	Day	Night	
	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>A1</sub> (1 minute)
R1 - Hammond	41	35	45
R2 – Hitchcock	40	35	45
R5 – Pignataro	42	35	45
R6 – Camilleri	40	35	45
R7 – Maroota Public School	36 <sub>(L<sub>Aeq</sub>(1 Hour))</sub>	N/A	N/A
R8 – Portelli	39	35	45
R9 – Young	39	35	45
R10 - Tornatola	39	35	45

Table 1: Noise Impact Assessment Criteria

#### Notes:

- To determine compliance with the L<sub>Aeq(15 minute)</sub> noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the

dwelling where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance may be accepted (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.

- To determine compliance with the  $L_{A1(1 \text{ minute})}$  limit, noise from the project is to be measured at 1 metre from the dwelling façade.
- The noise limits apply under meteorological conditions of:
  - wind speed up to 3m/s at 10m above ground level;
  - temperature inversion conditions of up to 3 degrees C/100m and wind speed up to 2m/s at 10m above the ground;
 where the wind velocity and temperature gradients are determined to be relevant to the project site in accordance with the NSW Industrial Noise Policy.
- The Director-General may relax the noise limits in Table 1 for any property where the Proponent has an agreement with the relevant owner/s to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.
- For more information on the noise assessment locations see Appendix 4.

### Cumulative Noise Criteria

6. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other extractive industries does not exceed the following amenity criteria on any privately owned land, to the satisfaction of the Director-General:

- $L_{Aeq(11 \text{ hour})}$  50 dB(A) – Day;
- $L_{Aeq(4 \text{ hour})}$  45 dB(A) – Evening; and
- $L_{Aeq(9 \text{ hour})}$  40 dB(A) – Night.

### Operating Hours

7. The Proponent shall comply with the operating hours in Table 2.

Activity	Day	Time
Construction work	Monday - Friday	7.00am to 6.00pm
	Saturday	8.00am to 1.00pm
	Sunday and Public Holidays	None
Quarrying and Processing, (inc. overburden removal)	Monday – Saturday	7.00am to 6.00pm
	Sunday and Public Holidays	None
Product Transportation	Monday – Saturday	6.00am to 6.00pm
	Sunday and Public Holidays	None
Maintenance	Monday – Saturday	7.00am to 6.00pm
	Sunday and Public Holidays	None

Table 2: Operating Hours

#### Notes:

- Product transportation prior to 7.00am is restricted as per condition 8 of Schedule 2.
- Maintenance activities may be conducted outside the hours in Table 2 provided that the activities are not audible at any residence beyond the boundary of the site.
- This condition does not apply to delivery of material if that delivery is required by police or other authorities for safety reasons, and/or the operation or personnel or equipment are endangered. In such circumstances, notification is to be provided to DECC and the affected residents as soon as possible, or within a reasonable period in the case of emergency.

### Noise Management Plan



8. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan shall:
- (a) be submitted to the Director-General within 3 months of the date of this approval;
  - (b) be prepared in consultation with DECC;
  - (c) include details of how the noise performance of the project would be monitored, and include a noise monitoring protocol for evaluating compliance with the relevant noise limits in this approval; and
  - (d) include an investigation and assessment (including modelling) of additional reasonable and feasible noise mitigation measures that would be implemented to ensure that noise emissions at all stages of the project comply with the noise impact assessment criteria in Table 1.

*Note: The EA predicted that receiver locations R5, R6, R9 and R10 would exceed the applicable noise criteria by between 2 and 5 decibels, during worst case operations.*

9. If the additional noise mitigation measures identified in condition 8(d) are not able to reduce noise levels to within 2 decibels of the impact assessment criteria in Table 1 then, upon receiving a written request from the applicable landowner, the Proponent shall implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner.

These additional mitigation measures must be reasonable and feasible.

If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

## AIR QUALITY

### Impact Assessment Criteria

10. The Proponent shall ensure that dust generated by the project does not cause exceedances of the criteria listed in Tables 3, 4 and 5 at any residence or on more than 25 per cent of any privately owned land.

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m <sup>3</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	30 µg/m <sup>3</sup>

*Table 3: Long Term Impact Assessment Criteria for Particulate Matter*

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>

*Table 4: Short Term Impact Assessment Criteria for Particulate Matter*

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month

Table 5: Long Term Impact Assessment Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.11991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

### Operating Conditions

11. The Proponent shall ensure any visible air pollution generated by the project is assessed regularly, and that quarrying operations are relocated, modified, and/or stopped as required to minimise air quality impacts on privately owned land.

### Air Quality Monitoring

12. The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program shall:
- (a) be submitted to the Director-General for approval within 3 months of the date of this approval; (b) be prepared in consultation with DECC;
  - (c) include details of how the air quality performance of the project would be monitored, providing for additional dust deposition monitoring in the vicinity of clusters of residences to the north and west of the site; and
  - (d) include a protocol for evaluating compliance with the relevant air quality criteria in this approval.

### METEOROLOGICAL MONITORING

13. The Proponent shall ensure the project has a suitable meteorological station on the site or in the immediate vicinity that complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* publication.

## WATER

### Water Supply

14. The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations to match its water supply.

Note: The Proponent is required to obtain necessary water licences for the project under the Water Act 1912 and/or Water Management Act 2000.

### Discharges

15. The Proponent shall not discharge any water from the quarry or its associated operations except in accordance with an EPL.

## Water Management and Monitoring

16. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan shall:
  - (a) be submitted to the Director-General within 3 months of the date of this approval;
  - (b) be prepared in consultation with DWE and DECC; and (c) include a:
    - Site Water Balance;
    - Erosion and Sediment Control Plan;
    - Surface Water Monitoring Program; and
    - Groundwater Monitoring Program.
17. The Site Water Balance shall:
  - (a) include details of:
    - sources and security of water supply;
    - water use on site;
    - water management on site, including the location and capacity of water storages on site and the means of access;
    - off-site water transfers; and
    - reporting procedures; and
  - (b) investigate and describe measures to minimise water use by the project.
18. The Erosion and Sediment Control Plan shall:
  - (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction, Volume 1, 4<sup>th</sup> Edition, 2004* (Landcom);
  - (b) identify activities that could cause soil erosion and generate sediment;
  - (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;
  - (d) describe the location, function, and capacity of erosion and sediment control structures;
  - (e) demonstrate that the design capacity of basins intended to collect storm runoff will not be compromised by storage of operational water; and
  - (f) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time.
19. The Surface Water Monitoring Program shall include:
  - (a) detailed baseline data on surface water flows and quality in downstream watercourses that could be affected by the project;
  - (b) surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts; and (c) a program to monitor:
    - surface water flows, quality, and impacts on water users; • stream health; and
    - channel stability.
20. The Groundwater Monitoring Program shall include:
  - (a) provision of additional monitoring bores around the periphery of the site;
  - (b) detailed baseline data on groundwater levels, flows and quality in the region, and particularly any groundwater bores, springs and seeps (including spring and seep fed dams) that may be affected by operations on site;
  - (c) groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts; (d) a program to monitor:

- groundwater levels and quality in new and existing monitoring bores;
  - the impacts of the project on:
    - any groundwater bores, springs and seeps (including spring and seep fed farm dams) on privately-owned land; and
    - any groundwater dependent ecosystems; and
- (e) a protocol for further groundwater modelling to confirm the limits to excavation depth across the site permitted in accordance with condition 9 of Schedule 2.

## LANDSCAPE MANAGEMENT

### Rehabilitation

21. The Proponent shall progressively rehabilitate the site to the satisfaction of the Director-General, in a manner that is generally consistent with the concept final landform (Strategy A or Strategy B) in the preferred project report (as reproduced in Appendix 7).

### Offset Strategy

22. The Proponent shall implement the Offset Strategy described in the preferred project report, and summarised in Table 6 (shown conceptually on the plan in Appendix 5), to the satisfaction of the Director-General.

Area	Minimum Size (hectares)
On-Site Revegetation Area (SHTW)	7.9
On-Site Revegetation Area (Other Woodland)	4.1
<b>Total</b>	<b>12</b>

Table 6: Offset Strategy

23. Within 3 years of the date of this approval, the Proponent shall make suitable arrangements to provide appropriate long term security for the offset areas to the satisfaction of the Director-General.

*Note: The Department acknowledges that the arrangements may provide for staged or delayed implementation, in accordance with the extraction in these areas.*

### Landscape Management Plan

24. The Proponent shall prepare and implement a Landscape Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with DECC by suitably qualified expert/s whose appointment/s have been approved by the Director-General;
  - (b) be submitted to the Director-General for approval within 6 months of the date of this approval; and
  - (c) include a:
    - Rehabilitation and Offset Management Plan; and
    - Quarry Closure Plan.

## **Rehabilitation and Offset Management Plan**

25. The Rehabilitation and Offset Management Plan must include:

- (a) the rehabilitation objectives for the site, vegetation offsets and landscaping;
- (b) a description of the short, medium, and long term measures that would be implemented to:
  - rehabilitate the site;
  - implement the Offset Strategy; and
  - maintain and enhance existing site vegetation outside the disturbance area;
- (c) detailed performance and completion criteria for the site rehabilitation and implementation of the Offset Strategy;
- (d) a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:
  - progressively rehabilitating disturbed areas;
  - implementing vegetation offsets;
  - protecting vegetation and soil outside the disturbance areas;
  - rehabilitating creeks and drainage lines on the site to ensure no net loss of stream length and aquatic habitat;
  - undertaking pre-clearance surveys;
  - managing impacts on fauna;
  - landscaping the site to minimise visual impacts;
  - conserving and reusing topsoil;
  - collecting and propagating seed for rehabilitation works;
  - salvaging and reusing material from the site for habitat enhancement;
  - controlling weeds and feral pests;
  - controlling access; and
  - bushfire management;
- (e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
- (f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and (g) details of who would be responsible for monitoring, reviewing, and implementing the plan.

## **Quarry Closure Plan**

26. The Quarry Closure Plan must:

- (a) include provision for certification from a qualified geotechnical engineer that the final proposed landform is stable;
- (b) define the objectives and criteria for closure of the quarry;
- (c) investigate options for the future use of the site, including any final void;
- (d) describe the measures that would be implemented to minimise or manage the ongoing (post closure) environmental effects of the project; and
- (e) describe how the performance of these measures would be monitored over time.

## **Rehabilitation and Offset Bond**

27. Within 3 months of the approval of the Landscape Management Plan, the Proponent shall lodge a rehabilitation and offset bond for the project with the Director-General. The sum of the bond shall be calculated at:

- (a) \$2.50/m<sup>2</sup> for the area of disturbance in each 3 year review period, including the offset areas; and

- (b) \$1.00/m<sup>2</sup> for the total area of land previously disturbed by the quarry, or as otherwise directed by the Director-General.

Notes:

- *If the rehabilitation and offsets are completed to the satisfaction of the Director-General, the DirectorGeneral will release the bond.*
- *If the rehabilitation and/or offsets are not completed to the satisfaction of the Director-General, the DirectorGeneral will call in all or part of the bond, and arrange for the satisfactory completion of the relevant works.*

## **ABORIGINAL HERITAGE**

28. Should the Proponent discover material suspected of being Aboriginal relics or skeletal remains, work in that area shall cease and the Proponent shall advise DECC and proceed in accordance with DECC instructions.

## **TRAFFIC AND TRANSPORT**

### **Materials Transport**

29. The Proponent shall transport all excavated material between the extraction site and processing plant site, including processing residues, via slurry pipelines.

*Note: When the slurry system is unusable by reason of breakdown or essential maintenance, extractive material may be transported by truck during the period of such breakdown or maintenance. The Proponent shall ensure that such periods are as brief as possible and shall advise the Council each day that truck transport is to be used.*

### **Haulage Records**

30. The Proponent shall record and maintain a log of the extraction quantities and traffic movement in and out of the site, available for inspection at the request of the Director-General or the Council.

### **Road Haulage**

31. The Proponent shall ensure that:
- (a) all loaded vehicles entering or leaving the site are covered; and
  - (b) all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site.

## **VISUAL**

### **Visual Amenity**

32. The Proponent shall minimise the visual impacts of the project to the satisfaction of the DirectorGeneral.

### **Lighting Emissions**

33. The Proponent shall:
- (a) take all practicable measures to mitigate off-site lighting impacts from the project; and

- (b) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*, to the satisfaction of the Director-General.

### **Advertising**

34. The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General.

*Note: This does not include traffic management and safety or environmental signs.*

## **WASTE MANAGEMENT**

### **Waste Minimisation**

35. The Proponent shall:
- (a) only import VENM to the site; and
  - (b) minimise the amount of waste generated by the project to the satisfaction of the DirectorGeneral.

## **EMERGENCY AND HAZARDS MANAGEMENT**

### **Dangerous Goods**

36. The Proponent shall ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

### **Safety**

37. The Proponent shall secure the project to ensure public safety to the satisfaction of the DirectorGeneral.

### **Bushfire Management**

38. The Proponent shall:
- (a) ensure that the project is suitably equipped to respond to any fires on-site; and
  - (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire on site.

## **PRODUCTION DATA**

39. The Proponent shall:
- (a) provide annual production data to the DPI using the standard form for that purpose; and
  - (b) include a copy of this data in the AEMR.

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## **SCHEDULE 4**

## **ADDITIONAL PROCEDURES**

### **NOTIFICATION OF LANDOWNERS**

1. If the results of monitoring required in Schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, then the Proponent shall notify the Director-General and the affected landowners and/or existing or future tenants accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the relevant criteria.

### **INDEPENDENT REVIEW**

2. If a landowner of privately owned land considers that the operations of the quarry are exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Proponent in writing for an independent review of the impacts of the project on his/her land.

If the Director-General is satisfied that an independent review is warranted, the Proponent shall within 3 months of the Director-General advising that an independent review is warranted:

- (a) consult with the landowner to determine his/her concerns;
  - (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to determine whether the project is complying with the relevant criteria in Schedule 3, and identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and (c) give the Director-General and landowner a copy of the independent review.
3. If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.
4. If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, and that the quarry is primarily responsible for this non-compliance, then the Proponent shall:
  - (a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria; and
  - (b) conduct further monitoring to determine whether these measures ensure compliance; or
  - (c) secure a written agreement with the landowner to allow exceedances of the relevant criteria in Schedule 3, to the satisfaction of the Director-General.

If the additional monitoring referred to above subsequently determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the Proponent is unable to finalise an agreement with the landowner, then the Proponent or landowner may refer the matter to the Director-General for resolution.



If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).

5. If the landowner disputes the results of the independent review, either the Proponent or the landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).

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## **SCHEDULE 5**

### **ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING & AUDITING**

#### **ENVIRONMENTAL MANAGEMENT STRATEGY**

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy shall be submitted to the Director-General within 3 months of the date of this approval, and;
  - (a) provide the strategic context for environmental management of the project;
  - (b) identify the statutory requirements that apply to the project;
  - (c) describe in general how the environmental performance of the project would be monitored and managed;
  - (d) describe the procedures that would be implemented to:
    - keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;
    - receive, handle, respond to, and record complaints;
    - resolve any disputes that may arise during the life of the project;
    - respond to any non-compliance;
    - manage cumulative impacts; and
    - respond to emergencies; and
  - (e) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.

#### **ENVIRONMENTAL MONITORING PROGRAM**

2. The Proponent shall prepare an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program shall be submitted to the Director-General concurrently with the submission of the various monitoring programs and consolidate the various monitoring requirements in Schedule 3 of this approval into a single document.

## **REPORTING**

#### **Incident Reporting**

3. Within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.

4. Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that:
  - (a) describes the date, time, and nature of the exceedance/incident;
  - (b) identifies the cause (or likely cause) of the exceedance/incident;
  - (c) describes what action has been taken to date; and
  - (d) describes the proposed measures to address the exceedance/incident.

#### **Annual Reporting**

5. Within 12 months of the date of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General, relevant agencies and CCC. This report shall:
  - (a) identify the standards and performance measures that apply to the project;
  - (b) describe the works that will be carried out in the next 12 months;
  - (c) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
  - (d) include a summary of the monitoring results for the project during the past year; (e) include an analysis of these monitoring results against the relevant:
    - impact assessment criteria/limits;
    - monitoring results from previous years; and
    - predictions in the EA;
  - (f) identify any trends in the monitoring results over the life of the project;
  - (g) identify any non-compliance during the previous year; and
  - (h) describe what actions were, or are being, taken to ensure compliance.

#### **INDEPENDENT ENVIRONMENTAL AUDIT**

6. Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit shall:
  - (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General;
  - (b) include consultation with the relevant agencies;
  - (c) assess the environmental performance of the project, and its effects on the surrounding environment;
  - (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and
  - (e) review the adequacy of any strategy/plan/program required under this approval, and, if necessary, recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval.

*Note: The person(s) conducting the audit should have expertise in flora and fauna assessment, hydrogeology and quarry rehabilitation.*

7. Within 6 weeks of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the Director-General, with a response to any of the recommendations in the audit report.
8. Within 3 months of submitting a copy of the audit report to the Director-General, the Proponent shall review and if necessary revise:

- (a) each of the environmental management and monitoring strategies/plans/programs in Schedules 3 and 5; and
- (b) the sum of the Vegetation Offset Bond (see Schedule 3). This review shall consider:
  - the effects of inflation;
  - any changes to the total area of disturbance; and
  - the performance of the vegetation offsets against the completion criteria of the Rehabilitation and Vegetation Offset Management Plan,

to the satisfaction of the Director-General

#### **COMMUNITY CONSULTATIVE COMMITTEE**

9. The Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the Department's *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects*.

*Note: The Proponent may continue the operation of the Liaison and Review Committee established under condition 6.7 of the development consent issued by the Land and Environment Court on 14 July 1998 to fulfil this condition.*

#### **ACCESS TO INFORMATION**

10. Within 1 month of the approval of any plan/strategy/program required under this approval (or any subsequent revision of these plans/strategies/programs), or the completion of the audits or AEMR required under this approval, the Proponent shall:
- (a) provide a copy of the relevant document/s to the relevant agencies and to members of the general public upon request; and
  - (b) ensure that a copy of the relevant document/s is made publicly available on its website and at the Proponent's office.
11. During the project, the Proponent shall:
- (a) make a summary of monitoring results required under this approval publicly available on its website and at the site office; and
  - (b) update these results on a regular basis.
-

## APPENDIX 1 SCHEDULE OF LAND

Extraction Area	<ul style="list-style-type: none"><li>• Lots 1 &amp; 2 DP 570966</li><li>• Lots 1 &amp; 2 DP 1063296</li><li>• Lot 1 DP 1013943</li><li>• Lot 2 DP 233818</li><li>• Lot 1 DP 1091018</li><li>• Lot 1 DP 223323</li><li>• Lots 167 &amp; 214 DP 752039</li></ul>
Processing Plant	<ul style="list-style-type: none"><li>• Lot 198 DP 752025</li></ul>

## APPENDIX 2 GENERAL LAYOUT OF PROJECT



- Area already extracted and partially rehabilitated
- Area for future extraction
- Clean water dam
- Existing internal haul road
- Land included in the application





## **APPENDIX 3 STATEMENT OF COMMITMENTS**

### **Noise and Vibration**

- Site activities will be managed so that any necessary high noise and vibration levels occur at times of least impact.
- All site activities will be undertaken incorporating noise attenuation measures such as restricting working hours for certain works required in the proximity of sensitive receptors.
- All equipment used on site will be certified in relation to noise performance.
- Panels and covers of silenced plant will be kept shut and plant and equipment switched off when not in use.
- All mechanical equipment will be silenced by the best practical means using current technology, prior to use. Noise suppression devices will be fitted according to manufacturer's instructions. Noise control kits will be fitted to noisy mobile equipment and shrouds provided around stationary equipment where necessary.
- All plant and equipment will be inspected regularly to ensure that it is well maintained to minimise noise emissions.
- The  $L_{10}$  noise level at the boundary of adjacent receivers where baseline data has been obtained will not normally exceed the background level by more than 5 dB(A).
- Compliance monitoring of noise levels will be undertaken and appropriate records of measurements kept.
- The local community will be informed of the level and duration of noise to be expected during specific activities and phases of development when necessary. Communication of concerns to the Environmental Manager will be invited.

### **Air Quality and Greenhouse Gas Emissions**

- Ambient air quality monitoring will be conducted at identified sites.
- Dust suppression equipment will be fitted to all processing plant on the site. This will be regularly inspected and maintained in good working order at all times.
- Trafficable areas will be defined to prevent unnecessary vehicle movement into other parts of the site.
- All unsealed trafficable areas and working areas will be kept damp by spraying regularly with a water cart, water sprays or sprinklers to minimise dust emissions. Frequency of spraying to be determined based on weather conditions, soil erodibility and the observation of any visible dust.
- Speed controls will be applied to all unsealed areas (maximum speed of 20 km/h) and signposted accordingly.
- All semi-permanent stockpiles will be vegetated with suitable groundcover and regularly watered until the vegetation is well established.



- Work on any extraction activity producing dust will cease due to high winds if control cannot be achieved by watering or other means. Work will not resume until the wind velocity decreases and any dust generation can be controlled by normal means.
- All loaded trucks leaving the central processing plant on Lot 198 DP 752025 will have their payloads fully covered by a suitable material to prevent spillage.
- No fires will be permitted on-site without a permit.
- A mechanical road sweeping unit and water cart will be maintained for use as required to keep all roads including the intersection of the haul road and Wisemans Ferry Road free from deposited material.
- Exhausts from all vehicles and plant/equipment will be inspected to ensure that they are maintained at an acceptable level.
- All vehicles will be regularly serviced to ensure that exhaust emissions comply with the regulations. Appropriate service records will be maintained.
- Any opportunities to minimise machinery use and ensure that all equipment used on the site is energy efficient will be identified.

### **Access and Traffic**

- If the sand slurry plant and transport system is unusable due to breakdown or during maintenance periods, trucks will be used for the transport of extractive material on a temporary basis. This will cease once the system is operating satisfactorily.
- The number of laden vehicle movements will not exceed a combined total of two hundred per day via the intersection of the haulage road and Wisemans Ferry Road. This is the total of laden vehicle movements allowed for PF Formation's combined extractive industry operations in Baulkham Hills Shire.
- Operations involving the transportation of material on the site will only be undertaken between 07.00 and 18.00 hours, Monday to Saturday, except a maximum of 10 laden vehicles will be allowed to enter and leave the site between 06.00 and 07.00 hours, Monday to Saturday only. Vehicles will not be allowed to arrive at the site prior to 05.45 hours on any day.

### **Erosion and Sediment Control**

- Soil and Water Management Plan will be reviewed and revised, if required.
- Temporary erosion and sedimentation control structures such as detention basins and catch drains will be constructed as appropriate to collect runoff from cleared land including extraction areas and access roads.
- Silt traps and erosion control fencing will be erected as appropriate along extraction area boundaries and drainage lines.
- Sediment basins with a minimum storage capacity of 400 m<sup>3</sup> per hectare of catchment will be constructed. Spillway capacity and stability will be designed as follows: – life of less than 5

years, adopt the 20 year tc event; – life between 5 and 10 years, adopt the 50 year tc event; and – life greater than 10 years, adopt the 100 year tc event.

- Stormwater control measures will be assessed and routine inspections conducted to ensure that compliance with best practice guidelines and relevant legislation is achieved.
- Locations for topsoil and material stockpiles will be selected on level ground and away from drainage lines. Diversion drains and sediment filter fences will be installed up slope as appropriate.
- Training will be provided to operational personnel on the importance of erosion control measures and drivers informed of the damage that can be caused to the environment by heavy vehicles.
- Areas of exposed land will be kept to a minimum compatible with operational requirements.
- Exposed areas not in use will be stabilized with an appropriate cover crop and watered until well established.
- Erosion and sediment controls will be monitored regularly and immediately following a rainfall event. Monitoring will take place initially on a weekly basis, then monthly once operating correctly. Sediment will be cleared when the traps have collected 60% of the capacity of the basin or where sediment build-up is less than 300 mm below the spillway crest. Sediment will be removed to a location where further pollution to downslope lands and waterways will not occur.
- Maintenance of erosion and sediment controls will be undertaken when any deterioration is identified or when replacement is necessary.
- Stored stormwater will be reused for dust control and the watering of site vegetation.
- Soil stockpiles will be seeded where these are to remain unused for a period in excess of four weeks. The area will be watered until the vegetation is well established.

## **Water Management**

- Maximum depth of extraction will be restricted to not less than two metres above the wet weather high groundwater level. (nominally 181 m AHD).
- The groundwater will not be breached or contaminated. In the event that either should occur, operations will cease in the affected area and the Department of Environment and Climate Change consulted to determine the basis on which extraction may recommence.
- Retention basins will be designed to accommodate the 100-year tc event. The minimum basin capacities are:
  - Northern catchment 10,000 m<sup>3</sup>
  - Southern catchment 38,000 m<sup>3</sup>

The volume of these basins can be varied depending on the extent of the area exposed for extraction within each catchment.

- All retention basins will be regularly inspected and an annual report prepared on their effectiveness.
- A minimum of two groundwater monitoring bores will be installed. One will be located within or near the extraction area and another at some location within the site beyond the area of any direct extraction influence. The location of these bores will meet the requirements of the Department of Environment and Conservation and Baulkham Hills Shire Council.

### **Flora and Fauna**

- All areas which are not to be disturbed will be clearly marked.
- Topsoil will be separated and stored or use in rehabilitation works.
- An area of not less than 12 hectares will be identified, and indicated on the site survey. This will be identified as a revegetation area and access controlled.
- Seed will be collected from the existing woodland communities (Sydney Hinterland Transition Woodland), stored under controlled conditions, made available for future broadcasting and a suitable proportion propagated to provide tubestock for revegetation.
- Stored topsoil and that derived from suitable areas adjacent to the woodland communities will be spread over the defined revegetation area and seed broadcast over the site to augment the soil-borne native seed bank. Tube stock suitably protected against animal predation will also be used in appropriate locations.
- Access to bushland will be restricted to minimise the potential for damage. These areas will be marked and signs erected to ensure that this prohibition is made clear. The boundary of the site will be fenced to prevent external access.

### **Rehabilitation**

- The Rehabilitation Plan will be reviewed and amended as necessary to reflect changing operational conditions. This will include a revised phasing plan and implementation programme.
- Setbacks to all roads and adjacent properties will be defined taking account of existing trees and other features. Programmes of mound construction and screen planting will be undertaken as required in the Rehabilitation Plan. All plant material used will reflect the species mix existing in the area.
- A staged seeding and planting programme will be undertaken as areas become available following completion of extraction and capping of sediment basins. This will be aimed at producing a dense plantation on the steeper slopes derived from the flora resources already established. The aim is to replicate as far as possible the mix and density of planting which is currently present.
- All suitable plant material will be used on the site as a seed and planting medium. Topsoil will be stored in appropriately marked low stockpiles for reuse in locations as close as possible to their source. Care will be taken to ensure that this does not become contaminated with the seeds of exotic species and weeds.

- The site will be rehabilitated in stages leaving areas exposed for as short a time as possible. This will be undertaken in conformity with the approved Rehabilitation Plan with maximum final batter grades of 4(H):1(V) on north and west facing slopes and 3(H):1(V) on those facing south and east. Final slopes will be as gentle as possible depending on the availability of fill material.
- All soil stockpiles and exposed areas will be seeded with an appropriate vegetation cover where no activity is to take place for more than four weeks.
- Revegetation of the site will be undertaken on the following basis:
  - as far as possible re-establish the Sydney Hinterland Transitional Woodland using seed and mulch collected from the area ;
  - rehabilitate other areas to native species with a light sowing of cereal and allowing natural regeneration;
  - rehabilitate the soil to achieve a full profile;
  - lime, fertilise and sow areas where improved grass cover is required; and
  - suitably turf surfaces expected to experience high surface flows leaving the site.
- A maintenance programme aimed at promoting and protecting the growth of the rehabilitated areas will be established.

### **Social Impact Management**

- Material concerning activities at the site will be prepared and published on the company's website which will allow the community and others to be informed about current news on the site.
- Regular bi-annual meetings of community representatives will be established to discuss issues in relation to sand extraction on the site.
- A Complaints Register will be established incorporating date and time, type of communication, contact details of the complainant, nature of the complaint and response taken.

### **Heritage**

- All work will cease in the area if an archaeological or heritage item is identified during extraction operations and the National Parks and Wildlife Service, the Deerubbin Aboriginal Land Council or the Heritage Office consulted to determine any appropriate course of action prior to recommencement of the work.
- Any additional survey work required for submittal of application to destroy artefact scatters located in the later stages of the development will be undertaken. Reasonable requirements of the National Parks and Wildlife Service (DECC), the Deerubbin Aboriginal Land Council and the Heritage Office arising out of any additional studies will be implemented.

### **Visual Amenity**

- Peripheral bunds will be constructed within the established setbacks where necessary to screen extraction activities. These will be a minimum of three metres high with slopes ranging from 3(H):1(V) to 6(H):1(V) depending on the location using overburden stripped from the site.
- Screen planting works will be undertaken in the peripheral areas to an agreed specification using mulch to allow for native plant regeneration. This species mix will be reinforced using appropriate plantings at specified intervals.
- A tree planting programme will be undertaken within the ten metre buffer zones and in other defined parts of the site to establish a dense plantation using an appropriate mix of species reflecting that of the existing community.
- The final rehabilitated landform will be established in conformity with the Rehabilitation Plan.
- All temporary fencing will be removed when no longer required.
- Vegetation in areas suitable for agricultural/horticultural uses will be re-established.
- All site infrastructure including the slurry plant and its associated pipelines will be removed. Those areas affected by the plant will be restored and rehabilitated.
- All waste materials will be removed and disposed of in an appropriate manner.
- The final Rehabilitation Plan will be reviewed and proposals for future use of the site prepared.

### **Waste Management**

- Waste handling areas will be clearly delineated.
- Specific areas for the collection of materials for reuse and recycling will be defined and clearly labelled.
- Cleared vegetation will be used within the landscape programme.
- All topsoil will be stored in stockpiles for later use in site rehabilitation.
- Bins or skips will be provided for the collection and storage of recyclable material and waste. General construction waste will be stored in a skip located at the workshop on Lot 198 DP752025. Waste food will be removed and stored in a vermin proof bin for collection by a waste contractor. Paper waste generated from site offices, plastics and glass will be collected separately for recycling.
- Hazardous wastes (including empty drums, rags, soil contaminated with oil) will be separated from nonhazardous wastes and managed in accordance with the relevant legislation.
- Liquid wastes (chemicals, oils and greases) will be temporarily stored in an appropriately bunded area and disposed of via a licensed contractor. Wash down water will be directed to an appropriate settlement basin if quality is acceptable.
- Copies of current licences of all waste removal contractors on site will be retained.
- All documentation relating to waste removal and disposal will be retained on file at the site. This documentation will include dockets for the removal and disposal of waste at a licensed facility.

- Waste material will be progressively separated and stockpiled in designated areas for collection. Adequately secure waste disposal areas to prevent access by wildlife.
- All waste licences will be reviewed and terms and conditions for compliance monitored.
- Any materials and waste remaining on the site following completion of extraction operations will be recycled or sent of disposal. This will be either recycled or disposed of in an appropriate manner.

### **Emergency Response**

- All personnel on site during operations will be trained in appropriate procedures including site induction, materials handling and response procedures.
- Emergency response procedures will be developed and put in place. Appropriate individuals will be appointed as emergency services liaison officers.
- An emergency response table listing contact details of all relevant parties required in an environmental emergency will be prepared.
- A Register of Environmentally Hazardous Materials to be stored and used on site will be established.
- Appropriate safety and spill response equipment will be made available on site.
- All materials to be used and stored on site will be clearly labelled.
- Emergency response procedures will be reviewed and updated bi-annually.
- Appropriate safety and response equipment will be available at all times.

### **Hazard, Risk and Safety**

- A licence to keep dangerous goods will be obtained from WorkCover NSW for all materials stored on site which require licensing.
- A Register of Hazardous Materials setting out details of quantities, storage and specific handling requirements for all relevant materials stored on site will be established.
- Material Safety Data Sheets for all hazardous materials stored on site will be obtained.
- Appropriate storage and secondary containment facilities for all hazardous materials stored on site will be provided. All bunded areas will be designed to contain at least 110% of the volume of materials stored within the area.
- A Safety Officer will be appointed for the development.
- All flammable material storage areas will be located at least ten metres from possible ignition sources.

- Contents of all above ground storage areas will be clearly labelled.
- All hazardous and dangerous goods storage areas will be secured and appropriate signage displayed. All incompatible material will be segregated.
- All personnel will be trained in the handling and safety procedures required for the hazardous materials stored and used on site.
- An Emergency Response Plan will be developed and put in place.
- A mobile spill control kit containing appropriate absorbent materials, neutralising chemicals and other spill containment equipment will be provided.
- Personal protective equipment will be provided and personnel instructed in its use.
- Any spills beyond the bunded area will be cleaned up immediately and the contaminated material disposed of in an appropriate manner.
- The relevant authorities will be contacted in the event of a leak or spill and any instructions followed. Any contamination will be remediated to the satisfaction of the regulatory authorities.
- Any spills or hazardous wastes that cannot be recycled will be collected and disposal by a licensed waste contractor arranged. All records of waste removal on site will be retained.

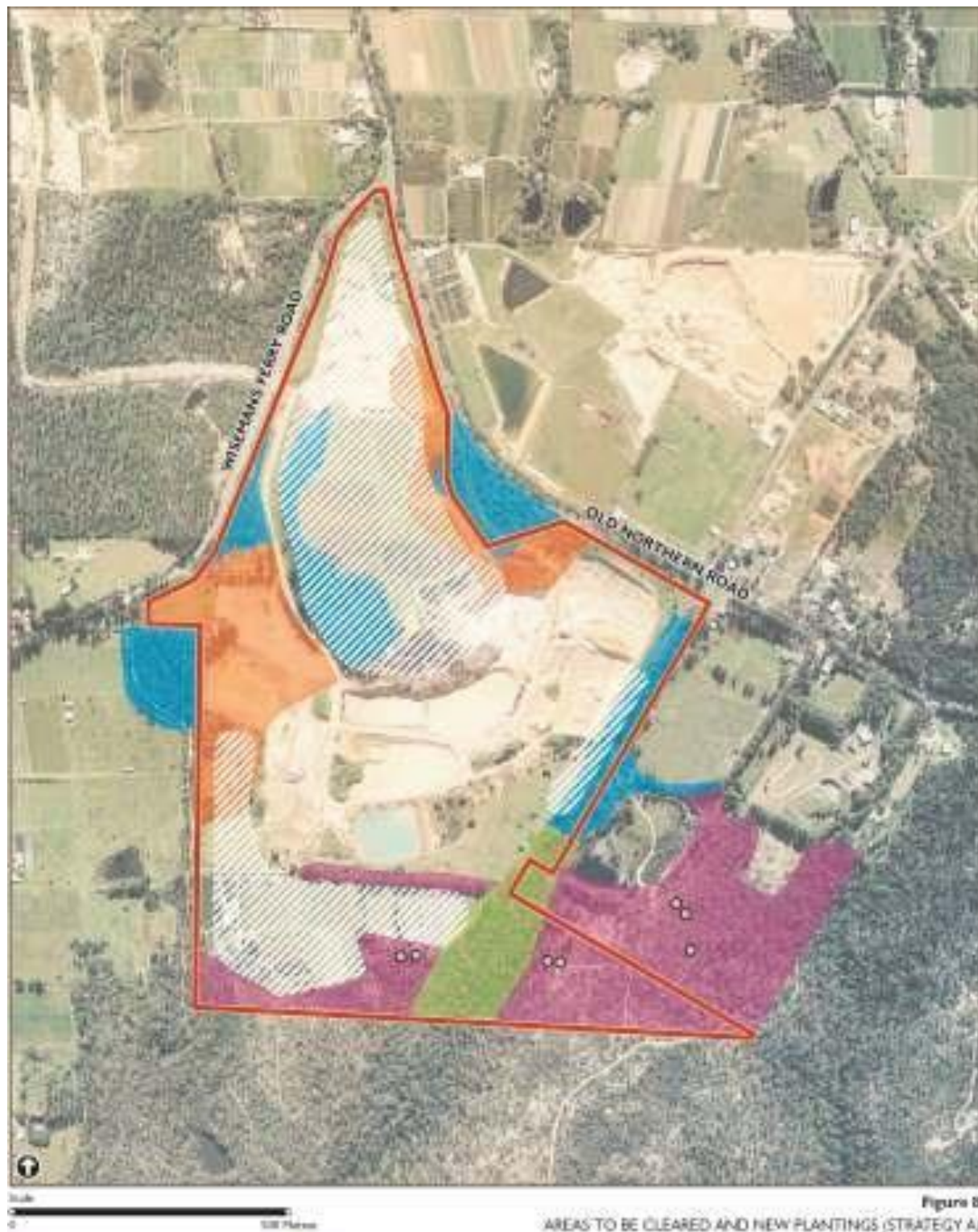


Figure 4.1  
NOISE MONITORING AND ASSESSMENT LOCATIONS

#### APPENDIX 4 NOISE ASSESSMENT LOCATIONS

#### APPENDIX 5 VEGETATION OFFSET PLAN





- Hitchcock Road site
- Areas for new plantings
- *Tetraodon glandulosa*
- Sydney Sandstone Gully Forest
- Sydney Sandstone Ridgeline Woodland
- Sydney Hinterland Transition Woodland
- Areas to be cleared

Note: Sydney Hinterland Transition Woodland shown at time of photograph (2006)  
Parts of this area can be cleared under the current consent

# APPENDIX 6 CRITERIA TO MONITOR SUCCESS OF REVEGETATION

Table 3-1 Criteria to monitor success of revegetation

Category	Criteria	1 year	5 years	15 years	Final condition of vegetation to be removed
Native species	Native species diversity	20	25	40	48
	Percentage number per 400m <sup>2</sup> quadrat				
	Average number of individuals per species per 400m <sup>2</sup> quadrat	15	20	30	34.5 + 1.5t
	Native species cover	40	45	49.5	50
Weeds	% of vegetation cover in 400m <sup>2</sup> quadrat	10	10	10	10
	% of vegetation cover in 400m <sup>2</sup> quadrat				
	Types of weed (Native weed, weed, or grass)	Controlled	Controlled	Controlled	Restricted
Vegetation structure	Vegetation structure	Canopy, shrub layer and groundcover well established. However, shrubs are mostly generally consisting of low canopy and ground cover	Canopy, shrub layer and groundcover well established. Shrubs beginning to develop	Well structured and includes canopy, shrub layer and ground cover	Well structured and includes canopy, shrub layer and ground cover
Canopy	Average canopy height (m)	4	8	12	12-16
	Native canopy cover (minimum % cover)	5	5	5	5
	(marked on a 100m <sup>2</sup> scale)	5	10	10	10
Shrub layer	Native shrub cover (minimum % cover)	10	10	10	10.5 + 0.5t
	(marked on a 100m <sup>2</sup> scale)	10	10	10	10
	Average shrub layer height (m)	0.5	1	1	1.25
Ground cover	Native ground cover (minimum % cover)	5	10	10	10.5 + 0.5t
	(marked on a 100m <sup>2</sup> scale) <sup>1</sup>	10	10	10	10

Category	Criteria	Target			Long-term condition of vegetation to be assessed
		3 years	10 years	15 years	
Ecosystem function	plant species	Vegetation structure beginning to develop	Woodland and Upland meadow  Habitat structure beginning to develop including groundcover such as leaf litter and fallen twigs	Woodland forest structure  Habitat structure beginning to develop including groundcover such as leaf litter and fallen twigs	Provides minimal habitat for fauna however many woodland and Upland species  Wood structure present includes moderate levels of leaf litter and fallen timber
	Native representation indicating dispersal of seed into soil and/or presence of seed bank	Yes	Yes	Yes	Yes

There is a range of canopy species and species may be further locally due to succession of species with different seed size type, growing north, southwards and in the presence of surrounding species. Native tree may be a mixture of existing species introduced and native species. Native tree may be a mixture of species that may be introduced and native tree.

2. Multi-plant species and seed

1. 100% species available
2. 100% species
3. 100%
4. 100%
5. 100%
6. 100%

## APPENDIX 7 FINAL LANDFORM PLANS

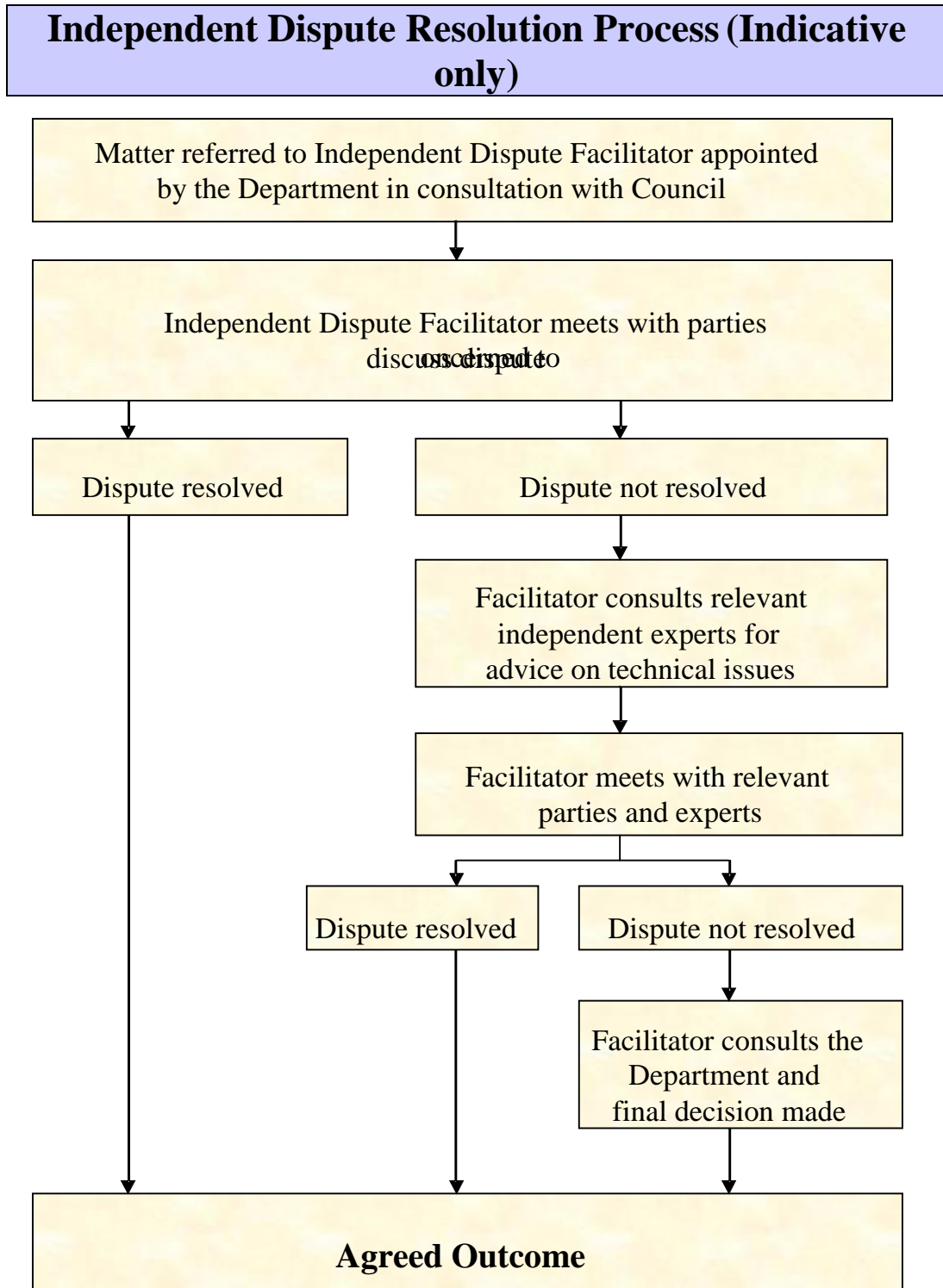




Figure 1.8  
FINAL LANDFORM STRATEGY



## APPENDIX 8 INDEPENDENT DISPUTE RESOLUTION PROCESS





# **ATTACHMENT 2**

## **EPA LICENCE Annual Return**



# Annual Return

ETRA PTY LTD



## ANNUAL RETURN

LICENCE NO	3407
LICENCE HOLDER	ETRA PTY LTD
REPORTING PERIOD	30-Sep-2014 to 29-Sep-2015

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD \_\_\_\_ / \_\_\_\_ / \_\_\_\_ to \_\_\_\_ / \_\_\_\_ / \_\_\_\_

(Note: the revised reporting period also needs to be entered in Section E)

**THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 29-Nov-2015**

**Your Annual Return must be completed, including certification in Section I, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.**

**Failure to submit this Annual Return within 60 days after the reporting period ends may result in:**

- the issue of a Penalty Notice for \$1500 (individuals) or \$3000 (corporations);
- OR
- prosecution.

Please send your completed Annual Return by **Registered Post** to:

**Regulatory and Compliance Support Unit  
Environment Protection Authority  
PO Box A290  
SYDNEY SOUTH NSW 1232**

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

**THERE IS A MAXIMUM PENALTY OF \$250,000 FOR A CORPORATION OR \$120,000 FOR AN INDIVIDUAL.**

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997*.

# Annual Return

ETRA PTY LTD



Use the checklist below to ensure that you have completed your Annual Return correctly.

(✓ the boxes)

CHECKLIST	
<input checked="" type="checkbox"/> Section A:	All licence details are correct
<input checked="" type="checkbox"/> Section B1:	You have entered the correct number in the complaints table
<input checked="" type="checkbox"/> Section B2 – B3:	If there are tables, you have provided the required details
<input checked="" type="checkbox"/> Section C:	You have answered question 1, and 2 if applicable
<input checked="" type="checkbox"/> Section D:	If applicable, you have completed all load calculation worksheets
<input checked="" type="checkbox"/> Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
<input checked="" type="checkbox"/> Section F:	You have answered question 1, 2 and 3 if applicable
<input checked="" type="checkbox"/> Section G:	You have answered question 1 and questions 2, 3 and 4 or questions 5 through to 11 if applicable
<input checked="" type="checkbox"/> Section H:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
<input type="checkbox"/> Section I:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
<input type="checkbox"/>	Make a copy of the completed Annual Return and keep it with your licence records
<input type="checkbox"/>	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit  
Environment Protection Authority  
PO Box A290  
SYDNEY SOUTH NSW 1232

## A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.

Licence variation and transfer application forms are available on the EPA website at: <http://www.epa.nsw.gov.au/licensing>, or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

### A1 Licence Holder

Licence Number 3407  
Licence Holder ETRA PTY LTD  
Trading Name (if applicable) PF FORMATION

### A2 Premises to which Licence Applies (if applicable)

Common Name (if any) ETRA PTY LTD  
Premises WISEMANS FERRY ROAD MAROOTA NSW 2756

### A3 Activities to which Licence Applies

Extractive Activities

### A4 Other Activities (if applicable)

Concrete Works

### A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Land-based extractive activity	> 100,000.00 - 500,000.00	T extracted, processed or stored

### A6 Assessable Pollutants (Not Applicable)

## B Monitoring and Complaints Summary

### B1 Number of Pollution Complaints

<p>Number of complaints recorded by the licensee during the reporting period.</p> <p>If no complaints were received enter nil in the attached box, otherwise complete the table below.</p>	<p>nil</p>
--	------------

Pollution Complaint Category	Number of Complaints
Air	
Water	
Noise	
Waste	
Other	

### B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.

**Note** that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

#### Monitoring Point 1

Dust monitoring, Dust gauge labelled "1- School" on the Map faxed to the EPA on 5 August 2002

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates - Deposited Matter	grams per square metre per month	12	12	1.18	2.09	3.43



# Annual Return

ETRA PTY LTD



## Monitoring Point 2

Dust monitoring, Dust gauge labelled 2 - intersection of Hitchcock and Wisemans Ferry Road

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates - Deposited Matter	grams per square metre per month	12	12	1.29	2.66	4.70

## Monitoring Point 3

Dust monitoring, Dust gauge labelled as "Jurds Paddock - 3 Por168" on the map faxed to the EPA on 5 August 2002

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Particulates - Deposited Matter	grams per square metre per month	12	12	1.74	3.41	9.80

## B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

**Note** that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

## C Statement of Compliance - Licence Conditions

### C1 Compliance with Licence Conditions

(☒ the boxes)

- 1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? ☒ Yes ☐ No

(✓ a box)

- 2 If you answered 'No' to question 1, please supply the following details for each non-compliance in the format, or similar format, provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

- a) What was the specific licence condition that was not complied with?
- b) What were the particulars of the non-compliance?
- c) What were the date(s) when the non-compliance occurred, if applicable?
- d) If relevant, what was the precise location where the non-compliance occurred?  
  
Attach a map or diagram to the Statement to show the precise location.
- e) What were the registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?
- f) What was the cause of the non-compliance?
- g) What action has been, or will be, taken to mitigate any adverse effects of the non-compliance?
- h) What action has been, or will be, taken to prevent a recurrence of the non-compliance?

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Return

# Annual Return

ETRA PTY LTD



## C2 Details of Non-Compliance with Licence

Licence condition number not complied with
Summary of particulars of the non-compliance (NO MORE THAN 50 WORDS)
If required, further details on particulars of non-compliance
Date(s) when the non-compliance occurred, if applicable
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
Cause of non-compliance
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
Action taken or that will be taken to prevent a recurrence of the non-compliance

## D Statement of Compliance - Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

### PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

**D1 - D8 (Not Applicable)**



## E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

- 1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(✓ a box)

☒ Yes

☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

- 2 Is the PIRMP available at the premises?

(✓ a box)

☒ Yes

☐ No

- 3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(✓ a box)

☒ Yes

☐ No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address

WNN.pfformation-com.au

- 4 Has the PIRMP been tested?

(✓ a box)

☒ Yes

☐ No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on

9 October 2015

- 5 Has the PIRMP been updated?

(✓ a box)

☒ Yes

☐ No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on

9 October 2015

- 6 How many times has the PIRMP been activated in this reporting period?

Nil

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on

The EPA's guidelines for preparation of pollution incident response management plans are available at

<http://www.epa.nsw.gov.au/legislation/20120227egpreppirmp.htm>

## F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box)

☒ Yes

☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box)

☒ Yes

☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box)

☒ Yes

☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address

www.pfformation.com.au

The EPA's written requirements for publishing pollution monitoring data are available at  
<http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm>

**Note** - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.



## G Statement of Compliance - Environmental Management Systems and Practices

- 1 Do you have an environmental management system (EMS) certified to ISO 14001 or any other demonstrated equivalent system<sup>1</sup>? (see note below on demonstrated equivalent)

(✓ a box)

☐ Yes

☒ No

If your answer to question 1 is 'No', please proceed to question 5. If your answer to question 1 is 'Yes', please proceed to question 2.

- 2 When was the last check of the EMS<sup>2</sup> completed (see note below on check of EMS)?

- 3 Were there any non-conformances related to environmental issues identified in the last check of the EMS?

(✓ a box)

☐ Yes

☐ No

- 4 If there were non-conformances identified, were these non-conformances rectified?

(✓ a box)

☐ Yes

☐ No

If you answered 'No' to question 1, please answer questions 5 - 11. If you answered 'Yes' to question 1 please proceed to section H. Questions 5-11 relate to any documented environmental practices, procedures and systems in place. Refer to <http://www.epa.nsw.gov.au/licensing/EMCP.htm> for guidance on how to complete questions 5 to 11.

- 5 Have you conducted an assessment of your activities and operations to identify the aspects that have a potential to cause environmental impacts and implemented operational controls to address these aspects?

(✓ a box)

☒ Yes

☐ No

- 6 Have you established and implemented an operational maintenance program, including preventative maintenance?

(✓ a box)

☒ Yes

☐ No

- 7 Do you keep records of regular inspections and maintenance of plant and equipment?

(✓ a box)

☒ Yes

☐ No

- 8 Do you conduct regular site audits to assess compliance with environmental legal requirements and assess conformance to the requirements of any documented environmental practices, procedures and systems in place?

(✓ a box)

☒ Yes

☐ No

- 8a If yes, how often?

every 3 years

- 9 Are the audits of documented environmental practices, procedures and systems undertaken by a third party?

(✓ a box)

☒ Yes

☐ No

- 10 Have you established and implemented an environmental improvement or management plan?

(✓ a box)

☒ Yes

☐ No

- 11 Do you train staff in environmental issues that may arise from your activities and operations and keep records of this

(✓ a box)

☒ Yes

☐ No

<sup>1</sup> Demonstrated equivalent refers to an environmental management system that the EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 system. For further information go to: [www.epa.nsw.gov.au/licensing/licencereg.htm](http://www.epa.nsw.gov.au/licensing/licencereg.htm)

<sup>2</sup> Undertaking a 'check of an EMS' refers to the ISO 14001 requirements that an organisation demonstrates conformity to the requirements of its EMS and to the standard, these checks require third-party certification that requirements have been met.

## H Statement of Compliance - Environmental Improvement Works

- 1 Have you completed any environmental improvement works in this licence reporting period that have resulted in demonstrated environmental improvements at the premises?

**Note:** these measures or works must be in addition to those required to achieve compliance with licence conditions or legislative requirements under the Protection of the Environment Operations Act 1997 or its regulations. For more information on environmental improvement works go to:

<http://www.epa.nsw.gov.au/resources/epa/140734-envimprove-works.pdf>

(✓ a box)

☐ Yes

☒ No

If you answered 'Yes', please provide the following supporting information:

- 2 Have you notified the EPA of these environmental improvement works? ☐ Yes

☐ No

- 3 Brief description of works.

- 4 Demonstration of environmental improvement as a result of the works.

**Note:** supporting information must cover the environmental issue being addressed by the works, how the issue was controlled prior to works being undertaken and demonstrate the environmental improvement post works.

- 5 Date when works were completed

- 6 Cost of works:



# Annual Return

ETRA PTY LTD



## I Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (✓) the box next to the category that describes how this Annual Return is being signed.**

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:	the Annual Return must be signed and certified:
an individual	<input type="checkbox"/> by the individual licence holder, or <input type="checkbox"/> by a person approved in writing by the EPA to sign on the licence holder's behalf
a company	<input type="checkbox"/> by affixing the common seal in accordance with Corporations Act 2001, or <input checked="" type="checkbox"/> by 2 directors, or <input type="checkbox"/> by a director and a company secretary, or <input type="checkbox"/> if a proprietary company that has a sole director who is also the sole company secretary – by that director, or <input type="checkbox"/> by a person delegated to sign on the company's behalf in accordance with the Corporations Act 2001 and approved in writing by the EPA to sign on the company's behalf.
a public authority (other than a council)	<input type="checkbox"/> by the Chief Executive Officer of the public authority, or <input type="checkbox"/> by a person delegated to sign on the public authority's behalf in accordance with its legislation and approved in writing by the EPA to sign on the public authority's behalf.
a local council	<input type="checkbox"/> by the General Manager in accordance with s.377 of the Local Government Act 1993, or <input type="checkbox"/> by affixing the seal of the council in a manner authorised under that Act.

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of \$250,000 for a corporation or \$120,000 for an individual.

I/We

- declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and
- certify that the information in the Statement of Compliance in sections A, C, D, E, F, G and H and any pages attached to Section C is correct and not false or misleading in a material respect.

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:

For the reporting period 30-Sep-2014 to 29-Sep-2015 or            /            /            to            /            /           

SIGNATURE: 

NAME: Joshua Graham  
(printed)

POSITION: Director

DATE: 20 / 10 / 2015

SIGNATURE: 

NAME: John Graham  
(printed)

POSITION: DIRECTOR

DATE: 21 / 10 / 2015

SEAL(if signing under seal)

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HAS BEEN COMPLETED

# **ATTACHMENT 3**

## **MONTHLY ENVIRONMENTAL OPERATIONAL PROCEDURES CHECKLIST**


# PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES

## Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota

The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2 A3-A5	2.1	Noise Management	✓	Nil	Noise readings were carried out at the nominated locations. Results from monitoring were consistent with previous results showing that quarry noise was either inaudible, or audible but not dominant.
A3 A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for June 2015 showed low levels at all locations.
A4 A10-A11	4.1	Access and Traffic	✓	Nil	
A5 A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
A6 A16-A19	6.1	Water Management	✓	Nil	
A7 A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
A8 A25-A26	8.1	Social Impact Management	✓	Nil	
A9 A27-A28	9.1	Heritage Management	✓	Nil	
A10 A29-A31	10.1	Visual Amenity Management	✓	Nil	
A11 A32-A34	11.1	Waste Management	✓	Nil	
A12 A35-A36	12.1	Emergency Response Management	✓	Nil	
A13 A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	

Completed by Environmental Manager (Josh Graham)

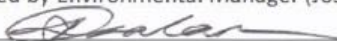
Signed: 

Date: 31<sup>st</sup> July 2015

**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**

**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**

*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*


CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for July 2015 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements not exceeded, weighbridge records reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	Annual Groundwater Report for the site has been prepared and will be included in the 2014 – 2015 AEMR.
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	A qualified consultant has been commissioned to carry out an assessment of the SHTW rehabilitation site. The report and recommendations will be included in the 2015 – 2016 AEMR.
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 31 <sup>st</sup> August 2015	



# PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES

## Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota


The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2 A3-A5	2.1	Noise Management	✓	Nil	
A3 A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for August 2015 showed low levels at all locations.
A4 A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements not exceeded, weighbridge records reviewed.
A5 A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	Water samples were collected downstream from Lot 198 and sent away for testing, the results will be posted on the PF Formation website and included in the AEMR.
A6 A16-A19	6.1	Water Management	✓	Nil	
A7 A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
A8 A25-A26	8.1	Social Impact Management	✓	Nil	
A9 A27-A28	9.1	Heritage Management	✓	Nil	
A10 A29-A31	10.1	Visual Amenity Management	✓	Nil	
A11 A32-A34	11.1	Waste Management	✓	Nil	
A12 A35-A36	12.1	Emergency Response Management	✓	Nil	
A13 A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 30 <sup>th</sup> September 2015	

# PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES

## Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota

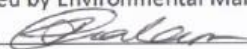
The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	Noise monitoring was carried out at the nominated locations. Quarry noise was predominantly in audible and Road Traffic noise was found to be the dominant noise source. Results from noise readings are posted on the PF Formation website.
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for September 2015 showed low levels at all locations. Dust monitoring results are posted on the PF Formation website quarterly.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 30 <sup>th</sup> October 2015	

**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**

**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**


*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for October 2015 showed low levels at Sites 1 and 2 but were slightly higher than the average level at Site 3. The annual average to date for Site 3 remains below the exceedance levels.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	Sediment traps along the main haul road into Lot 198 were cleaned out following excessive runoff created from storm events experienced throughout the month.
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	The Sydney Hinterland Transition Woodland rehabilitation areas were assessed by a qualified person against the target criteria for the site. The final report from the assessment will be posted on the PF Formation website and attached to the 2015 – 2016 AEMR.
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 30 <sup>th</sup> November 2015	

# PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES

## Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota

The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.


CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for November 2015 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	Water samples were collected downstream from Lot 198 and sent away for analysis.
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 24 <sup>th</sup> December 2015	



**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**

**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**


*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	Noise monitoring was carried out at four locations. Results showed quarry noise was not dominant and road traffic and cicada noise were typically the dominant noise sources. The results have been up - loaded to the PF Formation website.
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for December 2015 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 29 <sup>th</sup> January 2016	

# PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES

## Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota

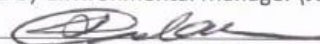
The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for January 2016 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 29 <sup>th</sup> February 2016	

**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**

**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**

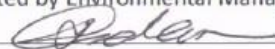
*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for February 2016 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	Water samples were collected downstream from Lot 198 and sent away for analysis. The results showed low levels of total suspended solids.
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 31 <sup>st</sup> March 2016	

**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**

**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**


*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*

CHAPTER Page No.	STRATEGY Point No.	MANAGEMENT CONTROLS	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	Noise monitoring was carried out at the nominated locations during day and night hours. PF Formation quarry noise was not audible and not measurable at all locations.
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for March 2016 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
				Completed by Environmental Manager (Josh Graham) Signed:  Date: 29 <sup>th</sup> April 2016	




**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**  
**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**

*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*

<b>CHAPTER Page No.</b>	<b>STRATEGY Point No.</b>	<b>MANAGEMENT CONTROLS</b>	<b>STATUS ✓ or x</b>	<b>COMPLAINTS RECEIVED</b>	<b>COMMENTS</b>
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for April 2016 showed low levels at all locations.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
Completed by Environmental Manager (Josh Graham)				Signed: 	Date: 31 <sup>st</sup> May 2016

**PF FORMATION – ENVIRONMENTAL OPERATIONAL PROCEDURES**  
**Hitchcock Road Sand Extraction and Rehabilitation Project, Maroota**

*The chapter, page number and strategy point number are references to the approved Environmental Strategy Appendix A – Environmental Operational Procedures.*

<b>CHAPTER Page No.</b>	<b>STRATEGY Point No.</b>	<b>MANAGEMENT CONTROLS</b>	<b>STATUS ✓ or ✗</b>	<b>COMPLAINTS RECEIVED</b>	<b>COMMENTS</b>
<u>A2</u> A3-A5	2.1	Noise Management	✓	Nil	
<u>A3</u> A6-A9	3.1, 3.2	Air Quality Management	✓	Nil	Deposited dust results for May 2016 were low at Sites 2 & 3 and higher than normal at Site 1. The high level at Site 1 was likely caused by a high level of total solids in the bottle. The average levels at Site 1 are below the EPA criterion.
<u>A4</u> A10-A11	4.1	Access and Traffic	✓	Nil	Truck movements were not exceeded, weighbridge records were reviewed.
<u>A5</u> A12-A15	5.1, 5.2, 5.3	Erosion & Sediment Control	✓	Nil	Water samples were collected downstream from Lot 198 and sent away for analysis. The results showed low levels of total suspended solids and turbidity.
<u>A6</u> A16-A19	6.1	Water Management	✓	Nil	
<u>A7</u> A20-A24	7.1, 7.2	Rehabilitation & Vegetation Offset Management	✓	Nil	
<u>A8</u> A25-A26	8.1	Social Impact Management	✓	Nil	
<u>A9</u> A27-A28	9.1	Heritage Management	✓	Nil	
<u>A10</u> A29-A31	10.1	Visual Amenity Management	✓	Nil	
<u>A11</u> A32-A34	11.1	Waste Management	✓	Nil	
<u>A12</u> A35-A36	12.1	Emergency Response Management	✓	Nil	
<u>A13</u> A37-A40	13.1, 13.2	Hazard, Risk and Safety Management	✓	Nil	
Completed by Environmental Manager (Josh Graham)				Signed: 	Date: 30 June 2016

# **ATTACHMENT 4**

## **ANNUAL ENVIRONMENTAL OPERATION PROCEDURES CHECKLIST**

### A2.3 Management controls

#### OPERATIONAL PHASE

**Strategy 2.1: Ensure that the site operations are undertaken in a manner that minimises the impacts of noise and vibration.**









Actions	Responsibility
2.1.1 Manage site activities so that any necessary high noise and vibration levels occur at times of least impact.	Quarry Manager <i>R</i>
2.1.2 Advise neighbouring properties at least 24 hours in advance of the extent and expected duration of especially noisy activities.	Quarry Manager/ Environmental Manager <i>No especially noisy activities occurred. [Signature]</i>
2.1.3 Undertake all site activities incorporating noise attenuation measures such as restricting working hours for certain works required close to sensitive receptors	Quarry Manager <i>R</i>
2.1.4 Ensure that panels and covers of silenced plant are kept shut and plant and equipment switched off when not in use.	Quarry Manager <i>R</i>
2.1.5 Ensure that mechanical equipment is silenced by the best practical means using current technology, prior to use. Noise suppression devices should be fitted according to manufacturer's instructions. Residential class mufflers should be used where possible. Noise control kits should be fitted to noisy mobile equipment and shrouds provided around stationary equipment where necessary.	Quarry Manager <i>R</i>
2.1.6 Working hours will be limited to 7.00am to 6.00pm, Monday to Saturday and at no time on Sundays and public holidays. A maximum of ten laden vehicles will be permitted to enter and leave the site between the hours of 6.00am and 7.00am, Monday to Saturday, excluding Sundays and public holidays.	Quarry Manager <i>R</i>
2.1.7 Arrange for all plant and equipment to be inspected regularly to ensure that it is well maintained to minimise noise emissions.	Quarry Manager <i>R</i>
2.1.8 Conduct compliance monitoring of noise levels at the defined locations and keep records of measurements.	Environmental Manager <i>Results are summarised in noise report</i>
<b>Performance indicator</b>	Noise from operational activities does not exceed the guideline limits. <i>Site complies with criteria [Signature]</i> Number of complaints received - nil <i>[Signature]</i>



### A3.3 Management controls

#### OPERATIONAL PHASE

**Strategy 3.1: Ensure that the site operations are undertaken in a manner that minimises and controls dust and vehicle emissions.**

Actions	Responsibility
3.1.1 Conduct ambient air quality monitoring at identified sites	Environmental Manager <i>Monthly samples collected</i> 
3.1.2 Fit dust suppression equipment to all processing plant on site as required. This is to be regularly inspected and maintained in good working order at all times.	Quarry Manager/ Environmental Manager 
3.1.3 Define haul road areas to prevent unnecessary vehicle movement into others	Quarry Manager 
3.1.4 Keep all unsealed trafficable areas and working areas damp to minimise dust emissions by spraying regularly with a water cart, water sprays or sprinklers. Frequency of spraying to be determined based on weather conditions, soil erodibility and the observation of any visible dust.	Quarry Manager/ Environmental Manager <i>Water carts are used regularly</i> 
3.1.5 Apply speed controls to all unsealed areas (maximum speed of 20 km/h) and signpost accordingly.	Quarry Manager 
3.1.6 Vegetate all semi-permanent stockpiles with suitable groundcover and water where necessary until the vegetation is well established.	Quarry Manager 
3.1.7 Cease work on any extraction activity producing dust due to high winds that cannot be controlled by watering or other means. Work will not resume until the wind velocity decreases and any dust generation can be controlled by normal means.	Quarry Manager 
3.1.8 Ensure that all loaded trucks leaving the site on Lot 198 DP595538 have their payloads fully covered by a suitable material to prevent spillage.	Quarry Manager 
3.1.9 Construct dust screens such as earth bunds and vegetated barriers.	Quarry Manager 
3.1.10 A mechanical road sweeping unit and water cart will be maintained for use as required to keep all roads including the intersection of the haul road and Wisemans Ferry Road free from deposited material.	Quarry Manager 
3.1.11 No fires to be permitted on-site.	Quarry Manager 

<b>Performance indicator</b>	Ambient air quality data compiled.  Dust generated from site activities to comply at all times with EPA specified air quality criteria. <i>Deposited dust results comply with the criteria</i>
<b>Monitoring</b>	Dust monitoring at identified locations. <i>AS NMP</i>  Compilation of a complaints register. <i>Nil</i>
<b>Reporting</b>	Annual reporting in the AEMR. Monitoring results will be suitably summarised for posting on the PF Formation website. <i>Results included in 2016 AEMR</i>

**Strategy 3.2: Minimise and control vehicle and plant exhaust emissions.**

Actions		Responsibility
3.2.1	Inspect all exhausts from vehicles and plant/equipment to ensure that they are maintained at an acceptable level.	Quarry Manager <i>H</i>
3.2.2	Regularly service all vehicles to ensure that exhaust emissions comply with the regulations. Maintain appropriate service records.	Quarry Manager <i>H</i>
3.2.3	Identify any opportunities to minimise machinery use and ensure that all equipment used on the site is energy efficient.	Quarry Manager <i>H</i>
<b>Performance Indicator</b>	Vehicle and plant emissions comply with the regulations.	
<b>Monitoring</b>	Regular vehicle and plant inspections.	
<b>Reporting</b>	Annual reporting of inspection results in the AEMR.	

#### A4.3 Management controls

##### OPERATIONAL PHASE

##### Strategy 4.1: Minimise the impact of operational traffic on the local community.

Actions	Responsibility
4.1.1 Ensure that the number of laden vehicle movements does not exceed a combined total of two hundred per day via the intersection of the haulage road and Wisemans Ferry Road. This is the total of laden vehicle movements allowed for PF Formation's combined extractive industry operations in The Hills Shire.	Quarry Manager/ Environmental Manager <i>Vehicle movements not exceeded Dale</i>
4.1.2 Undertake operations involving the transportation of material on the site only between 6.00am and 6.00pm, Monday to Saturday.	Quarry Manager/ Environmental Manager <i>Dale</i>
4.1.3 Allow a maximum of ten laden vehicles to enter and leave the site between 6.00am and 7.00am, Monday to Saturday only. Ensure that vehicles do not arrive at the site prior to 5.45am on any day.	Quarry Manager/ Environmental Manager <i>Neighbriidge records received regularly Dale</i>
4.1.4 Ensure that all vehicle loads leaving the site are suitably covered.	Quarry Manager/ Environmental Manager <i>Dale</i>
<b>Performance Indicator</b>	Minimum of complaints from the community. <i>no complaints Dale.</i>
<b>Monitoring</b>	Number and type of complaints received.  Weighbridge records of arrival and departure times.
<b>Reporting</b>	Annual report on complaints received.

#### A4.4 Monitoring and reporting





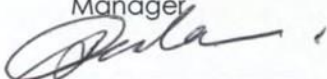

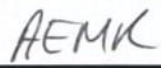
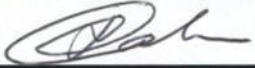
The Environmental Manager will be responsible for the monitoring of complaints on traffic issues from the community. Annual reports will be compiled on community complaints and reported in the AEMR.



### A5.3 Management controls



#### OPERATIONAL PHASE

**Strategy 5.1: Provide for treatment of stormwater runoff from extraction areas, stockpiles and access roads.**

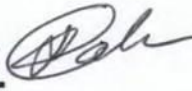
Actions	Responsibility
5.1.1 Construct temporary erosion and sedimentation control structures such as detention basins and catch drains as appropriate to collect runoff from cleared land including extraction areas and access roads.	Quarry Manager/ Environmental Manager 
5.1.2 Erect silt traps and erosion control fencing as appropriate along extraction area boundaries and drainage lines.	Quarry Manager/ Environmental Manager 
5.1.3 Design sediment basins with a minimum storage capacity of 400 m <sup>3</sup> per hectare of catchment. Spillway capacity and stability will be designed as follows: <ul style="list-style-type: none"> <li>• life of less than 5 years, adopt the 20 year t<sub>c</sub> event</li> <li>• life between 5 and 10 years, adopt the 50 year t<sub>c</sub> event</li> <li>• life greater than 10 years, adopt the 100 year t<sub>c</sub> event.</li> </ul>	Quarry Manager  
5.1.4 Undertake regular inspections to assess stormwater control measures and conduct routine inspections to ensure that compliance with best practice guidelines and relevant legislation is achieved.	Quarry Manager/ Environmental Manager 
<b>Performance indicator</b>	Stormwater control measures are in place prior to commencement of extraction in the particular phase of development and are effective in reducing sedimentation to acceptable levels.
<b>Monitoring</b>	Review effectiveness of the stormwater basins and treatment methods during and following major rainfall events. 
<b>Reporting</b>	Report on effectiveness of control measures once sedimentation works completed and then on an annual basis.  



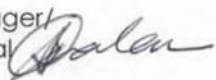




**Strategy 5.2: Plan site operations to minimise opportunities for soil erosion and sedimentation.**

Actions	Responsibility
5.2.1 Select locations for topsoil and material stockpiles on level ground and away from drainage lines. Install diversion drains up slope and sediment filter fences as appropriate	Quarry Manager/ Environmental Manager 
5.2.2 Provide training to operational personnel on the importance of erosion control measures and inform drivers of the damage that can be caused by to the environment by heavy vehicles	Quarry Manager/ Environmental Manager 
<b>Performance indicator</b>	Soil erosion control measures are incorporated in the operational activities on the site and are effective in reducing soil erosion.
<b>Monitoring</b>	Monitor suspended solid concentrations in stormwater runoff from the undisturbed parts of the site.
<b>Reporting</b>	Report on the effectiveness of soil erosion control measures prior to extraction.

**Strategy 5.3: Ensure that suspended solid levels in stormwater discharging from the site meets the guidelines for the protection of aquatic ecosystems (ANZECC 2000)**

*Quarterly downstream Lot 198 water testing - low TSS* 

Actions	Responsibility
5.3.1 Keep areas of exposed land to a minimum compatible with operational requirements.	Quarry Manager 
5.3.2 Where practicable, provide silt fences to minimise erosion and sedimentation from exposed areas. <i>not required</i>	Quarry Manager/ Environmental Manager 
5.3.3 Stabilise exposed areas that are not in use with an appropriate cover crop and water until well established.	Quarry Manager/ Environmental Manager 
5.3.4 Construct sediment retention basins with a capacity of at least 300m <sup>3</sup> per hectare of catchment, which will necessitate regular cleaning out, and a minimum freeboard of one metre.	Quarry Manager 

5.3.5	Monitor erosion and sediment controls regularly and immediately following a rainfall event. Clear sediment when the traps have collected 60% of the capacity of the basin or where sediment build-up is less than 300mm below the spillway crest. Remove sediment to a location where further pollution to downslope lands and waterways will not occur.	Quarry Manager/ Environmental Manager	
5.3.6	Undertake maintenance of erosion and sediment controls when any deterioration is identified or when replacement is necessary.	Quarry Manager/ Environmental Manager	
5.3.7	Reuse stored stormwater for dust control and the watering of site vegetation.	Quarry Manager/ Environmental Manager	
5.3.8	Seed material stockpiles where these are to remain unused for a period in excess of four weeks. Water the area when required until the vegetation is well established.	Quarry Manager/ Environmental Manager	
5.3.9	Control vehicle movement on the site by the identification of the haul road and current working areas.	Quarry Manager	
<hr/>			
<b>Performance indicator</b>	Acceptable control of sedimentation and erosion is achieved so that suspended solids levels in any stormwater leaving the site does not exceed ANZECC guidelines or other regulatory requirements.		
			
<b>Monitoring</b>	Monitor suspended solids levels in stormwater following rainfall events. Compare results with other appropriate locations.		
			
<b>Reporting</b>	Report on suspended solid levels and performance of erosion and sedimentation control measures for inclusion in the relevant AEMR.		
			

#### A5.4 Monitoring and reporting

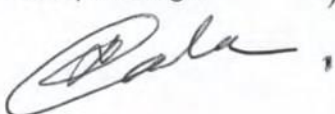
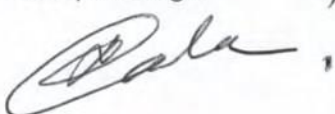

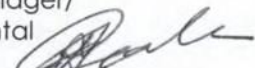
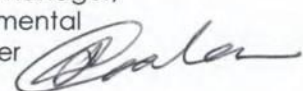

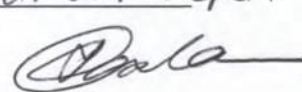
The Environmental Manager will be responsible for the monitoring of the effectiveness of the sediment and soil erosion control measures installed on-site, suspended solids levels in stormwater runoff and any off-site discharges. An annual report will be included in the AEMR.



### A6.3 Management controls

#### OPERATIONAL PHASE



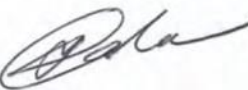

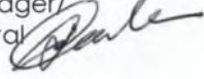

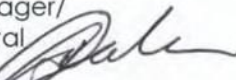
##### Strategy 6.1: Plan site operations to minimise potential impacts on groundwater

Actions	Responsibility
6.1.1 Restrict maximum depth of extraction to 2 metres above the wet weather high groundwater level as determined following at least 12 months site specific groundwater monitoring data.	<p>Quarry Manager  <i>Max extraction depth 191 AHD (average groundwater level is 185 AHD. No groundwater observed)</i>            Quarry Manager</p> 
6.1.2 Ensure that the groundwater is not breached or contaminated. In the event that either should occur, operations are to cease and the Department of Water and the Department of Planning consulted to determine the basis on which extraction may recommence.	<p>Quarry Manager</p> 
<p>6.1.3 The sediment retention basins are to accommodate the 100-year <math>t_c</math> event with the minimum basin capacities as follows:</p> <ul style="list-style-type: none"> <li>Southern catchment (Basin 1) 19,400 m<sup>3</sup></li> <li>Northern catchment (Basin 2) 7,800 m<sup>3</sup></li> </ul>	<p>Quarry Manager</p> 
<p>The volume of these basins can be varied depending on the extent of the area exposed for extraction within each catchment.</p>	
6.1.4 Arrange for regular inspection of the capacity and stability of all retention basins and report on their effectiveness.	<p>Quarry Manager/ Environmental Manager</p> 
6.1.5 Install a minimum of two groundwater monitoring bores. One should be located within or near the extraction area and another at some location within the site beyond the area of any direct extraction influence. The location of these bores is to meet the requirements of the Department of Water and the Department of Planning.	<p>Quarry Manager/ Environmental Manager</p> 
<b>Performance indicator</b>	<p>Maintenance of groundwater quality. Existing water levels and groundwater quality will be determined from data derived from the bores on the site.</p> 
<b>Monitoring</b>	<p>Regular monitoring of water levels and water quality data from the on-site bores.</p> <p><i>2016 Groundwater Report</i></p> 


### A7.3 Management controls

#### OPERATIONAL PHASE

##### Strategy 7.1: Implement measures to ensure the protection of native vegetation, including threatened species.

Actions	Responsibility
7.1.1 Clearly identify and mark out all areas which are not to be disturbed.	Quarry Manager/ Environmental Manager 
7.1.2 Assess areas where trees are to be removed to determine the commercial value of any which are too large to mulch. Any with commercial value are to be marked and arrangements made for removal.	Environmental Manager 
7.1.3 Prepare an assessment of the species mix of the Sydney Hinterland Transition Woodland and arrange for purchase or collection of seeds. Mulch vegetation removed from the area and stockpile for later use. This will initially be used on the peripheral bunds followed by other areas of the site where the regrowth of the species mix is to be undertaken. Protect young plants from predation by feral pests.	Environmental Manager 
7.1.5 Restrict access to bushland to minimise the potential for damage. Suitably identify and mark out these areas to ensure that this prohibition is made clear.	Quarry Manager/ Environmental Manager 
7.1.6 Separate topsoil for use in rehabilitation works.	Quarry Manager/ Environmental Manager 
7.1.7 Incorporate flora and fauna issues (to the extent it is relevant) in the education program so that the site operatives are aware of the requirements of this EMP.	Environmental Manager 
7.1.8 Once each extraction phase is complete, initiate the rehabilitation and revegetation program as set out in the Landscape management Plan.	Quarry Manager/ Environmental Manager 

L.M.P updated 2016.

**Performance indicator** All areas of significant flora and fauna habitat are protected prior to the start of extraction. 

**Monitoring** Ensure that the above are implemented prior to the commencement of extraction activities in the area.

Monitor condition of flora and fauna habitats on a regular basis.





## Reporting

A report with appropriate maps identifying the areas under rehabilitation and extraction activity is to be prepared.

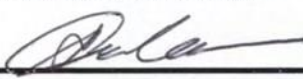
Prepare an annual report on the status of the flora of the site for inclusion in the AEMR.

*SHTW Vegetation Assessment (2015) in AEMR [Signature]*

## Strategy 7.2: Undertake the rehabilitation of the site to achieve an agreed and acceptable landform with appropriate planting.

Actions	Responsibility
7.2.1 Mulch all suitable plant material for reuse on the site as a seed and planting medium. Store all topsoil in appropriately marked low stockpiles for reuse in locations as close as possible to their source. Care should be taken to ensure that this does not become contaminated with the seeds of exotic species and weeds.	Environmental Manager [Signature]
7.2.2 Rehabilitate the site in stages leaving areas exposed for as short a time as possible. This should be undertaken in conformity with the approved Rehabilitation Plan with maximum final batter grades of 4(H):1(V) on north and west facing slopes and 3(H):1(V) on those facing south and east. Final slopes should be as gentle as possible depending on the availability of fill material.	Quarry Manager/ Environmental Manager [Signature]
7.2.3 Sow all stockpiles and exposed areas where no activity is to take place for more than four weeks with an appropriate vegetation cover.	Quarry Manager/ Environmental Manager [Signature]
7.2.4 Undertake revegetation of the site on the following basis: <ul style="list-style-type: none"> <li>re-establish the Sydney Hinterland Transition Woodland using seed and mulch collected from the area</li> <li>rehabilitate other areas to native species with a light sowing of cereal and allowing natural regeneration</li> <li>lime, fertilise and sow areas where improved grass cover is required</li> <li>suitably turf surfaces expected to experience high surface flows leaving the site</li> </ul>	Environmental Manager [Signature]
7.2.5 Establish a maintenance program aimed at promoting and protecting the growth of the rehabilitated areas.	Quarry Manager/ Environmental Manager [Signature]

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<b>Performance Indicator</b>	Completion of site rehabilitation in conformity with the approved Landscape Management Plan.
<hr/>	
<b>Monitoring</b>	<p>Regular site inspections to ensure that the following is achieved:</p> <ul style="list-style-type: none"><li>• rate of rehabilitation is in conformity with the staging program</li><li>• conservation zones and rehabilitated areas are being appropriately maintained</li><li>• vegetative covers are being established</li><li>• site works such as bunding and the establishment of re-vegetated areas are progressing in accordance with the Landscape Management Plan</li><li>• all sensitive flora and fauna habitat is being adequately protected from damage</li></ul>
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<b>Reporting</b>	<p>Reports of site inspections and annual reviews in the AEMR.</p> 

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#### **A7.4 Monitoring and reporting**

The Environmental Manager will be responsible for monitoring the effectiveness of the measures included for the protection of native vegetation on the site and the progress of site rehabilitation. Annual reports will be prepared by the Environmental Manager for inclusion in the AEMR.

### A8.3 Management controls

#### OPERATIONAL PHASE

**Strategy 8.1: Consider community feedback in determining operating procedures to minimise negative impacts.**

Actions	Responsibility
8.1.1 Maintain an <b>open door policy</b> . Widely publish contact phone number and provide an early response to all queries, comments and requests for information.	Quarry Manager/ Environmental Manager 
8.1.2 Provide access to all relevant environmental management documentation and monitoring results on the PF Formation web site.	Environmental Manager 
8.1.3 Organise and manage bi-annual meetings of the Community Consultative Committee to discuss issues in relation to environmental management of sand extraction on the site.	Environmental Manager 
8.1.4 Establish a complaints register incorporating date and time, type of communication, contact details of the complainant, nature of the complaint and response taken.	Quarry Manager/ Environmental Manager 
<b>Performance indicator</b>	Minimal complaints from the community. <i>no complaints</i> 
<b>Monitoring</b>	Number and type of responses and complaints raised by the community and improved performance.
<b>Reporting</b>	Annual reporting of community responses and complaints together with an assessment of any changes put in place to minimise any future difficulties for inclusion in the AEMR. 

### A8.4 Monitoring and reporting



The Environmental Manager will be responsible for the monitoring of the effectiveness of the measures included in response to community concerns. Annual reports will be prepared by the Environmental Manager for the AEMR.




### A9.3 Management controls

#### OPERATIONAL PHASE

##### Strategy 9.1: Protect items of heritage value during site operations.

Actions	Responsibility
9.1.1 Cease all work if an archaeological or heritage item is identified during extraction operations and consult the National Parks and Wildlife Service, the Deerubbin Aboriginal Land Council or the Heritage Office to determine any appropriate course of action prior to recommencement of the work. Obtain any required permits and submit together with supporting information. Notify the Hills Shire Council to ensure compliance with the conditions of approval.	Quarry Manager/ Environmental Manager 
9.1.2 Undertake additional survey work required for submittal of application to destroy artefact scatters located in the later stages of the development. Comply with the reasonable requirements of the National Parks and Wildlife Service, the Deerubbin Aboriginal Land Council and the Heritage Office arising out of any additional studies and notify the Hills Shire Council to ensure compliance with the conditions of the approval.	Environmental Manager <i>Was not required</i> 

<b>Performance Indicator</b>	Any item of heritage significance is protected during site operations.
<b>Monitoring</b>	The protection of any heritage items identified during site operations is to be monitored.
<b>Reporting</b>	Any heritage item identified during site operations is to be documented. <i>No heritage items identified</i> 

### A9.4 Monitoring and reporting



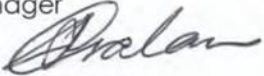



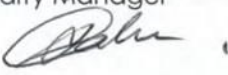

The Environmental Manager will be responsible for the reporting of any heritage items identified during the course of site activities. Annual reports will be prepared by the Environmental Manager.



### A10.3 Management controls

#### OPERATIONAL PHASE




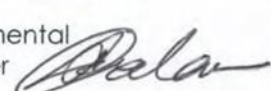






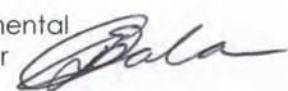
#### Strategy 10.1: Ensure that impacts on visual amenity are minimised during site activities and following completion.

Actions	Responsibility
10.1.1 Clearly mark all vegetation to be retained.	Quarry Manager/ Environmental Manager 
10.1.2 Construct peripheral bunding within the established setbacks. These should be a minimum of three metres high with slopes ranging from 3(H):1 (V) to 6(H):1 (V) depending on the location using overburden stripped from the site	Quarry Manager/ Environmental Manager 
10.1.3 Undertake screen planting works to the peripheral areas to an agreed specification using mulch to allow for native plant regeneration. Reinforce this species mix using appropriate plantings at specified intervals.	Environmental Manager 
10.1.4 Undertake a tree planting program within areas defined in the Landscape Management Plan to establish a dense plantation using an appropriate mix of species reflecting that of the existing community.	Environmental Manager 
10.1.5 Re-establish the landform of the extraction areas to that shown in the Landscape Management Plan.	Quarry Manager 
10.1.6 Complete the rehabilitation of the site in conformity with the proposals set out in the Landscape Management Plan.	Quarry Manager 
10.1.7 Remove all temporary fencing when no longer required.	Quarry Manager 
10.1.8 Re-establish vegetation in areas suitable for agricultural/horticultural uses.	Quarry Manager 
10.1.9 Remove all site infrastructure including the slurry plant and its associated pipelines. Restore those areas affected by the plant and rehabilitate. <i>When required</i>	Quarry Manager 
10.1.10 Remove all waste materials and dispose of in an appropriate manner.	Quarry Manager 
10.1.11 Review Quarry Closure Plan and prepare proposals for future use of the area.	Quarry Manager

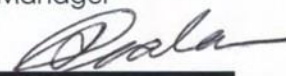
### A11.3 Management controls

#### OPERATIONAL PHASE

##### Strategy 11.1: Appropriate management and disposal of wastes generated during site operations.

Actions	Responsibility
11.1.1 Clearly delineate waste handling areas.	Quarry Manager 
11.1.2 Define specific areas for the collection of materials for reuse and recycling and clearly label.	Quarry Manager 
11.1.3 Process cleared vegetation on site for use as mulch within the landscape program.	Environmental Manager 
11.1.4 Store all topsoil in stockpiles for later use in site rehabilitation.	Environmental Manager 
11.1.5 Provide bins or skips for the collection and storage of recyclable material and waste. General construction waste will be stored in a skip located at the workshop on Lot 198 DP595538. Waste food will be removed on a daily basis and stored in a vermin proof bin for collection by waste contractor. Paper waste generated from site offices, plastics and glass are to be collected separately for recycling.	Quarry Manager 
11.1.6 Separate hazardous wastes (including empty drums, rags, soil contaminated with oil) from non-hazardous wastes and manage in accordance with the relevant legislation.	Quarry Manager 
11.1.7 Temporarily store liquid wastes (chemicals, oils and greases) in an appropriately bunded area and dispose of via a licensed contractor. Direct washdown water to an appropriate settlement basin if quality is acceptable. Otherwise, store and dispose as a liquid waste.	Quarry Manager 
11.1.8 Retain copies of current licences of all waste removal contractors on site.	Quarry Manager 
11.1.9 Keep all documentation relating to waste removal and disposal on file at the site. This documentation includes dockets for the removal and disposal of waste at a licensed facility.	Quarry Manager 
11.1.10 Progressively separate and stockpile waste material in designated areas for collection. Adequately secure waste disposal areas to prevent access by wildlife.	Quarry Manager 
11.1.11 Review all waste licences and monitor terms and conditions for compliance.	Environmental Manager 

- 11.1.12 Recycle or dispose of any materials and waste remaining on the site following completion of extraction operations. Environmental Manager  
All should be disposed of in an appropriate manner.



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**Performance Indicator** Effective use of waste recycling area and maximisation of material reuse.


Appropriate removal of all waste from the site on completion.

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**Monitoring** Regular review of recycling opportunities, quantities and cost savings.

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**Reporting** Annual report on waste management, reuse and recycling on the site.

2016 AEMK 

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#### A11.4 Monitoring and reporting

The Quarry Manager will be responsible for conducting regular waste audits, monitoring the currency of any waste disposal contracts and documentation relating to transport and disposal of wastes. The Quarry Manager will also monitor the quantities and costs/savings associated with the effective management of waste materials.



### A12.3 Management controls

#### OPERATIONAL PHASE

**Strategy 12.1: Ensure that procedures and controls are implemented to prevent, or if necessary, control any potential environmental emergency**

Actions		Responsibility
12.1.1	Ensure that all personnel on site during operations have been trained in appropriate procedures including site induction, materials handling and response procedures.	Quarry Manager 
12.1.2	Develop and put in place emergency response procedures. Appoint appropriate individuals as emergency services liaison officers.	Quarry Manager 
12.1.3	Establish an emergency response table listing contact details of all relevant parties required in an environmental emergency.	Quarry Manager 
12.1.4	Establish a Register of Environmentally Hazardous Materials to be stored and used on site.	Quarry Manager 
12.1.5	Ensure that appropriate safety and spill response equipment has been made available.	Quarry Manager 
12.1.6	Clearly label all materials to be used and stored on site.	Quarry Manager 
12.1.7	Review and update emergency response procedures bi-annually.	Quarry Manager 
12.1.8	Ensure that appropriate safety and response equipment is available at all times.	Quarry Manager 
<b>Performance indicator</b>		Emergency response procedures, controls and training adequate for potential emergencies.
<b>Monitoring</b>		Regular monitoring of response procedures and equipment.
<b>Reporting</b>		Annual report on incidents.










### A12.4 Monitoring and reporting

The Quarry Manager will be responsible for maintaining the currency of the emergency procedures and reporting on incidents.

### A13.3 Management controls







#### OPERATIONAL PHASE

#### Strategy 13.1: Minimise the risks associated with the storage and handling of hazardous materials.

Actions	Responsibility
13.1.1 Obtain a licence to keep dangerous goods from WorkCover NSW for all materials stored on site which require licensing <i>not required</i>	Quarry Manager 
13.1.2 Establish a Register of Hazardous Materials setting out details of quantities, storage and specific handling requirements for all relevant materials stored on site.	Quarry Manager/ <i>PIRMP</i> Environmental Manager 
13.1.3 Obtain Material Safety Data Sheets for all hazardous materials stored on site.	Quarry Manager/ Environmental Manager 
13.1.4 Provide appropriate storage and secondary containment facilities for all hazardous materials stored on site. All bunded areas must be designed to contain at least 110% of the volume of materials permanently stored within the area. Temporary facilities should have drip trays.	Quarry Manager 
13.1.5 Appoint a Safety Officer for the development. <i>Quarry Manager's Peter Watt, Luke Graham</i>	Quarry Manager 
13.1.6 Locate all flammable material storage areas at least ten metres from possible ignition sources.	Quarry Manager/ Environmental Manager 
14.1.7 Clearly label the contents of all above ground storage areas.	Quarry Manager/ Environmental Manager 
13.1.8 Secure all hazardous and dangerous goods storage areas and display appropriate signage. Segregate all incompatible material.	Quarry Manager/ Environmental Manager 
13.1.9 Train all personnel in the handling and safety procedures required for the hazardous materials stored and used on site during Staff Safety Meetings.	Quarry Manager/ Environmental Manager 
<b>Performance Indicator</b>	Storage and handling of hazardous materials complies with legislative requirements and demonstrates due diligence.

<b>Monitoring</b>	Regular review of compliance with legislative requirements for the storage and handling of hazardous materials.
<b>Reporting</b>	AEMR.

**Strategy 13.2: Ensure that procedures are implemented and facilities made available for clean up in the event of a pollution incident.**

<b>Actions</b>	<b>Responsibility</b>
13.2.1 Emergency Response Plan in place (see <b>Chapter 12</b> ).	Quarry Manager 
13.2.2 Provide a mobile spill control kit containing appropriate absorbent materials, neutralising chemicals and other spill containment equipment.	Quarry Manager 
13.2.3 Provide personal protective equipment and instruct personnel on its use.	Quarry Manager 
13.2.4 Clean up any spills beyond the bunded area immediately and dispose of the contaminated material in an appropriate manner.	Quarry Manager 
13.2.5 Contact the relevant authorities in the event of a leak or spill. Follow any instructions provided. Remediate any contamination to the satisfaction of the regulatory authorities.	Quarry Manager 
13.2.6 Collect any spills or hazardous wastes that cannot be recycled and arrange for disposal by a licensed waste contractor. Maintain all records of waste removal on site.	Quarry Manager 

<b>Performance Indicator</b>	All pollution incidents contained and cleaned up without impact on the environment or injury to personnel. All incidents recorded.
<b>Monitoring</b>	Stormwater and soil contamination monitoring undertaken following any spill and subsequent clean up.
<b>Reporting</b>	Report on all pollution events and the results of any clean up.



# **ATTACHMENT 5**

## **LOCATION WEATHER CHART**

JUL 15

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/07/2015	10	14	0-0	NW-S	1026.7	4	RAIN/CLOUDY
2/07/2015	3	15	0-5	S-SSW	1022.3	NIL	CLOUDY
3/07/2015	5	13	0-0	SW-S	1027.1	NIL	CLOUDY
4/07/2015	5	12	0-0	SW-SW	1024.1	NIL	FINE/CLOUDY
5/07/2015	SUNDAY						
6/07/2015	6	15	0-0	SW-SW	1018	NIL	CLOUDY
7/07/2015	4	11	0-0	SW-SE	1019.8	NIL	CLOUDY
8/07/2015	5	13	0-0	SE-ESE	1028.9	NIL	CLOUDY
9/07/2015	5	15	0-0	SE-SE	1031.4	NIL	CLOUDY
10/07/2015	6	12	0-6	NE-NE	1024.4	NIL	CLOUDY
11/07/2015	9	15	0-6	NW-NW	1017.4	NIL	FINE/CLOUDY
12/07/2015	SUNDAY						
13/07/2015	7	15	3-10	NW-WNW	1002.9	10	RAIN/CLOUDY
14/07/2015	8	15	0-0	NW-WNW	1011.5	2	FINE
15/07/2015	6	14	3-0	NW-NE	1017.9	NIL	CLOUDY
16/07/2015	7	11	0-0	NE-SW	1017.9	NIL	RAIN/CLOUDY
17/07/2015	6	12	0-0	NW-SW	1012.8	10	RAIN/CLOUDY
18/07/2015	6	11	0-10	S-SW	1025.2	NIL	FINE/CLOUDY
19/07/2015	SUNDAY						
20/07/2015	7	14	0-0	SE-NE	1035	NIL	CLOUDY/FINE
21/07/2015	7	17	0-0	SE-NE	1034.1	NIL	CLOUDY/FINE
22/07/2015	10	16	6-0	NW-WNW	1029.1	NIL	CLOUDY/RAIN
23/07/2015	10	16	0-0	NE-NW	1026.8	5	RAIN/CLOUDY
24/07/2015	10	17	0-0	NW-N	1021.3	5	CLOUDY
25/07/2015	9	17	0-0	W-SSW	1017.9	NIL	CLOUDY/FINE
26/07/2015	SUNDAY						
27/07/2015	6	14	0-5	NW-SW	1024.4	NIL	CLOUDY/FINE
28/07/2015	2	15	0-8	W-ESE	1032.9	NIL	FINE

29/07/2015	3	15	0-0	SE-NE	1035.5	NIL	CLOUDY/FINE
30/07/2015	7	18	0-14	SE-WNW	1028.8	NIL	CLOUDY/FINE
31/07/2015	11	18	0-0	NW-NW	1021.4	NIL	FINE

AUG  
15

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/08/2015	11	18	0-18	N-WNW	1020	NIL	CLOUDY
2/08/2015	SUNDAY						
3/08/2015	5	15	0-2	SE-S	1015.5	NIL	FINE
4/08/2015	3	12	0-0	SW-WNW	1023.7	NIL	CLOUDY/FINE
5/08/2015	2	13	0-6	SW-SW	1017.4	NIL	CLOUDY/FINE
6/08/2015	4	15	0-6	SW-SW	1016.7	NIL	CLOUDY/FINE
7/08/2015	3	15	0-5	SW-SW	1024.5	NIL	CLOUDY/FINE
8/08/2015	4	12	0-3	ESE-ESE	1025.2	NIL	CLOUDY/FINE
9/08/2015	SUNDAY						
10/08/2015	6	19	0-11	N-WNW	1019.6	NIL	FINE
11/08/2015	9	18	0-5	N-S	1015.3	NIL	CLOUDY/FINE
12/08/2015	6	13	0-16	N-SSW	1010.5	NIL	CLOUDY/WINDY
13/08/2015	5	17	0-13	W-SW	1014.8	NIL	CLOUDY/WINDY
14/08/2015	5	18	0-0	SW-SW	1025.2	NIL	FINE
15/08/2015	5	14	0-5	ESE-SW	1030.8	NIL	FINE
16/08/2015	SUNDAY						
17/08/2015	7	19	0-10	WNW-SSW	1018.6	NIL	CLOUDY/FINE
18/08/2015	6	15	0-0	SW-SW	1019.9	NIL	CLOUDY/FINE
19/08/2015	6	16	0-0	ESE-NE	1027.5	NIL	CLOUDY/FINE
20/08/2015	6	19	0-5	NE-NE	1029.3	NIL	CLOUDY/FINE
21/08/2015	7	21	0-0	NE-NE	1027.1	NIL	FOG/CLOUDY
22/08/2015	14	21	0-16	N-N	1022	NIL	CLOUDY/WINDY
23/08/2015	SUNDAY						
24/08/2015	13	14	0-0	S-SW	1019.4	15	RAIN

25/08/2015	11	15	0-0	SW-NW	1015.5	15	RAIN
26/08/2015	11	17	0-0	WNW-SSW	1018	10	CLOUDY
27/08/2015	10	18	0-8	S-NW	1021	3	CLOUDY
28/08/2015	8	17	0-0	WNW-SW	1020	NIL	CLOUDY
29/08/2015	6	15	0-3	SW-NW	1024.2	NIL	FINE
30/08/2015	SUNDAY						
31/08/2015	9	17	0-0	E-SW	1018.5	NIL	FINE

SEP 15

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/09/2015	5	20	0-0	NNE-NNE	1017	NIL	FINE
2/09/2015	5	19	0-5	NNE-NW	1019.2	NIL	FINE
3/09/2015	8	18	0-0	E-SW	1006.9	4	RAIN
4/09/2015	12	17	0-0	ESE-NE	1021	1	CLOUDY/RAIN
5/09/2015	10	18	0-8	NNE-NE	1022.8	1	FOG/CLOUDY
6/09/2015	SUNDAY						
7/09/2015	10	21	0-0	WNW-NW	1020.2	5	CLOUDY
8/09/2015	7	16	0-2	NW-SW	1020.2	NIL	FINE
9/09/2015	6	19	0-0	SW-SE	1022.6	NIL	FINE
10/09/2015	7	17	0-0	ESE-NE	1030.8	NIL	CLOUDY
11/09/2015	10	22	0-0	NNE-NW	1032.9	NIL	FINE
12/09/2015	9	22	0-5	N-NW	1029.2	NIL	FINE
13/09/2015	SUNDAY						
14/09/2015	11	24	0-0	NE-NE	1026.7	NIL	CLOUDY/FINE
15/09/2015	15	27	0-11	N-NW	1017.4	NIL	CLOUDY/FINE
16/09/2015	8	20	0-5	SW-SE	1018.1	NIL	FINE
17/09/2015	10	16	0-0	E-NE	1018.6	NIL	CLOUDY
18/09/2015	11	17	0-0	ESE-SE	1026.5	20	RAIN
19/09/2015	11	16	3-0	S-SE	1027.4	NIL	CLOUDY/RAIN
20/09/2015	SUNDAY						

21/09/2015	11	23	0-0	NE-NW	1021.4	6	CLOUDY
22/09/2015	14	15	3-0	S-SE	1017.1	NIL	RAIN/CLOUDY
23/09/2015	8	14	6-5	SW-SE	1026	NIL	CLOUDY
24/09/2015	7	13	3-6	SW-S	1027	NIL	FINE
25/09/2015	10	12	3-14	SW-SE	1029.4	5	CLOUDY/RAIN
26/09/2015	9	16	0-18	ESE-NW	1029.3	5	CLOUDY/RAIN
27/09/2015	SUNDAY						
28/09/2015	7	20	0-0	ESE-NE	1022.5	2	FINE
29/09/2015	9	25	0-0	E-NE	1020.5		FINE
30/09/2015	11	18	0-6	ESE-NE	1021.8		CLOUDY

*OCT*  
*15*

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/10/2015	13	25	0-0	NNE-NE	1027.1	NIL	CLOUDY
2/10/2015	14	22	0-0	S-NE	1033.2	NIL	CLOUDY
3/10/2015	13	27	0-0	NNE-WNW	1032.5	NIL	FINE
4/10/2015	SUNDAY						
5/10/2015	LABOUR DAY						
6/10/2015	19	36	0-11	N-NW	1022.9	NIL	FINE
7/10/2015	18	17	0-0	NNE-SE	1022.5	NIL	CLOUDY
8/10/2015	13	18	0-0	ESE-NE	1038.7	NIL	CLOUDY
9/10/2015	15	25	0-0	NE-NE	1034.8	NIL	CLOUDY
10/10/2015	14	23	0-0	ESE-SW	1029.8	NIL	CLOUDY
11/10/2015	SUNDAY						
12/10/2015	16	30	6-14	WNW-SW	1018.1	15	CLOUDY
13/10/2015	17	17	0-0	ESE-SW	1020.9	NIL	CLOUDY
14/10/2015	15	23	0-0	SE-NE	1026.9	NIL	FOG/FINE
15/10/2015	16	29	0-0	N-S	1026.3	NIL	CLOUDY
16/10/2015	15	33	0-8	NE-SE	1021.8	NIL	FINE

17/10/2015	16	25	0-0	NNE-NE	1021.8	NIL	CLOUDY/FINE
18/10/2015	SUNDAY						
19/10/2015	17	25	0-0	NE-NE	1026.8	NIL	CLOUDY
20/10/2015	17	26	0-0	NNE-SE	1021	NIL	CLOUDY
21/10/2015	20	24	0-0	WNW-NE	1014.5	NIL	CLOUDY
22/10/2015	17	17	0-16	WNW-SW	1011.3	4	CLOUDY/RAIN
23/10/2015	12	18	0-0	S-SE	1021.4	10	CLOUDY/RAIN
24/10/2015	10	18	0-5	ESE-WNW	1024.9	NIL	FINE/CLOUDY
25/10/2015	SUNDAY						
26/10/2015	20	18	0-0	WNW-SW	1015.5	NIL	FINE/RAIN
27/10/2015	14	16	0-3	ESE-SW	1023.9	6	RAIN
28/10/2015	11	18	0-0	ESE-NE	1025.7	NIL	CLOUDY
29/10/2015	11	23	0-0	NNE-NE	1024.9	NIL	CLOUDY
30/10/2015	10	24	0-2	NNE-NNE	1024.4	NIL	FINE
31/10/2015	13	21	0-2	NE-WNW	1021.8	NIL	CLOUDY

NOV  
15

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/11/2015	SUNDAY						
2/11/2015	17	29	0-0	W-SW	1011.7	45	RAIN
3/11/2015	18	17	5-Mar	ESE-SE	1015.4	10	RAIN
4/11/2015	16	17	0-11	SW-NE	1018.3	5	RAIN
5/11/2015	16	21	0-0	NE-E	1017.2	25	RAIN/CLOUDY
6/11/2015	18	19	0-5	W-NE	1008.6	35	CLOUDY
7/11/2015	16	24	0-0	ESE-WNW	1011.7	NIL	FINE/CLOUDY
8/11/2015	SUNDAY						
9/11/2015	12	24	0-0	ESE-NE	1022.6	10	FINE/CLOUDY
10/11/2015	14	29	0-0	NE-NE	1015.9	NIL	FINE
11/11/2015	17	22	0-0	ESE-SE	1019.7	NIL	CLOUDY
12/11/2015	16	22	0-6	WNW-NW	1021	NIL	CLOUDY



13/11/2015	16	23	0-0	WNW-SE	1014.3	NIL	CLOUDY
14/11/2015	16	16	5-0	S-SE	1015.7	NIL	RAIN/CLOUDY
15/11/2015	SUNDAY						
16/11/2015	13	23	0-0	S-SE	1020.6	35	CLOUDY
17/11/2015	12	27	0-0	NE-NW	1020.3	NIL	FINE
18/11/2015	18	35	0-6	WNW-SW	1015.2	NIL	FINE
19/11/2015	17	39	0-0	S-SW	1014.2	NIL	FINE
20/11/2015	21	39	0-18	NNE-SW	1013.3	NIL	FINE
21/11/2015	17	20	0-0	S-SE	1013.3	NIL	CLOUDY
22/11/2015	SUNDAY						
23/11/2015	14	27	0-0	NNE-NE	1012.3	NIL	CLOUDY
24/11/2015	16	26	0-5	ESE-NE	1017	NIL	CLOUDY
25/11/2015	15	33	0-6	NNE-NW	1013.2	NIL	FINE
26/11/2015	25	36	0-3	WNW-NW	1001.6	NIL	CLOUDY
27/11/2015	15	23	0-0	ESE-NE	1015.1	NIL	CLOUDY
28/11/2015	16	19	0-0	WNW-NE	1016.6	NIL	CLOUDY
29/11/2015	SUNDAY						
30/11/2015	17	29	0-0	ESE-NE	1012.5	NIL	CLOUDY

DEC  
15

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/12/2015	19	37	0-2	N-NW	1010.4	NIL	FINE
2/12/2015	19	17	0-11	ESE-SE	1012.2	NIL	CLOUDY
3/12/2015	12	22	0-2	ESE-SE	1026.6	NIL	CLOUDY
4/12/2015	11	23	0-0	E-NE	1027.4	NIL	CLOUDY
5/12/2015	12	22	0-0	NNE-W	1023.8	NIL	CLOUDY
6/12/2015	SUNDAY						
7/12/2015	17	25	0-0	ESE-NE	1020	NIL	CLOUDY
8/12/2015	17	26	0-0	NE-NE	1019	NIL	CLOUDY

9/12/2015	21	26	8-0	WNW-NW	1015.1	5	RAIN
10/12/2015	19	23	0-0	ESE-NE	1015.7	15	CLOUDY/RAIN
11/12/2015	19	23	0-0	NNE-W	1007.5	NIL	CLOUDY
12/12/2015	17	22	0-0	ESE-WNW	1012.9	NIL	CLOUDY
13/12/2015	SUNDAY						
14/12/2015	16	30	0-3	NNE-ESE	1016.1	NIL	CLOUDY
15/12/2015	15	30	0-0	ESE-NE	1015	NIL	CLOUDY
16/12/2015	19	17	0-0	ESE-NW	1014.5	6	CLOUDY/RAIN
17/12/2015	15	26	0-5	WNW-NE	1019.4	30	CLOUDY
18/12/2015	16	33	0-0	NE-NE	1017.5	NIL	FINE/CLOUDY
19/12/2015	18	32	0-5	NE-NW	1015	NIL	FINE/CLOUDY
20/12/2015	SUNDAY						
21/12/2015	27	22	0-0	WNW-NW	1012	60	RAIN
22/12/2015	16	17	0-0	ESE-SE	1022.5	50	RAIN
23/12/2015	16	19	0-0	ESE-ESE	1020.1	NIL	RAIN/CLOUDY
24/12/2015	14	22	0-0	SE-NE	1019.9	NIL	CLOUDY
25/12/2015	CHRISTMAS	DAY					
26/12/2015	BOXING	DAY					
27/12/2015	CLOSED						
28/12/2015	CLOSED						
29/12/2015	CLOSED						
30/12/2015	CLOSED						
31/12/2015	CLOSED						

JAN 16

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/01/2016	CLOSED						
2/01/2016	CLOSED						
3/01/2016	SUNDAY						
4/01/2016	17	22	0-0	ESE-E	1016.7	10	RAIN

5/01/2016	17	18	0-0	ESE-ESE	1016.2	100	RAIN
6/01/2016	16	17	0-6	ESE-S	1012.1	100	RAIN
7/01/2016	15	21	0-13	SW-ESE	1014.1	36	RAIN
8/01/2016	13	26	0-6	ESE-S	1020.4	NIL	CLOUDY
9/01/2016	17	24	0-0	E-E	1022	NIL	CLOUDY
10/01/2016	SUNDAY						
11/01/2016	19	32	0-0	NNE-NW	1014.1	NIL	CLOUDY
12/01/2016	25	30	0-6	N-SE	1010.3	NIL	CLOUDY
13/01/2016	19	32	0-2	S-N	1019.1	NIL	CLOUDY
14/01/2016	27	34	0-0	N-S	1012.9	NIL	CLOUDY
15/01/2016	14	20	0-0	ESE-ESE	1022.2	30	RAIN
16/01/2016	13	17	2-0	ESE-ESE	1027.2	20	CLOUDY/RAIN
17/01/2016	SUNDAY						
18/01/2016	14	28	0-0	NNE-S	1021.4	NIL	FINE
19/01/2016	18	33	0-0	NE-WNW	1017.5	NIL	CLOUDY
20/01/2016	24	36	0-2	WNW-NW	1012.5	NIL	CLOUDY
21/01/2016	22	29	0-31	SW-S	1010.3	NIL	CLOUDY/RAIN
22/01/2016	22	24	0-6	N-NE	1009.2	30	IN
23/01/2016	24	27	0-10	NE-S	1005.4	NIL	CLOUDY/RAIN
24/01/2016	SUNDAY						
25/01/2016	19	23	0-5	E-SE	1013.8	35	CLOUDY/RAIN
26/01/2016	AUSTRALIA	DAY					
27/01/2016	18	24	0-0	NNE-NE	1016.5	NIL	CLOUDY
28/01/2016	20	28	0-0	NNE-NW	1009	NIL	CLOUDY
29/01/2016	21	28	0-0	NNE-SE	1002.7	20	CLOUDY/RAIN
30/01/2016	18	26	0-0	SW-ESE	1003.6	25	CLOUDY/RAIN
31/01/2016	SUNDAY						

FEB 16

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
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1/02/2016	19	26	0-13	NE-S	1004.6	NIL	CLOUDY
2/02/2016	15	27	0-0	ESE-S	1006.1	NIL	FOG/CLOUDY
3/02/2016	17	31	0-0	ESE-SE	1004.1	NIL	CLOUDY
4/02/2016	19	22	May-24	ESE-SW	1010.4	20	RAIN
5/02/2016	17	23	0-10	S-ESE	1016.4	NIL	CLOUDY
6/02/2016	17	20	0-8	ESE-S	1018	NIL	CLOUDY/RAIN
7/02/2016	SUNDAY						
8/02/2016	17	28	0-0	NNE-SE	1019.1	5	FOG/ CLOUDY
9/02/2016	18	26	0-0	ESE-SE	1020	NIL	CLOUDY
10/02/2016	17	29	0-0	NNE-NE	1017.1	NIL	CLOUDY
11/02/2016	17	28	0-5	NNE-NE	1014.4	NIL	CLOUDY
12/02/2016	19	29	0-3	NNE-SE	1016.4	NIL	CLOUDY
13/02/2016	19	26	0-5	N-NE	1014.7	NIL	FINE
14/02/2016	SUNDAY						
15/02/2016	22	27	0-0	ESE-NE	1011.6	NIL	CLOUDY
16/02/2016	20	24	0-3	SE-SE	1007.6	NIL	FOG/CLOUDY
17/02/2016	17	23	0-0	S-SE	1011.6	NIL	CLOUDY
18/02/2016	16	27	0-0	NNE-NE	1009.2	NIL	CLOUDY
19/02/2016	18	33	0-5	NE-NW	1012.1	NIL	CLOUDY
20/02/2016	22	23	0-11	SE-SW	1015.5	NIL	CLOUDY
21/02/2016	SUNDAY						
22/02/2016	19	30	0-2	NNE-NS	1025.6	NIL	CLOUDY
23/02/2016	18	32	0-0	NNE-NNE	1021.5	NIL	FOG/CLOUDY
24/02/2016	19	34	0-0	NNE-NE	1015.9	NIL	FINE
25/02/2016	19	39	0-8	NE-SW	1012.2	NIL	CLOUDY/FINE
26/02/2016	22	25	0-3	S-SE	1012.8	NIL	CLOUDY
27/02/2016	19	30	0-0	ESE-ESE	1018.4	NIL	CLOUDY
28/02/2016	SUNDAY						
29/02/2016	17	27	0-0	SE-SE	1009.2	NIL	CLOUDY


MAR 16

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/03/2016	18	29	0-0	ESE-ESE	1010.4	NIL	RAIN
2/03/2016	20	28	0-0	NE-NE	1012.2	NIL	CLOUDY
3/03/2016	19	30	0-0	WNW-ESE	1019.3	NIL	CLOUDY
4/03/2016	20	30	0-0	NE-NE	1021.9	NIL	CLOUDY
5/03/2016	17	26	0-3	E-NE	1021.3	NIL	FINE
6/03/2016	SUNDAY						
7/03/2016	19	31	0-2	NE-NE	1021.2	NIL	CLOUDY
8/03/2016	18	28	0-6	E-NE	1022.7	NIL	CLOUDY
9/03/2016	20	34	0-5	NNE-N	1021.6	NIL	CLOUDY
10/03/2016	21	32	0-0	NE-NE	1018.9	NIL	CLOUDY
11/03/2016	22	27	0-0	ESE-S	1019.1	NIL	CLOUDY
12/03/2016	20	27	0-0	NE-NE	1019.2	NIL	FINE/CLOUDY
13/03/2016	SUNDAY						
14/03/2016	19	28	0-0	NNE-NE	1015.9	NIL	CLOUDY
15/03/2016	21	22	0-0	S-S	1018.3	NIL	CLOUDY/RAIN
16/03/2016	18	24	0-0	S-SE	1019.2	10	RAIN
17/03/2016	18	24	0-8	S-NE	1017.2	15	RAIN/CLOUDY
18/03/2016	18	24	0-8	NE-NE	1006.2	NIL	CLOUDY
19/03/2016	12	19	0-8	SSE-ESE	1009.4	NIL	FINE
20/03/2016	SUNDAY						
21/03/2016	14	18	0-11	S-S	1018.4	8	RAIN
22/03/2016	15	21	0-0	ESE-S	1018.3	NIL	CLOUDY
23/03/2016	13	25	0-0	ESE-NE	1018.7	NIL	FINE
24/03/2016	15	28	0-0	NNE-NE	1020.6	NIL	CLOUDY
25/03/2016	GOOD	FRIDAY					
26/03/2016	EASTER	SATURDAY					

27/03/2016	EASTER	SUNDAY					
28/03/2016	EASTER	MONDAY					
29/03/2016	19	20	3-May	ESE-SE	1016.9	NIL	CLOUDY /RAIN
30/03/2016	18	24	0-3	SW-NE	1015.8	NIL	CLOUDY
31/03/2016	13	25	0-0	W-S	1016.8	NIL	CLOUDY



# PF FORMATION WEATHER CHART

APR 16

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/04/2016	15	27	0-10	ESE-NW	1019.2	NIL	CLOUDY
2/04/2016	17	24	0-0	N-WNW	1015.9	NIL	CLOUDY
3/04/2016	SUNDAY						
4/04/2016	17	22	0-0	S-NE	1023.5	NIL	CLOUDY
5/04/2016	16	27	0-0	WNW-NE	1020.1	NIL	FOG/CLOUDY
6/04/2016	21	33	0-2	N-NW	1016.4	NIL	FINE
7/04/2016	19	18	0-0	ESE-SE	1020.1	NIL	CLOUDY
8/04/2016	15	19	0-0	ESE-NE	1024.1	NIL	RAIN/CLOUDY
9/04/2016	15	22	0-2	SW-S	1022.3	NIL	CLOUDY/FINE
10/04/2016	SUNDAY						
11/04/2016	12	23	0-0	NNE-NE	1018.2	NIL	FOG/CLOUDY
12/04/2016	14	20	0-0	ESE-SE	1022.1	NIL	CLOUDY
13/04/2016	13	22	0-0	ESE-SE	1026.9	NIL	CLOUDY
14/04/2016	14	21	0-0	NE-NE	1030.4	NIL	RAIN
15/04/2016	14	25	0-0	NNE-S	1027.9	1	CLOUDY
16/04/2016	15	26	0-0	NE-S	1021.3	NIL	CLOUDY
17/04/2016	SUNDAY						
18/04/2016	14	19	0-0	ESE-SE	1022.2	1	CLOUDY
19/04/2016	16	22	0-0	SW-NE	1021.1	NIL	CLOUDY
20/04/2016	16	23	0-11	NE-NE	1024.1	NIL	FOG/CLOUDY
21/04/2016	16	25	0-0	NNE-NE	1023.2	NIL	FOG/CLOUDY
22/04/2016	14	18	0-0	E-SE	1020.1	NIL	FOG/CLOUDY
23/04/2016	15	18	0-16	S-S	1023.3	NIL	CLOUDY/RAIN
24/04/2016	SUNDAY						

25/04/2016	ANZAC	DAY					
26/04/2016	12	21	0-0	E-NE	1031.7	NIL	FOG/CLOUDY
27/04/2016	12	23	0-0	E-NNE	1028.4	NIL	FOG/CLOUDY
28/04/2016	13	26	0-0	NE-NNE	1024.9	NIL	FOG/CLOUDY
29/04/2016	14	23	0-0	NNE-NE	1023.4	NIL	FOG/CLOUDY
30/04/2016	17	20	0-14	NE-NW	1019.5	NIL	CLOUDY/RAIN

# PF FORMATION WEATHER CHART

MAY 16

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/05/2016	SUNDAY						
2/05/2016	11	21	0-0	SW-SW	1018.2	10	FINE/CLOUDY
3/05/2016	13	23	0-16	SW-NE	1013.2	NIL	FINE/WINDY
4/05/2016	15	22	0-3	NW-NW	1014.2	NIL	FINE
5/05/2016	11	23	0-0	NW-NW	1020.7	NIL	FINE
6/05/2016	12	25	0-0	NE-N	1019.1	NIL	FINE
7/05/2016	10	22	0-0	N-N	1021.4	NIL	FINE
8/05/2016	SUNDAY						
9/05/2016	17	21	0-0	NE-NE	1011.1	NIL	RAIN
10/05/2016	17	21	8-5	WNW-NW	1007.5	2	FINE/CLOUDY
11/05/2016	12	18	6-0	WNW-SW	1015.4	NIL	FINE/CLOUDY
12/05/2016	13	20	0-5	WNW-W	1015.4	NIL	CLOUDY/FINE
13/05/2016	12	24	0-0	WNW-SW	1021.6	NIL	FINE
14/05/2016	9	21	0-6	SW-W	1024.3	NIL	FINE
15/05/2016	SUNDAY						
16/05/2016	12	22	0-0	WNW-NW	1021.5	NIL	FINE/CLOUDY
17/05/2016	15	25	0-6	WNW-SW	1017.6	NIL	CLOUDY/FINE
18/05/2016	9	18	0-0	WNW-NW	1020	NIL	CLOUDY
19/05/2016	8	21	0-2	ESE-NW	1019	NIL	FINE
20/05/2016	12	23	0-0	WNW-SW	1019.9	NIL	CLOUDY
21/05/2016	12	19	0-0	NNE-NE	1027.5	NIL	CLOUDY
22/05/2016	SUNDAY						
23/05/2016	17	21	5-2	WNW-SW	1017	NIL	CLOUDY
24/05/2016	7	20	0-8	SW-SW	1019.7	NIL	FINE
25/05/2016	7	20	0-0	WNW-SE	1018.5	NIL	FINE
26/05/2016	13	18	5-6	WNW-NW	1010.8	NIL	RAIN
27/05/2016	10	16	0-19	WNW-SW	1004.3	NIL	FINE
28/05/2016	11	11	0-6	NW-NW	1008.7	NIL	RAIN/CLOUDY

29/05/2016	SUNDAY						
30/05/2016	2	16	0-0	N-NE	1025.7	3	FINE
31/05/2016	4	15	0-0	S-SE	1030.8	NIL	CLOUDY

## PF FORMATION WEATHER CHART

JUN 16

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/06/2016	10	13	0-0	ESE-SE	1029.6	1	CLOUDY
2/06/2016	10	16	0-0	ESE-S	1027.6	NIL	FOG/CLOUDY
3/06/2016	11	16	0-0	ESE-S	1026.1	NIL	CLOUDY
4/06/2016	14	14	0-0	S-E	1017.2	NIL	RAIN
5/06/2016	SUNDAY						
6/06/2016	13	16	3-6	NW-SW	1001	160	CLOUDY
7/06/2016	11	16	0-0	NW-SW	1005.5	NIL	CLOUDY
8/06/2016	9	17	0-0	NW-NW	1012.4	NIL	FINE
9/06/2016	16	19	5-0	NW-NW	1009.6	NIL	RAIN/FINE
10/06/2016	12	18	0-0	NW-SW	1016.2	NIL	FINE
11/06/2016	9	16	0-11	NW-NW	1023.5	NIL	FINE
12/06/2016	SUNDAY						
13/06/2016	QUEENS	BIRTHDAY					
14/06/2016	8	20	0-0	NW-NW	1037.3	NIL	FOG/CLOUDY
15/06/2016	6	18	0-6	NW-SE	1034.3	NIL	CLOUDY
16/06/2016	9	19	0-0	E-NW	1027.3	NIL	CLOUDY
17/06/2016	10	18	0-0	N-NW	1019	NIL	CLOUDY
18/06/2016	14	17	0-0	NW-NE	1017.3	NIL	RAIN
19/06/2016	SUNDAY						
20/06/2016	14	12	0-0	NE-NW	1000.9	40	CLOUDY
21/06/2016	13	14	0-10	NW-NW	1004.3	NIL	CLOUDY
22/06/2016	13	16	0-6	NW-W	1004.7	NIL	CLOUDY
23/06/2016	9	14	0-5	N-NW	1013.4	NIL	CLOUDY
24/06/2016	13	10	13-5	NW-NW	1004.8	NIL	CLOUDY/WINDY

25/06/2016	6	10	0-0	WNW-SW	1018	NIL	CLOUDY/FINE
26/06/2016	SUNDAY						
27/06/2016	8	10	3-2	WNW-SW	1016.9	NIL	RAIN/CLOUDY
28/06/2016	6	14	0-0	SW-S	1022.5	NIL	FINE
29/06/2016	2	16	0-0	ESE-NW	1029.3	NIL	FINE
30/06/2016	7	14	3-5	WNW-NW	1023.2	NIL	FINE

# **ATTACHMENT 6**

## **SITE CURRENT PHOTOS**





**Photo 1 – Current extraction area Lot 1 DP1091018**



**Photo 2 – Current extraction area Lot 1 DP1091018**





**Photo 3 – Current extraction area Lot 214 DP7520399**



**Photo 4 – Clean water pond Lot 167 DP752039**





**Photo 5 – Tailings ponds 1 and 2 Lot 214 DP7520399**



**Photo 6 – Tailings pond 12 Lot 214 DP7520399**





**Photo 7 – Rehabilitation area Lot 2 DP520966**



**Photo 8 – Rehabilitation area Lot F DP233818**

# **ATTACHMENT 7**

## **SITE SURVEY PLAN**





# **ATTACHMENT 8**

## **WEIGHBRIDGE VERIFICATION CERTIFICATE**



Test report reference number: 0006587 Calibration Sticker Reference:

Verification: Y

In-Service Test:

Date of Test: 04/05/16

For in-service inspection record the verification/certification mark:

Name of owner/user: PF FORMATION- VERIFICATION

Contact:

Address of owner/user: 1774 WISEMAN FERRY RD

Phone:

Report Emailed from Site? N

**DESCRIPTION OF INSTRUMENT:**

Serial No: 3139483

Make / Model: RANGER 5000

NSC No S363

Capacity: 60.00t

Min: 0.4t

VSI e=d= 0.02t

Class III

DESCRIPTION	Y/N		Y/N
Instrument complies with NMI certificate?	Y	The data plate is fixed on instrument?	Y
Instrument is being used appropriately?	Y	Is the instrument clean?	Y
Is the instrument complete?	Y	Level-ind device fitted & Operates?	NA
Is the Instrument Operational?	Y	Mounted on a firm base?	NA
Is the instrument level?	Y	Mandatory marks are clear & permanent?	Y
Any apparent obstructions to Inst?	N		
Does the operator &/OR customer, have a clear and unobstructed view of the indicator & the weighing operation?			Y
Add indicating devices: Do the repeat the primary indication. Does price computation and/or, ticket/label comply with S1/0/A?			Y
If applicable, does the steelyard, tare bar or proportional weight comply with the mandatory requirements in respect to design and marking?			NA

1. 39.92t	2.39.92t	3. 39.92t
D fference: 0		

Repeatability Test: Pass or Fail? PASS	Zero Settings Pass or Fail? PASS
Is the instrument adequately protected against abnormal dust, air movement, vibrations, atmospheric conditions and any other influence likely to affect its performance?	Y
Suspended weighing instruments: does it hang freely & are all transparent covers in good repair?	NA

Eccentricity Reading 1 - 12:

1.6.18t	2. 6.18t	3. 6.18t	4. 6.18t	5. 6.18t	6. 6.18t	Mass Used: 6.18t
7.	8.	9.	10.	11.	12.	

Eccentricity Test Pass or Fail? P

No. of Supports? 6

Comments: FORKLIFT+2t

#### Weighing performance using substitution load (clause 5.4.2)

Substitution Load 1:	TRUCK 1
Substitution Load 2:	TRUCK 2
Substitution Load 3:	

Method Used: Method A? Y Method B?

MPE change points: 10.00t, 40.00t

Available weights: 20.00t

#### WEIGHBRIDGE WEIGHT TEST:

Lsub:

Up:	Load	Make up of load:	MPE:	1:	1/2 e:	DL:	E:	Lsub:	(rounded)	P or F?
1.	WEIGHT	5.00t	0.01t	5.00t	0.01t	-	-	-	-	PASS
2.	WEIGHT	10.00t	0.01t	10.00t	0.01t	-	-	-	-	PASS
3.	WEIGHT	20.00t	0.02t	20.00t	0.01t	-	-	-	-	PASS
4.	WEIGHTS+	39.86t	0.02	39.86t	0.01t	-	-	-	-	PASS
5	S <sub>WEIGHTS+</sub>	59.96t	0.03t	59.96t	0.01t	-	-	-	-	PASS

S

Over range blanking Pass or Fail? PASS

Discrimination (clause 5.5): PASS

Down:	Load	Make up of load:	MPE:	1:	P or F?	
1.	59.96t			59.96t	PASS	Accuracy of tare setting (clause 5.7): PASS
2.	39.86t			39.38t	PASS	Test Required: NA
3.	20.00t			20.00t	PASS	Weight test Pass or Fail?: PASS
4.	10.00t			10.00t	PASS	Sensitivity (clause 5.6): NA
5	5.00t			5.00t	PASS	Test Required: NA

**OVERALL RESULT? PASS**

**Technicians Name: SAM SINTMAARTENSDYK**

**ID No: AUS1872**

All scales are tested using uniform testing procedures as per NITP 6.1-6.4 using Reg 13 traceable masses and complies with the requirements of the NCS  
International Certified Quality Management System ISO9001

--

NATIONAL TRADE MEASUREMENT	
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CERTIFICATE OF VERIFICATION OR NOTICE OF NON VERIFICATION OF A MEASURING INSTRUMENT  
Note: \* denotes mandatory field and must contain data

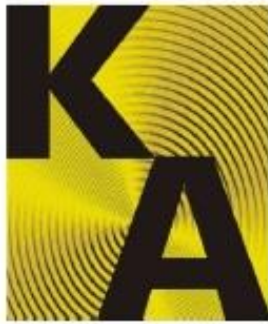
[illegible]



# **ATTACHMENT 9**

## **NOISE REPORT**





# **KOIKAS ACOUSTICS<sup>PTY LTD</sup>**

**CONSULTANTS IN NOISE & VIBRATION**

Commercial 1 (Unit 27)

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BEXLEY NSW 2207

ABN 12 058 524 771

Ph: (02) 9587 9702

Fax: (02) 9587 5337

E-mail: [Office@KoikasAcoustics.com](mailto:Office@KoikasAcoustics.com)

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## **NOISE COMPLIANCE TESTING**


### **OF PF FORMATION EXTRACTIVE INDUSTRY OPERATIONS**

#### **HITCHCOCK ROAD SAND PROJECT**

**(JULY 2015 - APRIL 2016)**

Date: Tuesday, 30<sup>th</sup> August 2016  
File Reference: 1933C20160830mfcMarootaS1-4v5

Koikas Acoustics Pty Ltd  
Commercial 1, Unit 27,  
637-645 Forest Road,  
Bexley NSW 2207

DOCUMENT CONTROL SHEET	
<b>Project Title</b>	NOISE COMPLIANCE TESTING OF PF FORMATION EXTRACTIVE INDUSTRY OPERATIONS HITCHCOCK ROAD SAND PROJECT (JULY 2015 - APRIL 2016)
<b>Our Project Number</b>	1933
<b>Our File Number</b>	Z:\ACOUSTICS\ACOUSTICS 16\REPORT\Other\1933C20160830mfcMarootaS1-4v5.docx
<b>Issue Date</b>	V5 30 <sup>th</sup> August 2016 V4 24 <sup>th</sup> August 2016 V3 23 <sup>rd</sup> August 2016 V2 19 <sup>th</sup> August 2016 V1 15 <sup>th</sup> August 2016
<b>Prepared By</b>	Michael Fan Chiang
<b>Checked By</b>	Nick Koikas 
<b>Client Project No.</b>	-
<b>Prepared For</b>	PF Formation Trust 1774 Wisemans Ferry Road Maroota NSW 2756 Attention: Joshua Graham E-mail: <a href="mailto:josh@pfformation.com.au">josh@pfformation.com.au</a> ; <a href="mailto:accounts@pfformation.com.au">accounts@pfformation.com.au</a>

The information contained herein should not be reproduced except in full. The information provided in this report relates to acoustic matters only. Supplementary advice should be sought for other matters relating to construction, design, structural, fire-rating, water proofing, and the likes.

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**NOISE COMPLIANCE TESTING**  
**OF PF FORMATION EXTRACTIVE INDUSTRY OPERATIONS**  
**HITCHCOCK ROAD SAND PROJECT**  
**(JULY 2015 - APRIL 2016)**

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**Appendix A -** Aerial photograph

**NOISE COMPLIANCE TESTING**  
**OF PF FORMATION EXTRACTIVE INDUSTRY OPERATIONS**  
**HITCHCOCK ROAD SAND PROJECT**  
**(JULY 2015 - APRIL 2016)**

## **1.0 CONSULTANT'S BRIEF**

Koikas Acoustics Pty Ltd was engaged by PF Formation Trust to undertake noise compliance testing during the sand extraction operations for Hitchcock Road Sand Project in Maroota.

The assessment provides the following:

- a discussion of the applicable noise criteria at each site, and
- attended noise monitoring survey results.

Sand extractions have been undertaken in this area for many years. Koikas Acoustics has been advised that there have been no noise complaints received from the local community in regards to the sand mining extraction works since periodic noise surveys commenced.

All monitoring procedures were done in accordance with the requirements of the Project Approval of 3<sup>rd</sup> February 2009 and EPA Licence 3407.

Some measurements of sleep disturbance could not be taken 1 metre from a bedroom window. Sound level measurements were taken from the boundary. Measurements taken from the boundary were closer to the noise source and therefore louder compared to if measurements were taken outside a bedroom window.



## 2.0 SITE DESCRIPTION

### 2.1 SITE LOCATION

The Hitchcock Road Sand Project site is bounded by:

- Old Northern Road along the east,
- Wisemans Ferry Road to the west (intersecting with the Old Northern Road to the north), and
- other rural properties to the south.

Refer to Figure 1 below for the project site extraction area.



Figure 1. Hitchcock Road Sand Project Site Area

Details of the topography are attached as a rendered aerial photograph in the Hitchcock Road Sand Extraction and Rehabilitation Project, revised January 2016 Maroota Noise Management Plan (Approved 21/07/2016) and the Project Approval dated 3<sup>rd</sup> February 2009 signed by the NSW Minister for Planning.

## 2.2 HOURS OF OPERATION

The hours of operation are specified in the project approval as shown in Table 1 below.

Table 1. Hours of Operation		
Activity	Day	Time [Hours]
Construction	Monday to Friday	0700 – 1800
	Saturday	0800 – 1300
	Sunday and Public Holiday	None
Quarrying and processing including overburden removal	Monday to Saturday	0700 – 1800
	Sunday and Public Holiday	None
Product Transportation	Monday to Saturday	0600 – 1800
	Sunday and Public Holiday	None
Maintenance	Monday to Saturday	0700 – 1800
	Sunday and Public Holiday	None

## 2.3 AMBIENT NOISE PROFILE OF THE NOISE MONITORING SITES (RECEIVERS)

The assessment site is located in a rural-residential area. The main roads passing through this area being Old Northern Road and Wisemans Ferry Road carry light and heavy vehicles.

During the daytime, the perceived intrusiveness of noise of cars and trucks traversing along these roads whilst residents are inside or outside their homes is expected to be significantly greater compared to the noise of sand mining extraction activities.

The rustling of leaves with slight wind speeds would normally raise background noise levels. For periods when the wind is calm, background noise levels would typically be that of distant noise emanating from trucks and cars, and the sound of insects and birds.

## 2.4 MONITORING LOCATIONS

Noise monitoring was conducted in the Maroota area at the following locations:

1. Tomatola property Hitchcock Road (driveway);
2. Pignataro property (corner of Wisemans Ferry Road and Old Northern Road)
3. Jurds property (back of fire shed, adjacent to Old Northern Road)
4. Maroota Public School (rear of school)

The site locations are attached as an aerial photo in **Appendix A**.



### 3.0 NOISE CRITERIA

The noise criteria are specified in the project approval, EPA Licence 3407 and approved Noise Management Plan.

#### 3.1 BACKGROUND NOISE

The noise criterion has been derived from previous noise surveys by undertaking long term ambient noise level measurements at a representative site. The background noise level was determined over consecutive 15 minute periods for a duration of at least one week. From this data of  $L_{A90,15 \text{ minutes}}$  noise levels, the 10 percentile lowest background noise levels were determined for each of the days. The *rating background level* was then determined by calculating the median value of the daily 10 percentile background noise levels for each of the three specific time periods: daytime, evening and night time.

The rating background level result is used to determine the noise criteria applicable for the surrounding residential properties in accordance with the EPA's Industrial Noise Policy (INP) assessment procedures.

The background noise level  $L_{A90,15 \text{ minutes}}$  is normally determined in the absence of extraneous noise such as traffic, wind, rain, conversation, birds chirping, insect noise and unnatural increases in noise from distant sources due to local air movement. The EPA defines such sources as *incidental noise* which can cause the masking of offensive noise from a specific source. When traffic or other incidental noises cannot be excluded, then it is considered that these noise sources are part of the background noise.

#### 3.2 EPA INDUSTRIAL NOISE POLICY

The INP defines two criteria, the Intrusive Noise Criterion and the Amenity Noise Criterion. The EPA requires that compliance with both the intrusive and amenity criteria be achieved for the purpose of controlling the intrusive nature of the industrial noise in the short term and also maintaining the noise level amenity of the area for residences and other land uses.

For the purpose of applying the INP the following time periods apply:

- Daytime            7am to 6pm Monday to Saturday  
                         8am to 6pm Sunday
- Evening            6pm to 10pm Monday to Sunday
- Night-time        10pm to 7am Monday to Saturday  
                         10pm to 8am Sunday



### 3.2.1 Intrusive Noise Criterion

The intrusiveness of an industrial noise source is generally considered acceptable by people if the equivalent continuous (A-weighted) noise level ( $L_{Aeq, 15 \text{ minutes}}$ ) does not exceed the background noise level by more than 5 dB. The intrusive noise criterion is defined as:

$$L_{Aeq, 15 \text{ minutes}} = (\text{rating background level}) L_{90, \text{Period}} + 5\text{dB}$$

When the noise source contains annoying characteristics such as prominent tonal, impulsive, intermittent, irregular and dominant low frequency components, adjustments are made.

### 3.2.2 Noise Amenity Criterion

In order to limit the continuing increase in noise, the EPA has nominated recommended acceptable and maximum ambient noise levels for various receiver sites from industrial noise.

Table 2.1 of the EPA's INP (below) specifies the following acceptable and maximum recommended  $L_{Aeq, \text{Period}}$  noise levels for this project specific type area. In this case, the area is described as being Rural.

The EPA refers to rural as:

Rural—means an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic. Such areas may include:

- an agricultural area, except those used for intensive agricultural activities
- a rural recreational area such as resort areas
- a wilderness area or national park
- an area generally characterised by low background noise levels (except in the immediate vicinity of industrial noise sources).

This area may be located in either a rural, rural-residential, environment protection zone or scenic protection zone, as defined on a council zoning map (Local Environmental Plan (LEP) or other planning instrument).

Table 2.1 of the EPA INP

Type of Receiver	Indicative Noise Amenity	Time of Day	Recommended $L_{Aeq, \text{Period}}$	
			Acceptable	Recommended Maximum
Residential	Rural	Day	50	55
		Evening	45	50
		Night	40	45
Schools	All	Noisiest 1 hour period when in use	35	40

Table 2.2 of the EPA INP (below) specifies the modification to the acceptable noise level to account for the existing level of industrial noise when additional industrial noise sources are proposed for the site:

Table 2.2 of the EPA INP

Total existing LAeq noise level from industrial sources, dB(A)	Maximum LAeq noise level from new sources alone, dB(A)
Acceptable noise level plus 2	If existing noise level is likely to decrease in future: acceptable noise level minus 10 If existing noise level is unlikely to decrease in future: existing level minus 10
Acceptable noise level plus 1	Acceptable noise level minus 8
Acceptable noise level	Acceptable noise level minus 8
Acceptable noise level minus 1	Acceptable noise level minus 6
Acceptable noise level minus 2	Acceptable noise level minus 4
Acceptable noise level minus 3	Acceptable noise level minus 3
Acceptable noise level minus 4	Acceptable noise level minus 2
Acceptable noise level minus 5	Acceptable noise level minus 2
Acceptable noise level minus 6	Acceptable noise level minus 1
< Acceptable noise level minus 6	Acceptable noise level

The amendments to the EPA INP (2006) state that both the predicted amenity noise level criterion and the intrusive noise level criteria need to be satisfied, which supersedes the requirement of assessing only the most stringent of the two noise criterion. In clearly obvious cases, one or the other noise criterion is considered. In this case, the intrusive noise criterion has been considered as it is clearly the most stringent due to the low Rating Background Level (RBL).

### 3.3 NOMINATED NOISE CRITERIA

As per the approved Noise Management Plan January 2016, the following noise criteria were adopted:

Table 9.1 Noise impact assessment monitoring locations and criteria

Noise assessment location	Other locations covered	Day	Night 1	Night 1
		LAeq (15 minute)	LAeq (15 minute)	LA1 (1 minute)
1. R9 – Young, Hitchcock Road	R10 Tomatola	39	35	45
2. R5 – Pignataro	R6 Camilleri	42	35	45
3. R3 – Fire station/Jurd	R1 Hammond and R2 Hitchcock	40	35	45
4. R7 – Maroota Public School	R6 Camilleri and R8 Portelli	36(LAeq(1 hour))	N/A	N/A

Note 1: Night time is defined as the period between 10.00pm and 7.00am. Activities on the site start at 6.00am and are completed by 6.00pm. There is no activity on the site during the evening period.



## 4.0 NOISE SURVEYS

### 4.1 NOISE MONITORING PROCEDURES

All noise methodologies and equipment used comply with the following Australian Standards:

- AS1259.2-1990 "Acoustics - Sound Level Meters - Integrating - Averaging", and
- ISO 1996.2-2007 "Acoustics – Description, measurement and assessment of environmental noise" Part 2: Determination of environmental noise levels.

All sound and noise level measurements were A-frequency and Fast-time weighted.

### 4.2 ATTENDED NOISE MONITORING

Attended noise monitoring was conducted on the following days at each monitoring location below:

#### At location 1 Tornatola Property Hitchcock Road (@ driveway)

29 <sup>th</sup> July 2015	Night-time hours
29 <sup>th</sup> July 2015	Daytime hours
16 <sup>th</sup> October 2015	Daytime hours
19 <sup>th</sup> October 2015	Night-time hours
27 <sup>th</sup> January 2016	Daytime hours
27 <sup>th</sup> January 2016	Night-time hours
21 <sup>st</sup> April 2016	Daytime hours
27 <sup>th</sup> April 2016	Night-time hours

#### At location 2 Pignataro Property (corner of Wisemans Ferry Road and Old Northern Road)

29 <sup>th</sup> July 2015	Night-time hours
29 <sup>th</sup> July 2015	Daytime hours
16 <sup>th</sup> October 2015	Daytime hours
19 <sup>th</sup> October 2015	Night-time hours
27 <sup>th</sup> January 2016	Daytime hours
28 <sup>th</sup> January 2016	Night-time hours
21 <sup>st</sup> April 2016	Daytime hours
27 <sup>th</sup> April 2016	Night-time hours

At location 3 Jurds Property (back of fire shed, adjacent to Old Northern Road)

29 <sup>th</sup> July 2015	Night-time hours
29 <sup>th</sup> July 2015	Daytime hours
20 <sup>th</sup> October 2015	Night-time hours
21 <sup>st</sup> October 2015	Daytime hours
27 <sup>th</sup> January 2016	Daytime hours
28 <sup>th</sup> January 2016	Night-time hours
21 <sup>st</sup> April 2016	Daytime hours
27 <sup>th</sup> April 2016	Night-time hours

At location 4 Maroota Public School (rear of school)

29 <sup>th</sup> July 2015	Daytime hours
21 <sup>st</sup> October 2015	Daytime hours
28 <sup>th</sup> January 2016	Daytime hours
21 <sup>st</sup> April 2016	Daytime hours

The noise measurements taken from July 2015 to April 2016 were conducted with a Class 1 Svan 971 S/N 40412 Sound Level Meter and calibrated with a Svanteck SV 33 Class 1 Acoustic Calibrator.



## 5.0 NOISE SURVEY RESULTS

Table 2, 3, 4 and 5 refers to the measured noise levels obtained at locations 1,2,3 and 4 respectively for each monitoring period. It is noted, that in all cases the measured  $L_{Aeq}$  was dominated by environmental and intermittent noise sources unrelated to the quarry noise. The exceeding levels are therefore not that of quarry activities.

Table 2. Location 1 Tornatola Property Hitchcock Road - Noise Survey Results					
Date	Applicable Criterion Level	Measured Noise Level	Measured $L_{A90}$	Exceeding [dB]	Note
29 <sup>th</sup> July 2015 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	52 $L_{Aeq,15min}$ 48 $L_{A1,1min}$	41	17 3	Noise dominated by road traffic. See also Note 6.
29 <sup>th</sup> July 2015 Daytime hours	39 $L_{Aeq,15min}$	47 $L_{Aeq,15min}$	37	8	Road traffic noise levels of 48~52 dB(A). See also Note 6.
16 <sup>th</sup> October 2015 Daytime hours	39 $L_{Aeq,15min}$	47 $L_{Aeq,15min}$	36	8	Noise dominated by road traffic and natural sounds. See also Note 6.
19 <sup>th</sup> October 2015 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	49 $L_{Aeq,15min}$ 49 $L_{A1,1min}$	38	14 3	Noise dominated by road traffic. See also Note 6.
27 <sup>th</sup> January 2016 Daytime hours	39 $L_{Aeq,15min}$	62 $L_{Aeq,15min}$	60	23	Noise dominated by road traffic and natural sounds. See also Note 2.
21 <sup>st</sup> April 2016 Daytime hours	39 $L_{Aeq,15min}$	40 $L_{Aeq,15min}$	29	1	Noise dominated by road traffic and natural sounds. See also Note 1.
27 <sup>th</sup> April 2016 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	50 $L_{Aeq,15min}$ 50 $L_{A1,1min}$	38	15 5	Noise dominated by road traffic. See also Note 1.

Table 3. Location 2 Pignataro Property - Noise Survey Results					
Date	Applicable Criterion Level	Measured Noise Level	Measured $L_{A90}$	Exceeding [dB]	Note
29 <sup>th</sup> July 2015 Daytime hours	42 $L_{Aeq,15min}$	62 $L_{Aeq,15min}$	49	20	Road traffic noise levels of 55-65 dB(A). See also Note 2.
29 <sup>th</sup> July 2015 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	55 $L_{Aeq,15min}$ 55 $L_{A1,1min}$	43	20 10	Road traffic noise levels of 55-60 dB(A). See also Note 6.
16 <sup>th</sup> October 2015 Daytime hours	42 $L_{Aeq,15min}$	52 $L_{Aeq,15min}$	35	10	Road traffic noise levels of 55-60 dB(A). See also Note 3.
19 <sup>th</sup> October 2015 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	64 $L_{Aeq,15min}$ 74 $L_{A1,1min}$	34	29 29	Road traffic noise levels of 58-65 dB(A). See also Note 1.
27 <sup>th</sup> January 2016 Daytime hours	42 $L_{Aeq,15min}$	52 $L_{Aeq,15min}$	38	10	See Note 1.
28 <sup>th</sup> January 2016 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	56 $L_{Aeq,15min}$ 50 $L_{A1,1min}$	41	21 5	See Note 1.
21 <sup>st</sup> April 2016 Daytime hours	42 $L_{Aeq,15min}$	51 $L_{Aeq,15min}$	34	9	See Note 1.
27 <sup>th</sup> April 2016 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	53 $L_{Aeq,15min}$ 54 $L_{A1,1min}$	44	18 9	See Note 1.

Table 4. Location 3 Jurds Property - Noise Survey Results					
Date	Applicable Criterion Level	Measured Noise Level	Measured LA90	Exceeding [dB]	Note
29 <sup>th</sup> July 2015 Night-time hours	35 LAeq,15min 45 LA1,1min	56 LAeq,15min 65 LA1,1min	42	21 20	See Note 1.
29 <sup>th</sup> July 2015 Daytime Hours	40 LAeq, 15min	56 LAeq,15min	38	16	Road traffic noise levels of 56-60 dB(A). See also Note 5.
20 <sup>th</sup> October 2015 Night-time hours	35 LAeq,15min 45 LA1,1min	53 LAeq,15min 65 LA1,1min	36	18 20	Road traffic noise levels of 55-60 dB(A). See also Note 1.
21 <sup>st</sup> October 2015 Daytime Hours	40 LAeq, 15min	56 LAeq,15min	38	16	Road traffic noise levels of 58-65 dB(A). See also Note 3.
27 <sup>th</sup> January 2016 Daytime Hours	40 LAeq, 15min	53 LAeq,15min	32	13	See Note 1.
28 <sup>th</sup> January 2016 Night-time hours	35 LAeq,15min 45 LA1,1min	58 LAeq,15min 61 LA1,1min	33	23 16	See Note 2.
21 <sup>st</sup> April 2016 Daytime Hours	40 LAeq, 15min	55 LAeq,15min	33	15	See Note 3.
27 <sup>th</sup> April 2016 Night-time hours	35 LAeq,15min 45 LA1,1min	57 LAeq,15min 64 LA1,1min	41	22 19	See Note 1.

Table 5. Location 4 Maroota Public School - Noise Survey Results					
Date	Applicable Criterion Level	Measured Noise Level	Measured LA90	Exceeding [dB]	Note
29 <sup>th</sup> July 2015 Daytime hours	36 LAeq, 15min	48 LAeq,15min	45	12	Noise dominated by road traffic and bird noise. See also Note 3.
21 <sup>st</sup> October 2015 Daytime hours		45 LAeq,15min	42	9	Noise dominated by road traffic and bird noise. See also Note 4.
28 <sup>th</sup> January 2016 Daytime hours		44 LAeq,15min	41	8	See Note 3.
21 <sup>st</sup> April 2016 Daytime hours		40 LAeq,15min	37	3	See Note 4.

**Note 1.** Dominant noise source is that of traffic and birds chirping or natural sounds such as wind and rustling of leaves (during lulls in traffic). Quarry noise was not audible.

**Note 2.** Dominant noise source is that of traffic and birds chirping or insect noise (during lulls in traffic). Quarry noise was not audible and not measurable.

**Note 3.** Dominant noise source is that of traffic and birds chirping or natural sounds such as wind and rustling of leaves (during lulls in traffic). Quarry noise was audible but not measurable.

**Note 4.** Dominant noise source is that of traffic and/or birds chirping or insects (during lulls in traffic). Noise from other quarries were audible. Subject quarry noise was not audible and not measurable.

**Note 5.** Dominant noise source is that of traffic and/or birds chirping (during lulls in traffic). Quarry noise was audible during lulls in traffic but not measurable.



**Note 6.** Dominant noise source is that of traffic. Quarry noise was not audible even during lulls in traffic. Therefore quarry noise was not measurable.

On account of the large distances which sound travels from the sand mining extraction activities to the surrounding residential premises, it is often not measureable because it is either less than the prevailing background noise or because it is inaudible. At all the noise monitoring sites, the noise emanating from the Hitchcock Road Sand Project currently has minimal contribution compared to other noise sources such as traffic noise, birds chirping, insect noise, rustling of leaves and other quarry operation.

The noise criteria nominated by EPA Licence 3407, Minister of Planning approval and Table 9.1 of the approved Noise Management Plan January 2016 for the hours of operation were therefore not exceeded.

## 6.0 CONCLUSIONS

Koikas Acoustics was requested to undertake noise level surveys around the Hitchcock Road Sand Project sand mining extraction and processing quarry (from July 2015 to April 2016) and ascertain whether the noise from the extraction and processing works currently exceed the nominated noise criteria as nominated by EPA licence 3407 and the project approval.

The results of the noise surveys show that the site extraction works are currently comply with all the nominated noise criteria (including cumulative noise criteria).

At most sites, quarry activities are either just audible or inaudible and in most of cases, the noise emanating from the site was found not to be measureable on account of that the natural noise (which includes birds chirping, insects, rustling of leaves) and un-natural noise (being cars and trucks traversing along the main roads).

There are no noise mitigation measures necessary to be implemented for the subject quarry sites.

Koikas Acoustics therefore certifies that the subject Maroota Hitchcock Road Sand Project currently complies with the nominated noise criteria despite that the measured noise levels (predominantly that of traffic and other natural sound sources) are currently producing sound levels in excess of the nominated noise criteria.



## APPENDIX A - AERIAL PHOTOGRAPH





# **ATTACHMENT 10**

## **AIR QUALITY REPORT**


**Boral Construction Materials  
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### TEST REPORT

CLIENT: P.F. FORMATION

FILE No: 250 / 16

1774 Wisemans Ferry Road Maroota NSW 2756

PROJECT: Gravimetric Dust Monitoring at Maroota for June 2016

REQUEST No.: 68352

**TEST PROCEDURE:** AS 3580.10.1 – 2003 – Methods for Sampling and Analysis of Ambient Air  
Method 10.1 – Determination of Particulate Matter - Deposited Matter – Gravimetric Method

Lab Sample Number:	180245	180246	180247	180248
Site Location Number:	1	2	3	4
Sample Description:	Dust			
Sampling Period:	From	1.06.16	to	1.07.16

### TEST RESULTS

Insoluble Solids (g/m <sup>2</sup> month)	1.69	2.59	1.89	1.95
Ash (g/m <sup>2</sup> month)	0.76	0.92	1.16	0.97
Combustible Matter (g/m <sup>2</sup> month)	0.93	1.67	0.73	0.98
Soluble Matter (g/m <sup>2</sup> month)	1.44	1.49	0.37	0.94
Total Solids (g/m <sup>2</sup> month)	3.13	4.08	2.26	2.89
Volume of Liquid in the Gauge (ml)	4700	4900	4700	4600

### Notes:

- Refer to attached graphs.
- Samples submitted by the Client.

J.Graham, Mat. File, File.

Approved Signatory

S. Krishnamoorthy

Date

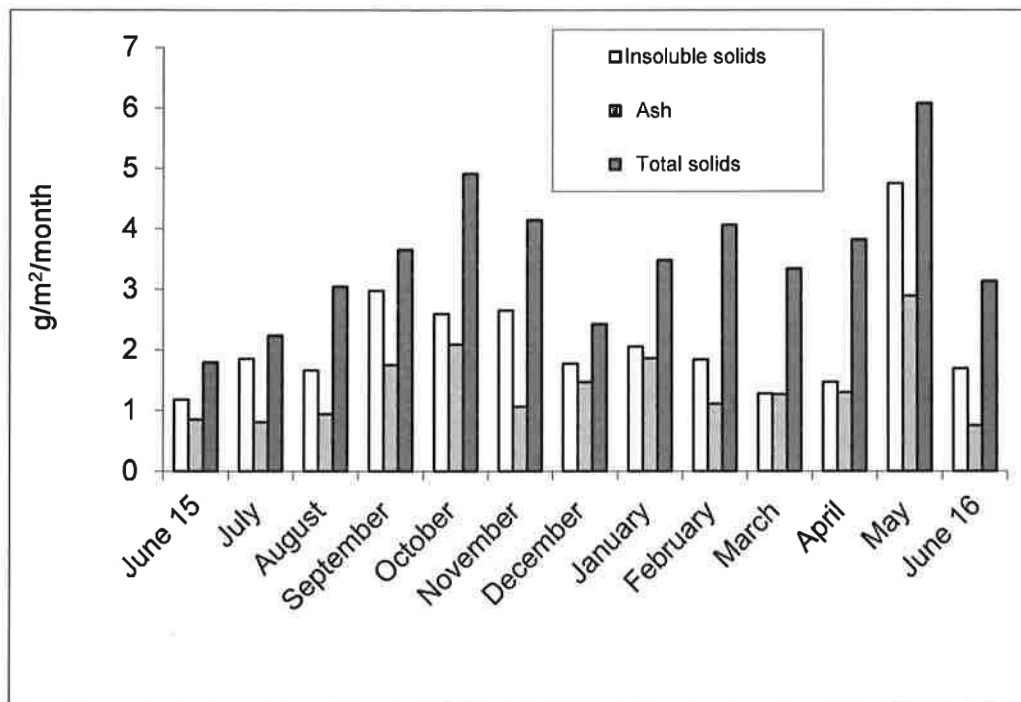
13.7.16

Serial No.

147972

**Dust Monitoring**  
**MAROOTA Site 1**  
**Maroota Public School**

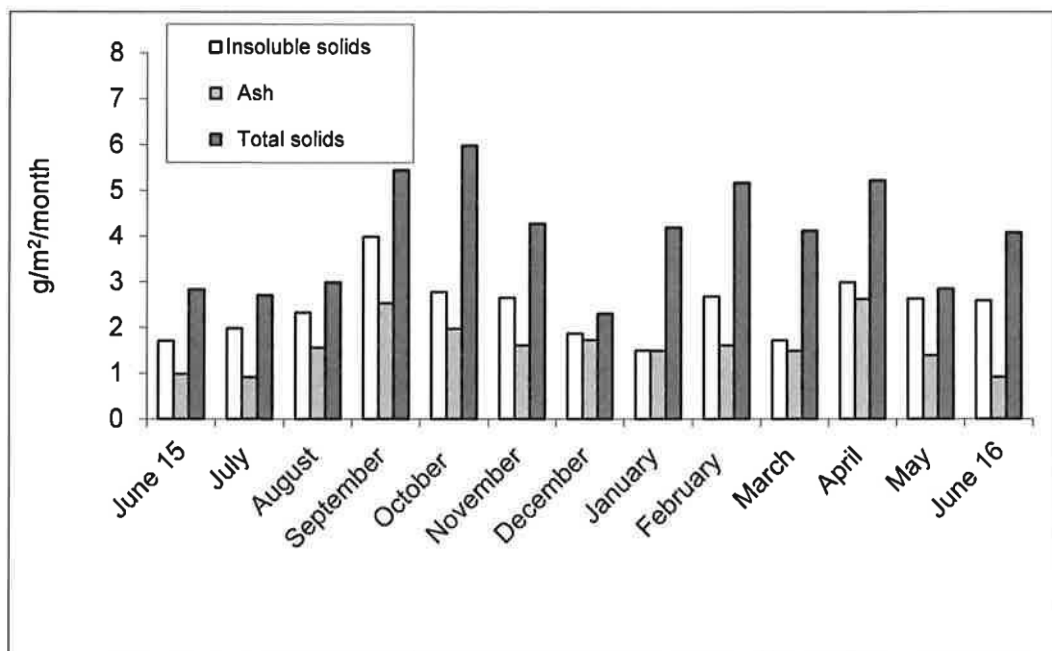
	Insoluble solids	Ash	Total solids
June 15	1.18	0.85	1.79
July	1.85	0.81	2.23
August	1.66	0.94	3.04
September	2.97	1.75	3.65
October	2.59	2.09	4.91
November	2.65	1.06	4.14
December	1.77	1.47	2.42
January	2.05	1.86	3.48
February	1.84	1.11	4.06
March	1.28	1.27	3.34
April	1.47	1.30	3.82
May	4.75	2.89	6.08
June 16	1.69	0.76	3.13



\* NSW-EPA - Approved Methods and Guidance- For the Modelling and Assessment of Air Pollutants in New South Wales - AUGUST 2005 (pg 28)

**Dust Monitoring**  
**MARootA Site 2**  
**Hitchcock Road**

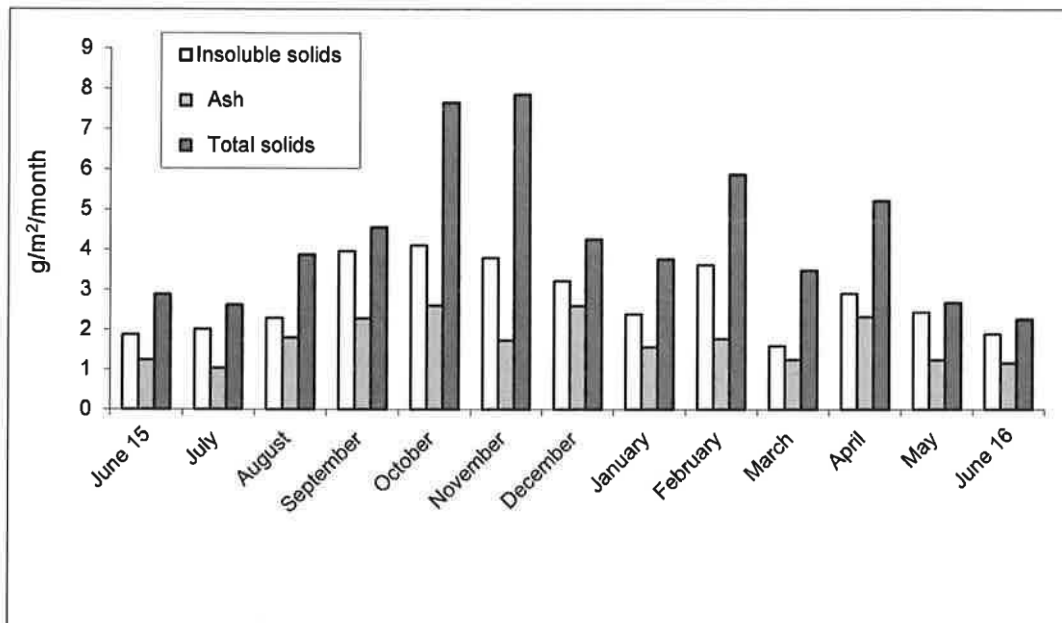
	Insoluble solids	Ash	Total solids
June 15	1.71	0.99	2.83
July	1.98	0.92	2.71
August	2.33	1.56	2.99
September	3.99	2.53	5.44
October	2.78	1.97	5.98
November	2.65	1.61	4.27
December	1.87	1.73	2.30
January	1.50	1.49	4.19
February	2.68	1.61	5.17
March	1.72	1.49	4.12
April	2.99	2.62	5.22
May	2.63	1.39	2.85
June 16	2.59	0.92	4.08



\* NSW-EPA - Approved Methods and Guidance- For the Modelling and Assessment of Air Pollutants in New South Wales - AUGUST 2005 (pg 28)

**Dust Monitoring**  
**MARootA Site 3**  
**Jurd's House**

	Insoluble solids	Ash	Total solids
June 15	1.87	1.24	2.88
July	2.01	1.03	2.61
August	2.29	1.80	3.87
September	3.96	2.28	4.55
October	4.10	2.60	7.65
November	3.79	1.73	7.85
December	3.21	2.59	4.25
January	2.38	1.56	3.76
February	3.61	1.77	5.87
March	1.59	1.25	3.48
April	2.90	2.32	5.21
May	2.43	1.24	2.67
June 16	1.89	1.16	2.26



\* NSW-EPA - Approved Methods and Guidance- For the Modelling and Assessment of Air Pollutants in New South Wales - AUGUST 2005 (pg 28)

# **ATTACHMENT 11**

## **GROUNDWATER REPORT**





PF Formation

# Groundwater Report: Hitchcock Road Site, Maroota, NSW. Annual Groundwater Management Plan 2015-2016.

Report E2W-0224 R003

19 September 2016



**Prepared by: Dino Parisotto (Director)**  
BAppSc-Geology (Hons); MAppSc-Groundwater  
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**earth<sub>2</sub>water**  
Pty Ltd  
Environmental & Groundwater Consulting

**Client: PF Formation**

**Project: Groundwater Report Hitchcock Road Site, Maroota 2015-  
2016 Annual Groundwater Management Plan**

Prepared for:  
Peter Cummins

**PF Formation 1774 Wisemans Ferry Road Maroota, NSW, 2756**

Report: 19 September 2016  
Ref: E2W-224 R003 (V2)

Prepared By: Earth2Water Pty Ltd



D. Parisotto (Managing Director)  
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## Appendices

Appendix A: Limitations

Appendix B: Analytical Laboratory Certificates (ALS, August 2016).

Appendix C: Previous Bore Hydrographs (URS, 2013)

Appendix D: Hitchcock Road Water Table Contours (22 June 2011)

Appendix E: PFF Sand Extraction Depths (Maximum, March 2016)

## 1 INTRODUCTION

Earth2Water Pty Ltd (E2W) was engaged by PF Formation (PFF) to provide the Groundwater Report (Maroota 2015-2016 Annual Groundwater Management Plan) for Hitchcock Road Site, Maroota (Figure 1). The water sampling and downloading of loggers (8) was conducted in consultation with Joshua Graham (PFF) on 10 August 2016. URS Australia Pty Ltd (URS) was previously (up to 2013) retained by PFF to prepare the groundwater component of the report.

PF Formation (PFF) is required under the Development Approval conditions set for the Maroota Hitchcock Road property area (Figure 1) to prepare an annual Water Management Plan (WMP) report to the *Department of Planning and Environment* (DPE). The WMP is part of the overall Environmental Management Plan and addresses the surface water and groundwater aspects of the sand extraction operations at the site.

The WMP for the year July 2015 to June 2016 also includes the monitoring data collected from 1996 to 30 June 2016 for the Hitchcock Road site, and also for Portion 198.

## 2 GROUNDWATER MONITORING NETWORK

At the Hitchcock Road site, groundwater is monitored at five locations:

1. Monitoring bore PF167MW1, located in Portion 167;
2. Monitoring bore PF166MW1, located in Portion 166;
3. Supply dam PF167DAM, located in Portion 167 (utilised for 2015-2016);
4. Monitoring bore PFL2HitchMW1, located in Lot 2; and
5. Monitoring bore PFP214MW1, located in Portion 214.

In addition, groundwater pumpage and chemical records are also collected from “one” of the two water supply bores in Portion 198 (i.e. PF198PB1. The Bore PF198PB2 has been treated with iron-floc chemicals due to clogging and was not sampled, Figure 1). Groundwater monitoring has been carried out at the sites since 1996. Initially, water levels in bores PF166MW1 and PF167MW1 were measured manually at weekly intervals together with chemical field parameters such as pH and Electrical Conductivity (EC). The manual measurements continued until December 1998. In January 1999, the two bores were equipped with Dataflow Systems automatic data loggers.

Data loggers have been downloaded quarterly between January 1999 and June 2000. Since June 2000, the dataloggers have been downloaded biannually. In January 2006, the old style Dataflow dataloggers were replaced with Solinst Levellogger 3001 units, capable of storing 40,000 readings in the memory, with a battery life span of around 10 years. The new Solinst dataloggers allow the data for annual downloading, a monitoring interval (once daily) started on July 2006.



Groundwater samples for chemical analysis have been collected on the same day (10 August 2016 from PF198PB1) from the monitoring and pumping bores. The analytical results have been plotted on individual graphs that are continuously updated to assess possible trends with time (URS, 2013).

Water samples from five bores (PF167MW1, PF166MW1, PFL2HitchMW1, PFP214MW1 and PF198PB1) were collected by E2W (Dino Parisotto) and PF (Joshua Graham) on 10 August 2016 and submitted for chemical analysis under Chain of Custody procedures to Australian Laboratory Services Pty Ltd. The laboratory reports are presented in Appendix B.

A groundwater sample from bore PF198PB1 (10 August 2016) was operational and pumping (*Note: in July 2013 the pump was out of service*). The analytical list for all bores, which was discussed and agreed upon with the DLWC (now the NSW Office of Water) has included:

- pH, Electrical Conductivity and Total Dissolved Solids;
- Calcium, Magnesium, Sodium and Potassium; □ Chloride, Sulphate, Bicarbonate; and
- Oil & Grease.

## 2.1 Monitoring Bore PF167MW1

Groundwater monitoring at bore PF167MW1 commenced in March 1996. The data between March 1996 and December 1998 (manual collection) have been plotted in the graph of Figure 2, together with EC and rainfall records collected by PFF. An automated weather station has been installed by PFF in 2010. Occasionally missing data from this station were integrated with data from the BoM Maroota station No.67014.

Figure 2 (2013-2015) presents the combined Solinst datalogger records for bore PF167MW1 (previous records are presented in Appendix C).

Previous minor data gaps exist and a slight difference between the manual data and the start of the automatic recording is evident in the previous data, which are due to the time intervening between the end of the manual and start of the automatic recording methods (URS, 2013).

## 2.2 Monitoring Bore PF166MW1

Groundwater monitoring at bore PF166MW1 (Figure 3 shows 2013 to 2016 monitoring data) commenced in March 1998 in the same manner as for bore PF167MW1. The data between March 1998 and December 1998 (manual collection) have been plotted in the graph of Figure 4 (Appendix C), together with EC and rainfall records collected by PFF.

## 2.3 Monitoring Bore PFP214MW1

Bore PFP214MW1 was installed in March 2009 as part of an extended groundwater monitoring network following the Development Approval for Portion 214, located at the southern boundary of the Hitchcock Road site.

A datalogger was installed in the bore in early April 2009 (Solinst Levellogger Gold 3001, serial no. 51040540). Bore PFP214MW1 hydrograph is presented in Figure 4 (showing 2013 to 2016 monitoring data).

## **2.4 Monitoring Bore PFL2HitchMW1**

Bore PFL2HitchMW1 was also installed in March 2009. This bore is located midway along the eastern boundary of the Hitchcock Site and monitors the full sequence of the Maroota Sand. A datalogger was installed in the bore in early April 2009 (Solinst Levellogger Gold 3001, serial no. 510405840). Bore PFL2HitchMW1 hydrograph is presented in Figure 5 (including 2013 to 2016 monitoring data).

## **2.5 Portion 167 Dam**

At the early stages of the site development, an excavation (PF167DAM) was carried out to the top of the Hawkesbury Sandstone to an approximate level of 178m AHD. The excavation collects groundwater and surface water run-off and was eventually licensed by the DLWC (No.10AL114808, Approval No.10WA114809 and WAL No. 24156) as part of the water supply of the operation. Water levels measured against surveyed pegs have been collected at the dam since September 1996 and pumpage records kept since January 1997.

Water quality in the dam is not monitored because the dam collects incident rainfall, run-off and groundwater and, as a result, water quality would vary according to the proportion of each component at the time of measurement.

Due to high rainfall in 2014-2015 (1321.5 mm) no monitoring or pumping was required from the Portion 167 Dam. Pumping was undertaken by PFF from Portion 167 Dam during the 2015-2016 period and summarised in Table 3-7 (Total of 46.829 ML). The pumpage was due to the lower rainfall (1176 mm for 2015-2016) and high volume of sand extraction (note: water levels monitoring are not required, not in the new licence conditions).

## **2.6 Portion 198 Water Supply Bores**

The two water supply bores in Portion 198 (PF198PB1 and PF198PB2) have been monitored manually since their installation in March 1998 (DLWC Reference number is 10AL109354, Application No.10WA109355 and WAL No.24282). Groundwater samples have been collected quarterly for the last four quarters to March 2000, biannually up to July 2006 and annually since then. Pumpage records are collected and totalised weekly. *(Note: Pump in bore PF198PB1 was out of service for most of the year 2012-2013 so that no pumpage data are available for this time).*

Water quality data have been plotted for selected parameters and the graph (5) and the laboratory reports in Appendix B.

The bore was operational and sampling from PF198PB1 discharge outlet occurred on 10 August 2016. No sample was collected from PF198PB2 due to chemical treatment arising from bore clogging (Iron floc).

### **3 GROUNDWATER DATA ASSESSMENT**

#### **3.1 Groundwater Levels**

Groundwater levels in the Maroota Sand measured in the monitoring bores indicates that the aquifer is variable and contains numerous perched water tables. The plots of bore PF167MW1, which taps the full saturated thickness of the Maroota Sand, and bore PF166MW1, which taps an unconfined aquifer perched at a higher elevation, indicate a general rapid response to periods of sustained rainfall (Appendix C). Records for the two new monitoring bores, PFP214MW1 and PFL2HitchMW1, indicate a moderate response to rainfall.

The maximum sand extraction depth at the site is 191 mAHD (8 March 2016, Appendix E). PFF have not observed groundwater ingress within the sand extractions. The groundwater level in the Hawkesbury Sandstone ranges from approximately 181 mAHD to 190 mAHD in the three bores (PF167MW-1, PFL2HitchMW-1, PFP214MW-1). The bore (PF166MW-1) intersects a perched aquifer in the Maroota Sand with water levels at approximately 201 mAHD.

The yearly rainfall for the year 2010 (1015.1mm), for the year 2011 (1115.4 mm) and for the year 2012 (984 mm) have been considerably above the long term average of 910.3 mm (to June 2013). Rainfall for the year July 2013- June 2014 has been just 595.5 mm, indicating that the rainfall for year is below the yearly long term average (Note: These rainfall data are reported from the BOM weather station No. 67014 located on Old Telegraph Road).

Rainfall for July 2014 to June 2015 was 1321.5 mm and above the annual average. The above average rainfall for 2014-2015 and high monthly rainfall during April 2015 (422 mm) has stabilised water levels associated with the previous year of low rainfall and subsequently caused a rising of the water table in all bores. Rainfall for July 2015 to June 2016 was 1176 mm and above the annual average.

#### **3.2 Bore PF167MW1**

After a significant rain event in June 2007, the water level rose by 4.5 m to a level similar to the highest recorded value in mid-2000 (Figure 2, and Appendix C).

Since June 2011 to 2014, after a period of variable and a slow decline, the water level in this bore has been rising steadily following the above average rainfall up to 2013 (2014 is below annual average). The current level from rainfall in 2014-2015 is similar in the year 2000. Water levels were stable in 2014 and then rose sharply (approximately 1.5 m, 183.8 mAHD) after the high recharge event of April 2015 (rainfall 422 mm, Figure 2).

Following the April 2015 rainfall event other recharge events occurred in early and mid 2016 causing groundwater levels to rise and vary between 183 and 184 mAHD (June 2016 is ~ 183.4 mAHD, Figure 2).

### **3.3 Bore PF166MW1**

Since March 2011, the water level in this bore has been rising steadily, although it shows a slight fall during a low rainfall period in the second half of 2012, followed by a rise as a result of the high rainfall at the beginning of 2013. Bore PF166MW1 taps a perched aquifer with variable responses to major and sustained rainfall events and periods (Figure 3, Appendix C).

The water level declines during 2014 and then rises steadily in 2015 due to the above average rainfall and high April 2015 rainfall (422 mm, Figure 3). Following the April 2015 rainfall event other recharge events occurred in early 2016 causing groundwater levels to rise and peak at approximately 200.8 mAHD in April 2016 (Figure 2).

### **3.4 Bore PFP214MW1**

Bore PFP214MW1 taps the full thickness of the Maroota Sand at the southern edge of the quarry area. Since its installation in March 2009, the water level has shown a slow declining trend up to end of February 2011. Since that time the water level has risen in response to the above average rainfall (Figure 4, Appendix C).

Water levels fluctuated slightly (<1m) during 2014 (181.6 m to 180.3 AHD) and then rises slightly and stabilises (180.3 to 181.2 mAHD) with minor fluctuations during 2015 and 2016.

### **3.5 Bore PFL2HitchMW1**

Bore PFL2HitchMW1 is the deepest bore in the Hitchcock Road site, as it is located in the vicinity of the former trigonometric station, which is the highest elevation on the site and taps the full thickness of the Maroota Sand aquifer.

The hydrograph shows that after an initial settlement period after drilling, the water level stabilised at an RL level of 189.6 m AHD without any significant response to the rainfall events until September 2012, after which time it shows a steady rise in response to the above average rainfall (Figure 5, Appendix C).

Since 2013, the water level shows a slight consistent decline to approximately December 2014, followed by a stable to gently rising water table after April 2015 to mid 2016 where it stabilises at approximately 189.95 mAHD (Figure 5).

### 3.6 PF167 Dam

Water levels in the PF167DAM, which was originally excavated to the base of the Maroota Sand within the deep palaeochannel, have been kept above 180 m AHD over the year to June 2011 period by regulating pumpage so as not to exceed this level (Figure 6 & 7, Appendix C). Due to the above average rainfall of the last three years there have been long periods when no water was extracted from this site.

The rainfall recorded at the BOM station since 2010 has been above the long term annual average of 910.3 mm. No water levels have been recorded at this site during the 2011 – 2013, 2014 - 2015 years, as the dam and the pump have been under water for most of the recording period due to the above average rainfall and resulting run-off experienced in the Maroota area during the 2001-2013 and, in particular, during the period May-June 2013 when the water level peaked briefly at 189 m AHD, returning to 180 m AHD at the end of June 2013.

During July 2013 the water level peaked at 209 m AHD, however in October 2013 the level reached 188m AHD (low rainfall). Total pumpage from the dam (PF167) was 30.395 ML for the 2013-2014 operational period. No pumpage occurred during 2014-2015 which had above average rainfall (1321.5 mm). Total pumpage from the dam (PF167) was 46.829 ML for the 2015-2016 operational period.

It should be noted that the quarry area is internally draining and, therefore, collects all incident rainfall on the site.

Although water is pumped from the dam for a variety of purposes, such as dust suppression and irrigation of rehabilitated areas and, more recently, for sand slurring, records show that water levels return rapidly to the average values indicated above, even after higher levels are experienced after heavy rainfall and consequent run-off.

Figure 6 (appendix C) shows these combined effects upon the water level in the dam. The records suggest that the Maroota Sand aquifer at the site is capable of sustaining the required pumpage even under the low rainfall recharge conditions and the additional demand posed upon it in the wider Maroota area by the many groundwater users.

### 3.7 Groundwater Quality

Water quality in bores PF167MW1 and PF166MW1 has been monitored for pH and EC since monitoring started. Since June 1999 groundwater quality has been analysed for a range of analytical parameters and for Oil and Grease to obtain background data.

Since July 2009, groundwater quality data have also become available from the newly installed monitoring bores, PFP214MW1 and PFL2HitchMW1. Historical and recent analytical results for the other samples from the monitoring sites are summarised in Tables 3-1 to 3-6, and have been plotted in the graphs (1 -5). The laboratory reports are presented in Appendix B.

The graphs (1&2) show EC time series trends with water levels and rainfall for the initial monitoring period (March 1996 to January 1999 for bore PF167MW1 and March 1998 to January 1999 for bore PF166MW1), before the installation of the dataloggers (refer to Appendix C for previous graphs presented in URS 2013). The EC graphs show a sympathetic variation with rainfall, indicating the effects of dilution generated by recharge (decrease in EC) and by lower water table. In the latter case, the improved EC is interpreted as the effect of aquifer recharge by fresher water.

The graphs (1 to 5) confirm the dependence of the aquifer upon rainfall to maintain storage and supply. No analysis has been carried out of the water from the Portion 167 Dam because extraneous influences, such as direct rainfall and run-off, make the water in the dam not representative of the groundwater at that site.

Groundwater quality has also been monitored at bores PF198PB1 (Graph-5) and PF198PB2 (Graph-6 in previous years, Appendix C), the two processing plant water supply bores. The water in these bores is derived from the Hawkesbury Sandstone aquifer. Water quality records are summarised in Tables 3-5 and 3-6 and have been graphed (Refer to Graphs 1 to 5, and also Appendix C, URS 2013).

The waters in the Maroota Sand aquifer monitoring bores are similar and have a characteristic rain composition, with low pH, low TDS and a Sodium-Chloride type. The samples were also analysed for Oil and Grease to monitor the possible effect of the sand extraction operations. Concentrations of Oil & Grease were not detected in any bores for the August 2016 or the previous 2015 and 2014 monitoring events (*Note: previous detections were considered anomalous by URS*).

The deep Hawkesbury Sandstone pumping bores groundwater display a slightly different character from that in the shallow Maroota Sand aquifer in the Hitchcock Road area and from the shallow Hawkesbury Sandstone aquifer in other areas of Maroota. The deeper groundwater has a slightly higher TDS, pH and Bicarbonate content (PF198PB1& 2) than the shallower Maroota Sand groundwater; however, its overall low salinity content and sodium-chloride rain composition indicate a dynamic groundwater regime with regular and rapid rainfall recharge.

Increasing EC/TDS trend is evident in two bores (PFL2HitchMW1, PF214MW1) from 2013 to 2016, and inferred to relate to variable aquifer characteristics and rainfall recharge patterns.

Overall, all the site monitoring bores in both the Hawkesbury Sandstone and in the Maroota Sand show a marginal decrease in Total Dissolved Solids over time, the deeper bores showing a more constant character. The general groundwater flow regime with the sandstone is shown in Appendix D (URS, groundwater regime in 2011).

### 3.8 Quality Control

The laboratory quality control samples (laboratory duplicates, procedure blanks and control spikes) returned results within the required limits and acceptance criteria. The quality control data generated by the laboratory are presented with the laboratory certificates in Appendix B.



Based on the evaluation of the data, it is assessed that the accuracy and precision of the analytical data generated in the sampling round, as reported by the analytical laboratory, are acceptable as a basis for interpretation.

### 3.9 Portion 167 dam

Records of pump operation have been kept from PF167DAM since January 1997. The Figure 7 (in Appendix C) shows the monthly summary of the pumpage from the dam and Table 3-7 shows the annual totals. Due to the above average rainfall over previous years (2011-2013 and 2014-2015) no pumping has been necessary from this source, however below average rainfall has occurred in early 2014, with some pumping necessary. No pumping occurred from July 2014 to June 2015. Pumpage occurred from Portion 167 Dam during 2015 to 2016.

(The licensed limit for the Portion 167 dam is 50 ML/year which are not exceeded for 2015).

### 3.10 Water Supply Bores, Portion 198

Pumping records for the two water supply bores in Portion 198 for the year July 2015 to June 2016 are tabulated in Table 3-8. In previous years, during 2014-2015 the total pumpage was 21.8 ML, whilst during 2013-2014 the total pumpage was 33.6 ML and still significantly below the combined annual allocation of 60 ML. This lower consumption rate is due to the nonoperational status of bore PF198PB1 for part of the year 2013, and overall improved efficiency of the plant (including in 2014).

During 2015 to 2016 and given the above average rainfall the available pumping records (PB1 & 2) indicate a usage of 16.841 ML. Groundwater usage is significantly below the combined annual allocation of 60 ML (Table 3-8).

## 4 CONCLUSIONS

The assessment of the data collected on the groundwater levels and quality in the Maroota Hitchcock Road site, some of which represent the oldest data available to the groundwater study carried out by the DLWC (now Office of Water) in the area, indicate that:

- Water levels in the Maroota Sand aquifer generally respond to the rainfall pattern (the rainfall in 2015/2016 was above the annual average).
- Water quality in the Maroota Sand aquifer varies with rainfall recharge (slight increasing EC/TDS trends are visible in two deep bores; PFL2HitchMW1, PF214MW1) due to variations in aquifer characteristics and rainfall from 2013 to 2016.
- Water was pumped from the dam in Portion 167 (46.829 ML) and below the PFF allocation (50 ML).
- Groundwater pumpage occurred from the two deep water supply bores in Portion 198 (21.8 ML in 2014-2015, 21.8 ML in 2014-2015). The pumpage records for 2015-2016 were 5.73 ML and 11.111 ML for PF198PB1, and PF198PB2, respectively.

- The chemical composition of the groundwater in the deep aquifer of the Hawkesbury Sandstone (water supply bores in Portion 198) has an overall character that indicates that recharge occurs readily.
- The maximum sand extraction depth at the site is 191 mAHD (8 March 2016). Groundwater levels in the Hawkesbury Sandstone ranges from approximately 181 mAHD to 190 mAHD.
- The current sand extraction operations in the Hitchcock Road area operate in a manner that does not appear to have an adverse impact upon the groundwater sustainability, and meet the DA Approval Conditions.

The data collected during the year are available to the NSW Office of Water for their continued study in the area.

## FIGURES



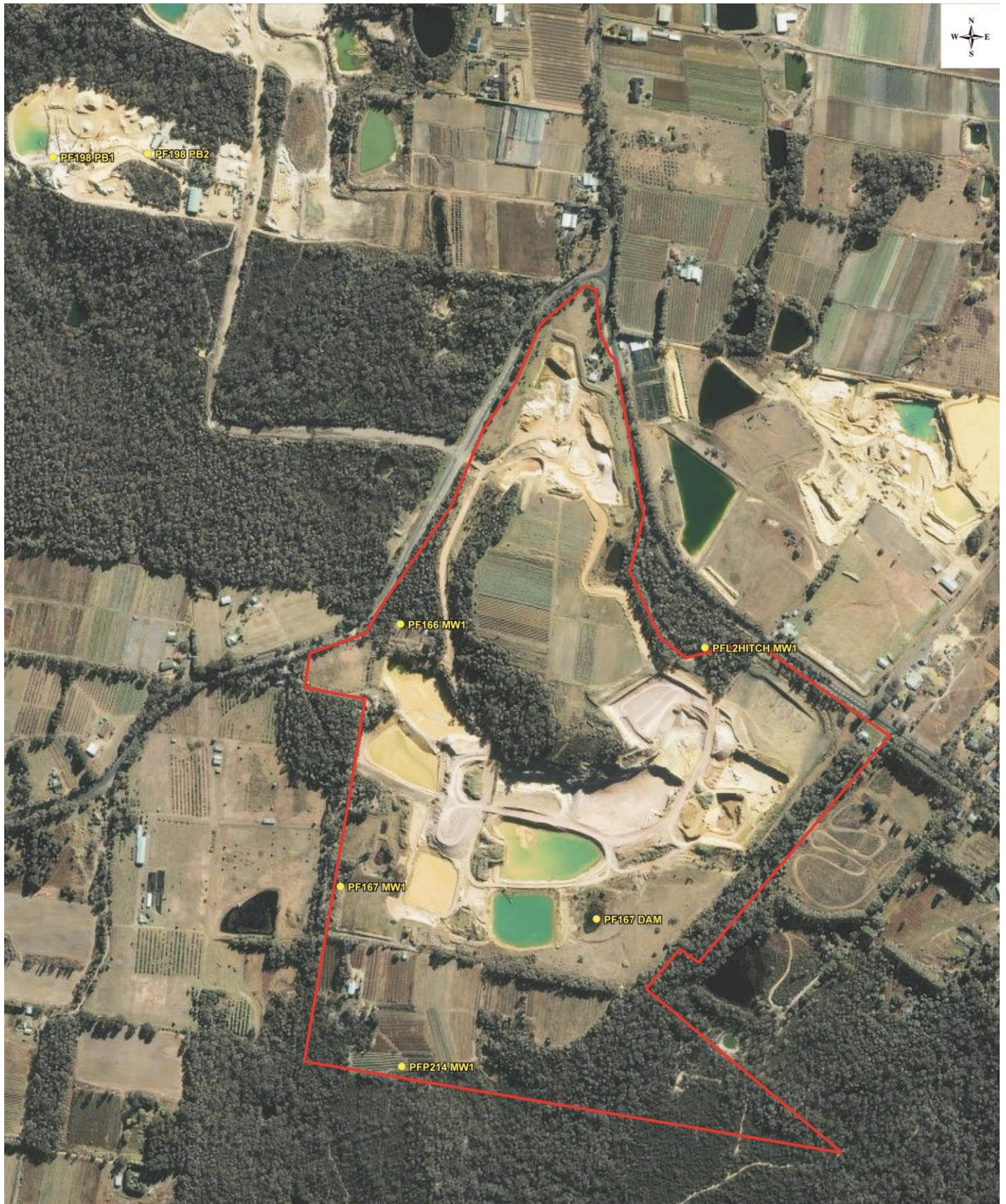
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earth<sup>2</sup> water

Pty Ltd

Environmental & Groundwater Consulting





#### LEGEND

- Site Boundary
- Groundwater Monitoring Location

Source: URS

0 254.4  
metres

**SITE LOCATION**

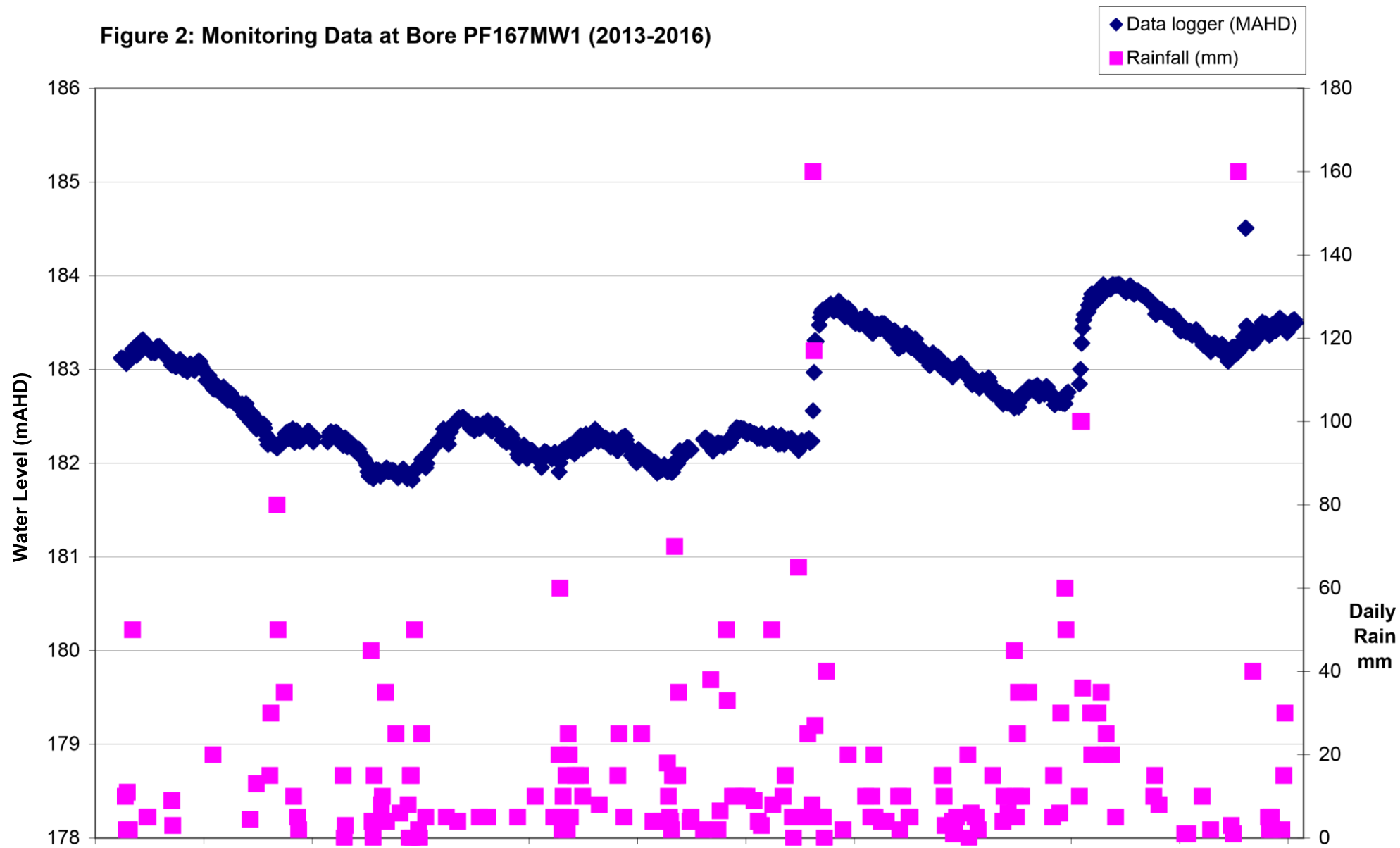
**Date:** August 2016

**Reference:** E2W\_224\_07.cdr

**PF FORMATION - Hitchcock Road Site (GMP), Maroota**

***Figure 1***

**Figure 2: Monitoring Data at Bore PF167MW1 (2013-2016)**

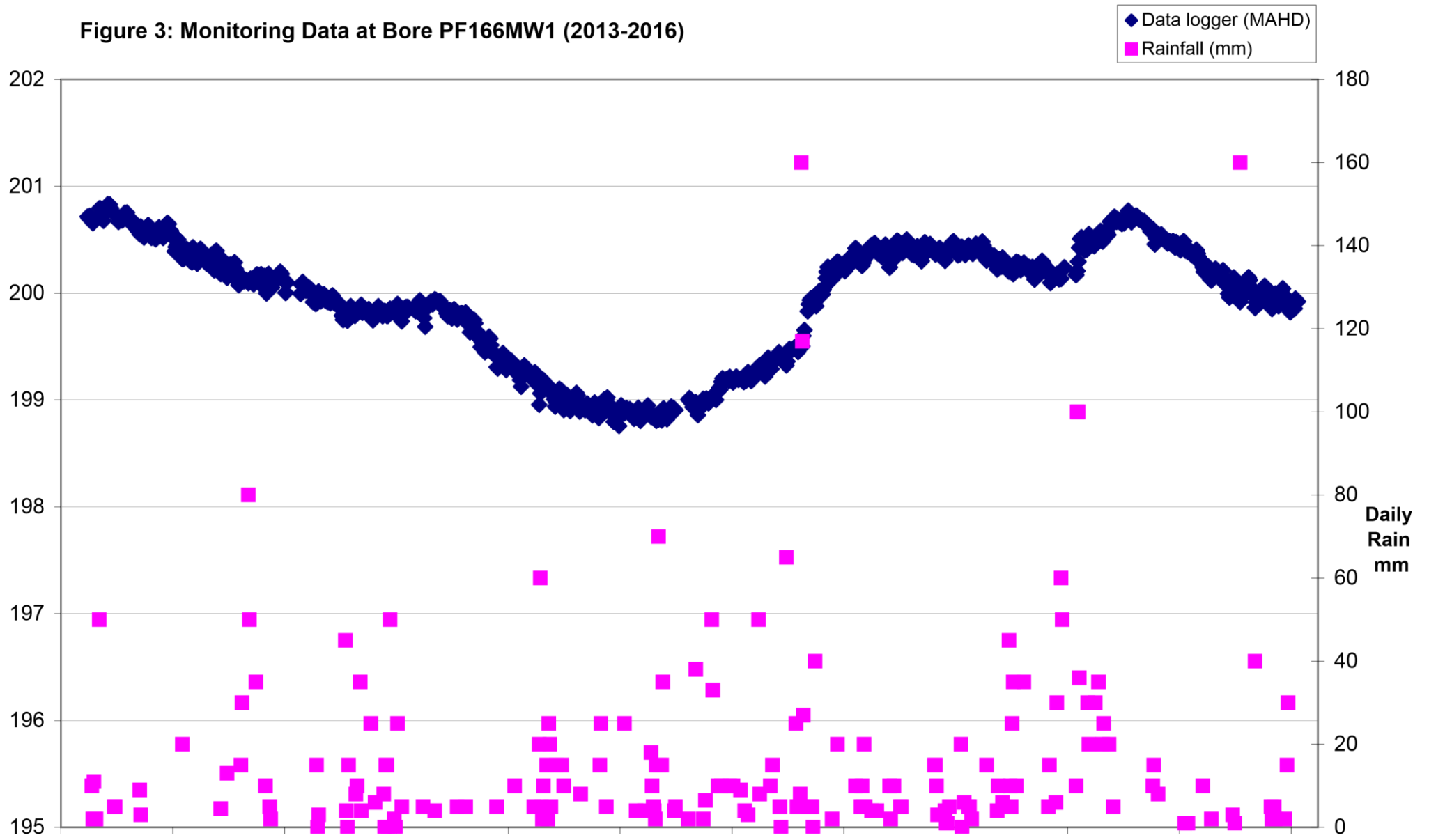




26/05/13    8/09/13    22/12/13    6/04/14    20/07/14    2/11/14    15/02/15    31/05/15    13/09/15    27/12/15    10/04/16    24/07/16

Date

Figure 3: Monitoring Data at Bore PF166MW1 (2013-2016)

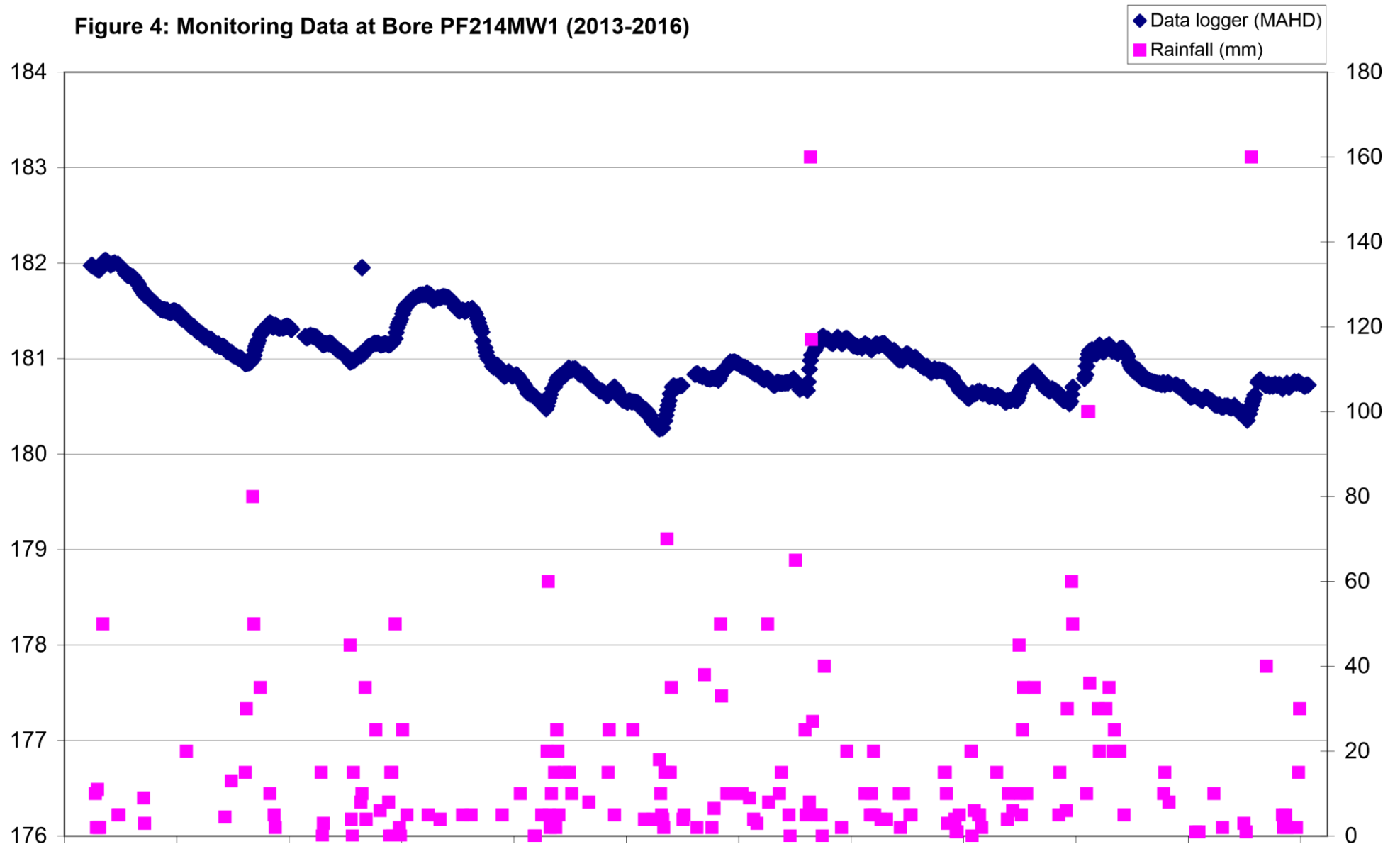


Water Level (mAHD)

26/05/13    8/09/13    22/12/13    6/04/14    20/07/14    2/11/14    15/02/15    31/05/15    13/09/15    27/12/15    10/04/16    24/07/16

Date

Figure 4: Monitoring Data at Bore PF214MW1 (2013-2016)



Water Level (mAHD)

26/05/13

8/09/13

22/12/13

6/04/14

20/07/14

2/11/14

15/02/15

31/05/15

13/09/15

27/12/15

10/04/16

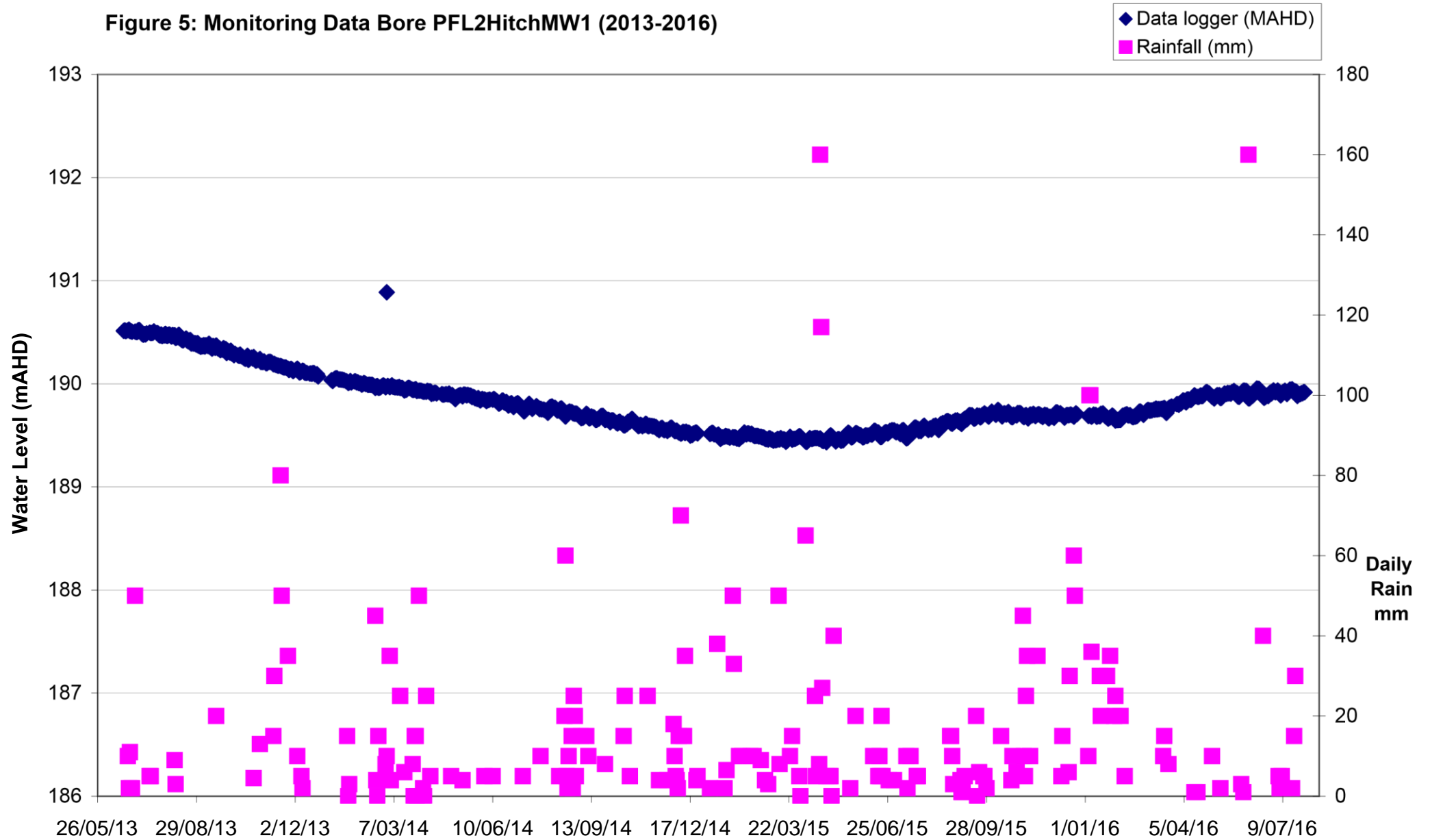
24/07/16

Date

Daily

Rain mm

Figure 5: Monitoring Data Bore PFL2HitchMW1 (2013-2016)



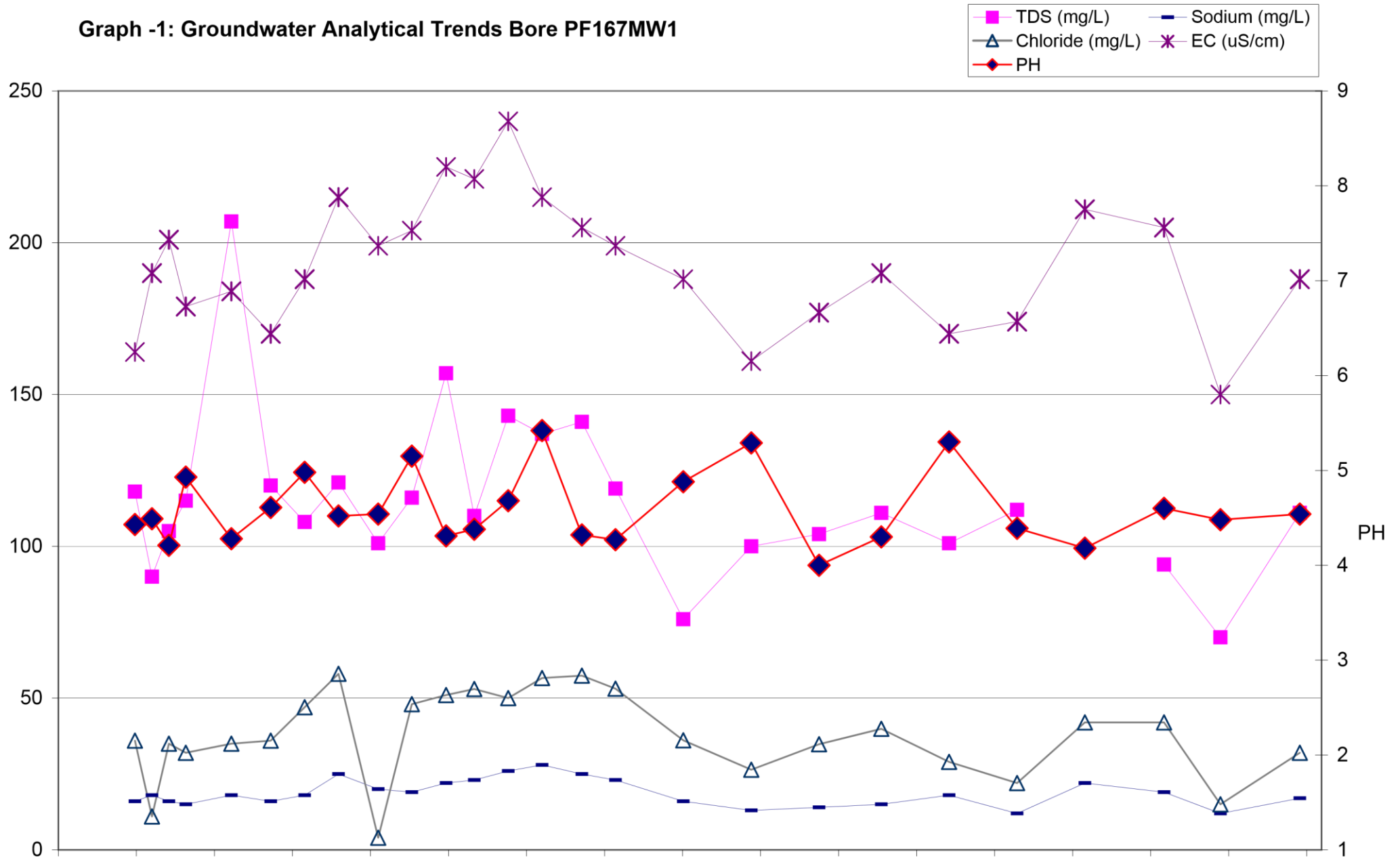


**Date**



# GRAPHS

Graph -1: Groundwater Analytical Trends Bore PF167MW1



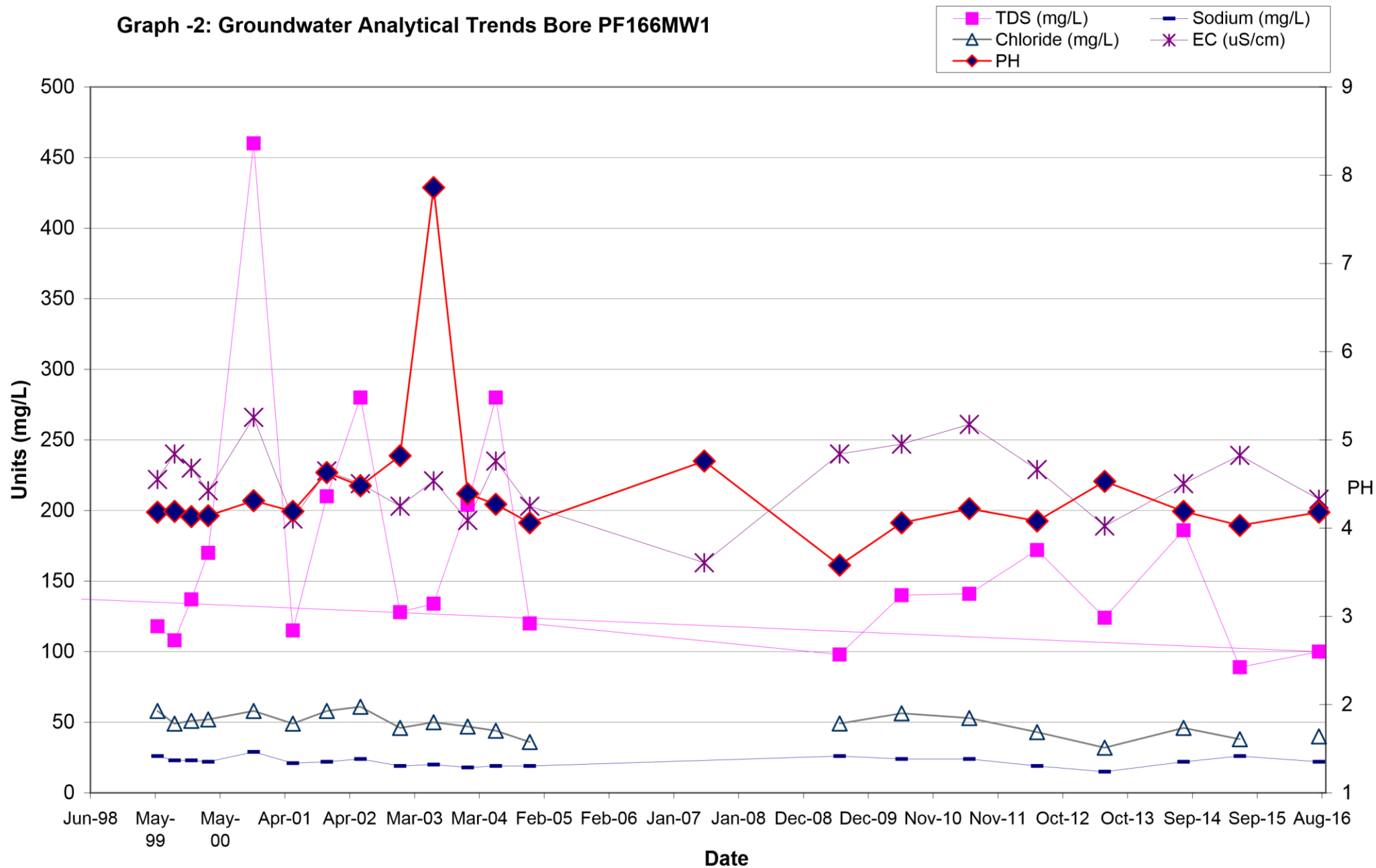
Apr-98 Jun-99 Aug-00 Sep-01 Nov-02 Jan-04 Mar-05 May-06 Jun-07 Aug-08 Oct-09 Dec-10 Feb-12 Mar-13 May-14 Jul-15 Sep-16

Units (mg/L)

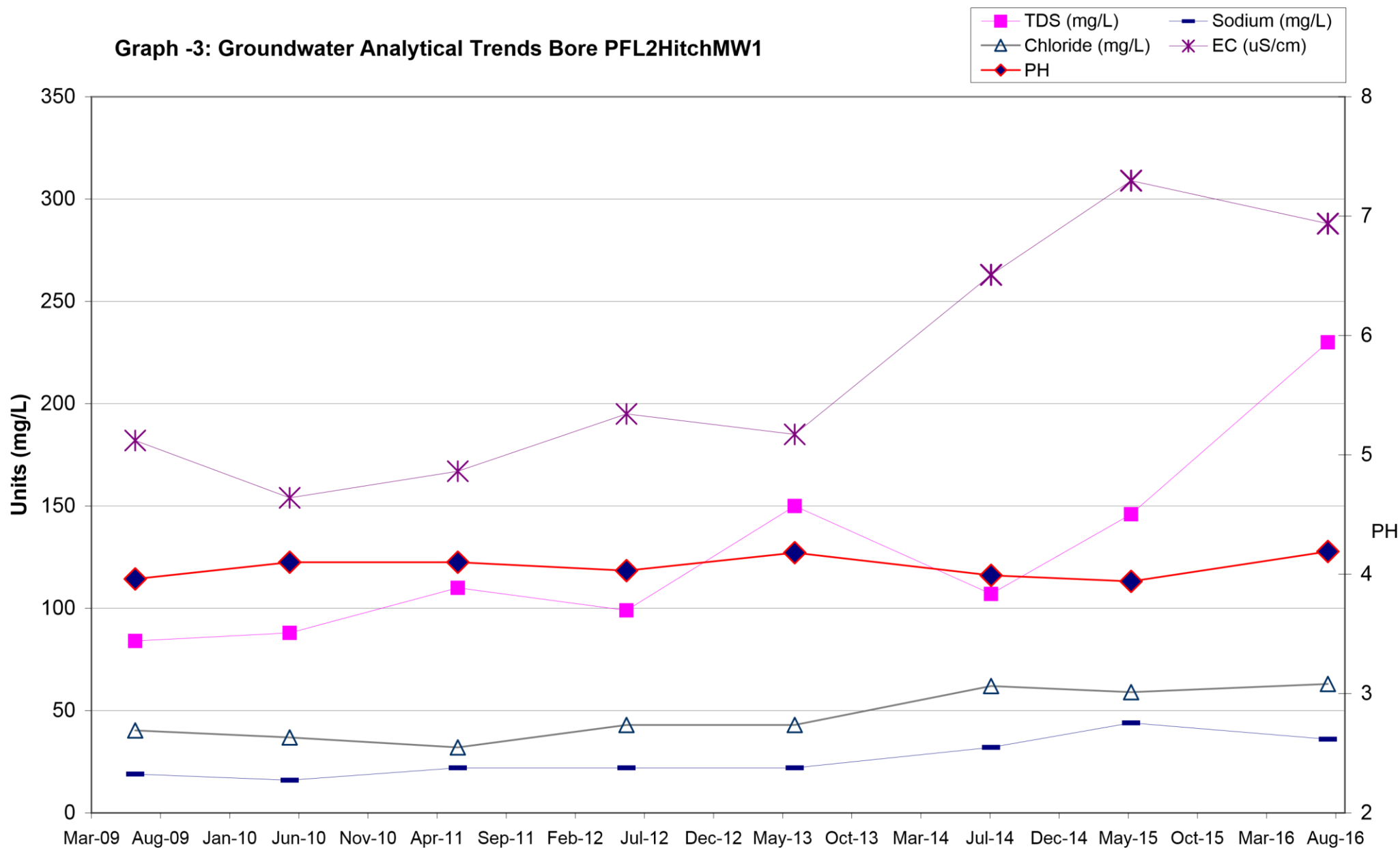
**Date**



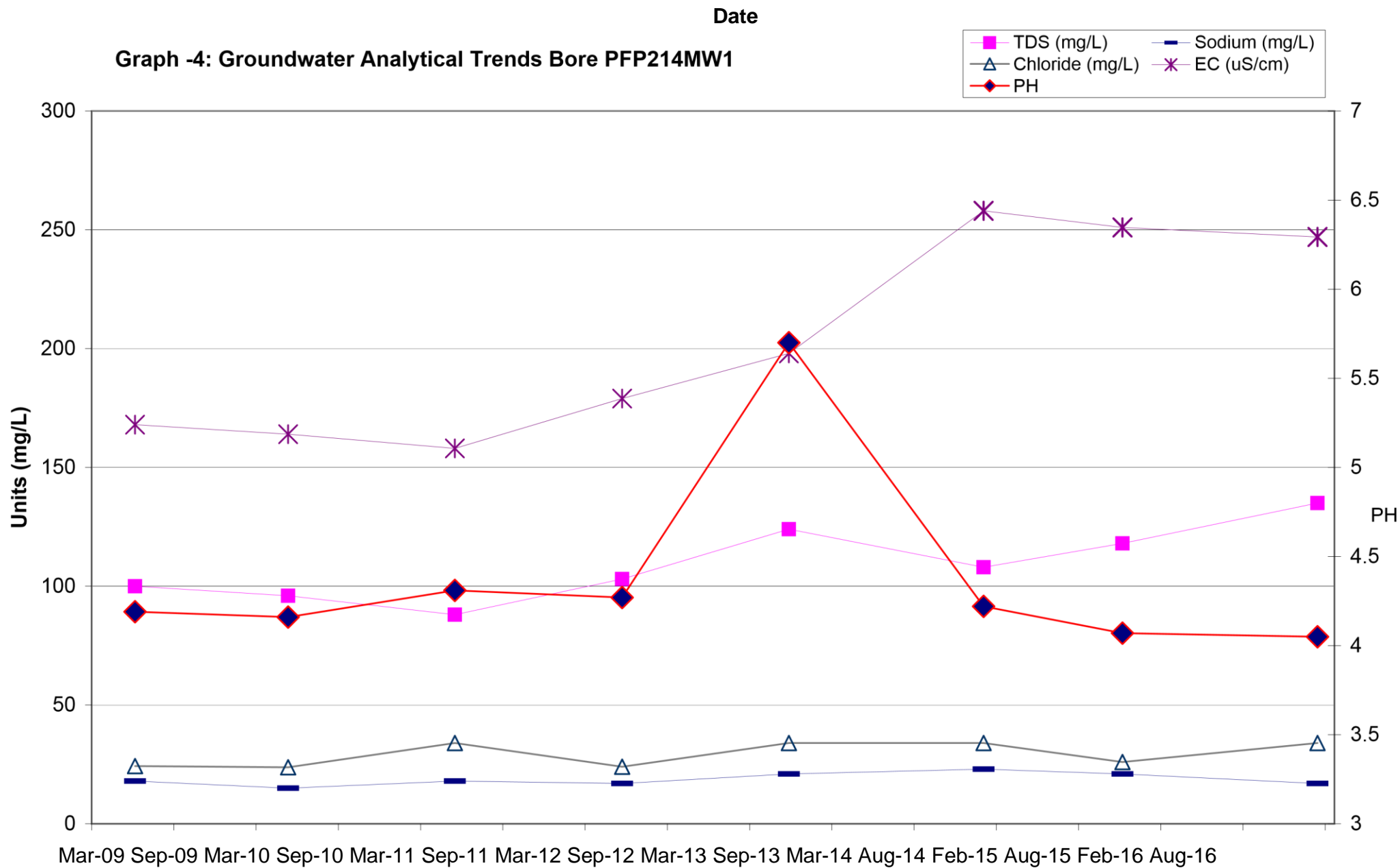
**Graph -2: Groundwater Analytical Trends Bore PF166MW1**



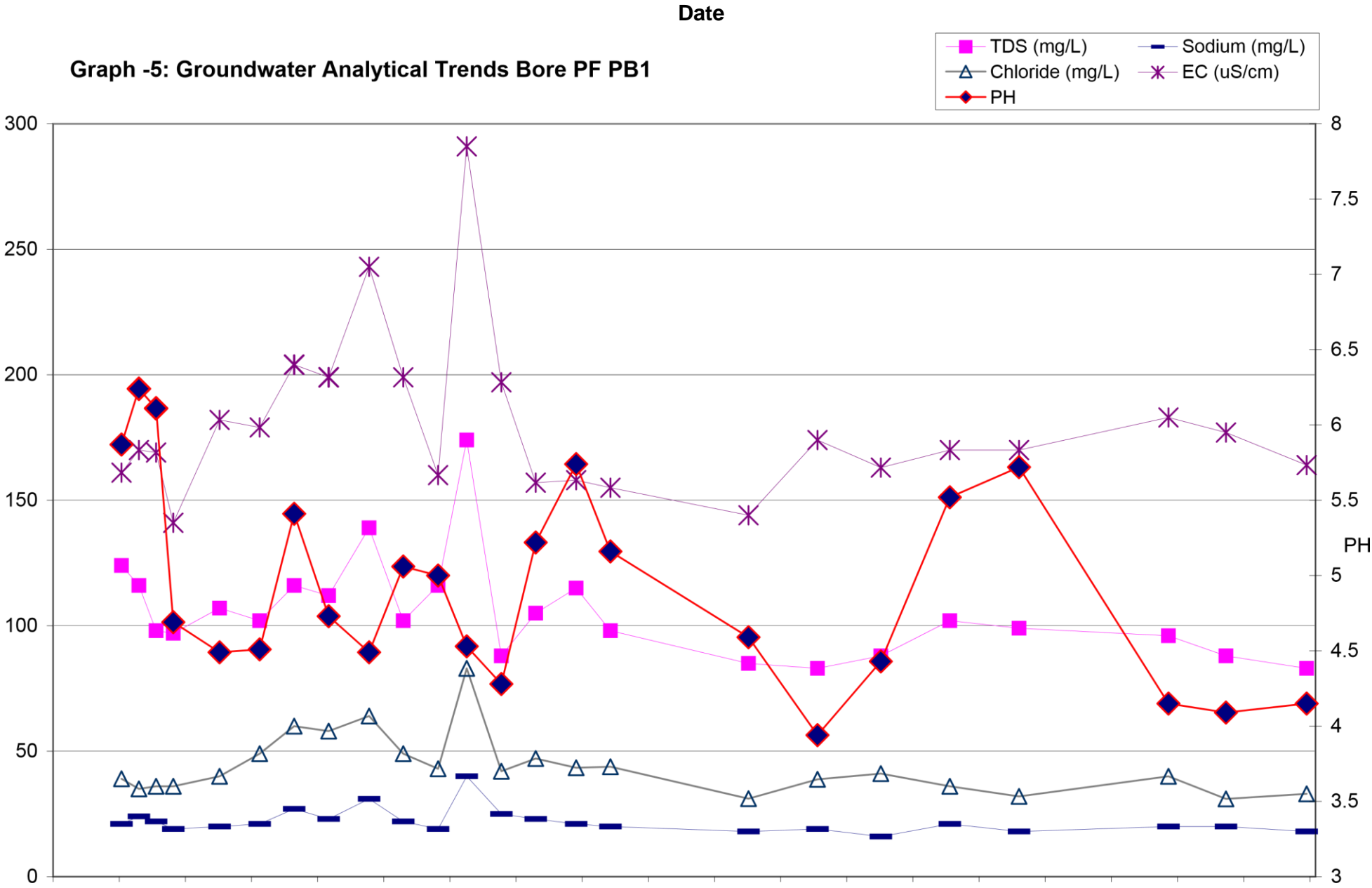
**Graph -3: Groundwater Analytical Trends Bore PFL2HitchMW1**



**Graph -4: Groundwater Analytical Trends Bore PFP214MW1**



Graph -5: Groundwater Analytical Trends Bore PF PB1



Units (mg/L)

Jun-98 May-99 May-00 Apr-01 Apr-02 Mar-03 Mar-04 Feb-05 Feb-06 Jan-07 Jan-08 Dec-08 Dec-09 Nov-10 Nov-11 Oct-12 Oct-13 Sep-14 Sep-15 Aug-16

Date





# TABLES

**Tables 3.1 to 3.2: Maroota Hitchcock Road- Water Analyses (1999 to 2016)****Table 3-1 Bore PF167MW1 Chemical Analyses Summary**

Date		2.6.99	8.9.99	21.12.99	9.3.00	28.11.00	21.6.01	19.12.01	26.6.02	23.1.03	9.7.03	30.1.04	29.6.04	15.12.04
pH		4.43	4.49	4.21	4.93	4.28	4.61	4.98	4.52	4.54	5.15	4.31	4.38	4.68
Electrical Conductivity, EC	uS/cm	164	190	201	179	184	170	188	215	199	204	225	221	240
Total Dissolved Solids, TDS	mg/L	118	90	105	115	207	120	108	121	101	116	157	110	143
Calcium, Ca	mg/L	3	3	5	6	3	6	6	5	3	4	4	5	5
Magnesium, Mg	mg/i.	5	4	4	4	4	4	5	4	4	3	4	4	4
Sodium, Na	mg/L	16	18	16	15	18	16	18	25	20	19	22	23	26
Potassium, K	mg/L	2	2	3	3	3	5	4	5	2	2	2	3	3
Bicarbonate, HCO <sub>3</sub>	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
Sulphate, SO <sub>4</sub>	mg/L	9	11	35	32	16	15	15	14	9	13	12	10	13
Chloride, Cl	mg/L	36	11	35	32	35	36	47	58	4	48	51	53	50
Oil and Grease	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	<5

**Table 3-1 (Con't) Bore PF167MW1 Chemical Analyses Summary**

Date		22.6.05	19.1.06	6.7.06	5.7.07	3.7.08	3.7.09	16.6.10	22.6.11	20.6.12	19.6.13	8.8.14	30.6.15	10.8.2016
pH		5.42	4.32	4.27	4.88	5.29	4	4.3	5.3	4.39	4.18	4.6	4.48	4.54
Electrical Conductivity, EC	uS/cm	215	205	199	188	161	177	190	170	174	211	205	150	188
Total Dissolved Solids, TDS	mg/L	137	141	119	76	100	104	111	101	112		94	70	111
Calcium, Ca	mg/L	5	4	4	2	6	5	3	4	7	<1	5	5	5
Magnesium, Mg	mg/i.	4	4	4	3	5	4	3	4	4	4	4	3	4
Sodium, Na	mg/L	28	25	23	16	13	14	15	18	12	22	19	12	17
Potassium, K	mg/L	3	3	3	2	4	4	2	4	4	2	3	2	3
Bicarbonate, HCO <sub>3</sub>	mg/L	2	1	<1	<1	<1	<1	2	2.4	<1	<1	<1	<1	<1
Sulphate, SO <sub>4</sub>	mg/L	13	10	6	10	30	22.6	17.1	18	28	1	19	30	22
Chloride, Cl	mg/L	56.6	57.4	53.1	36.1	26.4	34.8	39.9	29	22	42	42	15	32
Oil and Grease	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

**Table 3-2 Bore PF166MW1 Chemical Analyses Summary**

Date		1.6.99	8.9.99	21.12.99	9.3.00	29.11.00	21.6.01	19.12.01	26.6.02	23.1.03	9.7.03	30.1.04	29.6.04	15.12.04
pH		4.18	4.19	4.13	4.14	4.31	4.19	4.63	4.48	4.82	7.86	4.39	4.27	4.06
Electrical Conductivity, EC	uS/cm	222	240	230	214	266	194	228	219	203	221	193	235	203
Total Dissolved Solids, TDS	mg/L	118	108	137	170	460	115	210	280	128	134	204	280	120
Calcium, Ca	mg/L	1	1	1	1	1	1	1	2	1	1	<1	1	1
Magnesium, Mg	mg/L	6	6	6	5	6	5	6	6	5	4	5	5	4

Sodium, Na	mg/L	26	23	23	22	29	21	22	24	19	20	18	19	19
Potassium, K	mg/L	<1	<1	1	1	1	1	2	1	<1	<1	<1	1	1
Bicarbonate, HCO <sub>3</sub>	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
Sulphate, SO <sub>4</sub>	mg/L	1	7	1	1	16	2	1	2	<1	<1	2	<1	2
Chloride, Cl	mg/L	58	49	51	52	58	49	58	61	46	50	47	44	36
Oil and Grease	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	6	<5	<5	5	<5

**Table 3-2 (con't) Bore PF166MW1 Chemical Analyses Summary**

Date		22.6.05	19.1.06	6.7.06	5.7.07	3.7.08	3.7.09	16.6.10	22.6.11	20.6.12	19.6.13	8.8.14	30.6.15	10.8.2016
pH					4.76		3.58	4.06	4.22	4.08	4.53	4.19	4.03	4.18
Electrical Conductivity, EC	uS/cm	DRY	DRY	DRY	163	NA	240	247	261	229	189	219	239	208
Total Dissolved Solids, TDS	mg/L				98		140	141	172	124	186	89	100	234
Calcium, Ca	mg/L						<1	<1	1	1	6	1	<1	1
Magnesium, Mg	mg/L						4	4	6	5	4	5	6	5
Sodium, Na	mg/L						26	24	24	19	15	22	26	22
Potassium, K	mg/L						2	2	3	3	4	1	1	2
Bicarbonate, HCO <sub>3</sub>	mg/L						<1	<1	<1	<1	<1	<1	<1	<1
Sulphate, SO <sub>4</sub>	mg/L						2.21	1.77	1	1	21	2	1	2
Chloride, Cl	mg/L						49.1	56.3	53	43	32	46	38	40
Oil and Grease	mg/L						<5	<5	<5	<5	<5	<5	<5	<5

Prepared By: DP T3-1 3-2

1/1

Checked By: DP

Earth2Water Pty Ltd

## Tables 3.3 to 3.4: Maroota Hitchcock Road- Water Analyses (1999 to 2016)

**Table 3-3 Bore PFL2HitchMW1 Chemical Analyses Summary**

Date		3.7.2009	16.6.2010	22.6.2011	20.6.2012	20.6.2012	19.6.2013	8.08.2014	30.06.2015	10.8.2016
pH		3.96	4.1	4.1	4.03	4.03	4.18	3.99	3.94	4.19

Electrical Conductivity, EC	uS/cm	182	154	167	195	195	185	263	309	288
Total Dissolved Solids, TDS	mg/L	84	88	110	99	99	150	107	146	230
Calcium, Ca	mg/L	1	<1	<1	<1	<1	<1	<1	<1	<1
Magnesium, Mg	mg/L	2	2	2	2	2	2	3	3	3
Sodium, Na	mg/L	19	16	22	22	22	22	32	44	36
Potassium, K	mg/L	2	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate, HCO3	mg/L	<1	<	<1	<1	<1	<1	<1	<1	<1
Sulphate, SO4	mg/L	7.88	4.06	5	1	1	4	6	6	6
Chloride, Cl	mg/L	40.3	36.9	32	43	43	43	62	59	63
Oil and Grease	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5

**Table 3-4 Bore PFP214MW1 Chemical Analyses Summary**

Date		<b>3.7.2009</b>	<b>16.6.2010</b>	<b>22.6.2011</b>	<b>20.6.2012</b>	<b>19.6.2013</b>	<b>8.08.2014</b>	<b>30.06.2015</b>	<b>10.8.2016</b>
pH		4.19	4.16	4.31	4.27	5.7	4.22	4.07	4.05
Electrical Conductivity, EC	uS/cm	168	164	158	179	198	258	251	247
Total Dissolved Solids, TDS	mg/L	100	96	88	103	124	108	118	135
Calcium, Ca	mg/L	<1	<1	<1	<1	<1	<1	<1	<1
Magnesium, Mg	mg/L	6	5	4	6	7	10	11	10
Sodium, Na	mg/L	18	15	18	17	21	23	21	17
Potassium, K	mg/L	1	<1	1	<1	2	<1	<1	1
Bicarbonate, HCO3	mg/L	<1	<1	<1	<1	2	<1	<1	<1
Sulphate, SO4	mg/L	1.9	<0.5	<1	<1	<1	<1	<1	<1
Chloride, Cl	mg/L	24.3	23.8	34	24	34	34	26	34
Oil and Grease	mg/L	<5	<5	<5	<5	<5	<5	<5	<5

T3-3 & 3-4

1/1

**Tables 3.1 to 3.6: Maroota Hitchcock Road- Water Analyses (1999 to 2016)**

**Table 3-5 Bore 198PB1 Chemical Analyses Summary (199-2016)**

Date		1.6.99	8.9.99	21.12.99	9.3.00	28.11.00	21.6.01	19.12.01	26.6.02	23.1.03	9.7.03	30.1.04	29.6.04	15.12.04	22.6.05	19.1.06	6.7.06	5.7.07	3.7.08	3.7.09	16.6.10	22.6.11	20.6.12	19.6.13	8.08.14	30.06.15	10.08.16
pH		5.87	6.24	6.11	4.69	4.49	4.51	5.41	4.73	4.49	5.06	5	4.53	4.28	5.22	5.74	5.16	NA	4.59	3.94	4.43	5.52	5.72	NA	4.15	4.09	4.15
E Conductivity, EC	uS/cm	161	170	169	141	182	179	204	199	243	199	160	291	197	157	158	155		144	174	163	170	170		183	177	164
Total Dissolved Solids, TDS	mg/l	124	116	98	97	107	102	116	112	139	102	116	174	88	105	115	98		85	83	88	102	99		96	88	83
Calcium, Ca	mg/L	1	<1	1	1	3	2	2	4	3	2	2	4	1	1	2	1		<1	1	<1	2	2		1	1	1
Magnesium, Mg	mg/L	4	6	5	3	3	4	4	4	4	3	2	5	2	2	4	3		2	2	2	4	3		2	2	2
Sodium, Na	mg/L	21	24	22	19	20	21	27	23	31	22	19	40	25	23	21	20		18	19	16	21	18		20	20	18
Potassium, K	mg/L	1	<1	1	1	2	5	5	3	3	2	2	3	2	2	2	2		1	2	1	2	2		2	1	2
Bicarbonate, HCO3	mg/l	13	29	22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	12	5		<1	<1	<1	3.7	9.8		<1	<1	<1
Sulphate, SO4	mg/L	4	4	4	2	8	8	3	7	4	8	6	9	8	8	6	2		10	9.31	6.89	6	6		9	7	8
Chloride, Cl	mg/l	39	35	36	36	40	49	60	58	64	49	43	83	42	47.1	43.4	43.8		31.1	38.8	41.1	36	32		40	31	33
Oil and Grease	mg/l	<5	<5	<5	<5	<5	<5	<5	<5	6	<5	<5	<5	<5	<5	5	<5		<5	<5	<5	<5	<5		<5	<5	<5

**Table 3-6 Bore198PB2 Chemical Analyses Summary (1999-2014)**

Date		1.6.99	8.9.99	21.12.99	9.3.00	29.11.00	21.6.01	19.12.01	26.6.02	23.1.03	9.7.03	30.1.04	29.6.04	15.12.04	22.6.05	19.1.06	6.7.06	5.7.07	3.7.08	3.7.09	16.6.10	22.6.11	20.6.12	19.6.13	8.08.14	30.06.15	10.08.16
pH		5.78	6.61	5.96	NA	4.8	5.24	5.99	6.33	5.96	4.84	5	5.78	5.39	6.43	5.3	5.46	4.37	5.25	4.5	NA	NA	NA	5.71	5.93	no sample	
E Conductivity, EC	uS/cm	139	174	146	NA	152	130	141	151	146	162	160	136	156	133	126	122	195	135	130				146	150	(note 1)	(note 1)
Total Dissolved Solids, TDS	mg/L	126	102	85	NA	100	87	87	102	84	87	116	79	105	87	104	79	88	79	79				91	69		
Calcium, Ca	mg/L	1	2	2	NA	<1	<1	<1	1	<1	<1	2	1	1	<1	<1	1	<1	1	<1				<1	<1		
Magnesium, Mg	mg/L	5	5	5	NA	4	3	4	4	4	2	2	4	2	4	3	4	3	5	3				3	4		

Sodium, Na	mg/L	18	19	18	NA	19	18	18	21	17	18	19	18	20	17	19	16	21	16	16				18	18		
Potassium, K	mg/L	2	2	2	NA	1	1	2	2	1	<1	2	1	2	2	1	2	1	2	2				2	2		
Bicarbonate, HCO <sub>3</sub>	mg/L	23	33	19	NA	4	3	13	8	16	<1	<1	9	2	14	7	24	<1	24.4	9.2				9	10		
Sulphate, 804	mg/L	3	3	2	NA	1	1	3	2	<1	<1	6	1	4	4	1	1	4	2	2.78				2	4		
Chloride, Cl	mg/l	31	28	31	NA	41	38	33	46	33	40	43	37	35	34.9	38.8	30.2	44.8	31.8	32.2				33	36		
Oil and Grease	mg/L	<5	<5	<5	-	NA	<5	<5	11	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5				<5	<5		

*Note 1= Bore clogging (Iron floc) and chemicals added to unclogg (unrepresentative water)*



**Table 3-7: Portion 167 Dam Annual Pumpage Records**  
1997 to 2016

YEAR	TOTAL, ML
1997	24.56
1998	24.24
1999 to May	16.84
1 June 1999 - 30 June 2000	66.3
1 July 2000 - 5 September 2000	31.4
5 September 2000 - 25 June 2001	Not used
25 June 2001 - 30 June 2001	1
1 July 2001 - 8 February 2002	59.2
8 February 2002 - 30 June 2002	Not used
30 June 2002 - 29 August 2002	Not used
29 August 2002 - 30 June 2003	65.2
1 July 2003 - 29 June 2004	73.1
1 July 2004 - 3 May 2005	57.5
7 October 2005 - 30 June 2006	25.4
1 July 2006 - 30 June 2007	21.3
1 July 2007 - 30 June 2008	21.5
1 July 2008 - 30 June 2009	42.2
1 July 2009 - 30 June 2010	56.2
1 July 2010 - 30 June 2011	48.9
1 July 2011 - 30 June 2012	No pumpage
1 July 2012 - 30 June 2013	42.8
1 July 2013 - 30 June 2014	30.395
1 July 2014 - 30 June 2015	No pumpage
1 July 2015 - 30 June 2016	<b>46.829</b>

**Table 3-8: Water Supply Bores Annual Pumping Records**  
2000 to 2016

Year	Bore	Total, ML
1 July 1999 - 30 June 2000	Bore PF1 98PB1	21.1
	PF198PB2	35.6
1 July 2000 - 30 June 2001	Bore PF198PB1	20.3
	Bore PF198PB2	29
1 July 2001 - 30 June 2002	Bore PF198PB1	25.1
	Bore PF198PB2	36
1 July 2002 - 30 June 2003	Bore PF198PB1	24.8
	Bore PF198PB2	47.8
1 July 2003 - 29 June 2004	Bore PF198PB1	22.9
	Bore PF198PB2	49.3
1 July 2004 - 29 June 2005	Bore PF1 98PB1	4.2
	Bore PF198PB2	18.7
5 July 2005 - 23 June 2006*	Bore PF198PB1	14.8
	Bore PF198PB2	8.9
24 June 2006 - 30 June 2007*	Bore PF198PB1	7.8
	Bore PF198PB2	19.9
1 July 2007 - 30 June 2008*	Bore PF198PB1	1.6
	Bore PF198PB2	22.9
1 July 2008 - 30 June 2009*	Bore PF198PB1	25.6
	Bore PF198PB2	16
1 July 2009 - 30 June 2010*	Bore PF198PB1	9.5
	Bore PF198PB2	8.1
1 July 2010 - 30 June 2011*	Bore PF198PB1	11.8
	Bore PF198PB2	NA
1 July 2011 - 30 June 2012*	Bore PF198PB1	9.8
	Bore PF198PB2	13.2
1 July 2012 - 30 June 2013	Bore PF198PB1	NA
	Bore PF198PB2	10.9
1 July 2013 - 30 June 2014	Bore PF198PB1	3.6
	Bore PF198PB2	30
1 July 2014 - 30 June 2015	Bore PF198PB1	6.1
	Bore PF198PB2	15.7
1 July 2015 - 30 June 2016	Bore PF198PB1	<b>5.73</b>

	Bore PF198PB2	11.111
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Notes:

\* Due to modifications carried out at the wash plant, these bores are no longer required for continuous water supply

Pumping data Table 3-8



## APPENDIX A

### Limitations

Earth2Water Pty Ltd has prepared this report for the use of PF Formation in accordance with the standard terms and conditions of the consulting profession. This report is prepared in accordance with the scope of work and for the purpose outlined in the proposal. The methodology adopted and sources of information used by E2W are outlined in this report. Some adjustments were made to the initial data logger graphs (2013-2014) as more control data points were available for this assessment to aid water level reduction to m AHD.

This report was prepared in a short timeframe during August and September 2016 and is based on the information reviewed at the time of preparation. This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

The precision with which conditions are indicated depends largely on the frequency and method of sampling, and the uniformity of conditions as constrained by the project budget limitations. The behaviour of groundwater and some aspects of contaminants in soil and groundwater are complex. Our conclusions are based upon the analytical data presented in this report, and our experience.

Where conditions encountered at the site are subsequently found to differ significantly from those anticipated in this report, E2W should be notified of any such findings and be provided with an opportunity to review the recommendations of this report.

## APPENDIX B



180816

URGENT

# CHAIN OF CUSTODY DOCUMENTATION- EARTH2WATER PTY LTD

<b>CLIENT:</b> Earth2Water Pty Ltd <b>POSTAL ADDRESS:</b> 176 Fern St, Garrigong NSW <b>SEND REPORT TO:</b> D.P. Parisotto <b>DATA NEEDED BY:</b> 5 day turnaround <b>Site:</b> Maroota										<b>LABORATORY BATCH NO:</b> <b>SAMPLES:</b> Dino Parisotto/Ellen Swanson <b>PHONE:</b> 0422 334102 <b>FAX:</b> 4236 1824 <b>E-MAIL:</b> earth2o@tpg.com.au <b>REPORT FORMAT:</b> HARD: Yes FAX: Yes DISK: <input type="checkbox"/> <b>BULLETIN BOARD:</b> <input type="checkbox"/> <b>E-MAIL:</b> YES <b>QC LEVEL:</b> QCS1: <input type="checkbox"/> QCS2: <input type="checkbox"/> QCS3: Yes QCS4: <input type="checkbox"/>																													
<b>INVOICE to:</b> Earth2Water <b>COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:</b> Retain samples for 3 weeks prior to disposal										<b>ALS Environmental</b> <b>Smithfield</b>																													
<b>INVOICE to:</b> Earth2Water <b>COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:</b> Retain samples for 3 weeks prior to disposal										<b>ANALYSIS REQUIRED</b>																													
<b>SAMPLE DATA</b>										<b>ALS Containers</b>																													
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	1				2				3				4																					
Pit 4 MW-1	7	water	10/08/2016			YES																																	
Pit 4 MW-2	8	water	10/08/2016			YES																																	
Pit 4 MW-3	9	water	10/08/2016			YES																																	
<b>RELINQUISHED BY:</b>																				<b>RECEIVED BY:</b>																			
<b>NAME:</b> Dino Parisotto <b>OF:</b> Earth2Water <b>DATE:</b> 19-6-2014 <b>TIME:</b>										<b>NAME:</b> <b>OF:</b> <b>DATE:</b> <b>TIME:</b>																													
<b>NAME:</b> <b>OF:</b> <b>DATE:</b> <b>TIME:</b>										<b>NAME:</b> <b>OF:</b> <b>DATE:</b> <b>TIME:</b>																													

## Laboratory Analyses

- 1 Oil & Grease
- 1 Ph, EC, TDS,
- 1 Ca, Mg, Na, K, Cl, HCO3, SO4

water sample not filtered

received 15/8/16  
via email





Environmental

## CERTIFICATE OF ANALYSIS

Work Order : **ES1617794**

Amendment : **1**

Page : 1 of 3

Client : **EARTH2WATER PTY LTD**

Contact : **MR DINO PARISOTTO**

Address : **175 FERN ST  
GERRINGONG NSW 2534**

Telephone : **+61 4236 1334**

Project : **----**

Order number : **E2W-224A**

C-O-C number : **----**

Sampler : **DINO PARISOTTO, ELLEN SWANSON**

Site : **MARROTA**

Quote number : **----**

No. of samples received : **9**

No. of samples analysed : **5**

Laboratory : **Environmental Division Sydney**

Contact :

Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**

Telephone : **+61-2-8784 8555**

Date Samples Received : **12-Aug-2016 13:50**

Date Analysis Commenced : **12-Aug-2016**

Issue Date : **12-Sep-2016 09:53**



Accreditation No. 825  
Accredited for compliance with  
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

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

#### Signatories

Ankit Joshi

Celine Conceicao

#### Position

Inorganic Chemist

Senior Spectroscopist

#### Accreditation Category

Sydney Inorganics, Smithfield, NSW

Sydney Inorganics, Smithfield, NSW

Page : 2 of 3  
 Work Order : ES1617794 Amendment 1  
 Client : EARTH2WATER PTY LTD  
 Project : ----



## General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting ø

= ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

● TDS by method EA-015 may bias high for samples 1 and 2 due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.

● Ionic Balance out of acceptable limits due to analytes not quantified in this report. ● This report has been amended following the split of samples 6 to

ES1619980 and samples 7-9 to ES1619981 as requested by Dino, 8/9/16.

**Analytical Results**Sub-Matrix: **WATER**

Client sample ID

(Matrix: **WATER**)

Client sampling date / time				PF 167 MW-1	PF 166 MW1	PF L2 HICTH MW1
[10-Aug-2016]					[10-Aug-2016]	[10-Aug-2016]
Compound	CAS Number	LOR	Unit	ES1617794-001	ES1617794-002	ES1617794-003
Result				Result	Result	Result
pH Value	----	0.01	pH Unit	4.19	4.18	4.54
Electrical Conductivity @ 25°C	----	1	µS/cm	288	208	188
Total Dissolved Solids @180°C	----	10	mg/L	230	234	111
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	2	22
Chloride	16887-00-6	1	mg/L	63	40	32
Calcium	7440-70-2	1	mg/L	<1	1	5
Magnesium	7439-95-4	1	mg/L	3	5	4
Sodium	7440-23-5	1	mg/L	36	22	17
Potassium	7440-09-7	1	mg/L	<1	2	3

Total Anions	----	0.01	meq/L	1.90	1.17	1.36
Total Cations	----	0.01	meq/L	1.81	1.47	1.39
Oil & Grease	----	5	mg/L	<5	<5	<5



Environmental

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : **ES1617794**

Page

: 1 of 5

Amendment : **1**

Client : **EARTH2WATER PTY LTD**

Laboratory : Environmental Division Sydney

Contact : MR DINO PARISOTTO

Telephone : +61-2-8784 8555

Project : ----

Date Samples Received : 12-Aug-2016

Site : MAROOTA

Issue Date : 12-Sep-2016

Sampler : DINO PARISOTTO, ELLEN SWANSON

No. of samples received : 9

Order number : E2W-224A

No. of samples analysed : 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## ***Summary of Outliers***

### ***Outliers : Quality Control Samples***

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.** ● **NO Matrix Spike outliers occur.** ● **For all regular sample matrices, NO surrogate recovery outliers occur.**

### ***Outliers : Analysis Holding Time Compliance***

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

### ***Outliers : Frequency of Quality Control Samples***

- **NO Quality Control Sample Frequency Outliers exist.**



**Outliers : Analysis Holding Time Compliance**

Method		Sample Date	Extraction / Preparation			Analysis			
Container / Client	Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
Clear Plastic Bottle - Natural (EA005-P)	PF 167 MW-1, PF L2 HICTH MW1, PF 198 PB1	PF 166 MW1, PF P2 14 MW1,	10-Aug-2016	----	----	----	12-Aug-2016	10-Aug-2016	✖
Clear Plastic Bottle - Natural (EA010-P)	PF 167 MW-1, PF L2 HICTH MW1, PF 198 PB1	PF 166 MW1, PF P2 14 MW1,	10-Aug-2016	----	----	----	12-Aug-2016	07-Sep-2016	✔
Clear Plastic Bottle - Natural (EA015H)	PF 166 MW1, PF P2 14 MW1, PF 167 MW-1,		10-Aug-2016	----	----	----	17-Aug-2016	17-Aug-2016	✔



PF L2 HICTH MW1, PF 198 PB1							
Clear Plastic Bottle - Natural (ED037-P) PF 167 MW-1, PF L2 HICTH MW1, PF 198 PB1 PF 166 MW1, PF P2 14 MW1,	10-Aug-2016	----	----	----	12-Aug-2016	24-Aug-2016	✓

Matrix: WATER

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
Clear Plastic Bottle - Natural PF 167 MW-1, PF L2 HICTH MW1, PF 198 PB1 PF 166 MW1, PF P2 14 MW1,	----	----	----	12-Aug-2016	10-Aug-2016	2

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.





Holding times for **VOC in soils** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis	
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis
Clear Plastic Bottle - Natural (ED041G) PF 167 MW- PF 166 MW1, 1, PF P2 14 MW1, PF L2 HICTH MW1, PF 198 PB1	10-Aug-2016	----	----	----	15-Aug-2016	07-Sep-2016
Clear Plastic Bottle - Natural (ED045G) PF 167 MW- PF 166 MW1, 1, PF P2 14 MW1, PF L2 HICTH MW1, PF 198 PB1	10-Aug-2016	----	----	----	15-Aug-2016	07-Sep-2016
Clear Plastic Bottle - Natural (ED093F) PF 167 MW- PF 166 MW1, 1, PF P2 14 MW1, PF L2 HICTH MW1, PF 198 PB1	10-Aug-2016	----	----	----	15-Aug-2016	17-Aug-2016



<b>Amber Glass Bottle - Sulfuric Acid (EP020)</b> PF 167 MW- PF 166 MW1, 1, PF P2 14 MW1, PF L2 HICTH MW1, PF 198 PB1	10-Aug-2016	----	----	----	17-Aug-2016	07-Sep-2016
--	-------------	------	------	------	-------------	-------------

## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	9	22.22	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	24	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	6	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	36	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	36	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Conductivity by PC Titrator	EA010-P	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard

## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

			Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003



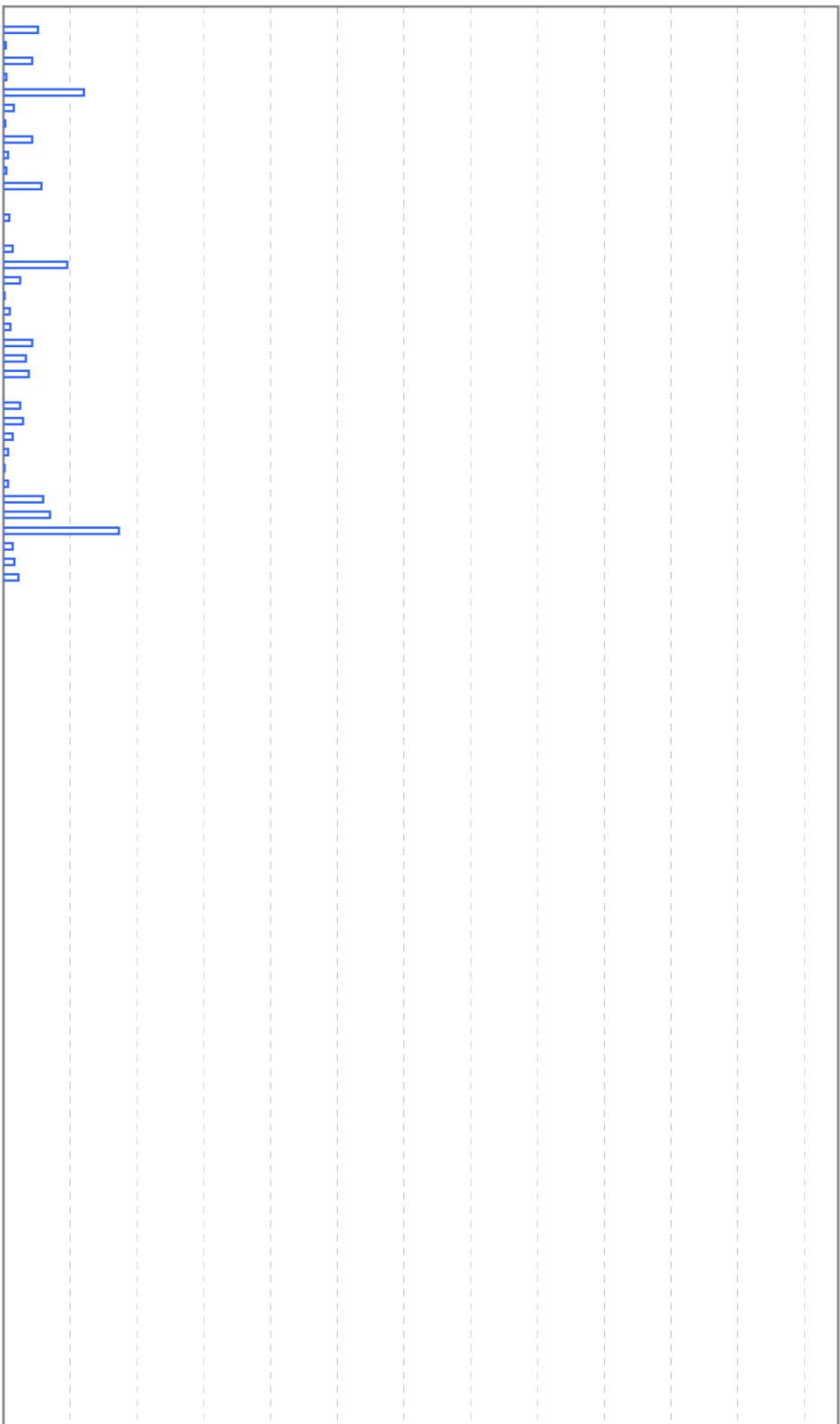
Major Cations - Dissolved	ED093F	WATER	<p>In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3)</p> <p>Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3)</p> <p>Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)</p>
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Oil and Grease	EP020	WATER	In house: Referenced to APHA 5520 B. Oil & grease is a gravimetric procedure to determine the amount of oil & grease residue in an aqueous sample. The sample is serially extracted three times n-hexane. The resultant extracts are combined, dehydrated and concentrated prior to gravimetric determination. This method is compliant with NEPM (2013) Schedule B(3)



## APPENDIX C

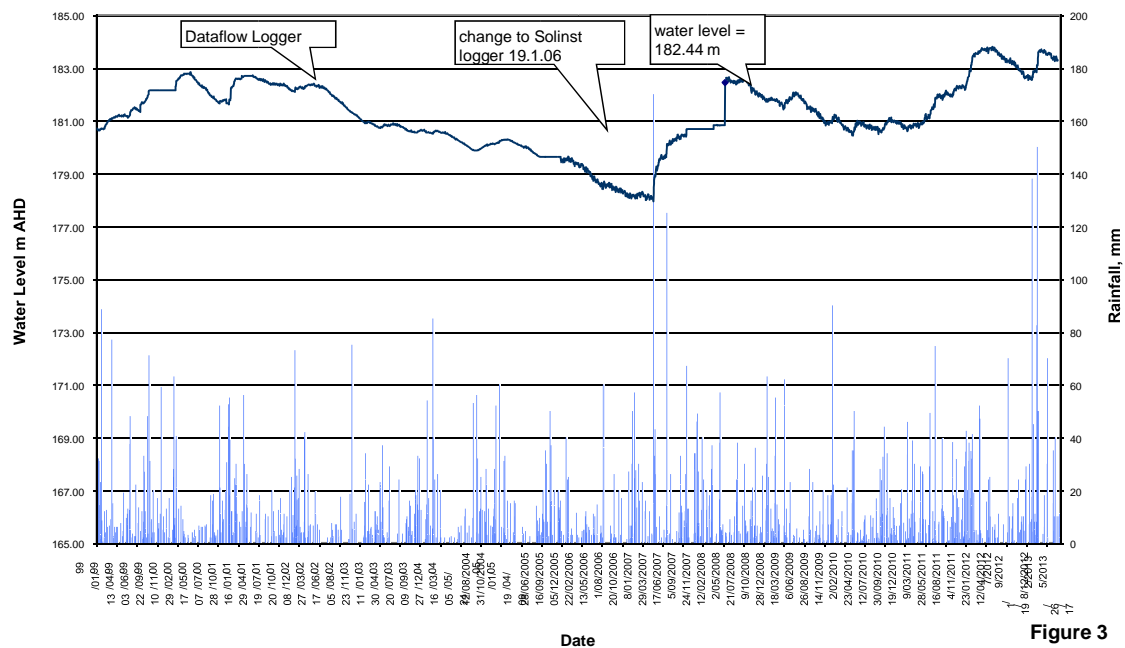






**PF FORMATION**  
**Bore PF167MW1 Groundwater Monitoring Data**

— Rainfall, mm  
 — Water level m AHD



**Figure 3**



PF166MW1GroundwaterMonitoringData

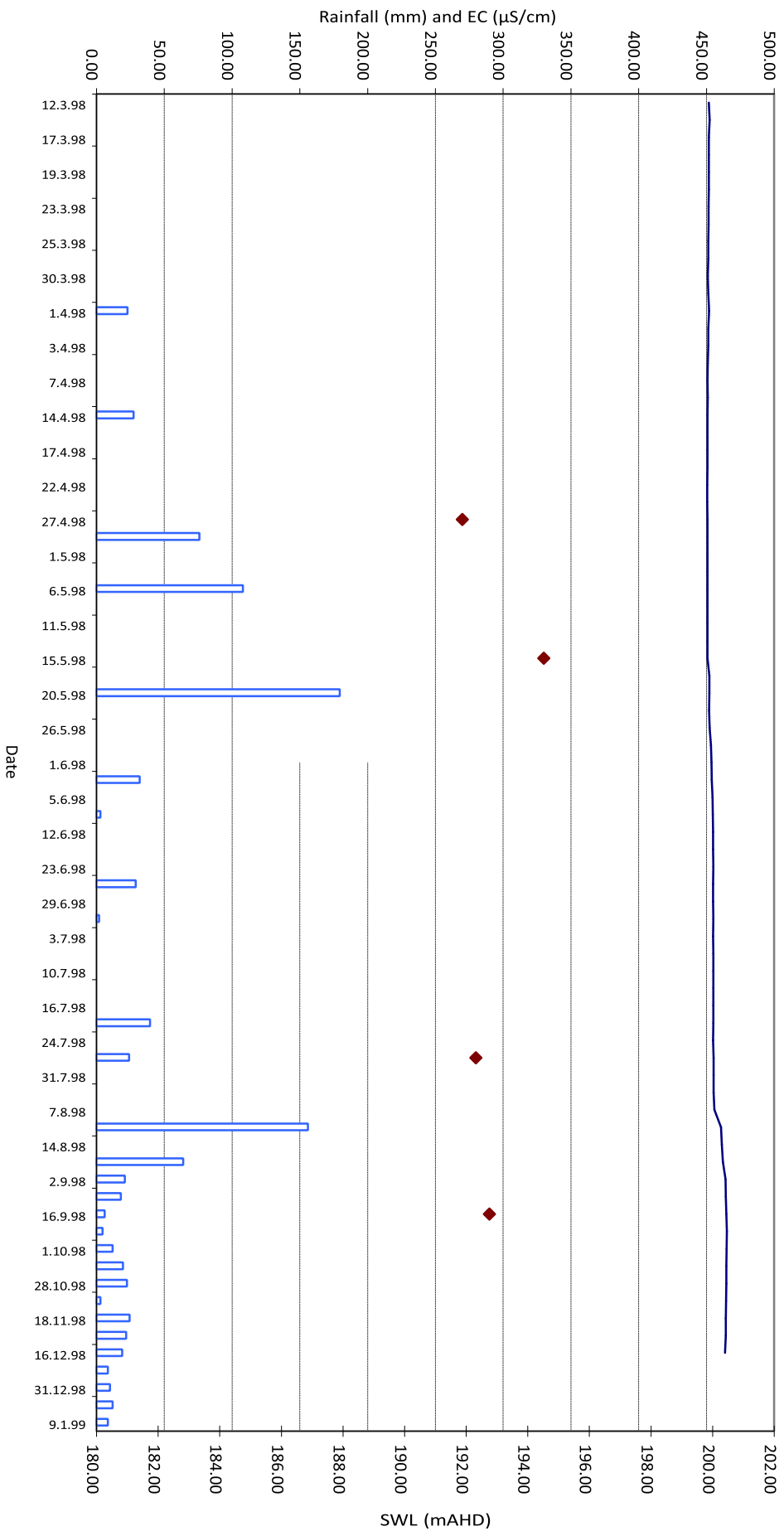
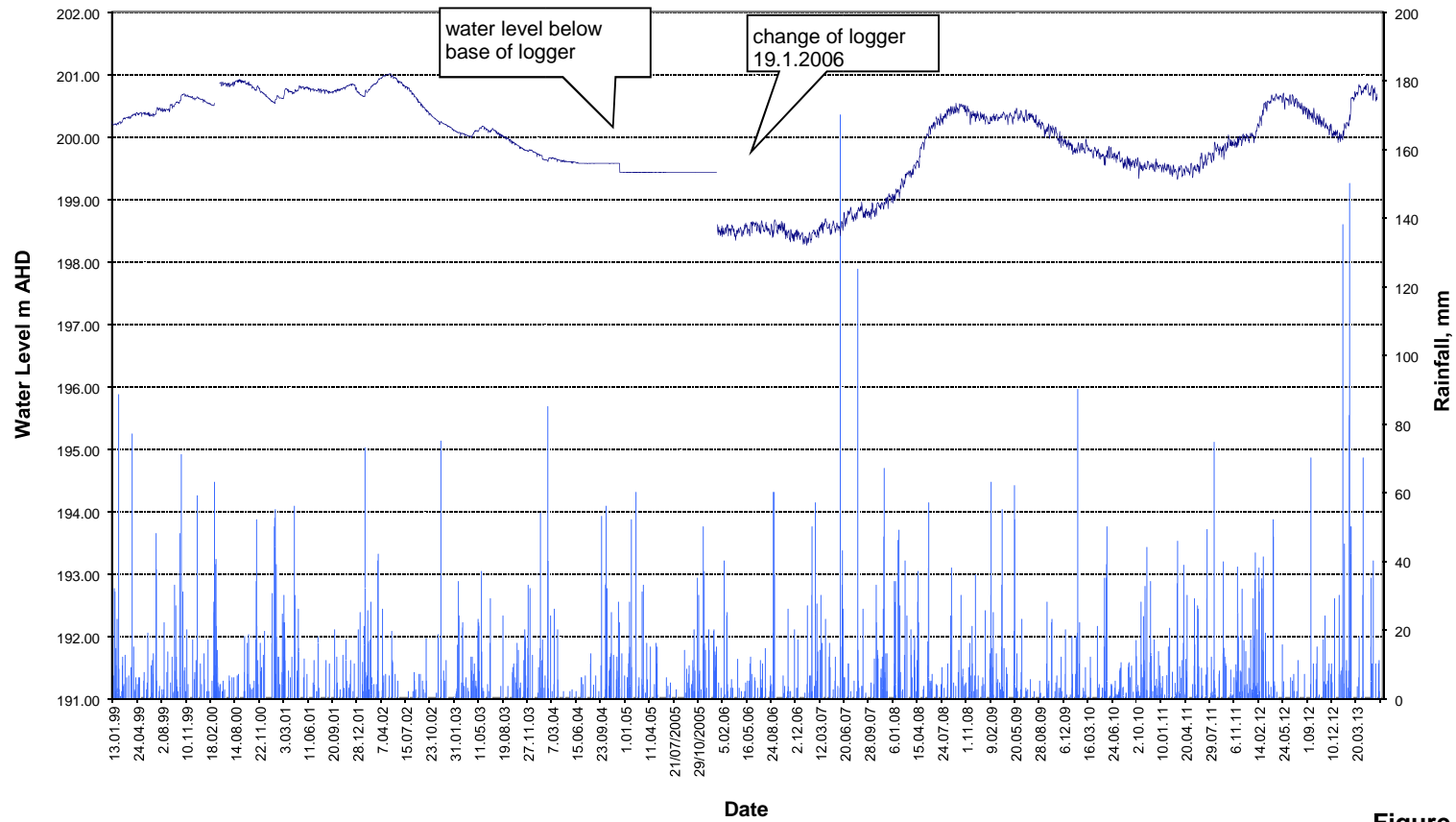
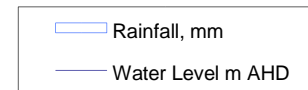


Figure4



**PF FORMATION**  
**Bore PF166MW1 Groundwater Monitoring Data**



**Figure 5**

# PF FORMATION Bore PFP214MW1 Groundwater Monitoring Data

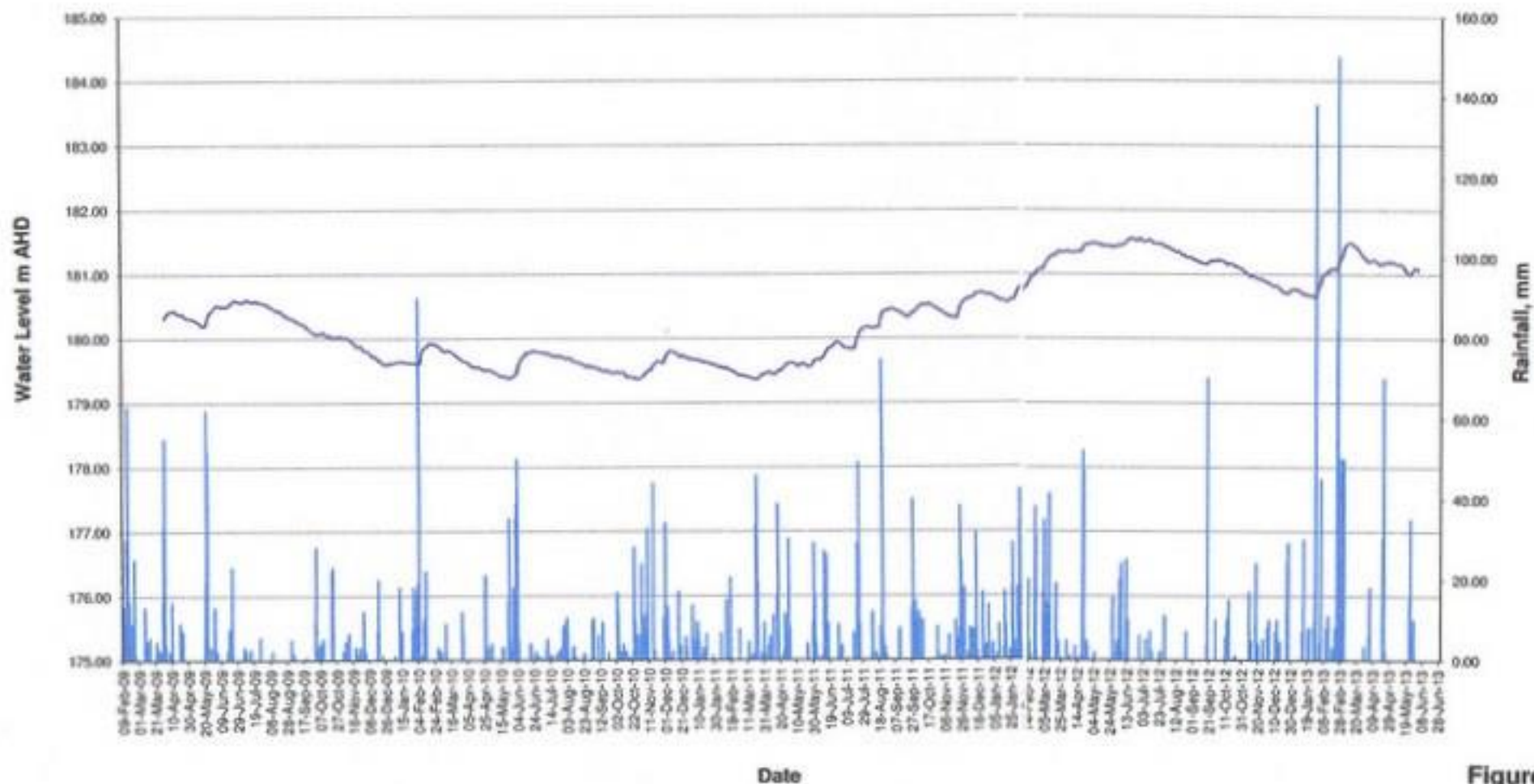
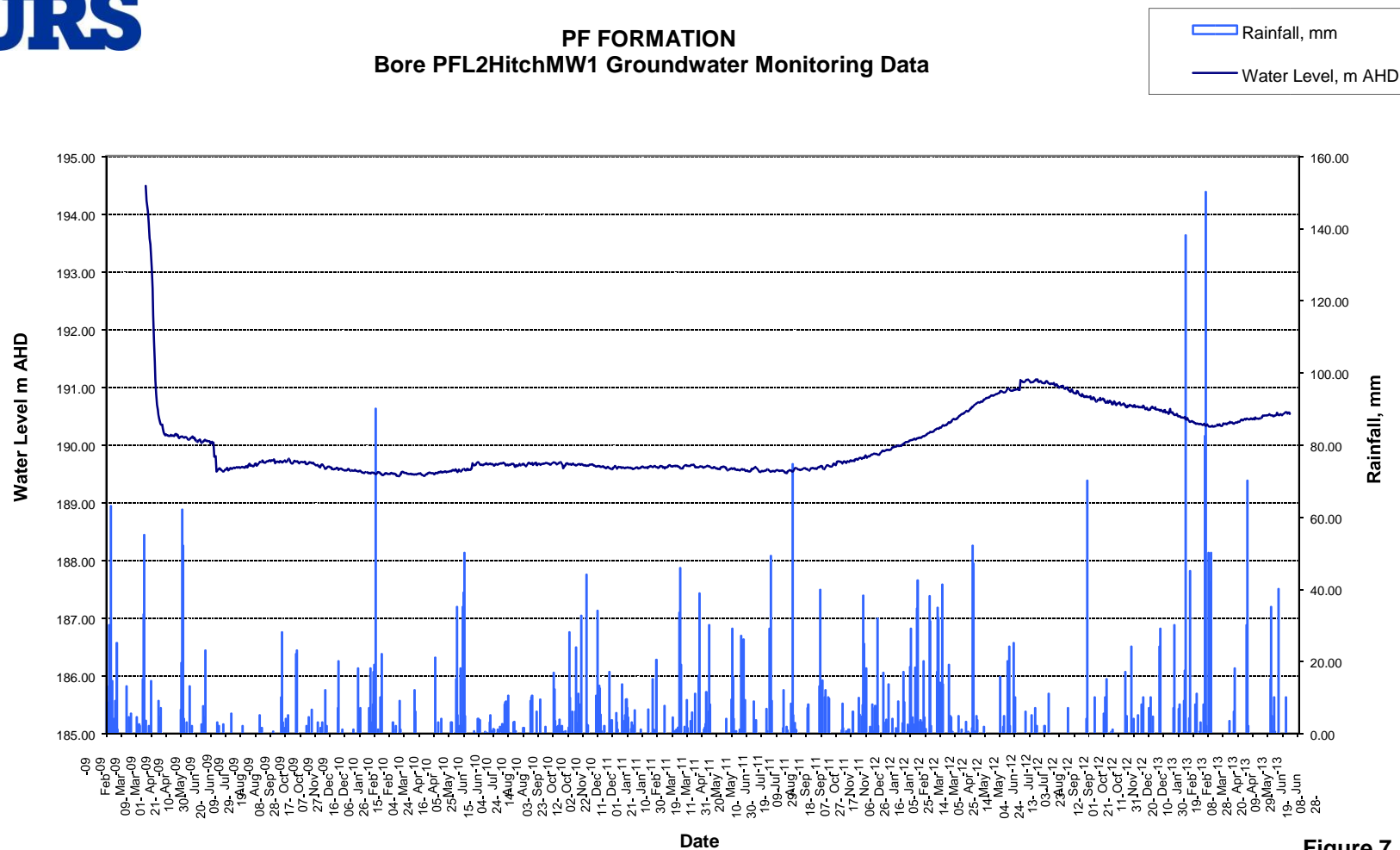


Figure 6



**PF FORMATION**  
**Bore PFL2HitchMW1 Groundwater Monitoring Data**



**Figure 7**



PF FORMATION  
PF167DAM, Licence No. 10BL157308, Groundwater Monitoring Data

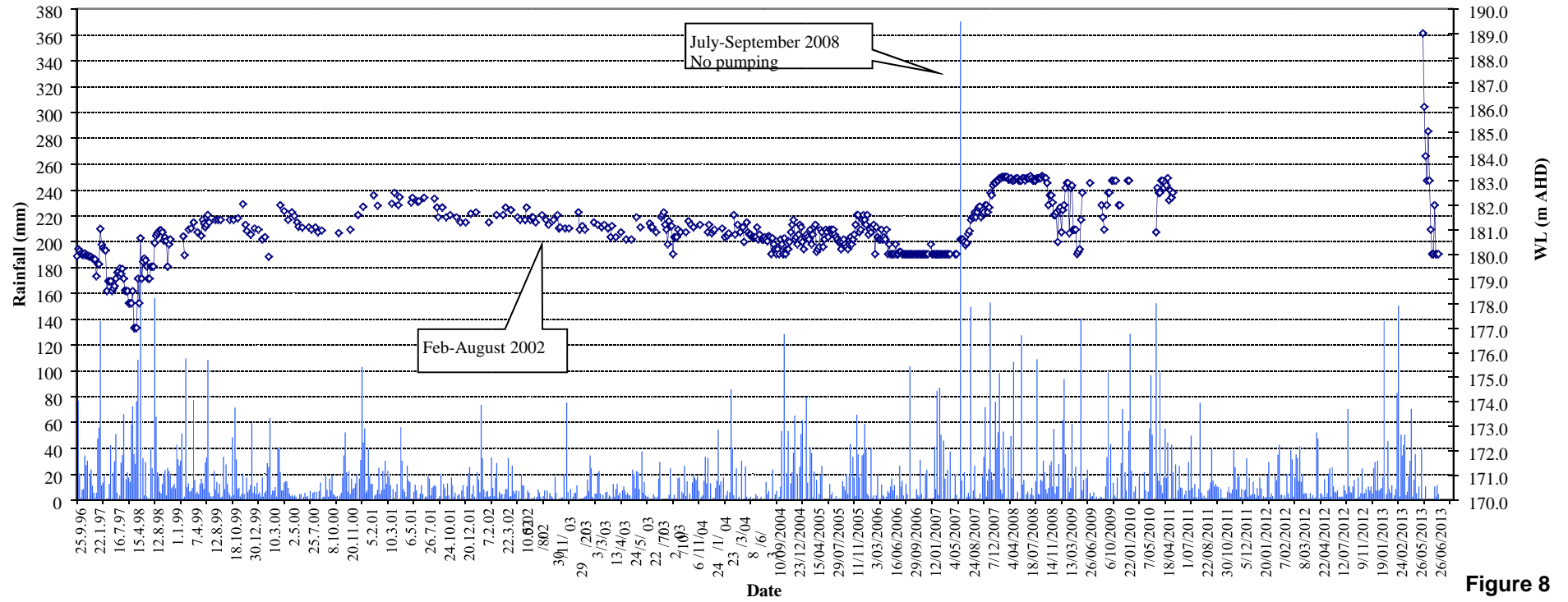
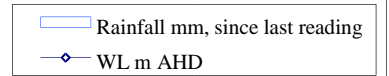


Figure 8





# PF FORMATION PF167DAM Monthly Pumpage Records

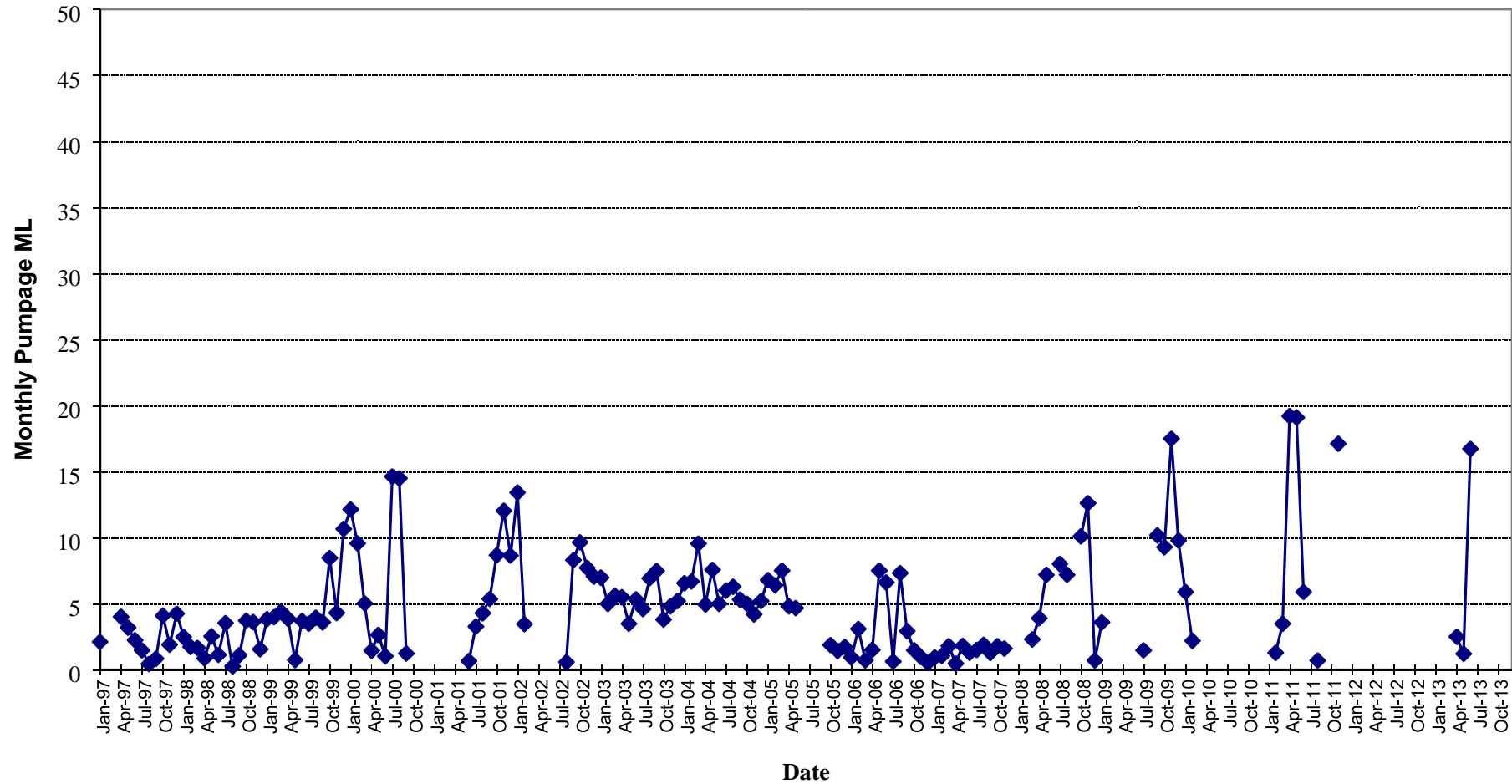


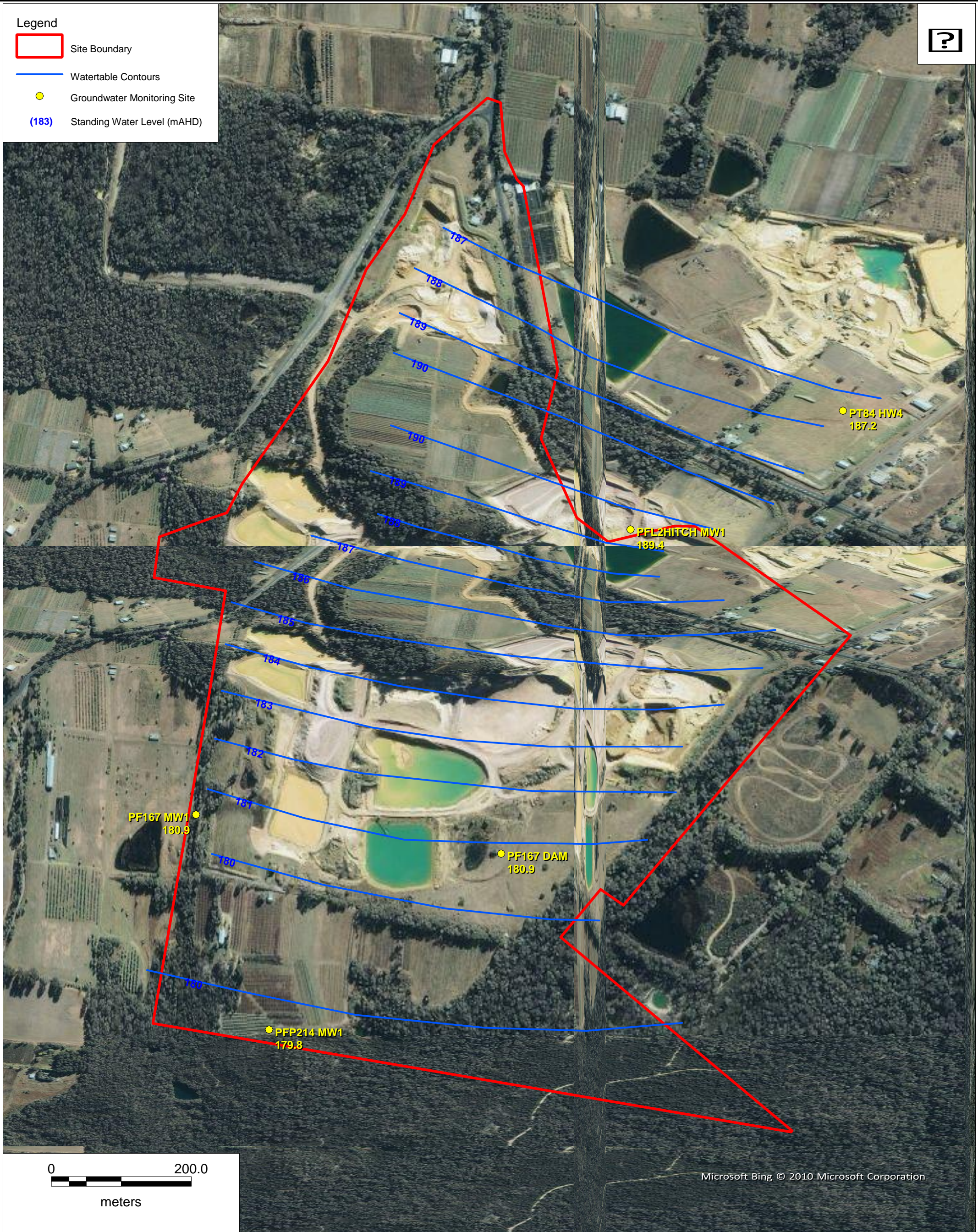
Figure 9



## APPENDIX D









PF FORMATION

HITCHCOCK ROAD, SAND EXTRACTION  
AND REHABILITATION PROJECT

HITCHCOCK ROAD SITE

WATERTABLE CONTOURS @ 22/06/2011

## **APPENDIX E**

### **PFF Sand Extraction Depths (Maximum, March 2016)**







Coordinate Tool

Click on the map to retrieve coordinates, or enter coordinates to locate:

GDA94 - MGA56

Easting 313517

Northing 6295085

GO

Reset

SS491 TS2985MAROOTA

 **EXTRACTION RL 191 AHD  
AS AT 8/3/2016**

SS172403



LAST PAGE OF REPORT



*Thank you for the opportunity to work with  
PF Formation.*

Feedback is Welcomed at Earth2Water  
([dino@earth2water.com.au](mailto:dino@earth2water.com.au))





# **ATTACHMENT 12**

## **SURFACE WATER MONITORING RESULTS**

**Boral Construction Materials  
Materials Technical Services**Unit 4, 3-5 Gibbon Road  
Baulkham Hills NSW 2153 Australia  
PO Box 400, Winston Hills NSW 2153T: +61 (02) 9624 9900  
F: +61 (02) 9624 9999

www.boral.com.au

**Test Report**

CLIENT: P.F. Formation

ADDRESS: 1774 Wisemans Ferry Road MAROOTA NSW 2756

PROJECT: Testing of Water from P.F. Formation.

FILE No.: 250/15

REQUEST No.: 64211

**TEST PROCEDURE:** APHA 4500 H+B - pH Value - Electrometric Method  
APHA 2130 B - Turbidity - Nephelometric Method  
APHA 5520 C - Oil & Grease - Partition-Infrared Method  
APHA 2540 D - Total Suspended Solids Dried at 103-105 °C  
APHA 2510 B - Conductivity - Laboratory Method

Laboratory Sample No.: 170607  
Date Sampled: 25/09/2015  
Date Received: 28/09/2015  
Sample Description: Water -  
Downstream - Lot  
198 - 11:30am  
Field No.: 2

**TEST RESULTS**

pH\*1 5.3  
Turbidity (NTU) 9.1  
Oil & Grease (mg/L) \*2 1.0  
Total Suspended Solid (mg/L) 4.4  
Conductivity (µS/cm) 181

Samples submitted by the Client.

**NOTE:**

\*1 Test has not met the sample specified holding time.

\*2 Solvent used in the determination of Solvent Extractable Matter for Oil &amp; Grease analysis: Polychlorotrifluoroethylene S316.

This report replaces our laboratory report with serial no 140121 issued on 30<sup>th</sup> September 2015.

Joshua Graham, Q.C. File, Mat. File, File.



Approved Signatory

Nanthini Selvadurai

Date 01-10-15

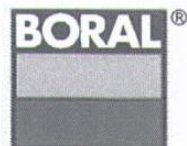
Serial No.

140189

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 9968



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**Test Report**

CLIENT: P.F. Formation

FILE No.: 250/15

ADDRESS: 1774 Wisemans Ferry Road MAROOTA NSW 2756

PROJECT: Testing of Water from P.F. Formation.

REQUEST No.: 65515

**TEST PROCEDURE:** APHA 4500 H+B - pH Value - Electrometric Method  
APHA 2130 B - Turbidity - Nephelometric Method  
APHA 5520 C - Oil & Grease - Partition-Infrared Method  
APHA 2540 D - Total Suspended Solids Dried at 103-105 °C  
APHA 2510 B - Conductivity - Laboratory Method

Laboratory Sample No.: 173449  
Date Sampled: 16/12/2015  
Date Received: 16/12/2015  
Sample Description: Water -  
Downstream - Lot  
198 - 8:10am  
Field No.: 2

**TEST RESULTS**

pH\*1 5.5  
Turbidity (NTU) 29  
Oil & Grease (mg/L) \*2 1.3  
Total Suspended Solid (mg/L) 15  
Conductivity (µS/cm) 134

Samples submitted by the Client.

NOTE:

\*1 Test has not met the sample specified holding time.

\*2 Solvent used in the determination of Solvent Extractable Matter for Oil & Grease analysis: Polychlorotrifluoroethylene S316.

This report replaces our laboratory reports 142436 issued on 22<sup>nd</sup> December 2015.

Joshua Graham, Q.C. File, Mat. File, File.



Approved Signatory

*Nanthini Selvadurai*

Nanthini Selvadurai

Date 11-01-16

Serial No. 14 2 5 0 1

NATA Accredited Laboratory

Accredited for compliance with ISO/IEC 17025

Number: 9968



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F: +61 (02) 9624 9999

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**Test Report**

CLIENT: P.F. Formation

1774 Wisemans Ferry Road MAROOTA NSW 2756

PROJECT: Testing of Water from P.F. Formation.

FILE No.: 250/16

REQUEST No.: 66690

**TEST PROCEDURE:** APHA 4500 H<sup>+</sup>B - pH Value - Electrometric Method  
APHA 2130 B - Turbidity - Nephelometric Method  
APHA 5520 C - Oil & Grease - Partition-Infrared Method  
APHA 2540 D - Total Suspended Solids Dried at 103-105 °C  
APHA 2510 B - Conductivity - Laboratory Method

Laboratory Sample No.: 176093  
Date Sampled: 18/03/2016  
Date Received: 18/03/2016  
Sample Description: Water -  
Downstream - Lot  
198 - 9:00am  
Field No.: 2

**TEST RESULTS**

pH 6.5  
Turbidity (NTU) 15  
Oil & Grease (mg/L) \*1 0.4  
Total Suspended Solid (mg/L) 8.8  
Conductivity (µS/cm) 143  
Samples submitted by the Client.

**NOTE:**

\*1 Solvent used in the determination of Solvent Extractable Matter for Oil & Grease analysis: Polychlorotrifluoroethylene S316.

J. Graham, Q.C. File, Mat. File, File.

\*Note that this report replaces our laboratory report with Serial No.145026 issued on 5<sup>th</sup> April 2016.

**Boral Construction Materials  
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www.boral.com.au

**Test Report**

CLIENT: P.F. Formation

1774 Wisemans Ferry Road MAROOTA NSW 2756

PROJECT: Testing of Water from P.F. Formation.

FILE No.: 250/16

REQUEST No.: 68073

**TEST PROCEDURE:** APHA 4500 H<sup>+</sup>B - pH Value - Electrometric Method  
APHA 2130 B - Turbidity - Nephelometric Method  
APHA 5520 C - Oil & Grease - Partition-Infrared Method  
APHA 2540 D - Total Suspended Solids Dried at 103-105 °C  
APHA 2510 B - Conductivity - Laboratory Method

Laboratory Sample No.: 179396  
Date Sampled: 16/06/2016  
Date Received: 17/06/2016  
Sample Description: Water -  
Downstream -  
Lot 198 -  
11:00am  
Field No.: 2

**TEST RESULTS**

pH\*1 6.2  
Turbidity (NTU)\*1 9.3  
Oil & Grease (mg/L) \*2 1.4  
Total Suspended Solid (mg/L) 4.0  
Conductivity (μS/cm) 169

Samples submitted by the Client.

**NOTE:**

\*1 Test has not met the sample specified holding time.

\*2 Solvent used in the determination of Solvent Extractable Matter for Oil &amp; Grease analysis: Polychlorotrifluoroethylene S316.

J. Graham, Q.C. File, Mat. File, File.

ACCREDITED FOR  
TECHNICAL  
COMPETENCE

Approved Signatory

Date 11-7-16 Serial No. 147878

Frank Grima

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 9968

# **ATTACHMENT 13**

## **REHABILITATION REPORT**

PF Formation

## 2015 Monitoring of revegetation at Hitchcock Road, Maroota

7 December 2015








#### Document information

Client: PF Formation  
Title: 2015 Monitoring of revegetation at  
Hitchcock Road, Maroota  
Document No: 2267030A-ECO-REP-001 RevA  
Date: 7 December 2015

Rev	Date	Details
A	25/11/2015	Draft
B	07/12/2015	Final

#### Author, Reviewer and Approver details

Prepared by:	Mark Stables	Date: 07/12/2015	Signature: 
Reviewed by:	Alex Cockerill	Date: 07/12/2015	Signature: 
Approved by:	Alex Cockerill	Date: 07/12/2015	Signature: 

#### Distribution

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www.pbworld.com  
Certified to ISO 9001, ISO 14001, OHSAS 18001

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# 1. Introduction

This report presents the findings of the third monitoring session of a rehabilitation area within PF Formation's sandmining operations at Hitchcock Road, Maroota.

## 1.1 Background

Expansion of an existing PF Formation sand mine at Hitchcock Road required clearing of 3.7 hectares of Sydney Hinterland Transition Woodland. It was proposed to offset this clearing with revegetation and recreation of this community within a 7.9 hectare area on the western boundary of the site where quarrying has been completed. Revegetation was commenced by PF Formation in 2004. To date an area of 4.2 hectares has been completed. A key condition of the clearing being permitted is that PF Formation establishes at least 3.7 hectares of revegetation, recreating the Sydney Hinterland Transition Woodland community. replanted (approximately 1 hectare in 2004, 2 hectares in 2006 and 1.2 hectares in 2011) with the aim to recreate the vegetation to be cleared from Lot 1 DP 1013943.

Monitoring of the rehabilitation of previously mined areas is a requirement of project approval and environmental reporting is required to provide some certainty that this revegetation will ultimately result in the creation of a naturally regenerating patch of Sydney Hinterland Transition Woodland. This monitoring needs to be undertaken regularly by independent consultants (not those undertaking the revegetation works) and to include assessment against the success criteria developed for rehabilitation within the site, as included in the consent conditions for the project.

Parsons Brinckerhoff undertook monitoring of the site in July 2010 (Parsons Brinckerhoff 2010) with a second monitoring session in October 2012 and a third event in 2013. Based on the monitoring results of 2012 (Parsons Brinckerhoff 2012) and the progress towards the ecological completion criteria, the Department of Planning and Infrastructure approved the clearing of Sydney Hinterland Transition Woodland within the site in March 2013. Continuation of the monitoring of the rehabilitation and offset obligations are required in accordance with the project approval and to provide detailed reporting for inclusion in the next Independent Environmental Audit report for the quarry.

## 1.2 Objectives of revegetation

The objectives of revegetation within the Hitchcock Road site are to:

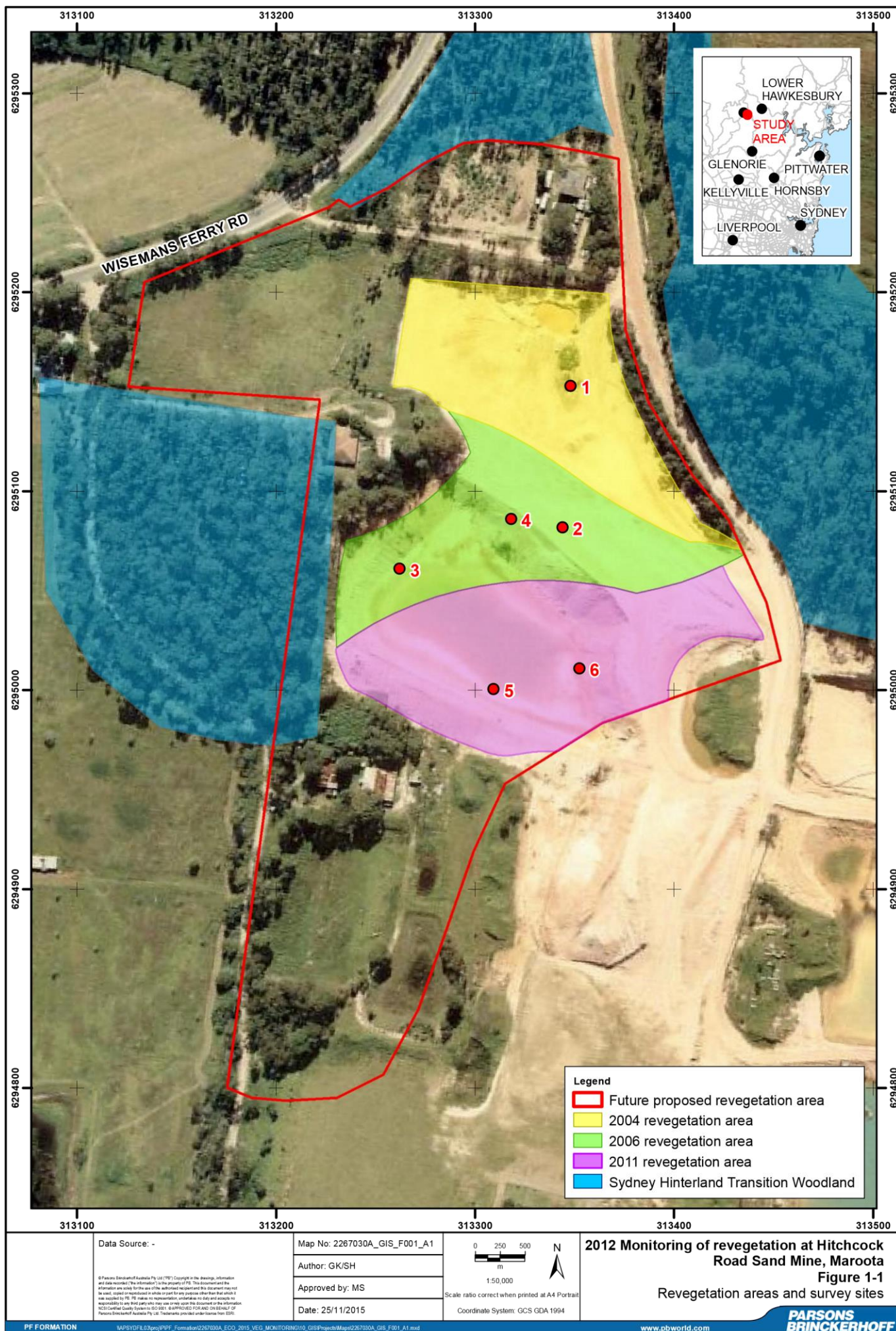
- rehabilitate and revegetate quarried areas
- revegetate with native vegetation characteristic of the community to be removed from Lot 1 DP 1013943, namely Sydney Hinterland Transition Woodland

- re-create the existing characteristics of this community, to provide an area suitable for offsetting the clearing of this community at that time.

## 1.3 Aims of report

The aims of this report are to:

- present the results of the monitoring survey
- analyse the results against the criteria for monitoring the success of rehabilitation and progress towards five, ten and fifteen year targets (see section 2.3)
- provide recommendations on management actions required to assist in successful re-creation of Sydney Hinterland Transition Woodland within the site and to meet the long-term goals
- provide independent monitoring report for inclusion as part of the Independent Environmental Audit for the quarry.







## 2. Methodology

### 2.1 Nomenclature

Names of plants used in this document follow Harden (Harden 1992, 1993, 2000, 2002) with updates from PlantNet (Royal Botanic Gardens 2015). Scientific names are used in this report for species of plant. Scientific and common names (where available) are provided in plant lists in Appendices A and C. Introduced species are identified within the text with an asterisk following the name, for example *Lantana camara*\*

### 2.2 Field survey

This is the fourth monitoring survey of the revegetation areas. The first site inspection was undertaken on 5 July 2010, the second undertaken on 25 October 2012, the third undertaken on 2 December 2013 and this, the fourth undertaken on 15 October 2015. Fixed quadrats (20 x 20 m) were set up with edges running in a north-south, east west direction. Quadrats were marked with stakes at the north western and south western corners of the quadrat.

Within each quadrat, every species of plant present was recorded and its cover abundance estimated using a modified braun blanquet scale:

1. <5%- rare or few individuals
2. <5% common
3. 5–25%
4. 25–50%
5. 50–75%
6. 75–100%.

Additional information recorded at each quadrat site included:

- centre and south western corner of quadrat using GPS
- slope and aspect
- landform
- soil type
- evidence of disturbance, condition
- evidence of canopy recruitment, natural regeneration

- fauna habitat values
- photographs from the south western corner of the quadrat (to the north, north east, east, south and west).

The location of quadrats is summarised in Table 2.1.

**Table 2.1      Quadrat survey locations**

Stratification	Quadrat identifier	Centre of site <sup>1</sup>		South west corner <sup>2</sup>	
		Easting	Northing	Easting	Northing
2004 revegetation area	1	313348	6295163	313335	6295148
2006 revegetation area	2	313343	6295082	313333	6295087
	3	313262	6295061	313253	6295059
	4	313318	6295086	313306	6295077
2011 revegetation area	5	313319	6295008	313309	6295000
	6	313363	6295018	313352	6295011

(1) UTM, WGS 84

(2) Location of monitoring photo point and stake marking the south western corner of quadrat

## 2.3 Criteria to assess rehabilitation success

Field surveys were undertaken in 2008 of the vegetation to be cleared to provide data on the typical characteristics of the community and provide baseline information against which the revegetation program can be assessed (Parsons Brinckerhoff 2008).

The criteria for assessment and the target values for these goals are provided in Table 2.2 on the following page.

**Table 2.2 Criteria to monitor success of revegetation**

Category	Criteria	Target			Condition of vegetation to be removed
		5 years	10 years	15 years	
<b>Native species</b>	Native species diversity (average number per 400 m <sup>2</sup> quadrat)	20	35	40	46
	Average number of characteristic species for the site occurring within 400 m <sup>2</sup>	15	20	27	34.5 (+/-1.5)
	Native species cover (% cover in 400 m <sup>2</sup> quadrat)	>50	>85	>95	99
<b>Weeds</b>	Weed abundance (% of vegetation cover in 400 m <sup>2</sup> quadrat)	<50	<15	<5	<1
	Invasive or Noxious weed species (e.g. Lantana, Blackberry, exotic vines)	Controlled	Controlled	Controlled	Restricted
<b>Vegetation structure</b>	Vegetation structure	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Well structured and includes canopy, mid-storey and ground cover units	Well structured and includes canopy, mid-storey and ground cover units
<b>Canopy<sup>a</sup></b>	Average canopy height (m)	4	8	12	12-16
	Native canopy cover (minimum % cover) [modified braun blanquet scale] <sup>b</sup>	5 [3]	5 [3]	5 [3]	5 [3]
<b>Shrub layer<sup>a</sup></b>	Native shrub cover (minimum % cover) [modified braun blanquet scale] <sup>b</sup>	10 [3]	15 [3]	25 [4]	32.5 (+/-7.5) [4]
	Average shrub layer height (m)	0.5	1	1	1.25

<b>Ground cover</b>	Native ground cover (minimum % cover) [modified braun blanquet scale] <sup>b</sup>	5 [3]	10 [3]	10 [3]	15 (+/-5) [3]
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Category	Criteria	Target			Condition of vegetation to be removed
		5 years	10 years	15 years	
<b>Ecosystem function</b>	Habitat values	Vegetation structure beginning to develop.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Provides minimal habitat for fauna, however, many woodland birds present.  Well structured habitat, includes moderate levels of leaf litter and fallen timber.
	Natural regeneration indicating dispersal of seed into site and/or presence of soil seed bank	Yes	Yes	Yes	Yes



## 2.4 Results

Photos of the vegetation to be cleared within Lot 1 DP 1013943 and the rehabilitation area quadrat sites are provided in Appendix B. Species recorded, vegetation structure and other environmental characteristics of the quadrat sites are summarised in Appendix C.

## 2.5 Species of plant

A total of 88 species of plant was recorded within the site during this monitoring session, of which 68 (77%) are native. A full list of species recorded within each quadrat and the vegetation structure is provided in Appendix C.

No species listed as noxious under the *Noxious Weeds Act 1993* or Weed of National Significance was recorded.

## 2.6 Assessment against criteria

The results of the field survey were assessed against the criteria for successful revegetation, using the five, 10 and 15 year targets (Table 2.3).

**Table 2.3 Assessment against criteria to monitor success of revegetation**

Category	Criteria	Target			Results		
		5 years	10 years	15 years	2004 revegetation area (11 years)	2006 revegetation area (9 years)	2011 revegetation area (4 years)
Native species	Native species diversity (average number per 400 m <sup>2</sup> quadrat)	20	35	40	31	25	14
	Average number of characteristic species for the site occurring within 400 m <sup>2</sup>	15	20	27	25	15	10
	Native species cover (% of species in 400 m <sup>2</sup> quadrat)	>50	>85	>95	97	71	36
Weeds	Weed abundance (% of vegetation cover in 400 m <sup>2</sup> quadrat)	<50	<15	<5	3	19	64
	Invasive or Noxious weed species (e.g. Lantana, Blackberry, exotic vines)	Controlled	Controlled	Controlled	Controlled	Controlled	Ground cover generally dominated by invasive species, but no noxious or highly invasive species present

<b>Vegetation structure</b>	Vegetation structure	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Well structured and includes canopy, midstorey and ground cover units	Well structured and includes canopy, midstorey and ground cover units	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.
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Category	Criteria	Target			Results		
		5 years	10 years	15 years	2004 revegetation area (11 years)	2006 revegetation area (9 years)	2011 revegetation area (4 years)
<b>Canopy<sup>a</sup></b>	Average canopy height (m)	4	8	12	14	8	0.3
	Native canopy cover (minimum % cover) [modified braun blanquet scale] <sup>b</sup>	5 [3]	5 [3]	5 [3]	37 [4]	17 [3]	0
<b>Shrub layer<sup>a</sup></b>	Native shrub cover (minimum % cover) [modified braun blanquet scale] <sup>b</sup>	10 [3]	15 [3]	25 [4]	10 [3]	43 [4]	52 [5]
	Average shrub layer height (m)	0.5	1	1	1.5	2	2.5
<b>Ground cover</b>	Native ground cover (minimum % cover) [modified braun blanquet scale] <sup>b</sup>	5 [3]	10 [3]	10 [3]	55 [5]	55 [5]	19 [3]

Ecosystem function	Habitat values	Vegetation structure beginning to develop.	Woodland birds recorded.  Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded.  Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded.  Habitat structure continuing to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded.  Habitat structure beginning to develop, including a dense native shrub layer. Groundcover such as leaf litter and fallen timber also developing.	Vegetation structure beginning to develop, however, no distinct canopy layer developing yet although Eucalypt seedling recruitment was observed. Leaf litter and fallen timber absent or very sparse.
	Natural regeneration indicating dispersal of seed into site and/or presence of soil seed bank	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Purple font indicates that the 5 year target has been met; black font that the 10 year target has been met, green font that the 15 year criteria has been met. Red font indicates that no target has been met.



### 3. Discussion and recommendations

There has been a stabilisation or general improvement in the habitat quality and native species diversity cover and vegetation structure since the previous monitoring survey in 2013. Erosion noted in previous years appears to be stable with increasing cover of groundcover vegetation. Weed cover has generally stabilised in the 2004 and 2006 revegetation areas although a general increase in weed cover within the ground layer was observed in the 2011 revegetation area. Key findings include:

- ▶ Has met the 10 and even 15 year targets in the majority of criteria. The only exception is that the:
- After 11 years the 2004 revegetation area:
  - Native species diversity (average number per 400 m<sup>2</sup> quadrat) is at the 5 year target (31). This is not considered to require active management at this stage, and is likely to continue to develop towards the 10 and 15 year targets.
  - Native shrub cover (minimum % cover) is at the 5 year target (10). This is not considered to require active management at this stage, and is likely to continue to develop towards the 10 and 15 year targets.
- After 9 years, the 2006 revegetation area:
  - ▶ Has met the 5 year targets for all criteria.
  - ▶ Has met the 10 and 15 year targets for a number of criteria relating to vegetation structure (cover and vegetation height).
  - ▶ Has some criteria that will require improvement to reach the 10 year target. However, at this stage no active management is considered necessary for these criteria as they are likely to improve naturally given time. These criteria are:
    - native species cover and diversity –
    - average number of characteristic
    - species – decrease in weed cover.
- After 4 years, the 2011 revegetation area:
  - ▶ Was dominated by early colonising Acacia species.
  - ▶ Natural regeneration in the form of Eucalypt seedling recruitment was observed in the ground layer.
  - ▶ Ground cover weed species abundance has nearly doubled since the last monitoring event in 2013.

- ▶ Has met few of the 5 year targets. The exceptions (species cover, native ground cover, shrub cover and height and weed abundance) provide some encouragement that given more time and implementing targeted weeding and supplementary plantings, this area will regenerate well.
- ▶ Requires regular visual assessments to check for spread of weeds that may inhibit germination and growth of native species.

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Given the progress towards the targets, little additional work is considered necessary within the 2004 and 2006 revegetation areas at this stage with natural regeneration considered likely to continue without active management. In contrast, it is recommended that weed control and supplementary plantings are undertaken with the 2011 revegetation areas to assist in progressing towards 5 year targets.

Recommendations for monitoring, weed control and supplementary plantings are summarised in Table 3.1.

**Table 3.1 Recommendations to improve revegetation success**

Observation	Recommendation
<b>Monitoring</b>	
Monitoring has not been undertaken annually as part of the annual environmental reporting. However, based on the work undertaken and natural regeneration of the area, this has been appropriate.	<p>Given that the rehabilitation has met or exceeded the relevant targets for the 2004 and 2006 revegetation areas, monitoring next year is not considered necessary for these areas. In these areas monitoring in two years' time (i.e. at 13 and 11 years since rehabilitation respectively) would be sufficient.</p> <p>It is recommended that an additional monitoring site is sampled within the 2004 revegetation area during the 13 year monitoring event. Additional sampling will reduce any sample bias from a single monitoring site.</p> <p>The 2011 revegetation area would benefit from regular visual inspections (twice yearly), particularly for weed abundance and cover. Where noxious, highly invasive species or dense weeds smothering native species are noted, these should be controlled. Detailed independent monitoring of this area in two year's</p>
<b>Weeds</b>	
Weed abundance with 2004 and 2006 revegetation has generally stabilised and does not appear to be inhibiting natural regeneration. Weed abundance within the ground layer of the 2011 revegetation area has nearly doubled since the 2013 monitoring event. Exotic grasses were dominant in patches throughout the 2011 revegetation area.	<p>Consider broad spraying exotic grasses where they occur densely, particularly in the 2011 revegetation area. Broad spraying should be followed by:</p> <ul style="list-style-type: none"> <li>■ slashing and raking or mowing to remove excess debris and stimulate seed germination</li> <li>■ inspection for regeneration of native plants</li> <li>■ repeated broad spraying of germinating weeds if native regeneration is minimal</li> <li>■ spot-spraying and/or hand weeding if substantial germination of native species is recorded.</li> </ul>
<b>Supplementary Plantings</b>	
Native species diversity, average number of characteristic species and native species cover were all observed below 5 years targets within the 2011 revegetation area.	<p>Consider undertaking supplementary plantings within the 2011 revegetation area. Supplementary plantings are recommended to be undertaken in the following manner:</p> <ul style="list-style-type: none"> <li>■ in conjunction with appropriate weed control</li> <li>■ species selection should include a mixture of canopy, shrub and groundcover species consistent with those previously planted as outlined in Appendix A</li> <li>■ planting should be undertaken in autumn preferable following rain</li> <li>■ follow up weed control and planting maintenance is recommended.</li> </ul>



The rehabilitation is progressing well and is generally meeting or exceeding the targets set with the exception of 2011. This suggests that given time the 2004 and 2006 revegetation areas are likely to continue to meet and exceed the target criteria. Given the promising results to date and the fact that the 2011 revegetation has been undertaken using similar methods as the 2004 and 2006 areas, with time, this area is likely to have similar success provided appropriate weed control and supplementary plantings are undertaken.

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# Appendix A

Revegetation works to date



# A1. Revegetation works to date

To date an area of 4.2 hectares has been replanted with the aim to recreate the vegetation to be removed from Lot 1 DP 1013943. The revegetation area is on the western boundary of the site (Figure 1.1) and further revegetation scheduled to the south as quarrying is completed. The revegetation area occurs adjacent to remnant vegetation, both within and adjacent to the site. This adjacent vegetation provides a potential seed source for natural seed dispersal into the revegetation area.

Greening Australia were commissioned to propagate tubestock from cuttings and seed from collected vegetation within Lot 1 DP 1013943 to enable the revegetation of quarried areas. The first collection period occurred from late 2000 to February 2002.

Rehabilitation and revegetation has commenced with further revegetation scheduled to the south as quarrying is completed. In 2004 over one hectare of the quarry that had been previously extracted and used as a silt pond was reshaped and prepared for rehabilitation by PF Formation staff. The top soil had been stored from an adjacent area with Sydney Hinterland Transition Woodland and was spread over the site. Further seed collected over the previous 4 years was broadcast over the site in June 2004 to augment the natural soil borne native seed bank.

In 2006 an additional area of approximately two hectares that had been previously mined was prepared for 10,000 seedlings and supervised the planting in September to November 2006. An irrigation system was revegetation. The stored top soil was distributed over the site. Greening Australia then provided over installed to water the plantings over that summer.

In 2011 an additional area of approximately 1.2 hectares was prepared for revegetation and stored top soil was spread over the site.

In 2011, additional work was undertaken as recommended in the 2010 report. This included weed control, erosion control and additional planting (of both seed and tube stock). Seed used for the revegetation was collected locally including from the former trig site. Species used for additional planting are listed in Table A1.1.

No additional work has been undertaken on the site since the 2012 monitoring survey.

**Table A1.1 Additional plantings undertaken in 2011**

Scientific name	Common name	Previously recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Additional plantings	
				Seed	Tubestock
<i>Acacia decurrens</i>	Black Wattle			Y	Y
<i>Acacia falcata</i>			Y	Y	Y
<i>Acacia fimbriata</i>	Fringed Wattle			Y	
<i>Acacia linifolia</i>	Flax-leaved Wattle	Y	Y		Y

<i>Acacia longifolia</i>			Y	Y	Y
<i>Acacia myrtifolia</i>	Red-stemmed Wattle	Y	Y		Y
<i>Acacia parramattensis</i>	Parramatta Wattle	Y	Y	Y	Y
<i>Acacia suaveolens</i>	Sweet Wattle	Y	Y	Y	Y

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Scientific name	Common name	Previously recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Additional plantings	
				Seed	Tubestock
<i>Acacia terminalis</i>	Sunshine Wattle	Y	Y	Y	
<i>Acacia ulicifolia</i>	Heath Wattle	Y	Y	Y	Y
<i>Allocasuarina littoralis</i>	Black Sheoak	Y	Y	Y	Y
<i>Angophora costata</i>	Sydney Red Gum	Y	Y	Y	Y
<i>Angophora floribunda</i>				Y	
<i>Angophora hispida</i>				Y	
<i>Austrodanthonia tenuior</i>			Y		Y
<i>Banksia ericifolia</i>	Heath Banksia				Y
<i>Banksia integrifolia</i>					Y
<i>Bursaria spinosa</i>	Native Blackthorn				Y
<i>Callistemon pinifolius</i>				Y	
<i>Chloris truncata</i>					Y
<i>Clematis aristata</i>		Y		Y	
<i>Daviesia acicularis</i>			Y		Y
<i>Daviesia ulicifolia</i>					Y
<i>Daviesia virgata</i>					Y
<i>Dianella caerulea</i>		Y	Y		Y
<i>Dichelachne crinita</i>					Y
<i>Dodonaea triquetra</i>			Y	Y	Y
<i>Elaeocarpus reticulatus</i>				Y	
<i>Eragrostis benthamii</i>			Y	Y	
<i>Eragrostis brownii</i>	Brown's Lovegrass		Y	Y	
<i>Eucalyptus crebra</i>			Y	Y	
<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark	Y	Y	Y	
<i>Eucalyptus eximia</i>				Y	
<i>Eucalyptus globoidea</i>				Y	



<i>Eucalyptus haemastoma</i>				Y	
<i>Eucalyptus moluccana</i>				Y	
<i>Eucalyptus pilularis</i>			Y	Y	
<i>Eucalyptus piperita</i>				Y	
<i>Eucalyptus punctata</i>	Grey Gum	Y	Y		Y
<i>Eucalyptus robusta</i>				Y	
<i>Eucalyptus saligna</i>					Y

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Scientific name	Common name	Previously recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Additional plantings	
				Seed	Tubestock
<i>Eucalyptus</i> sp.				Y	
<i>Eucalyptus sparsifolia</i>	Narrow-leaved Stringybark	Y	Y	Y	
<i>Gahnia sieberiana</i>				Y	
<i>Glycine clandestina</i>		Y	Y		Y
<i>Hakea sericea</i>		Y	Y		Y
<i>Imperata cylindrica</i> var. <i>major</i>	Bladey Grass	Y	Y	Y	
<i>Isopogon anemonifolius</i>			Y	Y	
<i>Kunzea ambigua</i>	Tick Bush		Y	Y	Y
<i>Leptospermum polygalifolium</i>				Y	
<i>Leptospermum trinervium</i>			Y	Y	Y
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Y		Y	Y
<i>Macrozamia spiralis</i>		Y	Y	Y	
<i>Petrophile pulchella</i>			Y	Y	
<i>Pittosporum undulatum</i>	Sweet Pittosporum	Y		Y	
<i>Poa labillardierei</i> var. <i>labillardierei</i>		Y		Y	Y
<i>Pultenaea villosa</i>			Y	Y	Y
<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>	Turpentine	Y	Y	Y	
<i>Themeda australis</i>	Kangaroo Grass	Y	Y		Y

## Appendix B

Photos



# B1. Vegetation within Lot 1 DP 1013943 (2008)















# B2. Photomonitoring

Table B2.1      Quadrat 1 – 2004 rehabilitation area

Q1	2010	2012	2013	2015
To north				
To east				
To south				



To west				
North east into centre				

Table B2.2      Quadrat 2 – 2006 rehabilitation area

	Q2	2010	2012	2013	2015
To north					



To east				
To south				
To west				



North east into centre				
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Table B2.3      Quadrat 3 – 2006 rehabilitation area





















Q3	2010	2012	2013	2015
To north				
To east				















Table B2.4      Quadrat 4 – 2006 rehabilitation area







Q4	2010	2012	2013	2015
To north				
To east				
To south				



Q4	2010	2012	2013	2015
To west				
North east into centre				








**Table B2.5      Quadrat 5 – 2011 rehabilitation area**



Q5	2012	2013	2015
To north			
To east			
To south			

**Table B2.6      Quadrat 6 – 2011 rehabilitation area**



Q6	2012	2013	2015
To north			
To east			
To south			



## Appendix C

Quadrat results



# C1. Quadrat results

Table C1.1      Vegetation structure

Vegetation layer	Height: range (median) m	% foliage cover	Dominant species
Quadrat 1			
T1	8–16 (14)	35	<i>Acacia parramattensis</i> , <i>Allocasuarina littoralis</i> , <i>Eucalyptus pilularis</i> , <i>Eucalyptus oblonga</i> , <i>Angophora costata</i>
S1	0.5–3 (1.5)	10	<i>Daviesia genistifolia</i> , <i>Bossiaea lenticularis</i> , <i>Ozothamnus diosmifolius</i> , <i>Oxylobium ilicifolium</i> , <i>Acacia parramattensis</i>
G1	0.1–0.8 (0.4)	55	<i>Entolasia stricta</i> , <i>Bossiaea lenticularis</i> , <i>Lomandra longifolia</i> , <i>Panicum simile</i>
Notes:	Good regeneration continuing. Canopy developing. Good layer of leaf litter and some dead grass; Very low cover of weeds, No weedy shrubs, weeds present only in groundcover layer; good soil health - soil lichens and moss; fauna habitat moderate - no hollows or timber, limited groundcover, leaf litter developing; lots of birds present.		
Quadrat 2			
T1	4–12 (10)	15	<i>Angophora costata</i> , <i>Syncarpia glomulifera</i> , <i>Acacia parramattensis</i> ,
S1	0.5–3 (1)	25	<i>Hakea salicifolia</i> , <i>Acacia longifolia</i> , <i>Hakea sericea</i> , <i>Syncarpia glomulifera</i> , <i>Angophora costata</i>
G1	0.1–1.2 (0.5)	70	<i>Themeda australis</i> , <i>Hypochaeris radicata</i> *, <i>Andropogon virginicus</i> *, <i>Briza maxima</i> *
Notes:	Significant planting has been undertaken in the area. Lots of native seedlings, especially of <i>Hakea sericea</i> and <i>Eucalyptus</i> spp.Shrub layer is developing. Soil health developing with cryptograms present, <i>Themeda australis</i> dominant in patches; poor fauna habitat - no hollows, grass is dense, leaf litter developing, some senescent and fallen shrubs. Main weeds are <i>Andropogon virginicus</i> * and <i>Briza maxima</i> *.		
Quadrat 3			
T1	8–11 (9)	15	<i>Eucalyptus eugenoides</i> , <i>Angophora costata</i> , <i>Syncarpia glomulifera</i> , <i>Allocasuarina littoralis</i>
S1	2–5 (3)	50	<i>Acacia linifolia</i> , <i>Leptospermum polygalifolium</i> , <i>Hakea sericea</i> , <i>Persoonia levis</i> , <i>Acacia terminalis</i>
G1	0.1–1 (0.3)	64	<i>Entolasia stricta</i> , <i>Themeda australis</i> , <i>Andropogon virginicus</i> *, <i>Kunzea ambigua</i>
Notes:	Canopy developing and tall shrub layer evident. Few weeds, only occasional introduced grass; good regeneration of natives including seedlings from seedbank and mature plantings; some erosion; good soil health - soil lichens and moss common; fauna habitat poor - no hollows or timber, sparse understory, limited leaf litter, lots of small lizards present.		

Vegetation layer	Height: range (median) m	% foliage cover	Dominant species
Quadrat 4			
T1	1.5–5 (3.5)	10	<i>Banksia ericifolia</i> , <i>Kunzea ambigua</i> , <i>Hakea dactyloides</i>
S1	0.2–1 (0.6)	55	<i>Banksia ericifolia</i> , <i>Acacia longifolia</i> , <i>Acacia myrtifolia</i> , <i>Acacia ulicifolia</i> , <i>Leptospermum polygalifolium</i>
G1	0–0.5 (0.4)	80	<i>Themeda australis</i> , <i>Hakea sericea</i> , <i>Andropogon virginicus</i> *, <i>Leptospermum trinervium</i> , <i>Briza maxima</i> *, <i>Kunzea ambigua</i>
Notes:	Erosion evident from previous surveys has stabilized, no eucalypts present; good recruitment; good native groundcover dominated by <i>Themeda australis</i> ; soil health developing with good cover of cryptograms, fauna habitat poor - no hollows or timber, limited groundcover or leaf litter		
Quadrat 5			
T1	-	-	-
S1	0.3–3.5 (2.5)	45	<i>Acacia parramattensis</i> , <i>Acacia longifolia</i> , <i>Verbena bonariensis</i> *
G1	0–0.5 (0.3)	85	<i>Pennisetum clandestinum</i> *, <i>Andropogon virginicus</i> *, <i>Acacia parramattensis</i> , <i>Trifolium repens</i> *, <i>Conyza bonariensis</i> *, <i>Paspalum dilatatum</i> *

Notes:	Predominantly weedy groundcover, a diversity of <i>Acacia</i> spp. growing and some other native species germinating; leaf litter developing, shrub layer developing. Fauna habitat poor, evidence of kangaroos and rabbits.		
Quadrat 6			
T1	-	-	
S1	0.5–3.5 (2.5)	60	<i>Acacia parramattensis</i> , <i>Acacia longifolia</i> , <i>Acacia myrtifolia</i>
G1	0.1–0.6 (0.3)	80	<i>Pennisetum clandestinum</i> *, <i>Andropogon virginicus</i> *, <i>Acacia parramattensis</i> , <i>Sida rhombifolia</i> *, <i>Conyza bonariensis</i> *, <i>Plantago lanceolata</i> *, <i>Hypochaeris radicata</i> *
Notes:	Shrub layer developing with colonizing <i>Acacia</i> spp., regeneration of canopy species evident in groundcover including <i>Allocasuarina littoralis</i> and <i>Eucalyptus</i> spp., predominantly weedy groundcover of <i>Pennisetum clandestinum</i> *, <i>Andropogon virginicus</i> * although some regeneration of native ground cover species evident; Hard baked soil, with minor leaf litter and some gully erosion evident although exotic grasses are reducing erosion. Fauna habitat relatively poor, evidence of foxes and rabbits.		

Notes: T1= Tree layer; S1= Shrub layer; G1=Groundcover



Table C1.2      Quadrat results: groundcover, vegetation cover, slope and aspect

Characteristic	2010				2012						2013						2015					
	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Ground cover (% cover)																						
Bare soil	5	6	13	33	5	8	15	20	50	80	0	5	10	10	10	80	1	5	8	10	5	15
Litter	57	2	5	0	41	25	5	0	0	0	40	15	15	2	5	0	35	15	16	3	6	3
Timber	1	0	0	0	0	2	0	0	0	0	2	2	0	0	0	0	3	2	4	1	1	0
Rock	5	2	1	5	2	0	0	2	3	2	1	0	0	2	3	2	1	0	0	2	3	2
Cryptogram	2	0	1	2	2	0	10	2	0	0	2	10	10	5	0	0	5	8	8	4	0	0
Vegetation	30	90	80	60	50	65	70	76	47	18	55	68	65	81	82	18	55	70	64	80	85	80
Ground cover vegetation (% cover)																						
Native ground cover - grasses	20	15	70	25	28	10	53	45	1	0	44	25	43	60	15	5	40	22	40	58	12	3
Native ground cover - shrubs	2	2	5	2	3	3	5	5	5	5	3	2	10	10	5	5	5	2	10	10	10	7
Native ground cover - other	1	1	0	2	2	2	2	12	1	1	7	3	2	2	2	2	7	5	6	4	3	2
Exotic	7	72	5	30	10	50	10	20	40	12	1	38	10	9	60	6	3	41	8	8	60	68
Vegetation cover (% cover)																						
Total native groundcover	23	18	75	24	33	15	60	51	7	6	55	30	55	72	22	12	52	29	64	72	25	12
Native overstorey	30	10	10	0	25	15	10	0	0	0	25	15	15	0	0	0	37	15	15	5	0	0
Native midstorey	10	10	20	8	10	8	25	10	0	0	5	10	30	15	30	35	10	25	50	55	45	60
Exotic cover (all layers)	10	72	5	30	10	50	10	20	40	12	1	38	10	9	60	6	3	41	8	8	60	68
Slope (degrees)	3	6	8	6	3	6	8	6	5	4	3	6	8	6	5	4	3	6	8	6	5	4
Aspect	S	S	SE	SE	S	S	SE	SE	SW	S	S	S	SE	SE	SW	S	S	S	SE	SE	SW	S

**Table C1.3 Species recorded**

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Acacia brownii</i>	Heath Wattle			Y	Y	Y	Y	Y		2	2	2		
<i>Acacia decurrens</i>	Black Wattle				Y		Y	Y		3				
<i>Acacia falcata</i>				Y	Y	Y	Y	Y	1			1		1
<i>Acacia fimbriata</i>	Fringed Wattle				Y	Y	Y	Y					1	2
<i>Acacia hispidula</i>				Y										
<i>Acacia linifolia</i>	Flax-leaved Wattle		Y	Y	Y	Y	Y	Y	1	2	3	3		
<i>Acacia longifolia</i>				Y		Y	Y	Y		3		3	3	2
<i>Acacia myrtifolia</i>	Red-stemmed Wattle		Y	Y	Y	Y	Y	Y				1		1
<i>Acacia parramattensis</i>	Parramatta Wattle		Y	Y	Y	Y	Y	Y	3	3		3	3	4
<i>Acacia parvipinnula</i>				Y			Y	Y					3	3
<i>Acacia saligna</i>	Golden Wreath Wattle	*			Y									
<i>Acacia suaveolens</i>	Sweet Wattle		Y	Y	Y	Y	Y			1				
<i>Acacia terminalis</i>	Sunshine Wattle		Y	Y	Y	Y	Y	Y	1			3		
<i>Acacia trinervata</i>				Y			Y							
<i>Acacia ulicifolia</i>	Heath Wattle		Y	Y	Y	Y	Y	Y		1			1	1
<i>Acetosella vulgaris</i>		*					Y	Y					1	
<i>Acianthus fornicatus</i>	Pixie Caps		Y	Y			Y							
<i>Actinotus helianthi</i>				Y										
<i>Ageratina adenophora</i>	Crofton Weed	*	Y		Y			Y					1	

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Agrostis avenacea</i>						Y	Y	Y					1	
<i>Aira caryophyllea</i>	Silvery Hairgrass	*						Y				1		
<i>Allocasuarina littoralis</i>	Black Sheoak		Y	Y	Y	Y	Y	Y	4	1	2	2	1	2
<i>Anagallis arvensis</i>	Scarlet Pimpernel	*				Y	Y	Y		1			2	1
<i>Andropogon virginicus</i>	Whisky Grass	*			Y	Y	Y	Y	1	3	2	3	3	3
<i>Angophora bakeri</i>	Narrow-leaved Apple		Y	Y	Y	Y	Y							
<i>Angophora costata</i>	Sydney Red Gum		Y	Y	Y	Y	Y	Y	3	4	3	1		
<i>Anisopogon avenaceus</i>				Y										
<i>Araujia sericifera</i>	Moth Vine	*	Y											
<i>Aristida benthamii</i>				Y										
<i>Aristida vagans</i>	Threeawn Speargrass		Y	Y										
<i>Aristida warburgii</i>				Y										
<i>Astroloma humifusum</i>				Y										
<i>Astroloma pinifolium</i>				Y										
<i>Austrodanthonia fulva</i>				Y										
<i>Austrodanthonia tenuior</i> (now <i>Rytidosperma tenuius</i> )				Y			Y	Y					2	
<i>Austrostipa pubescens</i>			Y	Y										
<i>Banksia ericifolia</i>	Heath Banksia				Y	Y	Y	Y		1		4		



<i>Cassytha pubescens</i>				Y									
<i>Caustis flexuosa</i>				Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Centaurium erythraea</i>		*				Y	Y	Y		2		1	1	
<i>Ceratopetalum apetalum</i>	Coachwood		Y											
<i>Cheilanthes sieberi</i>				Y			Y	Y	1					
<i>Clematis aristata</i>			Y					Y	1					
<i>Comesperma ericinum</i>	Pyramid flower		Y											
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	*	Y		Y	Y	Y	Y					2	2
<i>Corymbia eximia</i>				Y				Y	1					
<i>Corymbia gummifera</i>	Red Bloodwood		Y	Y										
<i>Cyathochaeta diandra</i>				Y										
<i>Cynodon dactylon</i>	Couch						Y	Y		1		1	2	2
<i>Cyperus ?polystachyos</i>						Y	Y							
<i>Daviesia acicularis</i>				Y										
<i>Daviesia corymbosa</i>				Y										
<i>Daviesia genistifolia</i>	Broom Bitter Pea			Y	Y	Y	Y	Y	1	1				
<i>Daviesia squarrosa</i>				Y										
<i>Dianella caerulea</i>			Y	Y		Y	Y	Y		1	1			
<i>Dianella prunina</i>			Y	Y	Y	Y	Y							

<i>Dianella revoluta</i> var. <i>revoluta</i>				Y									
<i>Dichelachne crinite</i>	Long-haired Plume Grass						Y						

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Dillwynia acicularis</i>				Y										
<i>Dillwynia parvifolia</i>				Y										
<i>Dillwynia retorta</i>				Y	Y	Y	Y							
<i>Dodonaea pinnata</i>				Y										
<i>Dodonaea triquetra</i>				Y				Y						1
<i>Drosera auriculata</i>				Y										
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>				Y										
<i>Einadia hastata</i>	Berry Saltbush		Y											
<i>Entolasia stricta</i>	Wiry Panic		Y	Y	Y	Y	Y	Y	3		3			
<i>Entolasia whiteana</i>				Y										
<i>Epacris pulchella</i>	NSW Coral Heath			Y	Y									
<i>Epacris purpurascens</i> var. <i>purpurascens</i>				Y										
<i>Eragrostis benthamii</i>				Y										
<i>Eragrostis brownii</i>	Brown's Lovegrass			Y	Y	Y	Y	Y	2		2			
<i>Eragrostis leptostachya</i>	Paddock Lovegrass							Y			2			



<i>Eriostemon australasius</i>				Y										
<i>Eucalyptus ?saligna</i>					Y	Y								
<i>Eucalyptus beyeriana</i>				Y										
<i>Eucalyptus crebra</i>				Y										

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark		Y	Y	Y	Y	Y	Y		1	3			
<i>Eucalyptus notabilis</i>				Y	Y									
<i>Eucalyptus oblonga</i>	Stringybark			Y	Y	Y	Y	Y	3					
<i>Eucalyptus pilularis</i>				Y				Y	3					
<i>Eucalyptus punctata</i>	Grey Gum		Y	Y	Y	Y	Y	Y	2					
<i>Eucalyptus resinifera</i> subsp. <i>resinifera</i>				Y										
<i>Eucalyptus scias</i> subsp. <i>scias</i>				Y										
<i>Eucalyptus sclerophylla</i>			Y	Y										
<i>Eucalyptus</i> sp.						Y	Y	Y						2
<i>Eucalyptus sparsifolia</i>	Narrow-leaved Stringybark		Y	Y										
<i>Eucalyptus squamosa</i>				Y										
<i>Exocarpos cupressiformis</i>	Native Cherry				Y	Y	Y	Y	1					
<i>Exocarpos strictus</i>	Dwarf Cherry		Y	Y		Y								



[illegible][illegible]

<i>Hybanthus monopetalus</i>				Y										
<i>Hypochaeris radicata</i>	Catsear	*			Y	Y	Y	Y	1	2		2		
<i>Imperata cylindrica</i> var. <i>major</i>	Bladey Grass		Y	Y	Y	Y	Y	Y	1		2			
<i>Isopogon anemonifolius</i>				Y										
<i>Jacksonia scoparia</i>				Y										
<i>Juncus</i> sp.			Y		Y	Y		Y		1	1		1	1
<i>Kunzea ambigua</i>	Tick Bush			Y	Y	Y	Y	Y	2		4	3		

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Lagenifera gracilis</i>				Y										
<i>Lambertia formosa</i>	Mountain Devil			Y										
<i>Lasiopetalum ferrugineum</i>				Y										
<i>Lasiopetalum rufum</i>				Y										
<i>Laxmannia gracilis</i>				Y										
<i>Lepidosperma latens</i>				Y										
<i>Lepidosperma laterale</i>			Y	Y	Y	Y	Y	Y	2					
<i>Leptomeria acida</i>				Y										
<i>Leptospermum parvifolium</i>				Y										
<i>Leptospermum polygalifolium</i>								Y		2	1	3	1	

[illegible]



Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Logania pusilla</i>				Y										
<i>Lomandra confertifolia</i> subsp. <i>rubiginosa</i>				Y										
<i>Lomandra cylindrica</i>				Y										
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>				Y										
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>				Y										
<i>Lomandra glauca</i>				Y										
<i>Lomandra gracilis</i>			Y	Y										
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush		Y		Y	Y	Y	Y	2	1	1	2		
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>			Y	Y										
<i>Lomandra obliqua</i>			Y	Y										
<i>Lomatia silaifolia</i>	Crinkle Bush		Y	Y										
<i>Macrozamia spiralis</i>			Y	Y										
Medicago sp.		*				Y								
<i>Melaleuca nodosa</i>				Y										
<i>Micrantheum ericoides</i>				Y										
<i>Microtis</i> sp.						Y		Y		1		1		

<i>Mirbelia rubiifolia</i>				Y										
<i>Monotoca scoparia</i>				Y										

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Myrsiphyllum asparagoides</i>	Florist's Smilax	*	Y											
<i>Olearia microphylla</i>				Y										
<i>Opercularia diphylla</i>				Y										
<i>Opercularia varia</i>				Y										
<i>Oxalis perennans</i>					Y	Y	Y	Y	1					
<i>Oxylobium ilicifolium</i>	Prickly Shaggy Pea		Y		Y	Y	Y	Y	2					
<i>Ozothamnus diosmifolius</i>	White Dogwood		Y	Y	Y	Y	Y	Y	2					
<i>Pandorea pandorana</i>	Wonga Vine		Y											
<i>Panicum simile</i>	Two-colour Panic		Y	Y	Y	Y	Y	Y	3		2			
<i>Paspalum dilatatum</i>	Paspalum	*			Y	Y	Y	Y	2	1			2	2
<i>Passiflora sp.</i>	Passionfruit		Y											
<i>Patersonia glabrata</i>				Y										
<i>Patersonia longifolia</i>				Y										
<i>Patersonia sericea</i>				Y										
<i>Pennisetum clandestinum</i>		*				Y	Y	Y					3	3



<i>Platysace lanceolata</i>			Y										
<i>Platysace linearifolia</i>				Y									
<i>Poa labillardierei</i> var. <i>labillardierei</i>			Y				Y						
<i>Podolobium scandens</i>				Y									
<i>Polyscias sambucifolia</i>	Elderberry Panax		Y										

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Pomax umbellata</i>			Y	Y										
<i>Poranthera microphylla</i>			Y											
<i>Pratia purpurascens</i>	Whiteroot		Y	Y										
<i>Prostanthera howelliae</i>				Y										
<i>Pteridium esculentum</i>	Bracken				Y	Y	Y	Y			1			
<i>Pterostylis acuminata</i>				Y										
<i>Pterostylis longifolia</i>				Y										
<i>Pultenaea ferruginea</i>				Y										
<i>Pultenaea microphylla</i>			Y											
<i>Pultenaea polifolia</i>				Y										
<i>Pultenaea scabra</i>			Y	Y										
<i>Pultenaea tuberculata</i>				Y										
<i>Pultenaea villosa</i>				Y		Y	Y	Y		1			2	2





Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area				Quadrat results (2015)					
					2010	2012	2013	2015	1	2	3	4	5	6
<i>Xanthorrhoea media</i>				Y										
<i>Xanthorrhoea minor</i> <i>subsp. minor</i>				Y										
<i>Xanthorrhoea resinifera</i>				Y										
<i>Xanthorrhoea sp.</i>	Grass tree		Y											
<i>Xanthosia pilosa</i>				Y										
<i>Xanthosia tridentata</i>				Y			Y							
<i>Xylomelum pyrifforme</i>	Woody Pear		Y	Y										
<i>Trachymene incisa</i> <i>subsp. incisa</i>				Y										
<i>Tricoryne simplex</i>				Y										
<i>Trifolium arvense</i>	Haresfoot clover	*				Y	Y	Y		2		2	2	
<i>Trifolium repens</i>	White Clover	*			Y	Y	Y	Y		2			2	1
<i>Verbena bonariensis</i>	Purpletop	*			Y	Y	Y	Y		2			2	2
<i>Veronica plebeia</i>	Trailing Speedwell		Y											
<i>Vicia sativa</i>		*			Y	Y		Y		2		1	2	1
<i>Wahlenbergia stricta</i>	Tall Bluebell				Y	Y	Y	Y		1				1
<i>Xanthorrhoea concava</i>				Y										

Notes:

Cover abundance scores:

- (1) 5% - rare or few individuals
- (2) <5% common
- (3) 5–25%
- (4) 25–50%
- (5) 50–75%
- (6) 75–100%

# **ATTACHMENT 14**

## **COMMUNITY CONSULTATIVE COMMITTEE MEETING MINUTES**

**Community Consultative Committee  
Hitchcock Road and Lot 198 Maroota  
Sand Extraction and Rehabilitation Projects**

**Minutes  
10 November 2015**

**Attendance**

Kristine McKenzie – The Hills Shire Council (THSC) - Chairperson

Daniel Giffney – The Hills Shire Council (THSC)

Marianne Sheumack – Resident

Shaunagh Hitchcock – Resident

Lisa Aylward - Resident

John Graham – PF Formation (PF)

Peter Cummins – PF Formation (PF)

Joshua Graham – PF Formation (PF)

Apologies: None

**Minutes of Previous Meeting**

☐ Accepted

**Matters Arising from Minutes**

- ☐ EPA review of licences. The EPA have visited the site as part of the risk based licensing system they are introducing. There has been no correspondence with them since the visit.

**Report on Current Status of Operations by John Graham (PF)**

- There have been no complaints in the last 6 months
- The access road width near Wisemans Ferry Road has been reduced. When it was first built 24 years ago it encroached on the adjoining crown land. That land is now owned by the Deerubbin Aboriginal Land Council and they brought this matter to our attention. PF has ripped up the excess road width so that all vehicles travel on the licenced area.
- The access near Wisemans Ferry Road will be re-asphalted as a means to improve dust control around that intersection.
- Operations are becoming less routine as PF heads towards the highest point on the site. The overburden is getting thicker at a time when the saleable material is getting thinner. Production is slower and more expensive.
- Penrith Lakes Development Corporation has recently closed production after supplying the majority of Sydney's sand and gravel for over 50 years. This closure when combined with the increased building industry activity is placing a big demand on Sydney's sand availability. PF is currently at full capacity. ☐ No new planting has occurred recently.
- A change to the washplant mentioned previously will be installed early in the new year to improve the sandstone washing capability

### **Reporting**

- The Annual Environmental Management Report (AEMR) for the year ended 30 June 2015 is on our website for review
- To improve the frequency of information updates on the website PF is now uploading the results of noise, dust and downstream water monitoring each quarter
- The Department of Planning (DOP) has not responded to our updated strategies/plans/programs sent to them in 2014. As a result of matters raised in the DOP audit (discussed below) these documents will be revised and sent to the DOP for approval.

### **Environmental Matters**

- The most recent monitoring reports for the September quarter on dust, noise and downstream as uploaded to the website monitoring were discussed

### **DOP Audit**

- The DOP have a new compliance division and they conducted an environmental audit in August. A draft report has been sent to PF Formation and each item of the audit findings was discussed.
- The majority of the items were described as 'administrative non-compliances'. The strategies/plans/programs submitted to the DOP in 2014 will be revised to take account of most of the administrative matters raised.
- Whilst PF disagrees with several matters it accepts that improvements are required in areas such as dust prevention and minimizing exposed areas.

### **Other Matters Discussed**

- General discussion on trucks at Maroota including the total numbers and their impact.

### **Site Visit**

- A site inspection was conducted.

### **Next Meeting**

- 10.00 am Tuesday 3 May 2016



**Community Consultative Committee  
Hitchcock Road and Lot 198 Maroota  
Sand Extraction and Rehabilitation Projects**

**Minutes  
2 May 2016**

**Attendance**

Kristine McKenzie – The Hills Shire Council (THSC) - Chairperson

Robert Buckham – The Hills Shire Council (THSC)

Shaunagh Hitchcock – Resident

Lisa Aylward - Resident

John Graham – PF Formation (PF)

Peter Cummins – PF Formation (PF)

Joshua Graham – PF Formation (PF)

Apologies:

Daniel Giffney – The Hills Shire Council (THSC)

Marianne Sheumack – Resident

Megan Dawson – Department of Planning ('DOP')

**Minutes of Previous Meeting**

- Accepted

**Matters Arising from Minutes**

- None

**Report on Current Status of Operations by John Graham (PF)**

- There have been no complaints in the last 6 months
- The access road had been reduced in width and in December it was sealed to prevent dust tracking to Wisemans Ferry Road
- A new purpose built water tank has been built with more sprays to improve the dust suppression.
- The previous water truck has been registered and a new 12,000 litre tank replaced the old tank. It now has all the fire brigade fittings so that it may assist in time of fires. It also has been registered and fitted with front spray bars to improve the watering capability.

- The quarry operations have settled down a lot more and operations have been more routine.
- Recently PF have had further survey markers placed around the site to better demonstrate how the extraction depths are monitored
- Recently PF have installed a modification to the washplant to improve the fine sand washing capability.

### **Reporting**

- PF Formation has now received a response from the Department of Planning relating to the updated monitoring strategies/plans/programs and reviewed vegetation offset bond sent to the Department last year. In general they are happy with the Plans but some minor queries are to be completed and the Plans to be sent to other Government Departments for comment.
- Quarterly updating of the website is continuing.
- The summary of the audit findings of the DOP for all sand quarries in the State was reviewed and discussed.
- The PF Formation "Summary of Project Approval Non-Compliances" was discussed with the main issues being dust and improving controls to ensure material is not tracked on public roads. The sealing of the road to Wisemans Ferry Road and the new water trucks were the major actions taken by PF Formation in response to the audit.

### **Environmental Matters**

- The monthly dust deposit results were reviewed and discussed.
- The dust results were very low with no aberrations.
- No new vegetation rehabilitation has occurred recently although soil is stored ready for use. Significant reshaping of the land has been done.

### **Other Matters Discussed**

- PF gave an update on its future development plans in Maroota.

### **Site Visit**

- A site inspection was conducted.

### **Next Meeting**

□ 10.00 am Tuesday 8 November 2016

## **PF Formation (Hitchcock Road Sand Extraction and Rehabilitation Project) Sand Quarry**

### **Compliance Audit as part of State Sand Quarries Campaign (May – August 2015)**



*PF Formation (Hitchcock Road) Sand Quarry – Processing area*

Audit site inspection: 5 August 2015

## Abbreviations

AEMR	Annual Environmental Management Report
DP&E	NSW Department of Planning and Environment
EA	Environmental Assessment
Mod	Modification
The Act	Environmental Planning and Assessment Act 1979

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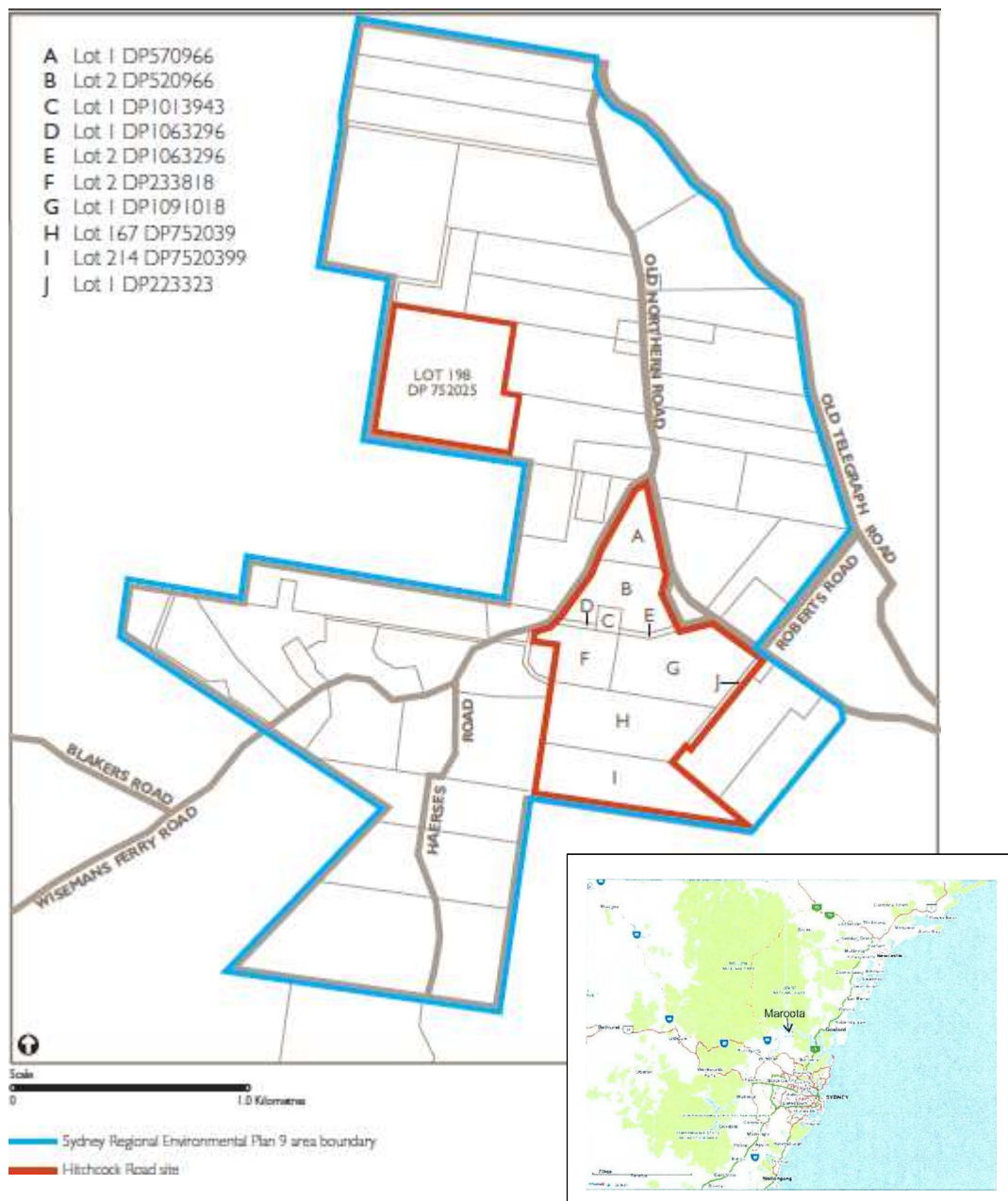
## 1 Introduction

The Department of Planning and Environment (DP&E) operates a strategic campaign audit program. A NSW-based operating sand quarries audit campaign was undertaken by the Department between May and August 2015. This report has been prepared to document the findings of compliance audit of the Hitchcock Road Sand Extraction and Rehabilitation Project (PF Formation Sand Quarry) operated by Etra Pty Ltd.

The Project Approval (06\_0104) for PF Formation Sand Quarry was granted by the then NSW Minister for Planning on 3 February 2009.

PF Formation Sand Quarry operations are located in Maroota, approximately 40 kilometres north of Parramatta (see Figure 1). The approval covers approximately 75 hectares.

Bulldozers strip topsoil and overburden from various pits within the project site and excavators then put raw material into dump trucks for transport to the on-site fixed processing or slurry plant located in the northern portion of the site. The coarse sand is initially screened and washed then pumped via a slurry pipeline under Wisemans Ferry Road to the main processing plant located approximately 750 metres to the north-west. The main processing plant, together with offices, workshops, concrete batching plant, fuel storage, weigh bridge loading and processed sand storage are located on Lot 198 DP752025. The processed sand is stockpiled then transported to markets for use in metropolitan Sydney's construction industry.



**Figure 1: PF Formation Sand Quarry**

Image taken from PF Formation – Environmental Strategy.

The compliance audit was undertaken by Chris Schultz and Anthony Pizzolato, Senior Compliance Officers with the DP&E. The site component of the compliance audit was conducted on 5 August 2015.

## 1.1 Objectives / Scope

The objectives of this compliance audit were to:

- review compliance with the conditions of the Project Approval and identify areas where data gaps were present or proponent non compliances were likely; and
- assess the environmental performance of each operation and the ability of each quarry's environmental management systems and controls specifically relating any areas identified through the desktop review or subsequent site inspection.

The assessment of compliance against the Project Approval conditions and Statement of Commitments, included compliance with the Landscape Management Plan (2011 and 2014) required by the conditions and relevant commitments in the quarry's Environmental Assessment (EAs).

The compliance audit scope also included undertaking an overall review of the performance of PF Formation Sand Quarry as it relates to groundwater and landscape management. Each audit scope included the 2014/ 2015 calendar year up to, and including, the date of the site inspections.

DP&E advised that the following compliance matters, typical of a compliance audit, were specifically excluded from the scope of the audit: Environment Protection Licence (EPL) conditions, Mining Lease (ML) conditions and other licences, such as Water Access Licence conditions.

## 1.2 Compliance Audit Criteria

The compliance audit assessed the level of compliance and the environmental performance of PF Formation Sand Quarry's operations against the following approvals:

- The Project Approval (PA 06\_0104);
- Strategies, plans or programs relating to landscape/rehabilitation issues, which have been prepared for the Project in accordance with the conditions of the Project Approval, including the Landscape Management Plan (2011 and 2014).

## 1.3 Limitations

The findings of the compliance audit are based upon visual observations of the site and its vicinity, interviews with site personnel and our interpretation of documentation provided by PF Formation Sand Quarry.

Opinions presented herein apply to the site as it existed at the time of the audit and from information provided by site personnel and government agencies. Any changes to this information of which the DP&E is not aware and has not had the opportunity to evaluate therefore cannot be considered in this report.

Auditors have taken due care to consider all reasonably available information provided during the undertaking of this audit and have taken this information to represent a fair and reasonable characterisation of the environmental status of the site, but recognise that any site assessment program is necessarily limited in scope and true site conditions may differ from those inferred from the available data.

## 2 Compliance Audit Methodology

The process for the compliance audit involved a review of documentation and samples of records provided by PF Formation Sand Quarry, and a site inspection of the quarrying operations to determine the level of environmental performance and compliance of the Project in relation to implementation of the conditions of the Project Approval. The compliance audit process is described in more detail in **Section 2.1 to 2.5**.

### 2.1 Preliminary Document Review

The Department of Planning and Environment (DP&E) reviewed the conditions of the Project Approval and EAs for the operation and the management plans that have been prepared in accordance with the Project Approval. Documents reviewed prior to the site inspection were from the proponent's website and the DP&E server/ document management system.

### 2.2 Site Inspection and Interviews

The DP&E compliance audit team introduced itself to the quarry's management team and outlined the purpose, depth and scope of the compliance audit being undertaken.

DP&E conducted a site inspection of PF Formation Sand Quarry with John Graham (Director), Peter Cummins (General Manager) and Joshua Graham (Operations Manager) on 5 August 2015. The inspections included visits of operational and non-active operational areas in order to assess the effectiveness of environmental management and associated compliance across the quarry. A selection of photographs taken during the inspection is provided in **Appendix 1**. Locations inspected included but are not limited to:

- The extraction, tailings dams and rehabilitation areas on the eastern side of Wisemans Ferry Road;
- The extraction area and buffer zones off Hitchcock Road;
- The processing plant; and
- The workshop area, diesel storage and oily water sump.

### 2.3 Evaluation of Compliance against the Audit Criteria

The level of impact of non-compliances were assessed utilising the Risk Analysis Matrix outlined in the Draft Guidelines – Independent Environmental Audits of Mining Projects (DP&E 2014) which assesses the likelihood of an impact occurring and the estimated level of impact to produce an overall risk ranking of high, moderate or low.

<i>Likelihood of impact occurring</i>	<i>Estimated level of impact</i>			
	<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>Administrative, non-compliance</i>
<i>Almost certain</i>	High	High	Moderate	
<i>Likely</i>	High	Moderate	Low	
<i>Unlikely</i>	Moderate	Low	Low	
				Administrative non-compliance

Figure 1 – Risk Analysis Matrix (Table 1 from the Draft Guidelines – Independent Environmental Audits of Mining Projects (DP&E 2014))

A non-compliance assessed as **high** is of considerable environmental significance and therefore must be dealt with and resolved as a matter of priority. A **moderate** assessment for non-compliance is still a significant risk of harm to the environment however it can be given a lower priority than a red risk assessment. A non-compliance assessed as **low** suggests that it could receive a lower priority but still must be attended to.

There are also a number of licence and operating conditions, such as those relating to administration and reporting requirements that do not have a direct environmental /community significance, but are still important to the integrity of the regulatory system. Non-compliance with these conditions is given an **Administrative** rating.

## 2.4 Determining the Significance of Breaches/ Enforcement

Non-compliances (Section 2.3) shall be assessed in accordance with the Department's Compliance Policy (September 2010) to determine the significance of the breach and to enact appropriate enforcement response.

Enforcement action, as required, shall be completed separate to the audit process.

## 2.5 Reporting

Following the completion of the site compliance audit, the Project Approval compliance checklists were completed and compliance audit notes were reviewed in order to compile a list of outstanding matters to be noted in the compliance audit reports. Reports were prepared for each quarry to provide an overview of the status of compliance by reference to the relevant compliance documentation and any other observations made during the site inspections and interviews. These reports were prepared primarily on an exception basis, highlighting any areas where action or improvement is required.



## 3 Compliance Audit Findings

### 3.1 Project Approval

PF Formation Sand Quarry was found to be operating generally in compliance with the conditions of the Project approval and Statement of Commitments; however, 15 administrative non-compliances and seven (7) low risk non-compliance with conditions were identified where action is required to ensure compliance is achieved. A number of performance observations were also made.

A completed compliance checklist against the conditions of the Project Approval is included in **Appendix 2** and Statement of Commitments in **Appendix 3**. A summary of the non-compliance issues is provided in Table 1 and Table 2 respectively.

**Table 1: Summary of Project Approval Non- Compliances**

ID number	Condition	Details of Non-compliance	Risk Rating	Recommendation
1.1	Schedule 2 Condition 1	Existing controls to prevent tracking of material on to public roads were observed to be ineffective, as tracked material was observed on the public road on the day of the audit.	Non - Compliant (Low Risk)	Implement additional or improve current controls to ensure material is not tracked on to public roads.
1.2	Schedule 3 Condition 11	The system to minimise dust emissions from the site was observed to be ineffective, as on the day prior to the inspection, dust emissions from the site were visible across Old Northern Road.  A water truck and road broom are in operation on the site, however there are no sprinklers on the stockpile.	Non - Compliant (Low Risk)	Review dust suppression techniques for all dust sources to minimise dust generation.
1.3	Schedule 3 Condition 36	The diesel fuel storage facility was inspected. The diesel fuel dispenser is located outside of the bund wall, with a refuelling hose attached. If the nozzle or hose was damaged, fuel would spill on to the ground. In addition, the tank is located very close to the bund wall, which may be non-compliant with the tan theta rule in AS 1940. A plan of the facility was provided that was signed off by an accredited consultant; however this plan does not include the location of the diesel fuel bowser or the exact location of the tank within the bund.  A spill from an oil drum was noted on the sealed area in front of the workshop. No attempt to clean the spill up had been made at the time of the inspection.	Non - Compliant (Low Risk)	Implement controls to prevent spillage from the bowser occurring on to unsealed ground.  Undertake an assessment of the facility to ensure that all components of the facility are compliant with AS 1940.
1.4	Schedule 3 Condition 3c	The Maximum Extraction Depth Map was submitted on 19 May 2009 (not done within 3 months of the date of the approval).	Non - Compliant (Administrative)	
1.5	Schedule 3 Condition 4	Letter sent dated 12/9/2014 indicating that no change was required to the Maximum Extraction Depth Map (letter not sent within 3 months).	Non - Compliant (Administrative)	

ID number	Condition	Details of Non-compliance	Risk Rating	Recommendation
1.6	Schedule 3 Condition 12 c and d	There is no explanation in the Air Quality Monitoring Program as to how monitoring of and compliance against the TSP/PM <sub>10</sub> parameters will be determined. A PM <sub>10</sub> Action Plan is provided in the AEMR (as attachment 5D), however is not included in the AQMP.	Non - Compliant (Administrative)	Provide an explanation in the Air Quality Monitoring Program as to how monitoring of and compliance against the TSP/PM <sub>10</sub> parameters will be determined.
1.7	Schedule 3 Condition 19 a, b and c	Detailed baseline data is not included in the Surface Water Monitoring Program.  Stream health assessment criteria are not included in the Water Management Program.  A program to monitor stream health is not included in the Water Management Program.	Non - Compliant (Administrative)	Include baseline data in the Surface Water Monitoring Program.  Amend Water Management Program to include stream health assessment criteria.  Amend Water Management Program to include a program for the monitoring of stream health.
1.8	Schedule 3 Condition 20 d	The Groundwater Monitoring Program (Chapter 8) of the Water Management Plan) does not provide auditable commitments for monitoring of water levels and water quality from monitoring bores.  The Plan states that monitoring of impacts on springs and seeps and groundwater dependent ecosystems is not required as sand extraction will remain above the required buffer zone of two metres above the wet weather water table.	Non - Compliant (Administrative)	Commitments for groundwater quality and level monitoring and management to be clearly outlined in the Water Management Plan and reported in the AEMR, including water level trends for at least the past three years.  Water level results are to be compared to extraction levels to confirm that the 2 metre extraction limit above the established wet weather groundwater level is being maintained.
1.9	Schedule 3 Condition 23	Suitable arrangements to provide appropriate long-term security for offset areas have not been made. A proposal was provided to the Department however a response has not been received. It is the responsibility of the proponent to ensure that the requirements of the	Non - Compliant (Administrative)	Response to be sought by the Secretary seeking approval of the long term strategy for the offset areas.

ID number	Condition	Details of Non-compliance	Risk Rating	Recommendation
		condition are met.		
1.10	Schedule 3 Condition 25 d	A detailed description of the required parameters is not provided for undertaking pre-clearance surveys and collecting and propagating seed for rehabilitation works (noted that these were included in the 2011 plan however were removed from the resubmitted 2014 plan).	Non - Compliant (Administrative)	Include all required information in the Landscape Management Plan.
1.11	Schedule 3 Condition 26 a, b and e	No provision for certification from a qualified geotechnical engineer that the final proposed landform is stable included in QMP submitted 2014 or approved 2011.  Criteria for closure of the quarry are not included.  While Section 4.6 is included, there are no performance monitoring measures.	Non - Compliant (Administrative)	Amend Quarry Management Plan to include provision for certification from a qualified geotechnical engineer that the final proposed landform is stable.  Amend Quarry Management Plan to define the objectives and criteria for closure of the quarry.  Amend Quarry Management Plan to describe how the performance of these measures would be monitored over time.
1.12	Schedule 3 Condition 39 b	The proponent noted that the information provided in this form is commercially sensitive and that the forms will not be included in versions of the AEMR that are publically available. It was noted that the form included information from all PF Formation operations in the area (not only operations covered by PA 06_0104).	Non - Compliant (Administrative)	Production data for PA 06_0104 is to be provided in the future AEMRs.
1.13	Schedule 5 Condition 1 d	Cumulative impacts not specifically mentioned in Environmental Management Strategy document, however they are mentioned in the Noise Management Plan and Air Quality Management Plan.	Non - Compliant (Administrative)	Section to be included in Environmental Management Strategy discussing cumulative impacts of the operation.
1.14	Schedule 5 Condition 5 e and f	Analysis of results against limits provided, however there is no comparison between years for noise and surface water monitoring results.  No trends available for noise and surface water monitoring results.	Non - Compliant (Administrative)	Provide a comparison between years for noise and surface water monitoring results, and a discussion of trends for all monitoring results.

<b>ID number</b>	<b>Condition</b>	<b>Details of Non-compliance</b>	<b>Risk Rating</b>	<b>Recommendation</b>
1.15	Schedule 5 Condition 6 and 6a	IEA 2014 states delayed approval of auditor in July 2010 resulted in first audit dated April 2011.  Environmental Planning was endorsed by the Director-General to undertake the 2011 audit; however endorsement was not sought for the 2014 audit. It is a requirement that auditors are endorsed prior to each audit to ensure any requirements of the Department are assessed as part of the audit.	Non - Compliant (Administrative)	Seek endorsement for IEA Auditors prior to each audit.
1.16	Schedule 5 Condition 11 b	The AEMR provides an annual update of results. It is not considered that this is a regular update.	Non - Compliant (Administrative)	Provide a regular summary of monitoring results on the website.

**Table 2: Summary of Statement of Commitments Non- Compliances**

ID number	Condition	Details of Non-compliance	Risk Rating	Recommendation
2.1	Erosion and Sediment Control	The nature of extracting from different areas to meet customer requirements requires areas to remain open, however extensive areas of exposed land were observed. Aside from the area which has been rehabilitated, no cover crops were observed on site to minimise exposed areas.  It cannot be confirmed that sediment basins on site meet the specified design criteria.	Non - Compliant (Low Risk)	Exposed areas to be maintained at a minimum.  Exposed areas not in use to be stabilised with an appropriate cover crop and watered until well established.
2.2	Rehabilitation	There were significant exposed areas on the site. Apart from the areas which have been rehabilitated and the bunds, no other areas appear to have been seeded.	Non - Compliant (Low Risk)	Exposed areas of the site to be seeded with an appropriate vegetation cover where no activity is to take place for more than four weeks.
2.3	Visual Amenity	The height of the bunds is variable, with not all bunds being at least three metres high. The slopes of the bunds was not checked. The IEA notes that a complete vegetated bund needs to be established along the Hitchcock Road boundary.	Non - Compliant (Low Risk)	
2.4	Hazard, Risk and Safety	A spill from an oil drum was noted on the sealed area in front of the workshop. No attempt to clean the spill up had been made at the time of the inspection.	Non - Compliant (Low Risk)	
2.5	Water Management	EMS nominates 7,800 m3 northern catchment and 19,400 m3 southern catchment, which is not consistent with the design criteria in the SoC.  No annual reports on the effectiveness of the retention basins have been prepared to date.	Non - Compliant (Administrative)	Annual reports on the effectiveness of the retention basins to be prepared.
2.6	Emergency Response	It was indicated that the emergency response procedures are not being reviewed and updated bi-annually.	Non - Compliant (Administrative)	



### 3.2 Management Plans

PF Formation Sand Quarry has developed environmental management strategies, plans and monitoring programs for the Project in accordance with the relevant requirements of the Project Approval. These documents address specific environmental impacts associated with the Project and reflect the requirements detailed in the Project Approval. The documents required to be prepared by the Project Approval and reviewed as part of this audit, including the Landscape Management Plan (2011 – approved and 2014 - submitted).

No auditable commitments for groundwater management were included in the Water Management Plan.

A complete compliance checklist against the commitments of these plans is included in **Appendix 3** (Landscape Management). A summary of the non-compliance issues related to this management plan is provided in **Table 3**.

PF Formation Sand Quarry was found to be generally operating in compliance with commitments of the management plan; however one (1) administrative non-compliance with commitments were identified where action is required to ensure compliance is achieved. A number of performance observations were also made (**Appendix 3**).

**Table 3: Landscape Management Plan Non- Compliances**

ID number	Section of Plan	Details of Non-compliance	Risk Rating	Recommendation
3.1	3.3.8 - Conserving and reusing topsoil	It was indicated during the site inspection that topsoil is being used in bunds around the site. There is inconsistency between this commitment and conditions of consent regarding bunds i.e. bunds will not exceed 3 metres in height.	Non - Compliant (Administrative)	Survey to be undertaken of the site of all bunds to confirm compliance with relevant conditions.

## 4 Conclusion

The compliance audit of the PF Formation Sand Quarry consent (PA 06\_0104), Statement of Commitments and the associated Landscape Management Plan identified an adequate level of compliance, whilst also identifying several non-compliances and administrative non-compliances.

In summary, PF Formation Sand Quarry was found to be operating generally in compliance with a number of conditions and/or commitments. However, 16 administrative non-compliances and seven (7) low risk non-compliances with conditions and /or commitments (or sub elements of conditions/commitments) were identified where action is required to ensure compliance is achieved.

The key non-compliance issues identified as part of the compliance audit against the PF Formation Sand Quarry Development Consent and Statement of Commitments are in relation to dust emissions, tracking of material on to public roads, rehabilitation of exposed areas and the potential risk associated with the diesel storage facility. For further information please refer to **Section 3.1** and **Table 1** and **Table 2**.

Furthermore, a completed compliance checklist against the conditions of the Project Approval is included in **Appendix 2** and Statement of Commitments in **Appendix 3**.

The key non-compliance issue with respect to the Landscape Management Program relates to the compliance of site bunds with commitments. For further information please refer to **Section 3.2, Table 3**.

In relation to the above non-compliances identified in Tables, 1, 2 and 3, all non-compliances will be actioned in accordance with the DP&E Compliance Policy.

## Appendix 1 – Photographs *(all photos taken 5 August 2015)*

**Photograph 1:** Primary screening



**Photograph 2:** Vegetated bund on eastern side of site.





**Photograph 3:** Tailings dam – looking south-east



**Photograph 4:** Tailings dams – looking south





**Photograph 5:** Extraction Face – Trig Hill – looking west



**Photograph 6:** Rehabilitation area signage





**Photograph 7:** Road between natural vegetation (left) and rehabilitated area (right).



**Photograph 8:** Pit highwall at extraction area adjacent to Hitchcock Road – looking north.





**Photograph 9:** Extraction area adjacent to Hitchcock Road – looking east.



**Photograph 10:** Diesel fuel storage facility.





**Photograph 11:** Oily water inceptor/silt pond near workshop area.



**Photograph 12:** Oil spill from drum at workshop.





**Photograph 13:** Sediment pond adjacent to processing area.



**Photograph 14:** Sand processing/stockpile area.



**Photograph 15:** Entry signage on Wisemans Ferry Road.



**Photograph 16:** Material being tracked on to Wisemans Ferry Road from both the eastern and western sites.



## Appendix 2 – Compliance Checklist

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
2	1	Administrative	The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.	Existing controls to prevent tracking of material on to public roads were observed to be ineffective, as tracked material was observed on the public road on the day of the audit.	Non Compliant (Low Risk)	Implement additional or improve current controls to ensure material is not tracked on to public roads.
2	2	Administrative	The Proponent shall carry out the project generally in accordance with the			
2	2a	Administrative	EA	Development has been generally carried out in accordance with this document except as identified in the audit report against specific conditions.	Compliant	
2	2b	Administrative	preferred project report	Development has been generally carried out in accordance with this document except as identified in the audit report against specific conditions.	Compliant	
2	2c	Administrative	statement of commitments; and	Development has been generally carried out in accordance with this document except as identified in the audit report against specific conditions.	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
2	2d	Administrative	conditions of this approval  Notes: • The layout of the project is shown in the figure in Appendix 2; and • The statement of commitments is included in Appendix 3.	Development has been generally carried out in accordance with this document except as identified in the audit report against specific conditions.	Compliant	
2	3	Administrative	If there is any inconsistency between the above:			
2	3a	Administrative	the preferred project report shall prevail over the EA		Compliant	
2	3b	Administrative	the conditions of this approval shall prevail generally, to the extent of the inconsistency.		Compliant	
2	4	Administrative	The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:			
2	4a	Administrative	any reports, plans, programs or correspondence that are submitted in accordance with the conditions of this approval; and		Compliant	
2	4b	Administrative	the implementation of any actions or measures contained in these reports, plans, programs or correspondence.		Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
2	5	Administrative	Subject to an agreement in accordance with condition 7 below, the Proponent may accept material extracted from Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998 to be transported across the site and to the slurry plant on Lot 1 DP 570966 via the slurry pipeline and processed on Lot 198 DP 752025.	No material has been taken from these properties on to site to date. It was noted that this was done to avoid the duplication of the 400,000 tonne extraction limits.	Not Yet Triggered and/ or Not Applicable	
2	6	Administrative	Extraction and processing operations may take place until 30 November 2028. Note: Under this approval, the Proponent is required to rehabilitate the site and provide offsets to the satisfaction of the Director-General. Consequently this approval will continue to apply in all other respects other than the right to conduct extraction and processing operations until the site has been rehabilitated and the offset provided to a satisfactory standard.	Consent has not lapsed	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
2	7	Administrative	The quantity of processed material produced at the site, together with material produced on Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998, shall not exceed 400,000 tonnes a year. Prior to the commencement of any processing of extractive material (under the above consent) from activities on Lot 2 DP 555184 or Lot 1 DP 34599, the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has reached an agreement with the owners of those Lots regarding the proportion of the extraction limit as it applies to each Lot.	265,000 tonnes in FY14 (including extraction from the area under Council Consent -31,000 tonnes) and 283,000 tonnes in FY15 (including extraction from the area under Council Consent - 29,128 tonnes). All extraction is from PF Formation owned sites.  Royalty Agreements are in place for these properties and they are seeking to extract from them in the next 12 months.	Compliant	
2	8	Administrative	The Proponent shall restrict total laden truck movements associated with the project to			
2	8a	Administrative	200 per day, for the Proponent's combined operations at Maroota	Truck records were viewed. No exceedances identified.	Compliant	
2	8b	Administrative	20 per day, for trucks importing VENM to the site; and	No trucks are transporting VENM.	Not Yet Triggered and/ or Not	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
					Applicable	
2	8c	Administrative	<p>10 per day, for trucks entering/exiting the site between 6.00am and 7.00am</p> <p>Note: For the avoidance of doubt, 200 is the maximum laden truck movement volume allowed on any one day, including the VENM and early morning truck movements.</p>	<p>Truck records were viewed. No exceedances identified.</p> <p>It was noted that the weighbridge operator does not allow trucks to be weighed until 6 am. This was picked up in the last IEA, where it was observed that trucks would not leave site until 6 am but this could not be demonstrated.</p>	Compliant	
2	9	Administrative	<p>The Proponent shall not undertake any extraction within 2 metres of the established wet weather groundwater level. Note: The wet weather groundwater level shall be established in accordance with condition 3 of Schedule 3.</p>	<p>Advised by the site that they use markers to keep check on the levels using a dumpy level from set bench marks, being the ground water monitoring bore heads that have established AHD RL. It is known where the sandstone base is under the tertiary sand through the resource bore logs and it is above the maximum depth of extraction. Additional bench mark points will soon be installed by our surveyors in areas where they will remain permanently.</p>	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
2	10	Administrative	The Proponent shall not disturb any SHTW vegetation (as shown on the plan in Appendix 5) on site without the prior written approval of the Director-General. In seeking this approval the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has established at least 3.7 hectares of SHTW on the site, to a standard that meets the criteria in Appendix 6. Note: This demonstration must include an assessment by a suitably qualified and independent ecologist.	IEA 2014 states that 4.2 hectares of SHTW was established by November 2012. Department provided the written approval for clearing on 15 March 2013.	Compliant	
2	11	Administrative	With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.	Management Plans approved in 2011. Revised Management Plans submitted in September 2014	Compliant	
2	12	Administrative	The Proponent shall ensure that all demolition work is carried out in accordance with AS 2601-2001: The Demolition of Structures, or its latest version.	IEA 2014 states no demolition to date	Compliant	
2	13	Administrative	The Proponent shall	IEA 2014 states no infrastructure has been affected to date.	Not Yet Triggered	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
					and/ or Not Applicable	
2	13a	Administrative	repair, or pay all reasonable costs associated with repairing, any public infrastructure that is damaged by the project; and		Not Yet Triggered and/ or Not Applicable	
2	13b	Administrative	relocate, or pay all reasonable costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.		Not Yet Triggered and/ or Not Applicable	
2	14	Administrative	The Proponent shall ensure that all plant and equipment used at the site is:			
2	14a	Administrative	maintained in a proper and efficient condition; and	A daily check list is filled out by the operator for all plant and equipment. These come in on a weekly basis and are checked over to schedule maintenance (urgent issues are addressed prior to operation of plant and equipment). Service stickers are present in machines indicating when their service is due.	Compliant	
2	14b	Administrative	operated in a proper and efficient condition	Equipment viewed on-site inspection appeared to be operated in a proper and efficient condition.	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
2	15	Administrative	The Proponent shall not commence any development authorised by this approval on Crown land without the prior approval of the Department of Lands	No work has been undertaken on the Crown Lands site to date. A survey has been undertaken and a letter has been sent.	Not Yet Triggered and/ or Not Applicable	
2	16	Administrative	The Proponent shall pay a monthly contribution to the Council for the upgrade and maintenance of roads in accordance with Baulkham Hills Shire Council's section 94 plan in force at the date of this approval.	Monthly records were sighted and advised that the Council regularly audits this process.	Compliant	
3	1	General Extraction and Processing Provisions	Within 3 months of the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall:			
3	1a	General Extraction and Processing Provisions	engage an independent registered surveyor to survey the boundaries of the approved limit of extraction and the approved ancillary work areas;	Survey plan was done - dated 15 April 2009	Compliant	
3	1b	General Extraction and Processing Provisions	submit a survey plan of these boundaries to the Director-General; and	Survey plan was submitted on 6 June 2009 (not within 3 months)	Non Compliant (Administrative)	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	1c	General Extraction and Processing Provisions	ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits. Note: The limit of extraction and ancillary areas is shown conceptually on the layout plans in Appendix 2, as amended/clarified by the conditions below.	Boundary markers of extraction were observed.	Compliant	
3	2	General Extraction and Processing Provisions	Notwithstanding the layout plans in Appendix 2, the Proponent shall not undertake extraction within	IEA 2014 confirms compliance with this condition.	Compliant	
3	2a	General Extraction and Processing Provisions	30 metres of Hitchcock Road; and	Extraction occurred within 30 metres of Hitchcock Road on Lot 167 DP 752039 as permitted under Court Consent 10064 of 1998 (the setback was 10 metres). Extraction on Lot 214 DP 752039 did not occur within 30 metres as evidenced by the Survey Markers on site.	Compliant	
3	2b	General Extraction and Processing Provisions	10 metres of the property boundary of Lot 2 DP 555184, unless sand extraction has commenced on that lot, and extraction in this buffer has been		Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			agreed by the Director-General			
3	3	General Extraction and Processing Provisions	The Proponent shall			
3	3a	General Extraction and Processing Provisions	establish the wet weather groundwater level for the site based on all available (and at least 12 months) site specific groundwater monitoring data	It was noted that the wet weather groundwater level varies across the site from 182 - 192 mAHD. Four monitoring wells with dataloggers which are downloaded once per year.	Compliant	
3	3b	General Extraction and Processing Provisions	engage a suitably qualified and experienced expert to establish the maximum extraction depths to which extraction can be undertaken on site, to comply with condition 9 of Schedule 2;	URS were engaged.	Compliant	
3	3c	General Extraction and Processing Provisions	submit a Maximum Extraction Depth Map (contour map or similar) for the project to the Director- General within 3 months of the date of this approval; and	The Maximum Extraction Depth Map was submitted on 19 May 2009 (not done within 3 months)	Non - Compliant (Administrative)	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	3d	General Extraction and Processing Provisions	comply with the extraction depths specified in the map, to the satisfaction of the Director-General.	RL markers are located across the site. The operators know the level of the sandstone and if they 'go off' the sandstone a survey will be done to ensure that they do not go below the level. This is verified on a regular basis by survey which was included in the last year's AEMR.	Compliant	
3	4	General Extraction and Processing Provisions	Within 3 months of the completion of the Independent Environmental Audit (see condition 6 of Schedule 5), the Proponent shall review and update the Maximum Extraction Depth Map for the project to the satisfaction of the Director-General.	Letter sent dated 12/9/2014 indicating that no change was required (letter not sent within 3 months).	Non - Compliant (Administrative)	
3	5	Noise	<p>The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence or on more than 25 per cent of any privately-owned land.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>- To determine compliance with the LAeq(15 minute) noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the</li> </ul>	<p>The Noise Management Plan which has been approved by the Department nominates 4 monitoring locations which have been monitored since 1996 and reported in AEMRs and similar reports.</p> <p>Noise monitoring does not strictly adhere to the conditions as listed in the notes, however are likely to be representative of noise emissions from the site.</p>	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			<p>boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance may be accepted (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.</p> <ul style="list-style-type: none"> <li>• To determine compliance with the LA1(1 minute) limit, noise from the project is to be measured at 1 metre from the dwelling façade.</li> <li>• The noise limits apply under meteorological conditions of: <ul style="list-style-type: none"> <li>- wind speed up to 3m/s at 10m above ground level;</li> <li>- temperature inversion conditions of up to 3 degrees C/100m and wind speed up to 2m/s at 10m above the ground; where the wind velocity and temperature gradients are determined to be relevant to the project site in accordance with the NSW Industrial Noise Policy.</li> </ul> </li> <li>• The Director-General may relax the noise limits in Table 1 for any property where the Proponent has an agreement with the relevant owner/s to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.</li> <li>• For more information on the noise assessment locations see Appendix 4.</li> </ul>	<p>The July 2014 - May 2015 Noise Compliance Testing indicated that on 27 October 2014 (Daytime Hours) at Site 3 that there was an exceedance of the 39 dBA (LAeq,15 in) criterion of 21 dBA, with road traffic noise being a significant contributor but quarry noise of 38-42 dBA was recorded during lulls in traffic. Compliance is not demonstrated by this result, however cannot be confirmed to be non-compliant.</p> <p>It is indicated from the overall noise monitoring results that the site is substantially demonstrating compliance.</p>		
3	6	Noise	<p>The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other extractive industries does not exceed the following amenity criteria on any privately owned land, to the</p>	<p>Operational procedures to mitigate noise are detailed in Section 8.3 of the Noise Management Plan.</p> <p>It is noted from the noise monitoring reports that PF Formation is not the major contributor to noise in the area. It is considered that the proponent</p>	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			satisfaction of the Director-General: <ul style="list-style-type: none"> <li>• LAeq(11 hour) 50 dB(A) – Day;</li> <li>• LAeq(4 hour) 45 dB(A) – Evening;</li> <li>and</li> <li>• LAeq(9 hour) 40 dB(A) – Night</li> </ul>	has generally implemented reasonable and feasible measures.		
3	7	Noise	The Proponent shall comply with the operating hours in Table 2.	The operators start at 6.30 am to do a toolbox/safety talk and machine pre-start check and start work at 7.00 am. The sales loader is the first on site (to start at 6 am).	Compliant	
3	8	Noise	The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan shall:		Compliant	
3	8a	Noise	be submitted to the Director-General within 3 months of the date of this approval;	Revised Noise Management Plan submitted to Department for approval on 12 September 2014. Previously approved 15/11/2011.	Compliant	
3	8b	Noise	be prepared in consultation with DECC;	Letter from EPA sighted dated 30 April 2009.	Compliant	
3	8c	Noise	include details of how the noise performance of the project would be monitored, and include a noise monitoring protocol for evaluating compliance with the relevant noise limits in this approval; and	Detail of noise monitoring are provided in the Noise Management Plan (Chapter 9) and evaluation is included in Chapter 8.5.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	8d	Noise	include an investigation and assessment (including modelling) of additional reasonable and feasible noise mitigation measures that would be implemented to ensure that noise emissions at all stages of the project comply with the noise impact assessment criteria in Table 1. Note: The EA predicted that receiver locations R5, R6, R9 and R10 would exceed the applicable noise criteria by between 2 and 5 decibels, during worst case operations.	Detailed in NMP	Compliant	
3	9	Noise	If the additional noise mitigation measures identified in condition 8(d) are not able to reduce noise levels to within 2 decibels of the impact assessment criteria in Table 1 then, upon receiving a written request from the applicable landowner, the Proponent shall implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner.	No additional noise mitigation work has been required.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			These additional mitigation measures must be reasonable and feasible. If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.			
3	10	Air Quality	The Proponent shall ensure that dust generated by the project does not cause exceedances of the criteria listed in Tables 3, 4 and 5 at any residence or on more than 25 per cent of any privately owned ground.	FY15 DDG results were reviewed. It was calculated that the annualised average was 3.47 g/m2/month at the Jurd Residence, which is a significant increase over previous years. While this is not an exceedance, it does indicate a concerning upwards trend.	Compliant	Upwards trend of deteriorating DDG results to be explained in next AEMR, including measures to be implemented to improve performance.
3	11	Air Quality	The Proponent shall ensure any visible air pollution generated by the project is assessed regularly, and that quarrying operations are relocated, modified, and/or stopped as required to minimise air quality impacts on privately owned land.	Monthly monitoring of DDGs is undertaken.  The system to minimise dust emissions from the site was observed to be ineffective, as on the day prior to the inspection, dust emissions from the site were visible across Old Northern Road.	Non Compliant (Low Risk)	Review dust suppression techniques for all dust sources to minimise dust generation.

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
				It was noted that a water truck and road broom are in operation on the site, however there are no sprinklers on the stockpile.		
3	12	Air Quality	The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program shall:			
3	12a	Air Quality	be submitted to the Director-General for approval within 3 months of the date of this approval;	Revised Air Quality Management Plan submitted to Department for approval on 12 September 2014. Previously approved 15/11/2011.	Compliant	
3	12b	Air Quality	be prepared in consultation with DECC;	Letter from EPA sighted dated 30 April 2009.	Compliant	
3	12c	Air Quality	include details of how the air quality performance of the project would be monitored, providing for additional dust deposition monitoring in the vicinity of clusters of residences to the north and west of the site; and	3 DDGs in place at receiver locations.  There is no explanation in the Air Quality Monitoring Program as to how monitoring of and compliance against the TSP/PM10 parameters will be determined. A PM10 Action Plan is provided in the AEMR (as attachment 5D), however is not included in the AQMP.	Non - Compliant (Administrative)	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	12d	Air Quality	include a protocol for evaluating compliance with the relevant air quality criteria in this approval.	There is no explanation in the Air Quality Monitoring Program as to how monitoring of and compliance against the TSP/PM10 parameters will be determined. A PM10 Action Plan is provided in the AEMR (as attachment 5D), however is not included in the AQMP.	Non - Compliant (Administrative)	
3	13	Meteorological Monitoring	The Proponent shall ensure the project has a suitable meteorological station on the site or in the immediate vicinity that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales publication.	The meteorological station is located at the weighbridge.	Compliant	
3	14	Water	The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations to match its water supply. Note: The Proponent is required to obtain necessary water licences for the project under the Water Act 1912 and/or Water Management Act 2000	3 licences are available for groundwater extraction. Which expire in 2025.	Compliant	
3	15	Water	The Proponent shall not discharge any water from the quarry or its associated operations except in	Advised that no discharge from the site has occurred.	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			accordance with an EPL.			
3	16	Water	The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan shall		Compliant	
3	16a	Water	be submitted to the Director-General within 3 months of the date of this approval;	Revised Water Management Plan submitted to Department for approval on 12 September 2014. Previously approved 15/11/2011.	Compliant	
3	16b	Water	be prepared in consultation with DWE and DECC; and	Letters sent to EPA and DWE (NOW). Letter from DECC (EPA) sighted dated 30 April 2009.	Compliant	
3	16c	Water	include a: <ul style="list-style-type: none"> <li>• Site Water Balance;</li> <li>• Erosion and Sediment Control Plan;</li> <li>• Surface Water Monitoring Program; and</li> <li>• Groundwater Monitoring Program.</li> </ul>	Included in WMP	Compliant	
3	17	Water	The Site Water Balance shall:			

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	17a	Water	include details of: <ul style="list-style-type: none"> <li>• sources and security of water supply;</li> <li>• water use on site;</li> <li>• water management on site, including the location and capacity of water storages on site and the means of access;</li> <li>• off-site water transfers; and</li> <li>• reporting procedures; and</li> </ul>	Included in WMP	Compliant	
3	17b	Water	investigate and describe measures to minimise water use by the project.	Included in WMP	Compliant	
3	18	Water	The Erosion and Sediment Control Plan shall:			
3	18	Water	be consistent with the requirements of Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004 (Landcom);	Noted in Erosion and Sediment Control Plan	Compliant	
3	18b	Water	identify activities that could cause soil erosion and generate sediment;	Section 6.2 of WMP	Compliant	
3	18c	Water	describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;	Section 6.3 of WMP	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	18d	Water	describe the location, function, and capacity of erosion and sediment control structures;	Sections 6.4 and 6.5 of WMP	Compliant	
3	18e	Water	demonstrate that the design capacity of basins intended to collect storm runoff will not be compromised by storage of operational water; and	Section 6.4 of WMP	Compliant	
3	18f	Water	describe what measures would be implemented to maintain (and if necessary decommission) the structures over time	Section 6.6 of WMP	Compliant	
3	19	Water	The Surface Water Monitoring Program shall include:			
3	19a	Water	detailed baseline data on surface water flows and quality in downstream watercourses that could be affected by the project	Detailed baseline data is not included	Non - Compliant (Administrative)	
3	19b	Water	surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts; and	Section 7.3 of WMP Stream health assessment criteria are not included in the Water Management Program.	Non - Compliant (Administrative)	Amend Water Management Program to include stream health assessment criteria.

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	19c	Water	a program to monitor: <ul style="list-style-type: none"> <li>• surface water flows, quality, and impacts on water users;</li> <li>• stream health; and</li> <li>• channel stability.</li> </ul>	Section 7.3 of WMP  A program to monitor stream health is not included in the Water Management Program.	Non Compliant (Administrative)	Amend Water Management Program to include a program for the monitoring of stream health.
3	20	Water	The Groundwater Monitoring Program shall include:	Note: An annual Groundwater Management Plan is attached to the 2013-2014 AEMR.		
3	20a	Water	provision of additional monitoring bores around the periphery of the site;	2 new bores installed in 2009	Compliant	
3	20b	Water	detailed baseline data on groundwater levels, flows and quality in the region, and particularly any groundwater bores, springs and seeps (including spring and seep fed dams) that may be affected by operations on site;	Detailed baseline data is not included in Water Management Plan, however it is included in the Annual Groundwater Management Plan attached to the AEMR.	Compliant	
3	20c	Water	groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts;	Assessment criteria and triggers included in Section 8.3 of the Water Management Plan.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	20d	Water	<p>a program to monitor:</p> <ul style="list-style-type: none"> <li>• groundwater levels and quality in new and existing monitoring bores;</li> <li>• the impacts of the project on: <ul style="list-style-type: none"> <li>- any groundwater bores, springs and seeps (including spring and seep fed farm dams) on privately-owned land; and</li> <li>- any groundwater dependent ecosystems; and</li> </ul> </li> </ul>	<p>The Groundwater Monitoring Program (Chapter 8) of the Water Management Plan) does not provide auditable commitments for monitoring of water levels and water quality from monitoring bores.</p> <p>The Plan states that monitoring of impacts on springs and seeps and groundwater dependent ecosystems is not required as sand extraction will remain above the required buffer zone of two metres above the wet weather water table.</p>	Non - Compliant (Administrative)	<p>Commitments for groundwater quality and level monitoring and management to be clearly outlined in the Water Management Plan and reported in the AEMR, including water level trends for at least three years.</p> <p>Water level results are to be compared to extraction levels to confirm that the 2 metre extraction limit above the established wet weather groundwater level is being maintained.</p>
3	20e	Water	a protocol for further groundwater modelling to confirm the limits to excavation depth across the site permitted in accordance with condition 9 of Schedule 2.	Section 8.7 of WMP.	Compliant	
3	21	Landscape Management	The Proponent shall progressively rehabilitate the site to the satisfaction of the Director-General, in a manner that is generally consistent with the concept final landform (Strategy A or Strategy B) in the preferred project report (as reproduced in Appendix 7).	<p>Progressive rehabilitation is being undertaken.</p> <p>It is noted that Strategy A has been selected.</p>	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	22	Landscape Management	The Proponent shall implement the Offset Strategy described in the preferred project report, and summarised in Table 6 (shown conceptually on the plan in Appendix 5) to the satisfaction of the Director General.	It was advised that the 7.9 hectare area is to be completed by the end of the project.  The 4.1 hectare on-site revegetation area (other woodland) has been progressed.	Compliant	
3	23	Landscape Management	Within 3 years of the date of this approval, the Proponent shall make suitable arrangements to provide appropriate long term security for the offset areas to the satisfaction of the Director-General. Note: The Department acknowledges that the arrangements may provide for staged or delayed implementation, in accordance with the extraction in these areas.	Suitable arrangements to provide appropriate long-term security for offset areas have not been made. A proposal was provided to the Department however a response has not been received. It is the responsibility of the proponent to ensure that the requirements of the condition are met.	Non Compliant (Administrative)	Response to be sought by the Secretary seeking approval of the long term strategy for the offset areas.
3	24	Landscape Management	The Proponent shall prepare and implement a Landscape Management Plan for the project to the satisfaction of the Director-General. This plan must:	Revised Landscape Management Plan submitted to Department for approval on 12 September 2014. Previously approved 15/11/2011.	Compliant	
3	24a	Landscape Management	be prepared in consultation with DECC by suitably qualified expert/s whose appointment/s have been approved by the Director-General;	Letter from EPA sighted dated 30 April 2009.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	24b	Landscape Management	be submitted to the Director-General for approval within 6 months of the date of this approval; and	Revised Landscape Management Plan submitted to Department for approval on 12 September 2014. Previously approved 15/11/2011.	Compliant	
3	24c	Landscape Management	include a: <ul style="list-style-type: none"> <li>• Rehabilitation and Offset Management Plan; and</li> <li>• Quarry Closure Plan.</li> </ul>	Sections 3 and 4	Compliant	
3	25	Landscape Management	The Rehabilitation and Offset Management Plan must include:			
3	25a	Landscape Management	the rehabilitation objectives for the site, vegetation offsets and landscaping;	Section 3.2 of 2014 Plan	Compliant	
3	25b	Landscape Management	a description of the short, medium, and long term measures that would be implemented to: <ul style="list-style-type: none"> <li>• rehabilitate the site;</li> <li>• implement the Offset Strategy; and</li> <li>• maintain and enhance existing site vegetation outside the disturbance area;</li> </ul>	Short term Section 3.3.3. Mention of medium and long term also in this section.	Compliant	
3	25c	Landscape Management	detailed performance and completion criteria for the site rehabilitation and implementation of the Offset Strategy;	Section 3.5	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	25d	Landscape Management	<p>a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:</p> <ul style="list-style-type: none"> <li>• progressively rehabilitating disturbed areas;</li> <li>• implementing vegetation offsets;</li> <li>• protecting vegetation and soil outside the disturbance areas;</li> <li>• rehabilitating creeks and drainage lines on the site to ensure no net loss of stream length and aquatic habitat;</li> <li>• undertaking pre-clearance surveys;</li> <li>• managing impacts on fauna;</li> <li>• landscaping the site to minimise visual impacts;</li> <li>• conserving and reusing topsoil;</li> <li>• collecting and propagating seed for rehabilitation works;</li> <li>• salvaging and reusing material from the site for habitat enhancement;</li> <li>• controlling weeds and feral pests;</li> <li>• controlling access; and</li> <li>• bushfire management;</li> </ul>	<p>i) 3.3.2  ii) 3.1  iii) 3.3.4  iv) 3.3.5  v) removed from 2014 plan, included in 2011 plan  vi) 3.3.6  vii) 3.3.7  viii) 3.3.8  ix) removed from 2014 plan, included in 2011 plan  x) 3.3.13  xi) 3.3.14  xii) 3.3.15  xiii) 3.3.16 and 3.3.17</p>	Non Compliant (Administrative)	Include all required information in the Landscape Management Plan.

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	25e	Landscape Management	a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;	Section 3.4	Compliant	
3	25f	Landscape Management	a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and	Section 3.3.17	Compliant	
3	25g	Landscape Management	details of who would be responsible for monitoring, reviewing, and implementing the plan.	Section 3.6	Compliant	
3	26	Landscape Management	The Quarry Closure Plan must			
3	26a	Landscape Management	include provision for certification from a qualified geotechnical engineer that the final proposed landform is stable;	No provision included in QMP submitted 2014 or approved 2011	Non Compliant (Administrative)	- Amend Quarry Management Plan to include provision for certification from a qualified geotechnical engineer that the final proposed landform is stable.
3	26b	Landscape Management	define the objectives and criteria for closure of the quarry;	Objectives are noted in Section 4.2. Criteria are not included.	Non Compliant (Administrative)	- Amend Quarry Management Plan to define the objectives and criteria for closure of the quarry.

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	26c	Landscape Management	investigate options for the future use of the site, including any final void;	Noted in Section 4.3. Stated in Section 4.5 there will be no final voids.	Compliant	
3	26d	Landscape Management	describe the measures that would be implemented to minimise or manage the ongoing (post closure) environmental effects of the project; and	Section 4.5	Compliant	
3	26e	Landscape Management	describe how the performance of these measures would be monitored over time.	While Section 4.6 is included, there are no performance monitoring measures.	Non Compliant (Administrative)	Amend Quarry Management Plan to describe how the performance of these measures would be monitored over time.
3	27	Landscape Management	Within 3 months of the approval of the Landscape Management Plan, the Proponent shall lodge a rehabilitation and offset bond for the project with the Director-General. The sum of the bond shall be calculated at:	A Bond for \$500,000 was established on 19/11/2010 (approval for Landscape Management Plan was provided on 26/8/2010)	Compliant	
3	27a	Landscape Management	\$2.50/m2 for the area of disturbance in each 3 year review period, including the offset areas; and		Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	27b	Landscape Management	<p>\$1.00/m2 for the total area of land previously disturbed by the quarry, or as otherwise directed by the Director-General.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• If the rehabilitation and offsets are completed to the satisfaction of the Director-General, the Director-General will release the bond.</li> <li>• If the rehabilitation and/or offsets are not completed to the satisfaction of the Director-General, the Director-General will call in all or part of the bond, and arrange for the satisfactory completion of the relevant works</li> </ul>		Compliant	
3	28	Aboriginal Heritage	Should the Proponent discover material suspected of being Aboriginal relics or skeletal remains, work in that area shall cease and the Proponent shall advise DECC and proceed in accordance with DECC instructions.	No Aboriginal relics or skeletal remains have been identified.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	29	Traffic and Transport	The Proponent shall transport all excavated material between the extraction site and processing plant site, including processing residues, via slurry pipelines. Note: When the slurry system is unusable by reason of breakdown or essential maintenance, extractive material may be transported by truck during the period of such breakdown or maintenance. The Proponent shall ensure that such periods are as brief as possible and shall advise the Council each day that truck transport is to be used.	Advised that excavated material is transported via slurry pipeline.  There have been infrequent occasions when transport by truck is undertaken as a result of breakdown or maintenance.	Compliant	
3	30	Traffic and Transport	The Proponent shall record and maintain a log of the extraction quantities and traffic movement in and out of the site, available for inspection at the request of the Director-General or the Council.	Weighbridge dockets and the transport spreadsheet were viewed.	Compliant	
3	31	Traffic and Transport	The Proponent shall ensure that:			
3	31a	Traffic and Transport	all loaded vehicles entering or leaving the site are covered; and	This is covered in the site induction . Signage is in place and there is a designated stopping area. This is monitored by the weighbridge operator.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	31b	Traffic and Transport	all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site.	This is covered in the site induction . Signage is in place and there is a designated stopping area.	Compliant	
3	32	Visual	The Proponent shall minimise the visual impacts of the project to the satisfaction of the Director-General.	Chapter A10 of EMS states measures to be implemented.  Vegetative and bund screening is in place around the majority of the site, however there are some areas where quarry operations are visible.	Compliant	
3	33	Visual	The Proponent shall:			
3	33a	Visual	take all practicable measures to mitigate off-site lighting impacts from the project; and	Operations are not undertaken at night. The pump station has floodlights however the lights are switched off at night and they are located behind bunds.	Compliant	
3	33b	Visual	ensure that all external lighting associated with the project complies with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting, to the satisfaction of the Director-General.	Operations are not undertaken at night. The pump station has floodlights however the lights are switched off at night and they are located behind bunds.  No lighting assessment has been undertaken and no complaints have been received.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	34	Visual	The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General. Note: This does not include traffic management and safety or environmental signs.	Signage is in place at the entrance to the site and on the northern-most point displaying contact numbers for which it was advised that approval has not been provided by the Department, however it is noted that this signage was in place prior to the issuing of the Department Project Approval and that the entrance is also for activities approved by the Council (eg the concrete batching plant).	Compliant	
3	35	Waste Management	The Proponent shall:			
3	35a	Waste Management	only import VENM to the site; and	Only VENM is imported to site (no waste products)	Compliant	
3	35b	Waste Management	minimise the amount of waste generated by the project to the satisfaction of the Director-General	Included in Chapter A11 of EMS  Individual waste bins are used and are removed by the relevant contractors/Council	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	36	Emergency and Hazards Management	The Proponent shall ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the Dangerous Goods Code.	<p>Included in Chapter A13 of EMS</p> <p>The diesel fuel storage facility was inspected. The diesel fuel dispenser is located outside of the bund wall, with a refuelling hose attached. If the nozzle or hose was damaged, fuel would spill on to the ground. In addition, the tank is located very close to the bund wall, which may be non-compliant with the tan theta rule in AS 1940. A plan of the facility was provided that was signed off by an accredited consultant; however this plan does not include the location of the diesel fuel bowser or the exact location of the tank within the bund.</p> <p>A spill from an oil drum was noted on the sealed area in front of the workshop. No attempt to clean the spill up had been made at the time of the inspection.</p> <p>It is noted that the area drains to a oily water sump, which is connected to an oily water separator.</p>	Non - Compliant (Low Risk)	<p>Implement controls to prevent spillage from the bowser occurring on to unsealed ground.</p> <p>Undertake an assessment of the facility to ensure that it is compliant with AS 1940.</p>

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
3	37	Emergency and Hazards Management	The Proponent shall secure the project to ensure public safety to the satisfaction of the Director-General.	The site is fenced, signage is in place, and the gates are locked when the site is closed.	Compliant	
3	38	Emergency and Hazards Management	The Proponent shall:			
3	38a	Emergency and Hazards Management	ensure that the project is suitably equipped to respond to any fires on-site; and	IEA 2014 states that a 10,000L tanker and a 30,000 L water truck are on site, plus fire extinguishers in vehicles and the workshop	Compliant	
3	38b	Emergency and Hazards Management	assist the Rural Fire Service and emergency services as much as possible if there is a fire on site.	Noted that a number of employees are RFS members, access has been provided for back-burning operations and the RFS has a key to gates.	Compliant	
3	39	Production data	The Proponent shall			
3	39a	Production data	provide annual production data to the DPI using the standard form for that purpose; and	The 2013-2014 annual return was viewed.	Compliant	
3	39b	Production data	include a copy of this data in the AEMR.	The proponent noted that the information provided in this form is commercially sensitive and that the forms will not be included in versions of the AEMR that are publically available. It was noted	Non - Compliant (Administrative)	Production data for PA 06_0104 is to be provided in the next and future AEMRs.



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
				that the form included information from all PF Formation operations in the area (not only operations covered by PA 06_0104).		
4	1	Notification of landowners	If the results of monitoring required in Schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, then the Proponent shall notify the Director- General and the affected landowners and/or existing or future tenants accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the relevant criteria.	IEA 2014 states no notifications required to date	Not Yet Triggered and/ or Not Applicable	
4	2	independent review	If a landowner of privately owned land considers that the operations of the quarry are exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Proponent in writing for an independent review of the impacts of the project on his/her land. If the Director-General is satisfied that an independent review is	IEA 2014 states no independent reviews required to date	Not Yet Triggered and/ or Not Applicable	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			warranted, the Proponent shall within 3 months of the Director-General advising that an independent review is warranted:			
4	2a	independent review	consult with the landowner to determine his/her concerns;		Not Yet Triggered and/ or Not Applicable	
4	2b	independent review	commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to determine whether the project is complying with the relevant criteria in Schedule 3, and identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and		Not Yet Triggered and/ or Not Applicable	
4	2c	independent review	give the Director-General and landowner a copy of the independent review		Not Yet Triggered and/ or Not Applicable	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
4	3	independent review	If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.		Not Yet Triggered and/ or Not Applicable	
4	4	independent review	If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, and that the quarry is primarily responsible for this non-compliance, then the Proponent shall:		Not Yet Triggered and/ or Not Applicable	
4	4a	independent review	implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria; and		Not Yet Triggered and/ or Not Applicable	
4	4b	independent review	conduct further monitoring to determine whether these measures ensure compliance; or		Not Yet Triggered and/ or Not Applicable	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
4	4c	independent review	<p>(c) secure a written agreement with the landowner to allow exceedances of the relevant criteria in Schedule 3, to the satisfaction of the Director-General.</p> <p>If the additional monitoring referred to above subsequently determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.</p> <p>If the Proponent is unable to finalise an agreement with the landowner, then the Proponent or landowner may refer the matter to the Director-General for resolution. If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).</p>		Not Yet Triggered and/ or Not Applicable	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
4	5	independent review	If the landowner disputes the results of the independent review, either the Proponent or the landowner may refer the matter to the Director-General for resolution. If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).		Not Yet Triggered and/ or Not Applicable	
5	1	Environmental Management Strategy	The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy shall be submitted to the Director-General within 3 months of the date of this approval, and;	Revised Environmental Management Strategy submitted to Department for approval on 12 September 2014. Previously approved 15/11/2011.	Compliant	
5	1a	Environmental Management Strategy	provide the strategic context for environmental management of the project		Compliant	
5	1b	Environmental Management Strategy	identify the statutory requirements that apply to the project		Compliant	
5	1c	Environmental Management Strategy	describe in general how the environmental performance of the project would be monitored and managed;		Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
5	1d	Environmental Management Strategy	describe the procedures that would be implemented to: <ul style="list-style-type: none"> <li>• keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;</li> <li>• receive, handle, respond to, and record complaints;</li> <li>• resolve any disputes that may arise during the life of the project;</li> <li>• respond to any non-compliance;</li> <li>• manage cumulative impacts; and</li> <li>• respond to emergencies; and</li> </ul>	<ul style="list-style-type: none"> <li>i) Chapter A8 of EMS</li> <li>ii) Section 3.2.3 of EMS</li> <li>iii) Appendix C of EMS</li> <li>iv) Section 3.2.4</li> <li>v) Cumulative impacts not specifically mentioned in EMS, however they are mentioned in the Noise Management Plan and Air Quality Management Plan</li> <li>vi) Strategy 13.2</li> </ul>	Non - Compliant (Administrative)	
5	1e	Environmental Management Strategy	describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.	Described throughout the document	Compliant	
5	2	Environmental Monitoring Program	The Proponent shall prepare an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program shall be submitted to the Director-General concurrently with the submission of the various monitoring programs and consolidate the various monitoring requirements in Schedule 3 of this approval into	The EMP is included in Chapter 5 of the EMS	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			a single document.			
5	3	Reporting	Within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.	No exceedances have been identified and therefore no notifications have been made.	Not Yet Triggered and/ or Not Applicable	
5	4	Reporting	Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that		Not Yet Triggered and/ or Not Applicable	
5	4a	Reporting	describes the date, time, and nature of the exceedance/incident;		Not Yet Triggered and/ or Not Applicable	
5	4b	Reporting	identifies the cause (or likely cause) of the		Not Yet Triggered	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			exceedance/incident;		and/ or Not Applicable	
5	4c	Reporting	describes what action has been taken to date; and		Not Yet Triggered and/ or Not Applicable	
5	4d	Reporting	describes the proposed measures to address the exceedance/incident.		Not Yet Triggered and/ or Not Applicable	
5	5	Reporting	Within 12 months of the date of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General, relevant agencies and CCC. This report shall:	AEMRs submitted from 2008-2009 to 2013-2014 FYs	Compliant	
5	5a	Reporting	identify the standards and performance measures that apply to the project;	Various sections	Compliant	
5	5b	Reporting	describe the works that will be carried out in the next 12 months	Chapter 2	Compliant	
5	5c	Reporting	include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;	Chapter 3	Compliant	
5	5d	Reporting	include a summary of the	Monitoring results are included in	Compliant	Tables and Graphs should be

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			monitoring results for the project during the past year;	Chapter 3, throughout the AEMR or as Appendices.		provided in the body of the AEMR with the summary of results rather than having to interpret Lab Reports or flick to appendices.
5	5e	Reporting	include an analysis of these monitoring results against the relevant: <ul style="list-style-type: none"> <li>• impact assessment criteria/limits;</li> <li>• monitoring results from previous years; and</li> <li>• predictions in the EA;</li> </ul>	Analysis of results against limits provided, however there is no comparison between years for noise and surface water monitoring results.	Non - Compliant (Administrative)	
5	5f	Reporting	identify any trends in the monitoring results over the life of the project	No trends available for noise and surface water monitoring results.	Non - Compliant (Administrative)	
5	5g	Reporting	identify any non-compliance during the previous year; and	No non-compliances were identified in 2013-2014 AEMR	Compliant	
5	5h	Reporting	describe what actions were, or are being, taken to ensure compliance	While no specific non-compliances were noted in 2013-2014, compliance measures are noted throughout the report.	Compliant	
5	6	Independent Environmental Audit	Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an	IEA 2014 states delayed approval of auditor in July 2010 resulted in first audit dated April 2011.	Non - Compliant (Administrative)	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			Independent Environmental Audit of the project. This audit shall:			
5	6a	Independent Environmental Audit	be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General	Environmental Planning was endorsed by the Director-General to undertake the 2011 audit; however endorsement was not sought for the 2014 audit. It is a requirement that auditors are endorsed prior to each audit to ensure any requirements of the Department are assessed as part of the audit.	Non Compliant (Administrative)	Seek endorsement for IEA Auditors prior to each audit.
5	6b	Independent Environmental Audit	include consultation with the relevant agencies;	Noted in IEA Section 5	Compliant	
5	6c	Independent Environmental Audit	assess the environmental performance of the project, and its effects on the surrounding environment;		Compliant	
5	6d	Independent Environmental Audit	assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and		Compliant	
5	6e	Independent Environmental Audit	review the adequacy of any strategy/plan/program required under this approval, and, if necessary, recommend measures or actions to improve the	Auditor was approved by DG	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
			<p>environmental performance of the project, and/or any strategy/plan/program required under this approval.</p> <p>Note: The person(s) conducting the audit should have expertise in flora and fauna assessment, hydrogeology and quarry rehabilitation.</p>			
5	7	Independent Environmental Audit	Within 6 weeks of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the Director-General, with a response to any of the recommendations in the audit report.	Letter dated 12 September 2014 from PF Formation stated that IEA and response to recommendations was submitted on 12 June 2014.	Compliant	
5	8	Independent Environmental Audit	Within 3 months of submitting a copy of the audit report to the Director-General, the Proponent shall review and if necessary revise:	Documents were submitted on 12 September 2014	Compliant	
5	8a	Independent Environmental Audit	each of the environmental management and monitoring strategies/plans/programs in Schedules 3 and 5; and	Water Management Plan, Noise Management Plan, Air Quality Management Plan, Landscape Management Plan and Environmental Management Strategy all submitted 12 September 2014.	Compliant	

Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
5	8b	Independent Environmental Audit	the sum of the Vegetation Offset Bond (see Schedule 3). This review shall consider: <ul style="list-style-type: none"> <li>• the effects of inflation;</li> <li>• any changes to the total area of disturbance; and</li> <li>• the performance of the vegetation offsets against the completion criteria of the Rehabilitation and Vegetation Offset Management Plan, to the satisfaction of the Director-General</li> </ul>	Included in letter dated 12 September 2014	Compliant	
5	9	Community Consultative Committee	The Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the Department's Guideline for Establishing and Operating Community Consultative Committees for Mining Projects. Note: The Proponent may continue the operation of the Liaison and Review Committee established under condition 6.7 of the development consent issued by the Land and Environment Court on 14 July 1998 to fulfil this condition.	CCC Meeting minutes for 11 Nov 2014 and 5 May 2015 sighted	Compliant	



Schedule	Condition Number	Category	Condition	Evidence	Compliance Status	Recommendation
5	10	Access to information	Within 1 month of the approval of any plan/strategy/program required under this approval (or any subsequent revision of these plans/strategies/programs), or the completion of the audits or AEMR required under this approval, the Proponent shall:		Compliant	
5	10a	Access to information	provide a copy of the relevant document/s to the relevant agencies and to members of the general public upon request; and	Documents are available on the Proponents website	Compliant	
5	10b	Access to information	ensure that a copy of the relevant document/s is made publicly available on its website and at the Proponent's office.	Documents are available on the Proponents website	Compliant	
5	11	Access to information	During the project, the Proponent shall			
5	11a	Access to information	make a summary of monitoring results required under this approval publicly available on its website and at the site office; and	Results are available in the AEMR, and the AEMR is available on the website.	Compliant	
5	11b	Access to information	update these results on a regular basis.	The AEMR provides an annual update of results. It is not considered that this is a regular update.	Non Compliant (Administrative)	- Provide a regular summary of monitoring results on the website.



## Appendix 3 – Statement of Commitments

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Noise and Vibration	Site activities will be managed so that any necessary high noise and vibration levels occur at times of least impact.	Activities on the site are only undertaken during 'daylight' hours.	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>All site activities will be undertaken incorporating noise attenuation measures such as restricting working hours for certain works required in the proximity of sensitive receptors.</li> </ul>	Activities on site are undertaken in accordance with the hors in the consent.	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>All equipment used on site will be certified in relation to noise performance.</li> </ul>	Noise monitoring results included in NMP	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>Panels and covers of silenced plant will be kept shut and plant and equipment switched off when not in use.</li> </ul>	Diesel powered portable plants and other equipment is turned off when not in use.	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>All mechanical equipment will be silenced by the best practical means using current technology, prior to use. Noise suppression devices will be fitted according to manufacturer's instructions. Noise control kits will be fitted to noisy mobile equipment and shrouds provided around stationary equipment where necessary.</li> </ul>	Reversing buzzers are quackers rather than beepers. Form was sighted for the purchase of equipment where it is noted that noise is considered.	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>All plant and equipment will be inspected regularly to ensure that it is well maintained to minimise noise emissions.</li> </ul>	Pre-start checks are undertaken on equipment prior to use.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Noise and Vibration	<ul style="list-style-type: none"> <li>The L10 noise level at the boundary of adjacent receivers where baseline data has been obtained will not normally exceed the background level by more than 5 dB(A).</li> </ul>	Noise monitoring results reviewed	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>Compliance monitoring of noise levels will be undertaken and appropriate records of measurements kept.</li> </ul>	Noise monitoring results reviewed and a report provided.	Compliant	
3	Noise and Vibration	<ul style="list-style-type: none"> <li>The local community will be informed of the level and duration of noise to be expected during specific activities and phases of development when necessary. Communication of concerns to the Environmental Manager will be invited.</li> </ul>	Noise from the site is discussed at CCC meetings.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	Ambient air quality monitoring will be conducted at identified sites.	Air quality monitoring results were reviewed.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>Dust suppression equipment will be fitted to all processing plant on the site. This will be regularly inspected and maintained in good working order at all times.</li> </ul>	The product is inherently wet as it is piped across in a slurry. Spray rails are in place. Pre-start checks on equipment.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>Trafficable areas will be defined to prevent unnecessary vehicle movement into other parts of the site.</li> </ul>	This is covered in the driver induction. Directional signage is in place. In toolbox talks personnel are directed if there are any changes to traffic conditions.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>All unsealed trafficable areas and working areas will be kept damp by spraying regularly with a water cart, water sprays or sprinklers to minimise dust emissions. Frequency of spraying to be determined based on weather conditions, soil erodibility and the observation of any visible dust.</li> </ul>	A water truck is available.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>Speed controls will be applied to all unsealed areas (maximum speed of 20 km/h) and signposted accordingly.</li> </ul>	Speed signage is in place (on western side of road) and on road to weigh bridge (states the limit is 15 km).	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>All semi-permanent stockpiles will be vegetated with suitable groundcover and regularly watered until the vegetation is well established.</li> </ul>	This only applies to soil bunds.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>Work on any extraction activity producing dust will cease due to high winds if control cannot be achieved by watering or other means. Work will not resume until the wind velocity decreases and any dust generation can be controlled by normal means.</li> </ul>	It was noted that there have been times that production has ceased due to high winds. Otherwise dust is controlled by the water cart.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>All loaded trucks leaving the central processing plant on Lot 198 DP 752025 will have their payloads fully covered by a suitable material to prevent spillage.</li> </ul>	This is covered in the site induction and monitored by the weigh bridge operator.	Compliant	
3	Air Quality and Greenhouse	<ul style="list-style-type: none"> <li>No fires will be permitted on-site without a permit.</li> </ul>	No fires are lit on site.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
	Gas Emissions				
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>A mechanical road sweeping unit and water cart will be maintained for use as required to keep all roads including the intersection of the haul road and Wisemans Ferry Road free from deposited material.</li> </ul>	A road sweeping unit and water cart are available.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>Exhausts from all vehicles and plant/equipment will be inspected to ensure that they are maintained at an acceptable level.</li> </ul>	This is checked by operators during the pre-start checks.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>All vehicles will be regularly serviced to ensure that exhaust emissions comply with the regulations.</li> </ul>	Pre-start checks are undertaken on equipment prior to use. Next service stickers are located in equipment.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	Appropriate service records will be maintained.	Service records were viewed and are being maintained.	Compliant	
3	Air Quality and Greenhouse Gas Emissions	<ul style="list-style-type: none"> <li>Any opportunities to minimise machinery use and ensure that all equipment used on the site is energy efficient will be identified.</li> </ul>	The purchase of equipment considers energy/fuel efficiency.	Compliant	
3	Access and Traffic	If the sand slurry plant and transport system is unusable due to breakdown or during maintenance periods, trucks will be used for the transport of	Trucks have been used infrequently to transport material during breakdowns or maintenance periods.	Compliant	



Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		extractive material on a temporary basis. This will cease once the system is operating satisfactorily.			
3	Access and Traffic	<ul style="list-style-type: none"> <li>The number of laden vehicle movements will not exceed a combined total of two hundred per day via the intersection of the haulage road and Wisemans Ferry Road. This is the total of laden vehicle movements allowed for PF Formation's combined extractive industry operations in Baulkham Hills Shire.</li> </ul>	Truck movements were viewed and no exceedances were identified for the period viewed.	Compliant	
3	Access and Traffic	<ul style="list-style-type: none"> <li>Operations involving the transportation of material on the site will only be undertaken between 07.00 and 18.00 hours, Monday to Saturday, except a maximum of 10 laden vehicles will be allowed to enter and leave the site between 06.00 and 07.00 hours, Monday to Saturday only. Vehicles will not be allowed to arrive at the site prior to 05.45 hours on any day.</li> </ul>	Advised that operations do not occur outside of the approved hours.	Compliant	
3	Erosion and Sediment Control	Soil and Water Management Plan will be reviewed and revised, if required.	Revised in 2014 as part of Water Management Plan	Compliant	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Temporary erosion and sedimentation control structures such as detention basins and catch drains will be constructed as appropriate to collect runoff from cleared land including extraction areas and access roads.</li> </ul>	Silt ponds are present on site. Drainage on the site is retained on site.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Silt traps and erosion control fencing will be erected as appropriate along extraction area boundaries and drainage lines.</li> </ul>	No sediment fences are installed. Drainage on the site is retained on site.	Compliant	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Sediment basins with a minimum storage capacity of 400 m3 per hectare of catchment will be constructed. Spillway capacity and stability will be designed as follows: <ul style="list-style-type: none"> <li>– life of less than 5 years, adopt the 20 year tc event;</li> <li>– life between 5 and 10 years, adopt the 50 year tc event; and</li> <li>– life greater than 10 years, adopt the 100 year tc event.</li> </ul> </li> </ul>	<p>It cannot be confirmed that sediment basins on site meet these design criteria.</p> <p>No discharge occurs off site.</p>	Non Compliant (Administrative)	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Stormwater control measures will be assessed and routine inspections conducted to ensure that compliance with best practice guidelines and relevant legislation is achieved.</li> </ul>	Sediment traps are cleaned out regularly. Material that run off haul roads is placed on stockpiles. Tailings dam water drains into the water recycling system.	Compliant	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Locations for topsoil and material stockpiles will be selected on level ground and away from drainage lines. Diversion drains and sediment filter fences will be installed up slope as appropriate.</li> </ul>	Advised that topsoil stockpiles are located on level ground.	Compliant	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Training will be provided to operational personnel on the importance of erosion control measures and drivers informed of the damage that can be caused to the environment by heavy vehicles.</li> </ul>	Safety/environmental training is provided every three months.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Areas of exposed land will be kept to a minimum compatible with operational requirements.</li> </ul>	The nature of extracting from different areas to meet customer requirements requires areas to remain open, however extensive areas of exposed land were observed.	Non - Compliant (Low Risk)	Exposed areas to be maintained at a minimum.
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Exposed areas not in use will be stabilized with an appropriate cover crop and watered until well established.</li> </ul>	Aside from the area which has been rehabilitated, no cover crops were observed on site to minimise exposed areas.	Non - Compliant (Low Risk)	Exposed areas not in use to be stabilized with an appropriate cover crop and watered until well established.
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Erosion and sediment controls will be monitored regularly and immediately following a rainfall event.</li> </ul>	Monthly inspections are undertaken and recorded.	Compliant	
3	Erosion and Sediment Control	Monitoring will take place initially on a weekly basis, then monthly once operating correctly. Sediment will be cleared when the traps have collected 60% of the capacity of the basin or where sediment build-up is less than 300 mm below the spillway crest. Sediment will be removed to a location where further pollution to downslope lands and waterways will not occur.	Monthly sediment control checks are undertaken. Material removed is processed.	Compliant	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Maintenance of erosion and sediment controls will be undertaken when any deterioration is identified or when replacement is necessary.</li> </ul>	Evidence of clean out being undertaken from monthly checklists.	Compliant	
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>Stored stormwater will be reused for dust control and the watering of site vegetation.</li> </ul>	No discharges occur off site. Stored water is used for dust control and in the process.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Erosion and Sediment Control	<ul style="list-style-type: none"> <li>• Soil stockpiles will be seeded where these are to remain unused for a period in excess of four weeks. The area will be watered until the vegetation is well established.</li> </ul>	Topsoil stockpiles have been seeded.	Compliant	
3	Water Management	Maximum depth of extraction will be restricted to not less than two metres above the wet weather high groundwater level. (nominally 181 m AHD).	It was noted that the wet weather groundwater level varies across the site from 182 - 192 mAHD. Four monitoring wells with data loggers which are downloaded once per year.	Compliant	
3	Water Management	<ul style="list-style-type: none"> <li>• The groundwater will not be breached or contaminated. In the event that either should occur, operations will cease in the affected area and the Department of Environment and Climate Change consulted to determine the basis on which extraction may recommence.</li> </ul>	There was no evidence that the groundwater had been breached.	Compliant	
3	Water Management	<ul style="list-style-type: none"> <li>• Retention basins will be designed to accommodate the 100-year tc event. The minimum basin capacities are: <ul style="list-style-type: none"> <li>– Northern catchment 10,000 m3</li> <li>– Southern catchment 38,000 m3</li> </ul> The volume of these basins can be varied depending on the extent of the area exposed for extraction within each catchment.</li> </ul>	EMS nominates 7,800 m3 northern catchment and 19,400 m3 southern catchment.	Non Compliant (Administrative) -	
3	Water Management	<ul style="list-style-type: none"> <li>• All retention basins will be regularly inspected and an annual report prepared on their effectiveness.</li> </ul>	No annual reports on the effectiveness of the retention basins have been prepared to date.	Non Compliant (Administrative) -	Annual reports on the effectiveness of the retention basins to be prepared.

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Water Management	<ul style="list-style-type: none"> <li>A minimum of two groundwater monitoring bores will be installed. One will be located within or near the extraction area and another at some location within the site beyond the area of any direct extraction influence. The location of these bores will meet the requirements of the Department of Environment and Conservation and Baulkham Hills Shire Council.</li> </ul>	Monitoring bores have been installed.	Compliant	
3	Flora and Fauna	All areas which are not to be disturbed will be clearly marked.	Boundary markers of extraction were observed. Signage on native vegetation areas and rehabilitation areas were observed.	Compliant	
3	Flora and Fauna	<ul style="list-style-type: none"> <li>Topsoil will be separated and stored or used in rehabilitation works.</li> </ul>		Compliant	
3	Flora and Fauna	<ul style="list-style-type: none"> <li>An area of not less than 12 hectares will be identified, and indicated on the site survey. This will be identified as a revegetation area and access controlled.</li> </ul>	Areas for rehabilitation have been identified.	Compliant	
3	Flora and Fauna	<ul style="list-style-type: none"> <li>Seed will be collected from the existing woodland communities (Sydney Hinterland Transition Woodland), stored under controlled conditions, made available for future broadcasting and a suitable proportion propagated to provide tube stock for revegetation.</li> </ul>	Greening Australia collected seeds on-site and these seeds and seedlings grown from them were used in our rehabilitation. The seeds were stored and seedlings grown at Greening Australia's Richmond Production Nursery.	Compliant	
3	Flora and Fauna	<ul style="list-style-type: none"> <li>Stored topsoil and that derived from suitable areas adjacent to the woodland communities will be spread over the defined revegetation area and</li> </ul>	Topsoil is stockpiled on site and rehabilitated area observed. Rehabilitation report states that direct seeding and tube stock planting were used.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		seed broadcast over the site to augment the soil-borne native seed bank. Tube stock suitably protected against animal predation will also be used in appropriate locations.			
3	Flora and Fauna	<ul style="list-style-type: none"> <li>Access to bushland will be restricted to minimise the potential for damage. These areas will be marked and signs erected to ensure that this prohibition is made clear. The boundary of the site will be fenced to prevent external access.</li> </ul>	Signage was in place designating rehabilitation zones. There is an external fence around the site.	Compliant	
3	Rehabilitation	The Rehabilitation Plan will be reviewed and amended as necessary to reflect changing operational conditions. This will include a revised phasing plan and implementation programme.	Amended in 2014 to remove reference to Strategy B.	Compliant	
3	Rehabilitation	<ul style="list-style-type: none"> <li>Setbacks to all roads and adjacent properties will be defined taking account of existing trees and other features. Programmes of mound construction and screen planting will be undertaken as required in the Rehabilitation Plan. All plant material used will reflect the species mix existing in the area.</li> </ul>		Compliant	
3	Rehabilitation	<ul style="list-style-type: none"> <li>A staged seeding and planting programme will be undertaken as areas become available following completion of extraction and capping of sediment basins. This will be aimed at producing a dense plantation on the</li> </ul>		Not Triggered or Applicable Yet and/ Not	



Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		steeper slopes derived from the flora resources already established. The aim is to replicate as far as possible the mix and density of planting which is currently present.			
3	Rehabilitation	<ul style="list-style-type: none"> <li>All suitable plant material will be used on the site as a seed and planting medium. Topsoil will be stored in appropriately marked low stockpiles for reuse in locations as close as possible to their source. Care will be taken to ensure that this does not become contaminated with the seeds of exotic species and weeds.</li> </ul>	Topsoil material is available on site. While not marked, they were clearly delineated.	Compliant	
3	Rehabilitation	<ul style="list-style-type: none"> <li>The site will be rehabilitated in stages leaving areas exposed for as short a time as possible. This will be undertaken in conformity with the approved Rehabilitation Plan with maximum final batter grades of 4(H):1(V) on north and west facing slopes and 3(H):1(V) on those facing south and east. Final slopes will be as gentle as possible depending on the availability of fill material.</li> </ul>	It is noted that there are significant areas of exposed soil/rock on site and the implementation of progressive rehabilitation is important to minimise exposed areas.	Not Triggered or Applicable Yet and/ Not	
3	Rehabilitation	<ul style="list-style-type: none"> <li>All soil stockpiles and exposed areas will be seeded with an appropriate vegetation cover where no activity is to take place for more than four weeks.</li> </ul>	There were significant exposed areas on the site. Apart from the areas which have been rehabilitated and the bunds, no other areas appear to have been seeded.	Non - Compliant (Low Risk)	Exposed areas of the site to be seeded with an appropriate vegetation cover where no activity is to take place for more than four weeks.

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Rehabilitation	<ul style="list-style-type: none"> <li>• Revegetation of the site will be undertaken on the following basis:               <ul style="list-style-type: none"> <li>– as far as possible re-establish the Sydney Hinterland Transitional Woodland using seed and mulch collected from the area ;</li> <li>– rehabilitate other areas to native species with a light sowing of cereal and allowing natural regeneration;</li> <li>– rehabilitate the soil to achieve a full profile;</li> <li>– lime, fertilise and sow areas where improved grass cover is required; and</li> <li>– suitably turf surfaces expected to experience high surface flows leaving the site.</li> </ul> </li> </ul>	Not net required apart from the SHTW area that has been rehabilitated.	Not Triggered or Applicable Yet and/ Not	
3	Rehabilitation	<ul style="list-style-type: none"> <li>• A maintenance programme aimed at promoting and protecting the growth of the rehabilitated areas will be established.</li> </ul>	A maintenance program is in place.	Compliant	
3	Social Impact Management	Material concerning activities at the site will be prepared and published on the company's website which will allow the community and others to be informed about current news on the site.	Website has been established	Compliant	
3	Social Impact Management	<ul style="list-style-type: none"> <li>• Regular bi-annual meetings of community representatives will be established to discuss issues in relation to sand extraction on the site.</li> </ul>	CCC meetings are held 6 monthly	Compliant	
3	Social Impact Management	<ul style="list-style-type: none"> <li>• A Complaints Register will be established incorporating date and time, type of communication, contact</li> </ul>	A complaints register has been established. Two complaints were noted - 14/09/10 and 24/04/12 - both relating to mud across the	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		details of the complainant, nature of the complaint and response taken.	road.		
3	Heritage	All work will cease in the area if an archaeological or heritage item is identified during extraction operations and the National Parks and Wildlife Service, the Deerubbin Aboriginal Land Council or the Heritage Office consulted to determine any appropriate course of action prior to recommencement of the work.	No archaeological or heritage items have been identified.	Not Triggered or Yet and/ Not Applicable	
3	Heritage	<ul style="list-style-type: none"> <li>Any additional survey work required for submittal of application to destroy artefact scatters located in the later stages of the development will be undertaken. Reasonable requirements of the National Parks and Wildlife Service (DECC), the Deerubbin Aboriginal Land Council and the Heritage Office arising out of any additional studies will be implemented</li> </ul>		Not Triggered or Yet and/ Not Applicable	
3	Visual Amenity	Peripheral bunds will be constructed within the established setbacks where necessary to screen extraction activities. These will be a minimum of three metres high with slopes ranging from 3(H):1(V) to 6(H):1(V) depending on the location using overburden stripped from the site.	The height of the bunds is variable, with not all bunds being at least three metres high. The slopes of the bunds was not checked. The IEA notes that a complete vegetated bund needs to be established along the Hitchcock Road boundary.	Non Compliant (Low Risk)	
3	Visual Amenity	<ul style="list-style-type: none"> <li>Screen planting works will be undertaken in the peripheral areas to an agreed specification using mulch to allow for native plant regeneration. This</li> </ul>	Screen planting works have been undertaken.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		species mix will be reinforced using appropriate plantings at specified intervals.			
3	Visual Amenity	<ul style="list-style-type: none"> <li>A tree planting programme will be undertaken within the ten metre buffer zones and in other defined parts of the site to establish a dense plantation using an appropriate mix of species reflecting that of the existing community.</li> </ul>	Progressive tree planting has been undertaken in the buffer zones however further planting will be undertaken.	Compliant	
3	Visual Amenity	<ul style="list-style-type: none"> <li>The final rehabilitated landform will be established in conformity with the Rehabilitation Plan.</li> </ul>		Not Triggered or Applicable Yet and/ Not	
3	Visual Amenity	<ul style="list-style-type: none"> <li>All temporary fencing will be removed when no longer required.</li> </ul>		Not Triggered or Applicable Yet and/ Not	
3	Visual Amenity	<ul style="list-style-type: none"> <li>Vegetation in areas suitable for agricultural/horticultural uses will be re-established.</li> </ul>		Not Triggered or Applicable Yet and/ Not	
3	Visual Amenity	<ul style="list-style-type: none"> <li>All site infrastructure including the slurry plant and its associated pipelines will be removed. Those areas affected by the plant will be restored and rehabilitated.</li> </ul>		Not Triggered or Applicable Yet and/ Not	
3	Visual Amenity	<ul style="list-style-type: none"> <li>All waste materials will be removed and disposed of in an appropriate manner.</li> </ul>	Waste materials are being progressively managed.	Not Triggered or Applicable Yet and/ Not	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Visual Amenity	<ul style="list-style-type: none"> <li>The final Rehabilitation Plan will be reviewed and proposals for future use of the site prepared</li> </ul>		Not Triggered or Applicable Yet and/ Not	
3	Waste Management	Waste handling areas will be clearly delineated.	Waste materials are managed in the workshop area.	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Specific areas for the collection of materials for reuse and recycling will be defined and clearly labelled.</li> </ul>	Waste materials are managed in the workshop area.	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Cleared vegetation will be used within the landscape programme.</li> </ul>		Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>All topsoil will be stored in stockpiles for later use in site rehabilitation.</li> </ul>		Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Bins or skips will be provided or the collection and storage of recyclable material and waste. General construction waste will be stored in a skip located at the workshop on Lot 198 DP752025. Waste food will be removed and stored in a vermin proof bin for collection by a waste contractor. Paper waste generated from site offices, plastics and glass will be collected separately for recycling.</li> </ul>	Waste segregation was observed.	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Hazardous wastes (including empty drums, rags, soil contaminated with oil) will be separated from nonhazardous wastes and manage in accordance with the relevant legislation.</li> </ul>	Waste segregation was observed.	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Waste Management	<ul style="list-style-type: none"> <li>Liquid wastes (chemicals, oils and greases) will be temporarily stored in an appropriately bunded area and disposed of via a licensed contractor. Wash down water will be directed to an appropriate settlement basin if quality is acceptable.</li> </ul>	An oily water sump and oily water separator was observed.	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Copies of current licences of all waste removal contractors on site will be retained.</li> </ul>	Copies of licences were observed	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>All documentation relating to waste removal and disposal will be retained on file at the site. This documentation will include dockets for the removal and disposal of waste at a licensed facility.</li> </ul>	Documentation is retained on site.	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Waste material will be progressively separated and stockpiled in designated areas for collection.</li> </ul>	Waste segregation was observed.	Compliant	
3	Waste Management	Adequately secure waste disposal areas to prevent access by wildlife.	No evidence of access by wildlife was observed.	Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>All waste licences will be reviewed and terms and conditions for compliance monitored.</li> </ul>		Compliant	
3	Waste Management	<ul style="list-style-type: none"> <li>Any materials and waste remaining on the site following completion of extraction operations will be recycled or sent of disposal. This will be either recycled or disposed of in an appropriate manner.</li> </ul>		Not Triggered or Applicable	Yet and/ Not
3	Emergency Response	All personnel on site during operations will be trained in appropriate	All personnel undertake a site induction. Records sighted.	Compliant	



Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		procedures including site induction, materials handling and response procedures.			
3	Emergency Response	• Emergency response procedures will be developed and put in place. Appropriate individuals will be appointed as emergency services liaison officers.	A Pollution Incident Response Plan is in place. Certificate III training is provided.	Compliant	
3	Emergency Response	• An emergency response table listing contact details of all relevant parties required in an environmental emergency will be prepared.	Details are provided in the Pollution Incident Response Plan.	Compliant	
3	Emergency Response	• A Register of Environmentally Hazardous Materials to be stored and used on site will be established.	Register has been established.	Compliant	
3	Emergency Response	• Appropriate safety and spill response equipment will be made available on site.		Compliant	
3	Emergency Response	• All materials to be used and stored on site will be clearly labelled.		Compliant	
3	Emergency Response	• Emergency response procedures will be reviewed and updated bi-annually.	It was indicated that this is not being done.	Non Compliant (Administrative)	
3	Emergency Response	• Appropriate safety and response equipment will be available at all times.		Compliant	
3	Hazard, Risk and Safety	A licence to keep dangerous goods will be obtained from WorkCover NSW for all materials stored on site which require licensing.	A Dangerous Goods Licence has been deemed to not be required based on the quantities of dangerous goods on site.	Not Triggered or Applicable Yet and/ Not	
3	Hazard, Risk and Safety	• A Register of Hazardous Materials setting out details of quantities, storage	Noted in IEA 2014 that the register requires revision	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
		and specific handling requirements for all relevant materials stored on site will be established.			
3	Hazard, Risk and Safety	<ul style="list-style-type: none"> <li>Material Safety Data Sheets for all hazardous materials stored on site will be obtained.</li> </ul>	The register of SDSs was viewed.	Compliant	
3	Hazard, Risk and Safety	<ul style="list-style-type: none"> <li>Appropriate storage and secondary containment facilities for all hazardous materials stored on site will be provided. All bunded areas will be designed to contain at least 110% of the volume of materials stored within the area.</li> </ul>	Bund for diesel tank was observed and appeared to be sufficient.	Compliant	
3	Hazard, Risk and Safety	<ul style="list-style-type: none"> <li>A Safety Officer will be appointed for the development.</li> </ul>	Production Manager is Safety Officer.	Compliant	
3	Hazard, Risk and Safety	<ul style="list-style-type: none"> <li>All flammable material storage areas will be located at least ten metres from possible ignition sources.</li> </ul>	No flammable materials were observed near ignition sources	Compliant	
3	Hazard, Risk and Safety	<ul style="list-style-type: none"> <li>Contents of all above ground storage areas will be clearly labelled.</li> </ul>		Compliant	
3	Hazard, Risk and Safety	<ul style="list-style-type: none"> <li>All hazardous and dangerous goods storage areas will be secured and appropriate signage displayed. All incompatible material will be segregated.</li> </ul>	No issues were observed on the date of inspection.	Compliant	
3	Hazard, Risk and Safety	All personnel will be trained in the handling and safety procedures required for the hazardous materials stored and used on site.	Included in induction and Safe Work Method Statement training	Compliant	

Appendix	Commitment Num	Condition	Evidence	Compliance Status	Recommendations
3	Hazard, Risk and Safety	• An Emergency Response Plan will be developed and put in place.	Included in EMS - A 12.3 Pollution/Incident Response Management Plan dated 13/10/14 provided.	Compliant	
3	Hazard, Risk and Safety	• A mobile spill control kit containing appropriate absorbent materials, neutralising chemicals and other spill containment equipment will be provided.		Compliant	
3	Hazard, Risk and Safety	• Personal protective equipment will be provided and personnel instructed in its use.		Compliant	
3	Hazard, Risk and Safety	• Any spills beyond the bunded area will be cleaned up immediately and the contaminated material disposed of in an appropriate manner.	A hydrocarbon spill from a drum was observed on hardstand outside the workshop which had not been cleaned up.	Non - Compliant (Low Risk)	
3	Hazard, Risk and Safety	• The relevant authorities will be contacted in the event of a leak or spill and any instructions followed. Any contamination will be remediated to the satisfaction of the regulatory authorities.		Not Triggered or Yet and/ Not Applicable	
3	Hazard, Risk and Safety	• Any spills or hazardous wastes that cannot be recycled will be collected and disposal by a licensed waste contractor arranged. All records of waste removal on site will be retained.		Compliant	

## Appendix 4 – Landscape Management Plan

Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
3.3.6	Impacts on local fauna	<p>The following mitigation measures will be implemented on site prior to the start of vegetation clearance:</p> <ul style="list-style-type: none"> <li>• preparation and implementation of a clearing management plan. The clearing protocols would include the following: <ul style="list-style-type: none"> <li>&gt; shaking the tree using a bulldozer;</li> <li>&gt; slowly pushing the tree to the ground so that it largely remains intact;</li> <li>&gt; inspection of hollows and removal of any animals if possible (to be undertaken in consultation with the OEH)</li> <li>&gt; leaving the tree in place once felled for at least one day/night before removing to allow animals to relocate to nearby vegetation; and</li> <li>&gt; undertaking vegetation clearing during September/October or in March/May to avoid summer breeding seasons and the winter hibernation for hollow dependent species.</li> </ul> </li> </ul>	It was indicated that this process is followed.	Compliant	
3.3.6	Impacts on local fauna	<ul style="list-style-type: none"> <li>• installation of sediment control devices prior to clearing vegetation; and</li> </ul>	No vegetation clearing was observed during the site inspection. It was indicated that this process is followed.	Compliant	
3.3.6	Impacts on local fauna	<ul style="list-style-type: none"> <li>• removal of topsoil from areas of native vegetation that are free of weeds and stockpiling for use in rehabilitation.</li> </ul>	Topsoil is stripped and stored.	Compliant	

Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
3.3.8	Conserving and reusing topsoil	Topsoil layers will be stripped from a minimum area of between two and five hectares to form a bund near the boundary of the area.	Advised that stripped topsoil has been stored in bunds around the site.	Compliant	
3.3.8	Conserving and reusing topsoil	The bund will not exceed 3m in height with a minimum crest width of 3m and side batters of 1 vertical to 2 horizontal.	It was indicated during the site inspection that topsoil is being used in bunds around the site. There is inconsistency between this commitment and conditions of consent regarding bunds.	Non Compliant (Low Risk)	- Survey to be undertaken of the site of all bunds to confirm compliance with relevant conditions.
3.3.8	Conserving and reusing topsoil	The bund will be revegetated for the duration of the operations.	Site bunds are vegetated.	Compliant	
3.3.8	Conserving and reusing topsoil	Bulky vegetation will be removed and stockpiled prior to soil stripping for respreading as a surface stabiliser or for mulching.	Vegetation that has been stripped was stockpiled with the majority used in the rehabilitation area. We confirm that the cleared vegetation is stored on site.	Compliant	
3.3.8	Conserving and reusing topsoil	Stripping will take place in moist conditions to avoid pulverisation and dust generation.		Compliant	
3.3.8	Conserving and reusing topsoil	Topsoil will be removed and replaced in two layers according to its organic matter content. Organic matter is characterised by the darker colour of the upper 50 to 100mm of the soil. The darker layer will be replaced uppermost above about 200 to 250mm of lighter coloured material spread over the ripped surface.	This has been generally done, noting that the top layer is directly moved to a rehabilitation site if possible.	Compliant	
3.3.8	Conserving and reusing	Where revegetation is to be based on agricultural species, soil testing will be		Not Yet Triggered and/	

Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
	topsoil	undertaken to assess lime and fertiliser requirements.		or Not Applicable	
3.3.8	Conserving and reusing topsoil	Topsoil will be respread to an even, but roughened surface with moderate compaction for optimum seedbed tilth.		Compliant	
3.3.8	Conserving and reusing topsoil	Areas being rehabilitated to native species will be lightly sown to annual cereal species and allowed to regenerate naturally. Supplementary planting and inoculation will be undertaken as and if required.		Not Triggered or Yet and/ Not Applicable	
3.3.8	Conserving and reusing topsoil	Areas where improved grass cover is required will be limed, fertilised and sown according to seasonal recommendations of NSW Department of Primary Industries.		Not Triggered or Yet and/ Not Applicable	
3.3.9	Site preparation for revegetation	Revegetation of the site is mainly based on a mixed approach using broadcast seed reinforced by the planting of tube stock. Where suitable topsoil is available, this will be used, but the volume available is not expected to be sufficient to cover the area required.	It is noted that an area on site has been rehabilitated, however further areas are to be rehabilitated. It is indicated that the current rehabilitated areas is compliant with this requirement.	Compliant	Additional sources of topsoil to be nominated and included in the Landscape Management Plan.



Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
3.3.9	Site preparation for revegetation	<p>These would include, where necessary:</p> <ul style="list-style-type: none"> <li>• stabilisation of the soil using fast growing native grasses such as <i>Chloris ventricosa</i>, <i>Austrodanthonia racemosa</i> or <i>Capillipedium spicigerum</i>;</li> <li>• ripping of any severely compacted soil following the contours of the site;</li> <li>• mulching of areas or around individual plants to conserve moisture and suppress weed growth taking care not to equally suppress native plant growth;</li> <li>• weed and rabbit control undertaken during the site preparation phase using methods appropriate to the area and the degree of infestation;</li> <li>• pre-watering of holes and plants; and</li> <li>• restriction of access to the rehabilitated site to protect the planted areas.</li> </ul>	It is noted that an area on site has been rehabilitated, however further areas are to be rehabilitated. It is indicated that the current rehabilitated areas is compliant with this requirement.	Compliant	
3.3.10	Direct Seeding	Direct seeding will also be considered as an approach following experience gained in the earlier stages of rehabilitation.		Compliant	
3.3.11	Planting	Planting of seedling tube stock will be included in the rehabilitation program.		Compliant	
3.3.11	Planting	Stands of local native vegetation will be re-established around the perimeter and on the highest points of the site, if required and on all batters too steep to accommodate agricultural uses.	It is noted that an area on site has been rehabilitated, however further areas are to be rehabilitated. It is indicated that the current rehabilitated areas is compliant with this requirement.	Compliant	
3.3.11	Planting	Weeds would be controlled as required		Compliant	

Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
		until pasture/ground cover is established.			
3.3.12	Care and Maintenance after planting	An area of approximately one metre in diameter around each plant should be kept weed-free.		Compliant	
3.3.12	Care and Maintenance after planting	Feral animal control, particularly of rabbits, may be required for up to two years after seedling establishment.		Compliant	
3.4	Success criteria and monitoring	The program will be predominantly undertaken using visual inspections reinforced by the assessment of aerial photography, regular site photography and site assessments using vegetation mapping.		Compliant	
3.4	Success criteria and monitoring	Regular assessments will include: <ul style="list-style-type: none"> <li>• inspection of all silt ponds for construction adequacy and structural integrity;</li> <li>• inspection of haul roads, pipeline bunds and associated overflow structures;</li> <li>• development and implementation of an annual program of reinstatement and maintenance works;</li> <li>• inspection of all batters to determine geological integrity and stability ;</li> <li>• assessment of rehabilitation progress over the previous audit period and determination of work program for the following period; and</li> <li>• assessment of regular aerial photography and before and after photographic records to identify changes occurring</li> </ul>		Compliant	

Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
		over the previous period.			
3.4	Success criteria and monitoring	Structured visual inspections will be undertaken each month. These will focus on the determination of the effectiveness of the measures employed in addition to recording the progress of site rehabilitation.	This is done as part of the Monthly Checklist sign-off.	Compliant	
3.4	Success criteria and monitoring	The following will be determined and reported annually: <ul style="list-style-type: none"> <li>• additional area of cleared/disturbed/excavated land over the reporting period;</li> <li>• additional area of backfilled/re-contoured/rehabilitated/planted land over the reporting period; and</li> <li>• confirmation of final rehabilitated slope grades of new work undertaken during the reporting period.</li> </ul>	Reported in AEMR (Chapter 2)	Compliant	
3.4	Success criteria and monitoring	The monthly inspections together with the vegetation audits will be reported on an annual basis in the AEMR with notification of any changes which need to be made. This will identify the need for any reworking, reseeding or application of fertilizer within the rehabilitated areas.	Monthly inspections are provided in the AEMR (Chapter 3)	Compliant	
3.5.2	Performance assessment criteria	Targets would be set to be achieved at five year intervals and comparisons made with the existing condition of the vegetation to be removed. Where a value is not achieved at the appropriate time, it is indicative of a	Targets are reported in the 2012 Monitoring of Revegetation Report	Compliant	

Plan Section	Category	Condition	Evidence	Compliance Status	Recommendations
		requirement for improved management of the program so that the overall goal can be achieved.			
3.5.3	Monitoring and reporting	Monitoring the performance of the revegetation program will be undertaken annually (or as required) and include observational information in addition to the collection of data from random 400 square metre quadrats (at least one per revegetation area). Each species of plant in the quadrat will be recorded and its cover abundance estimated. Additional information recorded at each site will include position using GPS, slope, aspect, landform, soil type/geology, evidence of disturbance, condition, evidence of canopy recruitment, natural regeneration and fauna habitat values.	2012 report included in AEMR. 2013 Report sighted.	Compliant	