

PF FORMATION



HITCHCOCK ROAD SAND EXTRACTION AND REHABILITATION PROJECT, MAROOTA

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT
2010 - 2011



PF Formation

HITCHCOCK ROAD
Sand Extraction and Rehabilitation Project Maroota

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Hitchcock Road sand extraction and rehabilitation project

Annual Environmental Management Report 2010-2011

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Term	Abbreviation
AEMR	Annual Environmental Management Report
AHD	Australian Height Datum. The standard reference level used to express the relative elevation of various features. A height given in metres AHD is essentially the height above sea level.
Airshed	Lower atmosphere within a defined geographic area.
Ambient	The background level at a specific location, being a composite of all sources.
Annual Average Daily Traffic	Annual average daily traffic volume representing the total traffic in both directions at a specified location calculated from mechanically obtained axle counts.
Annual Exceedance Probability (AEP)	The probability of a flood event exceeding a nominated level in a year. A one percent AEP is the probability of an event exceeding a nominated level in 100 years.
Aquifer	Geologic formation, group of formations, or part of a formation capable of transmitting and yielding economic quantities of water.
Archaeology	The scientific study of human history, particularly the relics and cultural remains of the distant past.
ARI	Average Recurrence Interval-average or expected period between exceedance of a flood.
Background Noise Level	The ambient sound pressure noise level in the absence of the sound under investigation exceeded for 90 percent of the measurement period. Normally equated to the average minimum A-weighted sound pressure level.
Batter	The side slope of walls, embankments and cuttings or the degree of such slope, usually expressed as a ratio of horizontal distance to one vertical height.
Bore	A cylindrical drill hole sunk into the ground from which water is pumped for use or monitoring.
Buffer	A physical barrier, structure or width of land which encloses, partially encloses or defines a particular environment. It serves to minimise the impacts of non-desirable external influences on the adjoining environment.
Bund Wall	A wall erected to prevent the escape of various emissions into the environment (liquids, noise or views).
Catchment	The area drained by a stream or body of water or the area of land from which water is collected.
Clay	Very fine grained sediment, often defined as having a particle size less than 2 microns (0.002mm) in diameter.
Compaction	The process of compressing individual grains in a soil or sediment in response to pressure.
Conservation	The management of resources in a way that will benefit both present

Term	Abbreviation
	and future generations.
Contaminant	Any physical, chemical, biological or radiological substance or matter in water or soil that is not of natural origin.
Contamination	The degradation of the natural environment as a result of human activities.
Council	The Hills Shire Council.
Day	The period from 7.00am to 6.00pm on Monday to Saturday and 8.00am to 6.00pm on Sunday and public holidays.
dBA	Decibels using the A-weighted scale measured according to the frequency of the human ear.
DECC	NSW Department of Environment and Climate Change now OEH.
Decibel	A scale unit used in the comparison of powers and levels of sound energy. The number of decibels is ten times the logarithm to the base of ten of the ratio of the powers.
Department	NSW Department of Planning.
Director-General	Director-General of the Department of Planning or delegate.
DPI	NSW Department of Primary Industries
DWE	NSW Department of Water
EA	Environmental Assessment of the project entitled <i>Hitchcock Road Sand Extraction and Rehabilitation Project Environmental Assessment and Appendices</i> (3 volumes) dated November 2007, prepared by DFA Consultants, including the response to submissions and Preferred Project Report.
Ecology	The relationship between living things and their environment.
Ecologically Sustainable Development	Using, conserving and enhancing the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased.
Ecosystem	A functional unit of energy transfer and nutrient cycling in a given place. It includes all relationships within the biotic community and between the biotic components of the system.
Emission	Discharge of a substance to the environment.
Environment	A term for all the conditions (physical, chemical, biological and social) in which an organism or group of organisms, including humans, exists.
Environmental Assessment (EA)	impact on the physical, social and economic environment. It includes an evaluation of alternatives and an overall justification of the project. The EA is used as a vehicle to facilitate public comment and as the basis for analysing the project with respect to granting approval under

Term	Abbreviation
	relevant legislation.
Environment Protection Licence	
EMP	Environmental Management Plan
EP&A Act	<i>Environmental Planning and Assessment Act 1979.</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000.</i>
EPL	Environmental Protection Licence issued under the <i>Protection of the Environment Operations Act 1997.</i>
Equivalent Continuous Sound Level (LAeq)	The constant sound level which when operating over the same time interval as a fluctuating sound over an extended time, is equivalent to the same sound energy.
Erosion	The wearing away of the land surface by the action of water, wind and ice.
Evening	The period from 6.00pm to 10.00pm.
Excavate	Dig into natural material and remove using specialist machinery.
Extraction	A term referring to the removal of material from the earth synonymous with quarrying.
Extraction area	The land described as the extraction area in Appendix 1 of the Project Approval.
Evapotranspiration	Loss of water from a land mass through transpiration from plants and evaporation from the soil.
Fauna	All animals including birds, reptiles, marsupials and fish.
Flora	All plants
Frequency	Similar to the pitch of a musical note in sound pressure fluctuations of cycles per second (Hertz). Most sounds comprise a composite of frequencies of varying sound pressure levels in the range of 20 Hertz to 20,000 Hertz.
Friable	Easily crumbled.
Front-end loader	Machine used to lift and place soil, earth, rocks and other materials within an extraction site or to load products into trucks.
Gradient	Rate of change of a given variable with distance, such as temperature or elevation.
g/m²/month	grams per square metre per month
Greenhouse effect	Changes in climate that could occur due to increases in atmospheric concentrations of certain gases.

Term	Abbreviation
Groundwater	Subsurface water contained within the saturated zone.
Hawkesbury Sandstone	Prominent cliff-forming sandstone occurring across the Sydney basin.
Head (hydraulic head)	Energy contained in a water mass produced by elevation, pressure or velocity.
Heritage	Things of value which are inherited from the past.
Hydrocarbon	Any organic compound, gaseous, liquid or solid, consisting only of carbon and hydrogen.
Hydrogeology	The study of subsurface water in its geological context.
Impact	The effect of human-induced action on the environment.
Infiltration	The process of surface water soaking into the soil.
Infrastructure	Supporting installations and services supplying the needs of a project.
Introduced species	Plants and animals not native to Australia and known or thought to have been brought here by humans.
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 the approval.
Landform	A specific feature of the landscape or the general shape of the land.
µg/m³	micrograms per cubic metre
µs/cm	microsiemens per centimetre
micron	Unit of measure-one millionth of a metre.
mg/L	milligrams per litre
Mitigation measures	Measures put in place to reduce an impact.
Modelling	Use of mathematical equations to simulate and predict real events and processes.
Monitoring	Regular measurement of components of the environment to understand their condition and establish if necessary standards are being met.
Minister	NSW 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 Sunday and public holidays/
Observation well	A well constructed or utilised for the purpose of observing groundwater parameters such as water levels, pressure changes and water quality.

Term	Abbreviation
OEH	Office of Environment and Heritage (formerly DECC)
Palaeochannel	An ancient river bed, often filled with more recent sediments.
Perched water	Unconfined groundwater separated from an underlying body of groundwater by an unsaturated zone.
pH	A measure of acidity or alkalinity of a solution, numerically equal to 7 for neutral solution, increasing with increasing alkalinity and decreasing with increasing acidity. Originally stood for the words potential of hydrogen.
Piezometer	A pipe in which the elevation of the water level or potentiometric surface can be determined.
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 Planning on 18 November 2008.
Process plant	Equipment used to clean and separate sand into various sizes.
Project	The development as described in the EA.
Proponent	PF Formation or its successors in title.
Recharge	Addition of water to the zone of saturation; also the amount of water added.
Recovery	The difference between the observed water level during the recovery period after cessation of pumping and the water level measured immediately before pumping stopped.
Receptor	An environmental modelling term used to describe a map reference point where the impact is predicted. A sensitive receptor is a home, work place, school or other place where people spend some time. An elevated receptor is a point above ground level.
Rehabilitation	Preparation of a final landform following extraction and its stabilisation with vegetation.
Remnant vegetation	Native vegetation remaining after widespread clearing has taken place.
Resource	Potentially usable material in a defined area that can be economically extracted.
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 of Planning dated 27 August 2008.
RL	Reduced level, usually in metres to an arbitrary datum.

Term	Abbreviation
RTA	NSW Roads and Traffic Authority
Run-off	The proportion of precipitation discharged through surface water systems.
Sand	Sediment comprising particles ranging between 0.063mm and 2mm.
Sandstone	A fine grained rock of sedimentary origin composed primarily of sand-sized particles (0.06 to 2 mm).
Sedimentation basin	An area where runoff is ponded to allow sediment to be deposited. The longer the period that the runoff is held, the smaller the size of the sediment deposited. Such basins have to be regularly cleaned.
SHTW	Sydney Hinterland Transition Woodland
Silt	Sediment comprising most particles between 0.004mm and 0.063mm.
Species	Taxonomic grouping of organisms that are able to interbreed with each other but not with other species.
Stakeholder	An individual or group with an interest in the proposal.
Statement of Commitments	The proponent's commitments in Appendix 3 of the Project Approval.
Stockpile	Mound used to store material.
Stormwater	Rainwater which runs off catchments following rain events. The untreated water is carried into creeks, rivers and lakes.
Strategy A, Strategy B	The alternative rehabilitation proposals described in the Preferred Project Report.
Terrestrial	Relating to the land as distinct from air or water.
Tertiary	Geologic time at the beginning of the Cainozoic era, 65 to 2 million years ago, after the Cretaceous and before the Quaternary.
Topography	The physical relief and contours of the area.
Topsoil	The surface layer of a soil profile containing most of the organic material and viable life forms and seeds.
Total Dissolved Solids (TDS)	The dissolved mineral content of groundwater, commonly expressed in milligrams/Litre.
Total Suspended Solids	A measure of suspended solids concentrations in a water body and expressed in terms of mass per unit of volume.
Triassic	The earliest of the three periods that constitute the Mesozoic Era. Approximately between 230 and 180 million years before present.
TSC Act	NSW Threatened Species Conservation Act.

Term	Abbreviation
Turbidity	A measure of light penetration through a water column containing particles of matter in suspension.
Underflow	The volume of groundwater that flows through a cross sectional area of an aquifer. It depends on permeability and the prevailing gradient.
Unsaturated zone	That part of an aquifer between the land surface and water table.
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 of the Project Approval.
VENM	Virgin Excavated Natural Material as defined in the <i>Protection of the Environment Operations Act 1997</i> .
Wash plant	Equipment designed to wash unwanted sized materials from the product.
Water quality	Degree or lack of contamination.
Water table	The surface of saturation in an unconfined aquifer at which the pressure of the water is equal to that of the atmosphere.
Well	A hole sunk into the ground and completed for the abstraction or injection of water or for water observation purposes. Generally synonymous with bore.
1 in 100 Year Flood Level	The flood which occurs on average once every 100 years. Also known as the 100 year Average Recurrence Interval of a flood.

Chapter One **INTRODUCTION**

Following the lodgement of a Development Application ('DA') and associated Environmental Assessment ('EA') under Part 3A of the Environmental Planning and Assessment Act, the present development was approved by the Minister for Planning on 3 February 2009. 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 4
- Air Quality Monitoring Program – results in Chapter 5
- Water Management Plan – results in Chapter 6
- Landscape Management Plan – results in Chapter 7

The first four were prepared in association with the Department of Environment and Climate Change (DECC) and submitted to the Department of Planning (DoP) three months from the date of approval. These were approved by the Director-General of the Department of Planning on 8 July 2009. The Landscape Management Plan was prepared by persons approved by the Director-General, in consultation with DECC, and submitted within six months of the date of Project Approval. This Plan was approved by DoP on 26 August 2010.

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 (AEMP). 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).

The first AEMP was completed September 2009 including 12 months of monitoring to June 2009 under a previous consent. The second AEMP provided 12 months of data in compliance with the requirements of the approved management plans/monitoring programs to June 2010.

This AEMP 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
- include an analysis of these results against the relevant
 - impact assessment criteria/limits
 - monitoring results from previous years
 - 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.

First Independent Environmental Audit

On the 13 July 2010 the Department of Planning approved Environmental Planning to conduct the first Environmental Audit of the Project. In April 2011 the Independent Environmental Audit Report of the Hitchcock Road Sand Project was received. A copy of the Report is appended in **Attachment 1A** 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, nevertheless 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 14 June 2011 as per **Attachment 1B**.

Points 3, 6, 7, 8, 9, 12, 13, 20 of the Audit Recommendations refer to changes/updates to be made to the Environmental Strategies, Management Plan and Water Table Contours Map and Depth of Mining Contours Map. These Plans have been updated and forwarded to the Department of Planning on 14 September 2011 and are currently awaiting approval by the Department.

Attachment 1A

Independent Environmental Audit Report

(Please refer to attached PDF File on disc)

Attachment 1B

Response to Audit Recommendations



Etra Pty Ltd as Trustee for PF Formation Trust
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14 June 2011

Dear Sir/Madam

Hitchcock Road Sand Project (06_0104) Comments on Independent Environmental Audit

Under Clause 7 of Schedule 5 of the Notice of Project Approval dated 3 February 2010 we are required to commission an Independent Environmental Audit within 12 months of the date of the approval. This audit has been completed and a copy is enclosed. Our response to the audit recommendations outlined on page 38 of the Report are detailed below:

1. *Improve screen planting on Lot 1 DP 570966 along Old Northern Road between Wisemans Ferry Road and 200 metres south and also near the project site access point on Wisemans Ferry Road.*

The bund wall along Old Northern Road will be reshaped to improve the visual screening.

With regard to the comment regarding Wisemans Ferry Road this relates to the gap in the bund wall used to access the site (photo 1). As the entry point is right opposite our extraction area there is no room to build a screening bund until this area is fully extracted which could take several years. Whilst the extraction area is clearly visible at this entry point the reality is no-one other than staff and visitors see this view. The gap in the bund wall is approximately 20 metres wide and road users only see this window while passing at 80 kilometres an hour ie for about 1.1 seconds.

2. *Old tyres need to be removed from public view near the project site access point on Wisemans Ferry Road and either stored within the main processing plant workshop area or legally disposed of.*

Agreed.

3. *The survey plan provided to the Department of Planning in May 2009 in the form of an orthophoto-map (see Appendix 5) needs amendment taking into account the approved Landscape Management Plan and re-submission to the Department of Planning and Infrastructure to show the following:*

- a. *A 10 metre buffer area (rather than 30 metres) along Old Northern Road near Lot 2 DP 570966 and Lot 2 DP 1063296.*
- b. *Areas of vegetation to be conserved including Sydney Hinterland Transition Woodland.*
- c. *An area of at least 12 hectares to be rehabilitated and re vegetated.*

The survey plan will be updated and re-submitted to the Department of Planning. The 12 hectares to be rehabilitated is conceptually shown in Appendix 5 to the Approval and will be progressively surveyed over the life of the development.

4. *Any encroachment of the extraction area within Lot 2 DP 570966 and the 10 metre buffer area near the intersection of the disused access way/Crown Road and Old Northern Road needs to be rehabilitated and revegetated during the spring months of 2011.*

There has not been an encroachment within the 10 metre set back from the Crown Road other than being used as an access track to backfill the extraction area. No extraction occurred within the setback. The area will be rehabilitated when the adjoining silt pond area is rehabilitated.

5. *All buffer setback areas need to be clearly delineated on the ground with a peg out survey and use of permanent markers such as star posts and high visibility tape, coloured stakes, fences or similar.*

The buffer setback areas in all extraction areas are all defined by existing bund walls, fences or other markers. Further identifying markers will be used.

6. *A Traffic Noise Management Strategy needs to be included in the Noise Management Plan and to refer to the Maroota local traffic management policy agreed with Maroota's major quarry operators.*

This will be included in the Noise Management Plan.

7. *The Environmental Strategy needs to be updated including the date of publication, new names of NSW government departments, new legislation, revised Australian Standards and references.*

This will be done.

8. *As required by the Environmental Strategy an annual internal audit needs to be completed and documented by the Environmental Manager and the Site Manager to provide the basis for the management of potential non-conformances and for annual reporting of environmental performance.*

Monthly the Environmental Manager has a checklist that is reviewed and signed with comments made as necessary. Annually each action required by the Environmental Operations Procedures are reviewed and signed by the relevant Manager. Annually these documents and a copy of the consent are reviewed by the Management team to make sure all matters have been completed. This review and matters taken forward are reported in the Annual Environmental Management Report (Chapter 3). The wording in 3.3.2 Compliance Audit of the Environmental Strategy will be revised to reflect the actual procedures which are satisfactory.

9. *Annual reports on the effectiveness of the retention basins need to be produced and included in the AEMRs.*

In the Water Management Statement of Commitments it says 'All retention basins will be regularly inspected and an annual report prepared on their effectiveness'. This commitment was incorporated into Strategy 5.1 of the Environmental Operation Procedures and is reviewed as part of the monthly checklist. These reports are signed off, dated and copies included in the AEMR (Chapter 3). Whilst there is no separate report it is reported in the AEMR in a satisfactory manner.

10. *In addition to the water truck the irrigation system along parts of the internal haul roads near the revegetation (other woodland) area needs to be fixed for regular use during dry windy periods.*

To minimize the need for water trucks to be used for dust suppression we have invested in fixed irrigation systems along some sections of the road. These systems require a high level of maintenance and regularly get blocked or break down. Therefore we have not expanded the use of the irrigation system and do not rely on it. We use our water truck to suppress dust from the roads when it is dry and windy.

11. *The concrete pipes and a large disused oil tank within the project site need to be removed off-site to reduce any risk of the items being buried within the areas of site excavation.*

Agreed.

12. *The depth of mining contours plan dated 08/05/2009 (see Appendix 6) and supplied to the Department of Planning needs to be updated to cover the whole extraction area of the site.*

As required by Clause 4 of Schedule 3 of the Approval Conditions this will be reviewed and updated within 3 months of the Environmental Audit.

13. *The water table contours plan dated 08/05/2009 (see Appendix 7) and supplied to the Department of Planning needs to be updated to cover the whole extraction area of the site.*

As above in point 12.

14. *Current calibration certificates for the weighbridge need to be included in the AEMRs.*

A copy of the certificate from the Department of Fair Trading will be included in the AEMR.

15. *Modified copies of the annual production data produced for the Department of Primary Industries using the standard form for that purpose need to be included in the AEMRs. With the consent of the Department of Planning and Infrastructure and to avoid disclosure of commercially sensitive information to the public and competitors, production data should be provided in 100,000 tonne bands in the AEMRs.*

The AEMR is available on our website for public viewing and therefore we are reluctant to include the detail of our sales as disclosed in the annual production data provided to the Department of Primary Industries. In the second paragraph of Chapter 2 of the AEMR we confirm that our annual volume was within the limit of 400,000 tonnes. We propose that the annual production form be appended to the AEMR but not included in the copy on the website or other copies that may potentially be publicized.

16. *Annual production data needs to be separated for Hornsby Shire and The Hills Shire in annual returns so that the maximum throughput of 400,000 tonnes/annum for the project can be independently verified.*

We are only required to complete one annual production data form for the Department of Primary Industries and there seems little point requiring more than one return. Even if a separate return was completed for Baulkham Hills Shire it still would not relate to this Approval as we have 3 different Approvals/Consents in this Council area (and 6 in the Maroota area). The throughput was readily audited in this Environmental Audit and any further paperwork serves no purpose.

17. *The Complaints Register needs to be recorded in full in response to any complaints on the project and any corrective actions undertaken.*

Agreed.

18. *Within the workshop area in PF Formations main processing area an impervious bund under a shelter needs to be provided as a storage area for disused and empty fuel, lubricant and chemical drums and containers. The bund must be designed to contain at least 110% of the volume of materials stored within the area.*

There is a storage area that should be used. Staff will be reminded of this.

19. *With the consent of the Department of Planning and Infrastructure only the three closest noise assessment locations to the project being R3 Jurd, R5 Pignataro, R10 Tornatola plus R7 Maroota Public School need be monitored in future.*

This is as required under our EPA licence after on-site meetings with the DECC before the Approval commenced.

20. *Future AEMRs need to make reference that the Site Manager and the Quarry Manager are interchangeable and the same person. Similarly future AEMRs need to make reference that the Environmental Manager and Environmental Officer positions are either one or two persons.*

Agreed.

21. *The AEMPs need to provide a plan showing all areas of in-progress rehabilitation and completed rehabilitation. The rehabilitation location plan should be based on the Vegetation Offset Plan and areas for new plantings included as Appendix 5 in the Project Approval.*

This is shown on Attachment 2A (green area) of the AEMP but will be made clearer in future AEMPs.

22. *In the interests of ecologically sustainable development the volume or quantity of fuels/lubricants, electricity and water/groundwater consumed by PF Formation's operations including the on-site and off-site processing plants should be monitored quarterly and an efficiency programme implemented to reduce annual consumption.*

We are a small company who closely monitor all expenses particularly the major components that impact our business such as fuel, electricity and water. Other than labour these are the major expenses in running our business. We constantly look for ways to reduce the usage of these items.

Fuel is used running all our quarry equipment and the fuel efficiency is a major consideration in every purchase decision.

Electricity is used to run all our sand washing equipment. We have always adopted a policy of utilizing electricity rather than diesel/petrol where we have a choice. We have had electricity specialists investigate our operations but as we mainly use it for running pumps and similar equipment there is little opportunity for introducing more efficient energy use.

Because of the shortage of water over the last few years we have an engineer implement measures to minimize our usage in our washplants. The main water loss is through evaporation in our silt ponds and we are continually looking at ways of minimizing this loss.

Formal quarterly monitoring would be an inefficient waste of resources on something that is reviewed continually and in particular each month when the bills are signed. An annual summary of work done will be incorporated in the AEMP.

23. *The PF Formation website needs regular updating for progress on approvals from the Department of Planning and Infrastructure and the audit.*

Agreed.

24. *The document Methodology to assess success of revegetation within Hitchcock Road site, September 2008, Parsons Brinckerhoff Australia Pty Limited needs to added to PF Formation's website as an addition to the Project Approval.*

Agreed and done. Included in Appendix 6 to the Project Approval.

25. *A full legible copy of the Project Approval including all Appendices as provided by the Department of Planning on 7 March 2011 needs to be included on PF Formation's website.*

Agreed and done. The copy previously on the website was the one received from the Department of Planning – a new clearer copy has now been received and put on the website.

Yours faithfully



Peter Cummins
General Manager

Photo 1 : Wisemans Ferry Road Maroota



Chapter Two

STATUS OF THE PROJECT

The site survey plan attached as **Attachment 2A** shows the current status of the development. The location of the various lots that make up the site is shown on Figure 2 at **Attachment 2B**.

The total amount of processed material derived from the Hitchcock Road site over the 12 months to June 2011 was within the limit of 400,000 tonnes of processed material allowed under Condition 7 of Schedule 2 for the Hitchcock Road Project Approval.

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

No significant changes have occurred to the areas being worked as noted below:

- Extraction has continued in Lot 214 DP752039 on the southern side of the main clean water dam. The majority of the sand from this site has now been extracted and limited extraction will occur in the next year. Commencement construction of tailing ponds will occur. **(Attachment 2C – Photo 1)**
- Extraction will extend from the southern side of Lot 214 DP752039 along the Hitchcock Road boundary on Lot 167 DP752039.
- Extraction on the south-western side of the slurry plant on Lot 1 DP570966 and will continue as necessary. This used as a backup to the main extraction above **(Attachment 2C – Photo 2)**
- Removal of significant overburden heading north through Lot 2 DP1063296 to Lot 2 DP570966 to prepare for long-term extraction of this area. Intermittent extraction will occur in this area.
- Capping of Tailings Pond 5 is about one-third complete and will continue. **(Attachment 2C – Photo 3)**
- Tailings Pond 7 is now a disused tailings pond and will be progressively capped. **(Attachment 2C – Photo 4)**
- Previously capped Tailings Ponds 8 has continued to be used as overburden stockpile area.
- Construction of a new tailings pond in the centre of Lot 1 DP1091018. This pond will be Tailings Pond 11 immediately north of Tailings Ponds 7.
- Tailings Ponds 9 and 10 will continue as the main ponds in use in the system. **(Attachment 2C – Photo 5&6)**
- Continuation of revegetation in the completed areas of Lot 2 DP233818 **(Attachment 2C – Photo 10, 11 & 12)**. Significant supplemental planting has occurred in the last year. An additional area of 1.5 hectares has been reshaped and planted in Spring 2011. More than 4 hectares of SHTW will have been planted on the site at that stage.

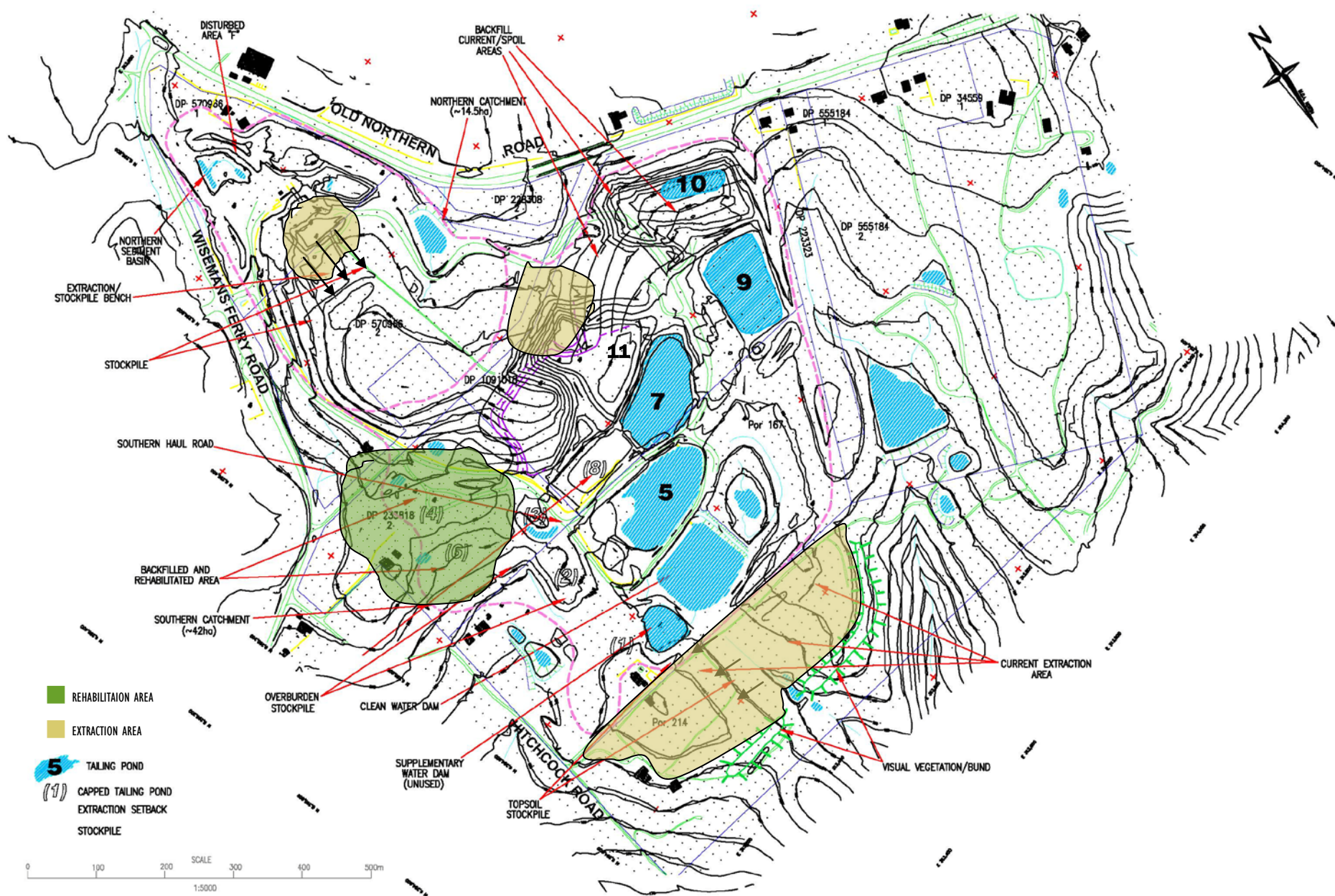
These activities will be initiated or continued over the next 12 months and be progressively completed over three years.

There has been one complaint recorded over the past 12 months. This was in regard to a pipe blowing near the intersection of Wisemans Ferry Road and Patricia Fay Drive. This problem caused sand to reach the intersection which was immediately cleaned up with the water truck washing the material back to the site. The majority of the pipeline has been replaced with rubber-lined steel pipes which has significantly reduced the risk of pipes leaking.

Other Matters

The weighbridge is required to be verified under the Fair Trading Rules every two years. The last verification was done on 28 October 2010 and a copy of the verification is in **Appendix 2D**.

Annual production data is forwarded to the Department of Primary Industries in aggregate for all material produced and sold at Maroota. The figures provided include material from Hornsby Shire Council and Hills Shire Council and from several Approvals/Consents. The information in these forms is commercially sensitive and in any case it does not break down the material from this Approval or others. The throughput for the year from this Approval was less than 400,000 tonnes and detail of this AEMR not available for publication.



Site Survey Plan



Scale
0 500 Metres

LOTS INCLUDED IN THE DEVELOPMENT

Boundary of the proposed extraction area



Photo 1: Extraction area - Lot 214 DP572039



Photo 2: Extraction Area - Lot 1 DP570966



Photo 3: Tailings Pond 5



Photo 4: Tailings Pond 7



Photo 5: Tailings Pond 9 (in current use)



Photo 6: Tailings Pond 10 (in current use)



Photo 7: clean water dam, Lot 167



Photo 8: Lot 198 Dam cleaned out in January 2010



Photo 9: Lot 198 Dam after clean out



Photo 10: Rehabilitation Area



Photo 11: Rehabilitation Area



Photo 12: Rehabilitation Area



Photo 13: Rehabilitation Area



Photo 14: Rehabilitation Area



Photo 15: Rehabilitation Area

Attachment 2D

Weighbridge Verification

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. A Summary of the Monitoring Results is in **Attachment 3A**.

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

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.

The only changes to the monitoring program for next year are:

- Quarterly noise testing will recommence from July 2010 and
- Parsons Brinkerhoff will undertake the rehabilitation monitoring in two years time in accordance with their recommendations rather than in the next year.

Summary of Monitoring Results

Noise Monitoring	2011	2010	2009
– Noise from operational activities exceed guidelines	NIL	NIL	NIL
– Complaints received	NIL	NIL	NIL
Air Quality			
Monthly dust deposit - average g/m2/month (from all sources)			
– Location 1 - behind Maroota Primary School	3.22 ^③	2.27	4.05 ^①
– Location 2 - Hitchcock & Wisemans Ferry Roads	2.38	2.18	6.04 ^{① ②}
– Location 3 - Jurd's Residence	2.56	2.55	3.14
^① results impacted by back burning in September 2008 (10.66, 12.60 respectively)			
^② results impacted by ploughing in July 2008 (21.97)			
^③ result impacted by reading of 10.5 in October 2010			
– Complaints received	NIL	NIL	NIL
– Plant exhaust deficiency when vehicles serviced	NIL	NIL	NIL
Access & Traffic			
– Traffic movements within limits	YES	YES	YES
Erosion & Sediment Control			
– Sediment leaving site	1	NIL	NIL
Water Management			
– Evidence of issue with groundwater quality	NIL	NIL	NIL
Rehabilitation			
– Area vegetated	> 4 hectares	2.4 hectares	2.4 hectares
Overall number of complaints received	1	NIL	NIL

Attachment 3B

Environmental Manager's Monthly Checklists

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

June 2011

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring results for the reporting period have been forwarded to Koikas Acoustics who will prepare a report to be included in the 2010 – 2011 AEMR.
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust Results for May 2011 have been received. Marginally higher readings were recorded at Sites 2 and 3 and low levels at Sites 1 and 2. The average for all sites still remains within the limits specified in the EPA Licence.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of truck movements was undertaken on 14 th June 2011. Five trucks were recorded leaving the site between the hours of 6:00am and 7:00am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	Sediment control fencing around the dam at the bottom of the Yellow Pit needs repairing after water discharged from the dam during heavy rainfall. A pump has been installed to lower the level of the dam to increase capacity if heavy rainfall is experienced again. The fencing is currently being repaired.
A6	A17-A20	Water	✓	Nil	Fabio from URS Australia attended the site on 22/06/11 to download data from the data loggers and collect water samples from monitoring bores on the site. A Groundwater Report will subsequently be prepared and will be included in the 2010 – 2011 AEMR.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 30th June 2011

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

May 2011

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring will next be undertaken in July 2011. Koikas Acoustics will be preparing a Noise Report based on readings taking throughout the year. This report will be included in the AEMP.
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust Results for April 2011 have been received and show low levels at all locations.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of truck movements was undertaken on 7 th May 2011. Eight trucks were recorded leaving the site between the hours of 6:00 and 7:00am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site throughout the month.
A6	A17-A20	Water	✓	Nil	Downstream Water Samples will be collected next month. URS will be attending the site next month to collect data and water samples for the Groundwater report to be included in the AEMR.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	Weed control was carried out throughout the month at the 2006 Rehabilitation Site. It was necessary to control invasive grasses growing around seedlings at the site.
A8	A26-A27	Social Impact	✓	Nil	The Community Consultative Committee meeting was held on 3 rd May. Minutes from the meeting are on the PFFormation website.
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	Further screen planting is required along areas adjacent to Old Northern Road to screen out stockpiles which are visible from the road. Invasive grassed will be sprayed and slashed then planting undertaken in Spring.
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 31st May 2011

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project
EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

April 2011

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring was undertaken throughout the month. Results were consistent with previous monitoring and will be summarised in the Noise Monitoring report to be included in the 2010 – 2011 AEMR.
A3	A6-A10	Air Quality	✓	Nil	Deposited dust results for March 2011 have been received. Results were lower than February 2011 and will be included in the 2010 – 2011 AEMR.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of truck movements was undertaken on 15 th April 2011. Nine trucks were recorded leaving the site between the hours of 6:00 and 7:00am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site throughout the month.
A6	A17-A20	Water	✓	Nil	Downstream water samples will next be collected in June 2011 unless extremely heavy rainfall is experienced before then.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	Seedlings planted in the 2006 rehabilitation site are doing well. No irrigation has been required throughout the month. Some hand weeding around the plants has been carried out and tree guards have needed readjusting after rainfall.
A8	A26-A27	Social Impact	✓	Nil	The independent audit undertaken by Bruce Adcock has been completed and PFFormation is in the process of reviewing the results. A community liaison committee meeting is scheduled for 3 rd May 2011.
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	On the 14 th April 2011 a PF Transport truck travelling south along Wisemans Ferry Rd rolled the dog trailer in Maroota. Although PF Transport is an unrelated company to PF Formation it was noted that the driver of the vehicle was dismissed and a letter from PF Transport was received noting the action that was taken.

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 29th April 2011

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

March 2011

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring will be undertaken next month.
A3	A6-A10	Air Quality	✓	Nil	Deposited dust results for February 2011 have been received. Levels were marginally higher at Site's 1 and 2 and significantly higher at Site 3 due to slashing undertaken in close proximity to the site.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of truck movements was undertaken on 24 th March 2011. 8 trucks were recorded leaving the site between the hours of 6 and 7 am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site throughout the month.
A6	A17-A20	Water	✓	Nil	Downstream water samples were collected on 1 st March 2011 and sent away for analysis. Results from testing were consistent with previous results and will be included in the 2010 – 2011 AEMR.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	Supplement planting of the 2006 rehabilitation site has continued throughout the month. A further 600 plants and 100 native grasses were planted with tree guards at the site. Slashing and spraying of invasive weeds will be undertaken next month to stop the seedlings being overrun by weeds which have previously dominated the site.
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 31st March 2011

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

February 2011

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust results for January 2011 have been received and show low levels at all locations. Grass cutting was undertaken by the council in close proximity to Site 3 during the month which could give a high reading at this location for February.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of truck movements was undertaken on 28 th Feb 2011. 9 trucks were recorded leaving the site between the hours of 6 and 7 am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site during this month.
A6	A17-A20	Water	✓	Nil	
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	600 native plants and 100 native grasses have been ordered and will be ready for pick up next month. They will be used for more supplement planting in the 2006 Rehabilitation site. Seedlings that were planted last year are doing well.
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	A truck and dog combination rolled over on Wisemans Ferry Rd during this month. The truck was carrying material from our quarry. We are reviewing our induction process for truck driver's to further stress the importance of road safety and maintaining safe speeds when travelling along windy roads.

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 28th February 2011

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

January 2011

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring has been carried out at the locations described in the EMP. Noise levels were above the Noise Limit criterion specified in the EPA Licence. Quarry noise was audible but not measurable at some locations and not audible at all at others. Noise from cicadas and road traffic dominated the readings.
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust results for December 2010 have been received and show low levels at all locations.
A4	A11-A12	Access and Traffic	✓	Nil	Records of daily truck movements are held at the weighbridge and closely monitored by the weighbridge officer.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site during this month.
A6	A17-A20	Water	✓	Nil	
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	Seedlings planted in the 2006 rehab site are doing well. Slashing and spraying of weeds has continued throughout the month and the plants have been hand watered regularly. Tree guards installed in December prove to be quite effective in protecting the plants from animal predation.
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 31st January 2011

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project
EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

December 2010

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring will be undertaken in January 2011.
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust results for November 2010 show low levels at all locations. The high reading at Site 1 in October 2010 was likely to be the result of organic matter deposited into the bottle. The average levels for the reporting period will remain within the limits specified in the EPA Licence at this stage.
A4	A11-A12	Access and Traffic	✓	Nil	
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site during this month.
A6	A17-A20	Water	✓	Nil	Downstream water samples were collected on 12/12/10 and sent away for analysis. Test results will be included in the AEMR.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 24th December 2010

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project
EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

November 2010

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Noise monitoring will be undertaken next in January 2011 if no complaints are received.
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust Results for Oct 10 show slightly higher results at Site's 2 & 3 and a significant spike at Site 1. Activities at the quarry have not changed throughout the month and no farming activity appears to have been undertaken in the paddock near the station. The laboratory will hold the samples from the site until results from Nov have been received in case further analysis is required.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of truck movements in the quarry was undertaken on the 18 th November 2010. Six trucks left the site between 6:00 and 7:00am and a total of 28 truck movements were recorded for day.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site during this month.
A6	A17-A20	Water	✓	Nil	
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	Native seedlings planted in the 2006 Rehabilitation area are doing well. Next month tree guards will be installed to protect the seedlings from animal predation. Further weed control will also be undertaken at the site.
A8	A26-A27	Social Impact	✓	Nil	The Community Consultative Committee Meeting was held at the meeting room on 11 th November 2010. The minutes will be posted on the P F Formation website. Bruce Adcock is currently undertaking the external audit and once completed a report will be sent to the department.
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 30th November 2010

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

October 2010

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Operator attended Noise Monitoring was undertaken throughout the month. The results were similar to monitoring undertaken in July 2010. Quarry noise was not measurable at all locations. (Road traffic dominant)
A3	A6-A10	Air Quality	✓	Nil	Deposited dust results for September 2010 show low levels at all locations.
A4	A11-A12	Access and Traffic	✓	Nil	An audit of trucks leaving the site was undertaken on 26 th October 2010. Five trucks recorded leaving site between 6:00 and 7:00am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	Sediment traps along the main haul road entering the quarry were cleaned out on 11 th October 2010. No water or sediment left the site during this month.
A6	A17-A20	Water	✓	Nil	Results for downstream water samples have been received and are within the requirements set out in the EIS.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	560 native SHTW seedlings were planted in the 2006 Rehabilitation site. An irrigation system has been installed to ensure a high success rate. Topsoil has been spread over a further 1.5ha of the site and seed broadcasting should commence early next month. The seed has been collected and is on site ready for use.
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	DPI will be undertaking an audit of our Electrical Management Systems next month.

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 29th October 2010

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project
EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

September 2010

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	The Noise Monitoring Report has been completed and will be included in the 2009-2010 AEMR. Quarterly noise monitoring for the new reporting period commenced in July 2010. Noise testing will be undertaken in October 2010, January 2011 & April 2011. Results will be summarised in 2010-2011 AEMR.
A3	A6-A10	Air Quality	✓	Nil	Deposited dust results for August 2010 show low levels at all locations.
A4	A11-A12	Access and Traffic	✓	Yes	On the 14 th September we received a phone call about mud spilling onto the road near the intersection between the two quarries. The person did not leave a name. The mud was from a blown sand pipe near the road. The mechanical sweeper was used to promptly clean the road.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left site during this month except for a minor spillage from a blown pipe at the intersection.
A6	A17-A20	Water	✓	Nil	Downstream water samples were collected and sent away for analysis.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	1.5 Ha has been prepared for seed broadcasting to be undertaken next month. Once enough seed has been obtained the new area will be broadcasted & covered with a light layer of mulch. An irrigation system will be installed to ensure high a success rate for the seed. Weed spraying was also carried out in sections of the 2006 Rehabilitation area.
A8	A26-A27	Social Impact	✓	Nil	An audit of trucks leaving the site was undertaken on 13 th September 2010. 9 trucks recorded leaving site between 6:00 and 7:00am.
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓ = Satisfactory
✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 30th September 2010

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project
EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

August 2010

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Draft copies of Noise Report are currently being reviewed and once finalised will be included in the 2009 - 2010 AEMR.
A3	A6-A10	Air Quality	✓	Nil	Deposited Dust Results for July 2010 show low levels at all locations.
A4	A11-A12	Access and Traffic	✓	Nil	Audit of trucks leaving site was undertaken on 25th August 2010. 5 Trucks recorded leaving site between 6:00 and 7:00am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left site during this month.
A6	A17-A20	Water	✓	Nil	
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	The final landform has been established in the new rehabilitation area and weed spraying has been undertaken. Once topsoil has been spread out planting and seed broadcasting will commence in Spring.
A8	A26-A27	Social Impact	✓	Nil	
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	

Key:

✓= Satisfactory
✗= Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed:



Date: 31st August 2010

PF FORMATION

HITCHCOCK ROAD MAROOTA - Sand Extraction and Rehabilitation Project
EMP MANAGEMENT CONTROLS OPERATIONAL CHECKLIST - ENVIRONMENTAL MANAGER

July 2010

STRATEGY POINT	PAGE NO	DESCRIPTION	STATUS ✓ or ✗	COMPLAINTS RECEIVED	COMMENTS
A2	A3-A5	Noise	✓	Nil	Koikas Acoustics are preparing a Noise Report to be included in the 2009 - 2010 AEMR.
A3	A6-A10	Air Quality	✓	Nil	Deposited dust results for June 2010 show low levels at all locations.
A4	A11-A12	Access and Traffic	✓	Nil	Audit of trucks leaving site was undertaken on 28th July 2010. 7 trucks recorded leaving site between 6:00 and 7:00am.
A5	A13-A16	Erosion & Sediment Control	✓	Nil	No water or sediment left the site during this month. Downstream water sample results will be included in the AEMR.
A6	A17-A20	Water	✓	Nil	URS have prepared the Groundwater Report. An annual report for Por167 Spring has been forwarded to DWE as per Lic conditions.
A7	A21-A25	Rehabilitation & Vegetation offset	✓	Nil	The Landscape Management Plan has been approved by DPP. PB Report to be included in the AEMR.
A8	A26-A27	Social Impact	✓	Nil	Bruce Adcock has been approved to undertake the Independent Audit and has been commissioned to do so.
A9	A28-A29	Heritage	✓	Nil	
A10	A30-A32	Visual Amenity	✓	Nil	
A11	A33-A35	Waste Management	✓	Nil	
A12	A36-A37	Emergency Response	✓	Nil	
A13	A38-A41	Hazard, Risk and Safety	✓	Nil	Annual safety audits were undertaken and are filed in the MSMP.

Key:

✓ = Satisfactory

✗ = Unsatisfactory

Completed by Environmental Manager (Josh Graham)

Signed: 

Date: 30th July 2010

Attachment 3C

Annual Environmental Operations 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.	Site Manager <i>[Signature]</i>
2.1.2	Advise neighbouring properties at least 24 hours in advance of the extent and expected duration of especially noisy activities.	Site Manager/ Environmental Manager <i>7/06/11 [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	Site Manager <i>16-6-11 [Signature]</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.	Site Manager <i>16-6-11 [Signature]</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.	Site Manager <i>16-6-11 [Signature]</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.	Site Manager <i>[Signature]</i> <i>SAVES ARE 6.00AM AS PER CONSENT OPERATORS START AT 6.00PM CHECK EQUIPMENT PRIOR TO 7.00AM START 16-6-11</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.	Site Manager <i>16-6-11 [Signature]</i>
2.1.8	Conduct compliance monitoring of noise levels at the defined locations and keep records of measurements.	Environmental Manager <i>7/06/11 [Signature]</i> <i>Monitoring results summarised in Noise Report and included in AEMR</i>
Performance indicator	Noise from operational activities does not exceed the guideline limits.	
	Number of complaints received <i>7/06/11 No Complaints [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 7/06/11 <i>Phalan</i> samples collected monthly
3.1.2 Fit dust suppression equipment to all processing plant on the site. This is to be regularly inspected and maintained in good working order at all times.	Site Manager/ Environmental Manager 7/06/11 <i>Phalan</i>
3.1.3 Define ^{haul road} trafficable areas to prevent unnecessary vehicle movement into others	Site Manager <i>h</i>
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.	Site Manager/ Environmental Manager 7/06/11 <i>Phalan</i>
3.1.5 Apply speed controls to all unsealed areas (maximum speed of 20 km/h) and signpost accordingly.	Site Manager <i>h</i> 16-6-11
3.1.6 Vegetate all semi-permanent stockpiles with suitable groundcover and regularly water until the vegetation is well established.	Site Manager <i>h</i> 16-6-11
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.	Site Manager <i>R</i> 16-6-11
3.1.8 Ensure that all loaded trucks leaving the central processing plant on Lot 198 DP595538 have their payloads fully covered by a suitable material to prevent spillage.	Site Manager <i>h</i> 16-6-11
3.1.9 Construct dust screens such as earth bunds and vegetated barriers.	Site Manager <i>h</i> 16-6-11
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.	Site Manager <i>h</i> 16-6-11
3.1.11 No fires to be permitted on-site.	Site Manager <i>h</i> 16-6-11

Performance indicator	Ambient air quality data compiled. Dust generated from site activities to comply at all times with DECC specified air quality criteria.
Monitoring	Dust monitoring at identified locations. Compilation of a complaints register.
Reporting	Annual reporting in the AEMR. Monitoring results will be suitably summarised for posting on the PF Formation website.

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.	Environmental Manager 7/06/11 <i>Phalen</i>
3.2.2	Regularly service all vehicles to ensure that exhaust emissions comply with the regulations. Maintain appropriate service records.	Site Manager <i>RH 16-6-11</i>
3.2.3	Identify any opportunities to minimise machinery use and ensure that all equipment used on the site is energy efficient.	Site Manager <i>RH 16-6-11</i>
Performance Indicator	Vehicle and plant emissions comply with the regulations.	
Monitoring	Regular vehicle and plant inspections.	
Reporting	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 Baulkham Hills Shire.	Site Manager/ Environmental Manager 7/06/11 <i>Palam</i> Weighbridge records reviewed.
4.1.2 Undertake operations involving the transportation of material on the site only between 6.00am and 6.00pm, Monday to Saturday.	Site Manager/ Environmental Manager 7/06/11 <i>Palam</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.	Site Manager/ Environmental Manager 7/06/11 <i>Palam</i> Audit weighbridge records monthly.
4.1.4 Ensure that all vehicle loads leaving the site are suitably covered.	Site Manager 16-6-11
Performance Indicator	Minimum of complaints from the community.
Monitoring	Number and type of complaints received.
	Weighbridge records of arrival and departure times.
Reporting	Annual report on complaints received.

A4.4 Monitoring and reporting

The Site 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.	Site Manager/ 7/06/11 <i>Palan</i> Environmental Manager
5.1.2 Erect silt traps and erosion control fencing as appropriate along extraction area boundaries and drainage lines.	Site Manager/ 7/06/11 <i>Palan</i> Environmental Manager
5.1.3 Design sediment basins with a minimum storage capacity of 400 m ³ per hectare of catchment. Spillway capacity and stability will be designed as follows: <ul style="list-style-type: none"> • life of less than 5 years, adopt the 20 year t_c event • life between 5 and 10 years, adopt the 50 year t_c event • life greater than 10 years, adopt the 100 year t_c event. 	Site Manager <i>16-6-11</i>
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.	Site Manager/ 7/06/11 <i>Palan</i> Environmental Manager <i>Monthly reporting.</i>
Performance indicator	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.
Monitoring	Review effectiveness of the stormwater basins and treatment methods during and following major rainfall events.
Reporting	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	Site 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	Site Manager/ Environmental Manager
Performance indicator	Soil erosion control measures are incorporated in the operational activities on the site and are effective in reducing soil erosion.
Monitoring	Monitor suspended solid concentrations in stormwater runoff from the undisturbed parts of the site.
Reporting	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)

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

5.3.5	Monitor erosion and sediment controls regularly and immediately following a rainfall event. Monitoring will take place initially on a weekly basis, then monthly once operating correctly. 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.	Site Manager/ Environmental Manager	7/06/11 <i>Palan</i>
5.3.6	Undertake maintenance of erosion and sediment controls when any deterioration is identified or when replacement is necessary.	Site Manager/ Environmental Manager	7/06/11 <i>Palan</i>
5.3.7	Reuse stored stormwater for dust control and the watering of site vegetation.	Site Manager/ Environmental Manager	7/06/11 <i>Palan</i>
5.3.8	Seed material stockpiles where these are to remain unused for a period in excess of four weeks. Water the area until the vegetation is well established.	Site Manager/ Environmental Manager	7/06/11 <i>Palan</i>
5.3.9	Control vehicle movement on the site by the identification of the haul road and current working areas.	Site Manager	<i>H 16-6-11</i>

Performance indicator	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.
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Monitoring	Monitor suspended solids levels in stormwater following rainfall events. Compare results with other appropriate locations.
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Reporting	Report on suspended solid levels and performance of erosion and sedimentation control measures for inclusion in the relevant AEMR.
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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.	Site Manager <i>RH 16-6-11</i>
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 Energy and the Department of Planning consulted to determine the basis on which extraction may recommence.	Site Manager <i>RH 16-6-11</i>
6.1.3 Design the sediment retention basins to accommodate the 100-year t_c event. The minimum basin capacities are as follows: <ul style="list-style-type: none"> Southern catchment (Basin 1) 19,400 m³ Northern catchment (Basin 2) 7,800 m³ <p>The volume of these basins can be varied depending on the extent of the area exposed for extraction within each catchment.</p>	Site Manager <i>RH 16-6-11</i>
6.1.4 Arrange for regular inspection of the capacity and stability of all retention basins and report on their effectiveness.	Site Manager/ Environmental Manager <i>3/06/11 Graham</i>
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 Energy and the Department of Planning.	Site Manager/ Environmental Manager <i>3/06/11 Graham</i>
Performance indicator	Maintenance of groundwater quality. Existing water levels and groundwater quality will be determined from data derived from the bores on the site.

Monitoring	Regular monitoring of water levels and water quality data from the on-site bores. Assessment in relation to the conclusions of the Maroota Groundwater Study when this becomes available.
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Reporting	Annual reporting of groundwater quality issues and assessment of impacts of site operations for inclusion in the AEMR.
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A6.4 Monitoring and reporting

The Environmental Manager will be responsible for the monitoring of the effectiveness of the water management measures installed on-site. Annual reports will be prepared by the Environmental Manager for inclusion in the AEMR.

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.	Site Manager/ Environmental Manager 8/06/11 <i>Pradham</i>
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 8/06/11 <i>Pradham</i>
7.1.3 Prepare an assessment of the species mix of the Sydney Hinterland Transition Woodland and arrange for collection of seeds from the vegetation to be removed and adjacent areas. 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 8/06/11 <i>Pradham</i>
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.	Site Manager/ Environmental Manager 8/06/11 <i>Pradham</i>
7.1.6 Separate topsoil for use in rehabilitation works.	Site Manager/ Environmental Manager 8/06/11 <i>Pradham</i>
7.1.7 Incorporate flora and fauna issues in the education program so that the site operatives are aware of the requirements of this EMP.	Environmental Manager 8/06/11 <i>Pradham</i>
7.1.8 Once each extraction phase is complete, initiate the rehabilitation and revegetation program as set out in the Landscape management Plan.	Site Manager/ Environmental Manager 8/06/11 <i>Pradham</i>
Performance indicator	All areas of significant flora and fauna habitat are protected prior to the start of extraction.

Monitoring

Ensure that all 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 fenced and defined areas for access and extraction activity is to be prepared.

Map disturbed areas on an annual basis and report on any impacts on bushland and rehabilitated areas.

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

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

Actions	Responsibility
<p>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.</p>	<p>Environmental Manager 8/06/11 <i>Palam</i></p>
<p>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.</p>	<p>Site Manager/ Environmental Manager 8/06/11 <i>Palam</i></p>
<p>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.</p>	<p>Site Manager/ Environmental Manager 8/06/11 <i>Palam</i></p>

7.2.4	Undertake revegetation of the site on the following basis:	Environmental Manager	8/06/11 <i>P. Alan</i>
	<ul style="list-style-type: none"> re-establish the Sydney Hinterland Transition 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 lime, fertilise and sow areas where improved grass cover is required suitably turf surfaces expected to experience high surface flows leaving the site 		
7.2.5	Establish a maintenance program aimed at promoting and protecting the growth of the rehabilitated areas.	Site Manager/ Environmental Manager	8/06/11 <i>P. Alan</i>

Performance Indicator	Completion of site rehabilitation in conformity with the approved Landscape Management Plan.
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Monitoring	Regular site inspections to ensure that the following is achieved: <ul style="list-style-type: none"> rate of rehabilitation is in conformity with the staging program conservation zones and rehabilitated areas are being appropriately maintained vegetative covers are being established site works such as bunding and the establishment of re-vegetated areas are progressing in accordance with the Landscape Management Plan all sensitive flora and fauna habitat is being adequately protected from damage
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Reporting	Reports of site inspections and annual reviews in the AEMR.
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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 open door policy . Widely publish contact phone number and provide an early response to all queries, comments and requests for information.	Site Manager/ Environmental Manager 8/06/11 <i>Palen</i>
8.1.2 Provide access to all relevant environmental management documentation and monitoring results on the PF Formation web site.	Environmental Manager 8/06/11 <i>Palen</i>
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 8/06/11 <i>Palen</i>
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.	Site Manager/ Environmental Manager 8/06/11 <i>Palen</i>
Performance indicator	Minimal complaints from the community.
Monitoring	Number and type of responses and complaints raised by the community and improved performance.
Reporting	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.	Site Manager/ Environmental Manager 8/06/11 <i>Palan</i> <i>No archaeological or heritage items have been identified.</i>
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 8/06/11 <i>Palan</i>

Performance Indicator	Any item of heritage significance is protected during site operations.
Monitoring	The protection of any heritage items identified during site operations is to be monitored.
Reporting	Any heritage item identified during site operations is to be documented.

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.	Site Manager/ Environmental Manager 8/06/11 <i>Palan</i>
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	Site Manager/ Environmental Manager 8/06/11 <i>Palan</i>
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 8/06/11 <i>Palan</i>
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 8/06/11 <i>Palan</i>
10.1.5 Re-establish the landform of the extraction areas to that shown in the Landscape Management Plan.	Site Manager <i>RH 16-6-11</i>
10.1.6 Complete the rehabilitation of the site in conformity with the proposals set out in the Landscape Management Plan.	Site Manager <i>RH 16-6-11</i>
10.1.7 Remove all temporary fencing when no longer required.	Site Manager <i>RH 16-6-11</i>
10.1.8 Re-establish vegetation in areas suitable for agricultural/horticultural uses.	Site Manager <i>RH 16-6-11</i>
10.1.9 Remove all site infrastructure including the slurry plant and its associated pipelines. Restore those areas affected by the plant and rehabilitate.	Site Manager <i>RH 16-6-11</i>
10.1.10 Remove all waste materials and dispose of in an appropriate manner.	Site Manager <i>RH 16-6-11</i>
10.1.11 Review Quarry Closure Plan and prepare proposals for future use of the area.	Site Manager <i>RH 16-6-11</i>

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.	Site Manager <i>R 16-6-11</i>
11.1.2 Define specific areas for the collection of materials for reuse and recycling and clearly label.	Site Manager <i>R 16-6-11</i>
11.1.3 Process cleared vegetation on site for use as mulch within the landscape program.	Environmental Manager <i>8/06/11 P. Alan</i>
11.1.4 Store all topsoil in stockpiles for later use in site rehabilitation.	Environmental Manager <i>8/06/11 P. Alan</i>
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.	Site Manager <i>R 16-6-11</i>
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.	Site Manager <i>R 16-6-11</i>
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.	Site Manager <i>R 16-6-11</i>
11.1.8 Retain copies of current licences of all waste removal contractors on site.	Site Manager <i>R</i>
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.	Site Manager <i>R</i>
11.1.10 Progressively separate and stockpile waste material in designated areas for collection. Adequately secure waste disposal areas to prevent access by wildlife.	Site Manager <i>R 16-6-11</i>

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- | | | | |
|---------|---|--------------|---|
| 11.1.11 | Review all waste licences and monitor terms and conditions for compliance. | Site Manager |  |
| 11.1.12 | Recycle or dispose of any materials and waste remaining on the site following completion of extraction operations.
All should be disposed of in an appropriate manner. | Site Manager | - Not yet. |
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Performance Indicator	Effective use of waste recycling area and maximisation of material reuse.
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Appropriate removal of all waste from the site on completion.

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.
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A11.4 Monitoring and reporting

The Site 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 Site 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.	Site Manager <i>R 16-6-11</i>
12.1.2 Develop and put in place emergency response procedures. Appoint appropriate individuals as emergency services liaison officers.	Site Manager <i>R 16-6-11</i>
12.1.3 Establish an emergency response table listing contact details of all relevant parties required in an environmental emergency.	Site Manager <i>R 16-6-11</i>
12.1.4 Establish a Register of Environmentally Hazardous Materials to be stored and used on site.	Site Manager <i>R 16-6-11</i>
12.1.5 Ensure that appropriate safety and spill response equipment has been made available.	Site Manager <i>R 16-6-11</i>
12.1.6 Clearly label all materials to be used and stored on site.	Site Manager <i>R 16-6-11</i>
12.1.7 Review and update emergency response procedures bi-annually.	Site Manager
12.1.8 Ensure that appropriate safety and response equipment is available at all times.	Site Manager <i>R 16-6-11</i>
Performance indicator	Emergency response procedures, controls and training adequate for potential emergencies.
Monitoring	Regular monitoring of response procedures and equipment.
Reporting	Annual report on incidents.

A12.4 Monitoring and reporting

The Site 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	Site Manager <i>Not required.</i>
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.	Site Manager/ Environmental Manager
13.1.3 Obtain Material Safety Data Sheets for all hazardous materials stored on site.	Site Manager/ Environmental Manager <i>16-6-11</i>
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 stored within the area.	Site Manager
13.1.5 <i>Temporary facilities have drip trays. permanently stored</i> Appoint a Safety Officer for the development.	Site Manager <i>16-6-11</i>
13.1.6 Locate all flammable material storage areas at least ten metres from possible ignition sources.	Site Manager/ Environmental Manager <i>16-6-11</i>
14.1.7 Clearly label the contents of all above ground storage areas.	Site Manager/ Environmental Manager <i>16-6-11</i>
13.1.8 Secure all hazardous and dangerous goods storage areas and display appropriate signage. Segregate all incompatible material.	Site Manager/ Environmental Manager <i>16-6-11</i>
13.1.9 Train all personnel in the handling and safety procedures required for the hazardous materials stored and used on site. <i>COVERED AT SAFETY MEETING.</i>	Site Manager/ Environmental Manager <i>16-6-11</i>

Performance Indicator

Storage and handling of hazardous materials complies with legislative requirements and demonstrates due diligence.

Monitoring	Regular audit of compliance with legislative requirements for the storage and handling of hazardous materials.
Reporting	Regular audit reports.

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

Actions		Responsibility	
13.2.1	Emergency Response Plan in place (see Chapter 12).	Site Manager	RH 16-6-11
13.2.2	Provide a mobile spill control kit containing appropriate absorbent materials, neutralising chemicals and other spill containment equipment.	Site Manager	RH 16-6-11
13.2.3	Provide personal protective equipment and instruct personnel on its use.	Site Manager	RH 16-6-11
13.2.4	Clean up any spills beyond the bunded area immediately and dispose of the contaminated material in an appropriate manner.	Site Manager	RH 16-6-11
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.	Site Manager	RH 16-6-11
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.	Site Manager	RH 16-6-11

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

Chapter Four NOISE MANAGEMENT

Introduction

The Project Approval (**Schedule 3 Condition 8**) 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 2011
- 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 4.1** to be applied to the impact assessment. These assessment locations as shown on **Attachment 4A** were selected because they are representative or closer to the quarry than the Noise Assessment Locations

Table 4.1 Noise impact assessment monitoring locations

Noise assessment location	Other locations covered	Day	Night ¹	
		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

identified in Table 1 of Schedule 3 to the Notice of Project Approval.

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.
- LAeq(1 minute) noise level measured at an appropriate free-field location close to the

façade of the relevant residence during night time hours.

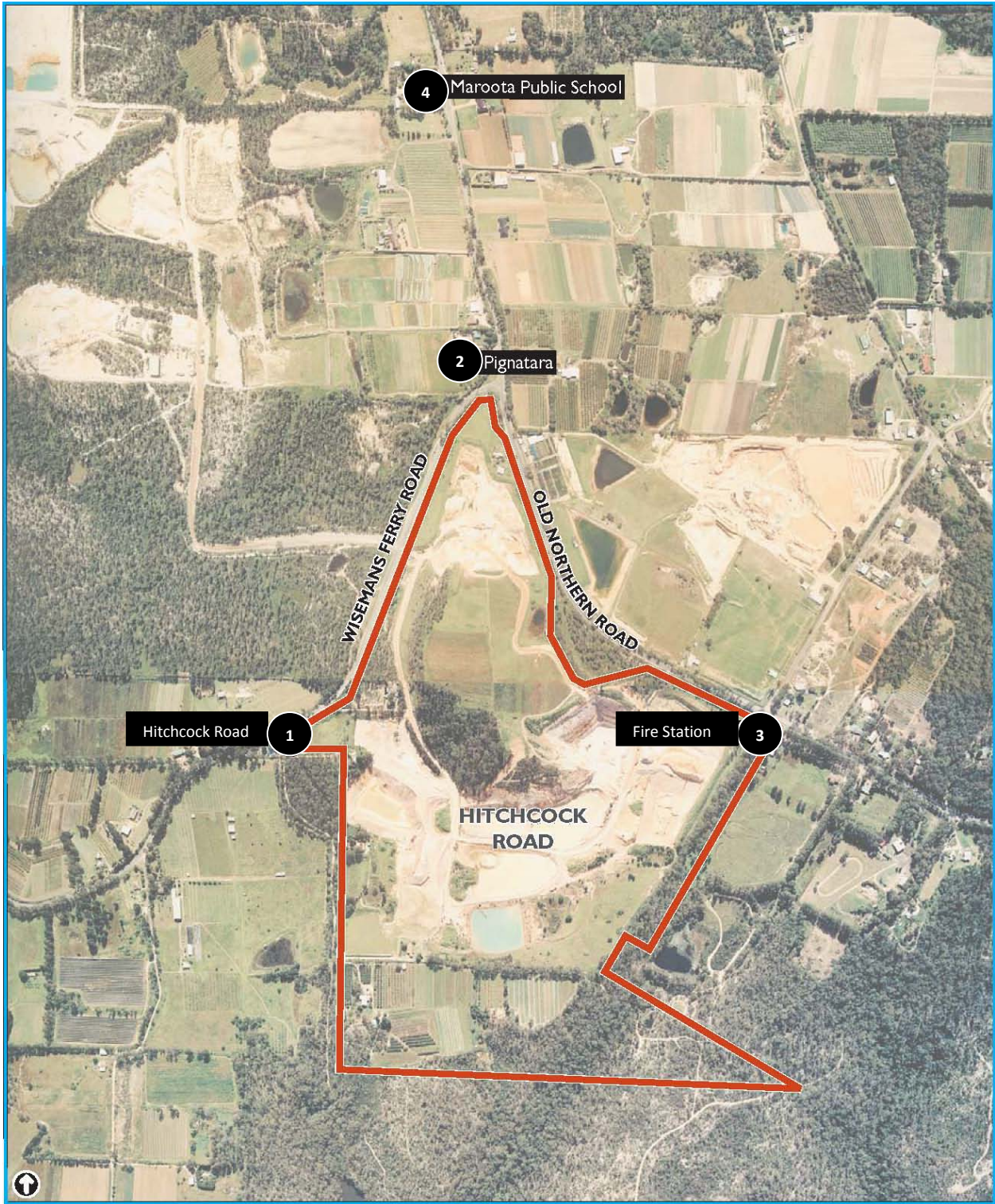
Operator-attended noise survey results

In accordance with the Noise Management Plan PF Formation conducted its quarterly operator attended daytime noise surveys at each of the four test locations. Testing was done on 8 July 2010 (incorporated in the 2010AEMR), 8 October 2010, 27 January 2011 and 4 April 2011. 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 4B**.

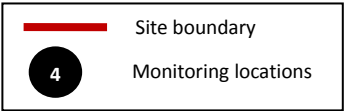
The locations used by Koikas Acoustics correspond to the locations in **Attachment 4A**.

Conclusion

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



NOISE IMPACT ASSESSMENT MONITORING LOCATIONS



Attachment 4B

Noise Survey Results

(Please refer to attached PDF File on disc)

Chapter Five AIR QUALITY

Introduction

The Project Approval (**Schedule 3 Condition 12**) for the Hitchcock Road development required the preparation and implementation of an Air Quality Monitoring Program. This Program was approved by the Department of Planning on 8 July 2009. 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 2011;
- 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 5.1** and **5.2** at any residence or on more than 25 per cent of any privately owned land.

Table 5.1 Impact Assessment Criteria for Particulate Matter		
Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90µg/m ³
Particulate matter < 10µm (PM ₁₀)	Annual	30µg/m ³
	24 hour	50µg/m ³

Table 5.2 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 ² /month	4g/m ² /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

During the reporting period to the end of June 2011, PF Formation maintained a program of continuous monthly dust deposition monitoring. This will remain in compliance with the requirements of the Air Quality Monitoring Program approved by the Director-General of the Department of Planning on 8 July 2009. The locations of the monitoring stations are shown on **Attachment 5A**. Location 2 was intended to be located on the Tornatola property but the landowner advised that the property is vacant and he did not want the monitoring station on his property. It then decided to move it across Wisemans Ferry Road on the back of the Dixon Sands property near the intersection of Wisemans Ferry Road and Hitchcock Road Maroota.

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*.

Monitoring results

A summary of the monthly dust deposition monitoring results is provided at **Attachment 5B**. The detailed measurement and analysis results by month as prepared by Boral Materials Testing and Environmental Services are summarised in **Attachment 5C**. 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*.

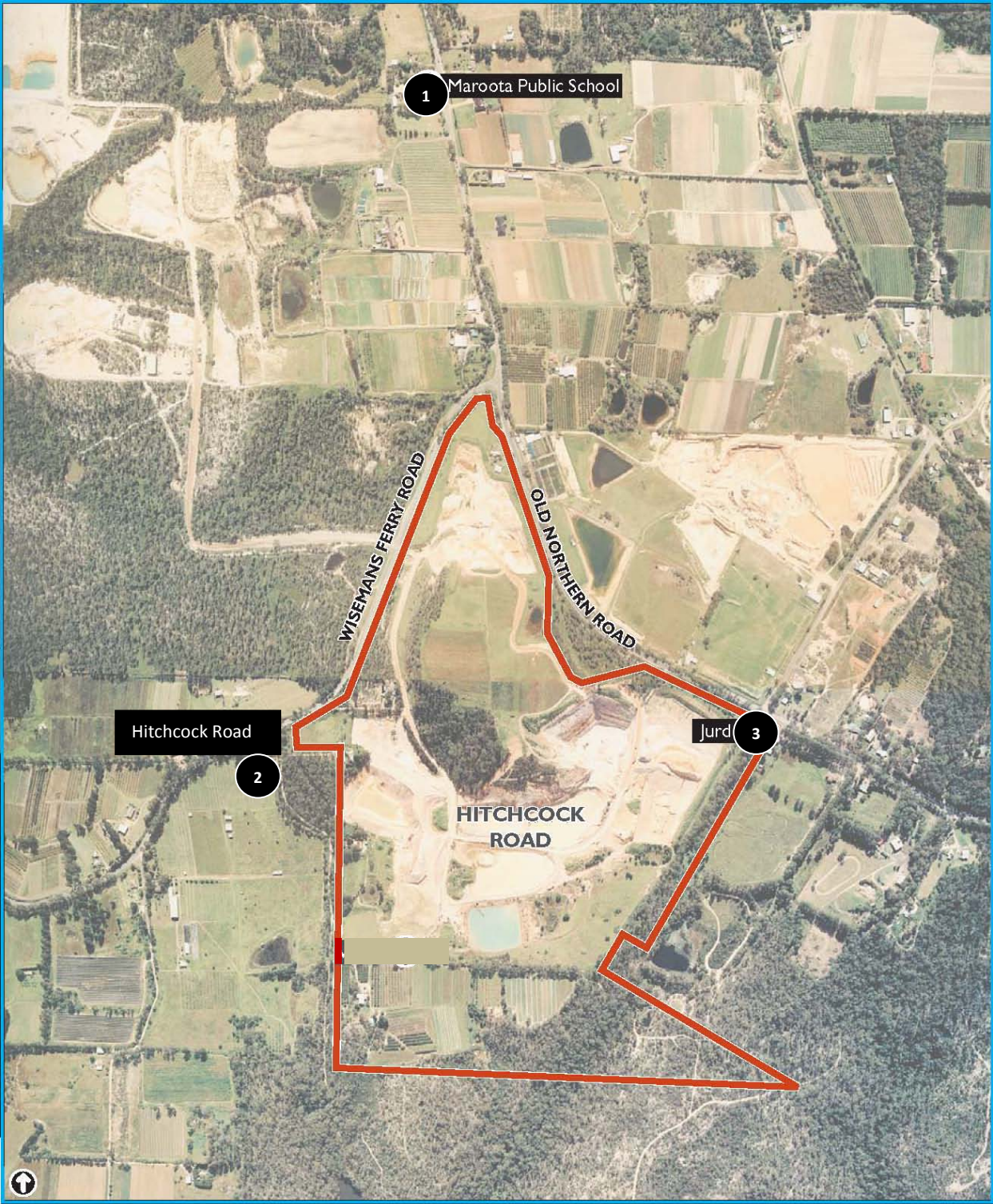
The following information can be derived from these results in relation to the dust nuisance criterion.

- 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 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/m²/month. All sites monitored had annual averages well below this level.
- The annual average ambient dust deposit rate (insoluble solids) at Location 1 – Maroota School was 3.22 g/m²/month. This is less than the dust nuisance criterion of 4 g/m²/month. This site often gets impacted by external factors such as horticultural activities adjoining the school. October 2010 result was abnormally high (10.5) and cannot be explained. Most of this dust was combustible (6.93 g/m²/month was ash component) and therefore was not a mineral increase (which could indicate a quarry caused increase). Results at other locations were low and there was not change in quarry activities. The high result was isolated at this location and must have been caused by localised slashing or burning near the school.

- The annual average ambient dust deposition rate (insoluble solids) at Location 2 (Hitchcock Road), which is located near the intersection of Hitchcock Road (a dirt road) and Old Northern Road was 2.38 g/m²/month which is very low. The results were very consistent and were not impacted by any spikes.
- The annual average ambient dust deposition rate (insoluble solids) at Location 3 (Jurd residence) was 2.56 g/m²/month which is below the dust nuisance criterion defined by the DECC.
- The results of the dust deposit gauges were very good for the year being well below the nuisance criterion. Because of the distances from the quarry operations and the significant other factors impacting the dust deposit gauge results high recordings are not necessarily a result of quarry operations. It is reassuring when all locations have relatively low results such as this year.
- PF Formation and Dixon Sand (a neighbouring operator) have an agreement whereby if the rolling 24-hour PM₁₀ average recorded by the TEOM reaches 42.5 µg/m³, PF Formation would be notified. The wind direction would then be assessed and measures to reduce any dust impacts affecting the TEOM readings would be implemented. At no time in the last 12 months have the results derived from the TEOM reached the designated trigger. A copy of the action plan if this occurs is attached in **Attachment 5D**.
- There have been no complaints concerning dust generation over the past year.
- A summary of the weather conditions recorded on-site are in **Attachment 5E**.

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 well below the maximum levels criteria.



Scale
0 500 Metres

AIR QUALITY MONITORING LOCATIONS

Site boundary

3

Monitoring locations

		Summary of Dust Deposition Monitoring Results (g/m2/month)								
		Location 1 - Maroota School			Location 2 - Hitchcock Road			Location 2 (Jurd residence)		
Month/Year		Insoluble Solids	Ash	Total Solids	Insoluble Solids	Ash	Total Solids	Insoluble Solids	Ash	Total Solids
2010	June	1.41	0.99	2.21	1.77	1.17	2.77	0.94	0.51	1.46
	July	0.95	0.86	2.91	1.22	0.96	3.37	1.5	1.22	3.06
	August	1.45	0.93	2.85	1.92	1.32	3.45	2.42	1.62	4.32
	September	2.06	1.74	4.7	1.95	1.61	4.65	2.13	1.8	4.46
	October	10.5	6.93	13.17	3.07	1.71	5.54	3.59	2.13	5.97
	November	2.56	1.39	3.23	1.09	0.73	1.32	3.34	2	4.45
	December	2.96	1.16	4.51	3.09	1.5	4.32	2.59	1.23	3.64
2011	January	2.6	1.84	5.33	3.21	1.02	9.46	2.46	1.66	5.49
	February	4.68	2.61	10.37	4.1	2.16	6.23	5.25	2.86	7.95
	March	3.64	2.61	4.98	2.17	1.62	2.63	1.34	0.96	1.82
	April	1.74	1.04	2.93	1.23	0.99	2.26	1.16	0.83	2.77
	May	1.9	0.98	3.95	4.07	1.45	5.64	4.65	2.01	5.31
	June	5.39	1.5	9.54	2.02	1.1	4.91	1.92	1.12	4.41
Monthly Average		3.22			2.38			2.56		
	2010	2.27			2.18			2.55		
Note: The 2010 AEMR only include the figures to May 2010 therefore June 2010 is included above.										

Attachment 5C

Monthly Dust Monitoring Results



MATERIALS TECHNICAL SERVICES
BORAL RESOURCES (NSW) PTY LTD
ABN 51 000 756 507

Unit 4, 3-5 Gibbon Road
Baulkham Hills NSW 2153 Australia
PO Box 400, Winston Hills NSW 2153
Telephone 61 2 9624 9900
Facsimile 61 2 9624 9999

TEST REPORT

CLIENT : P.F. FORMATION

FILE No.: 250 / 11

PROJECT: Gravimetrical Dust Monitoring at Maroota (P.F.Formation) for the month of June 2011

SAMPLE : Dust

TEST PROCEDURE : AS3580.10.1 - 2003 - Methods for sampling and analysis of ambient air.
Method 10.1 : Determination of particulate Deposited Matter - Gravimetric Method.

Field No.:	1	2	3	4
Lab. Sample No.:	118239	118240	118241	118242
Location:	Site 1	Site 2	Site 3	Site 4
Date sampled from:	1/6/2011	to	1/7/2011	

RESULTS:

Insoluble solids (g/m ² month):	5.39	2.02	1.92	1.14
Ash (g/m ² month):	1.50	1.10	1.12	0.61
Combustible matter (g/m ² month):	3.89	0.92	0.80	0.53
Soluble matter (g/m ² month):	4.15	2.89	2.49	1.24
Total Solids (g/m ² month):	9.54	4.91	4.41	2.38
Volume of liquid in the gauge, mL:	1900	1800	1500	1800

Refer to attached graph.

J.Graham, File.

S.Krishnamoorthy

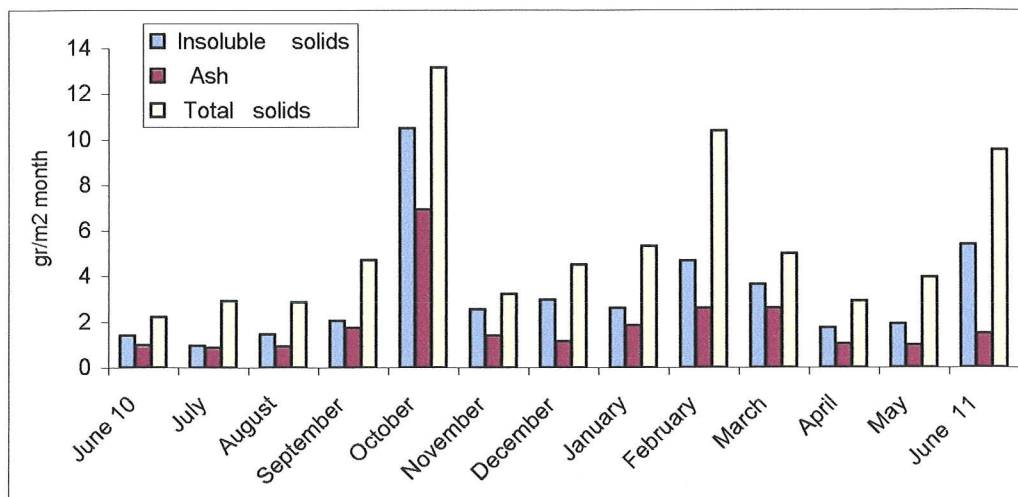


Approved Signatory *[Signature]*

Date 11/7/11 Serial No. 97075

Dust Monitoring
Maroota Site 1
Maroota Public School

	Insoluble solids	Ash	Total solids
June 10	1.41	0.99	2.21
July	0.95	0.86	2.91
August	1.45	0.93	2.85
September	2.06	1.74	4.70
October	10.50	6.93	13.17
November	2.56	1.39	3.23
December	2.96	1.16	4.51
January	2.60	1.84	5.33
February	4.68	2.61	10.37
March	3.64	2.61	4.98
April	1.74	1.04	2.93
May	1.90	0.98	3.95
June 11	5.39	1.50	9.54

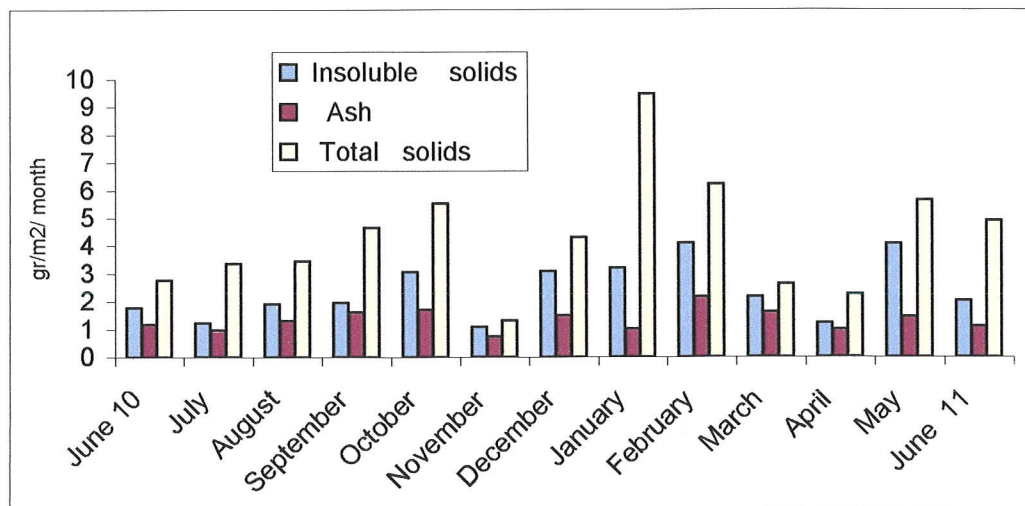


Dust Monitoring

Maroota Site 2

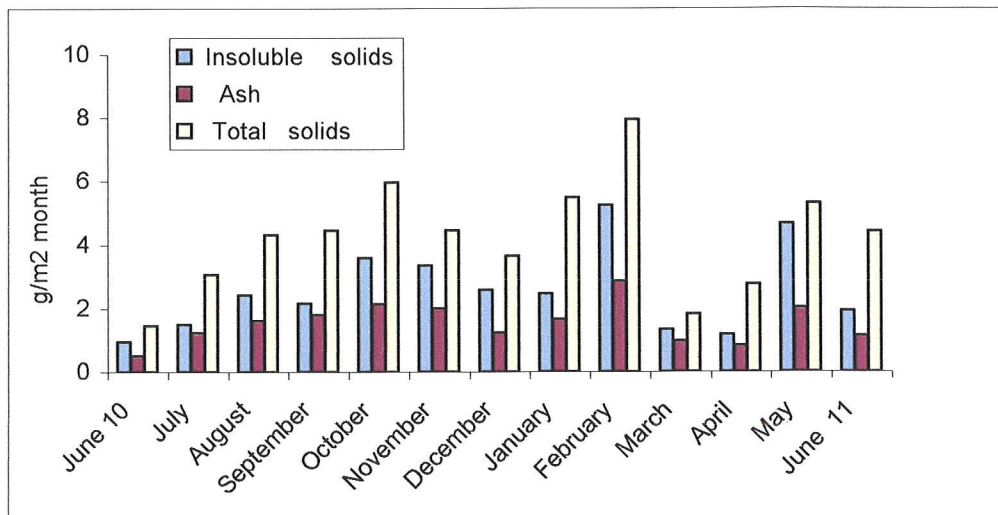
Vuck's House

	Insoluble solids	Ash	Total solids
June 10	1.77	1.17	2.77
July	1.22	0.96	3.37
August	1.92	1.32	3.45
September	1.95	1.61	4.65
October	3.07	1.71	5.54
November	1.09	0.73	1.32
December	3.09	1.50	4.32
January	3.21	1.02	9.46
February	4.10	2.16	6.23
March	2.17	1.62	2.63
April	1.23	0.99	2.26
May	4.07	1.45	5.64
June 11	2.02	1.10	4.91



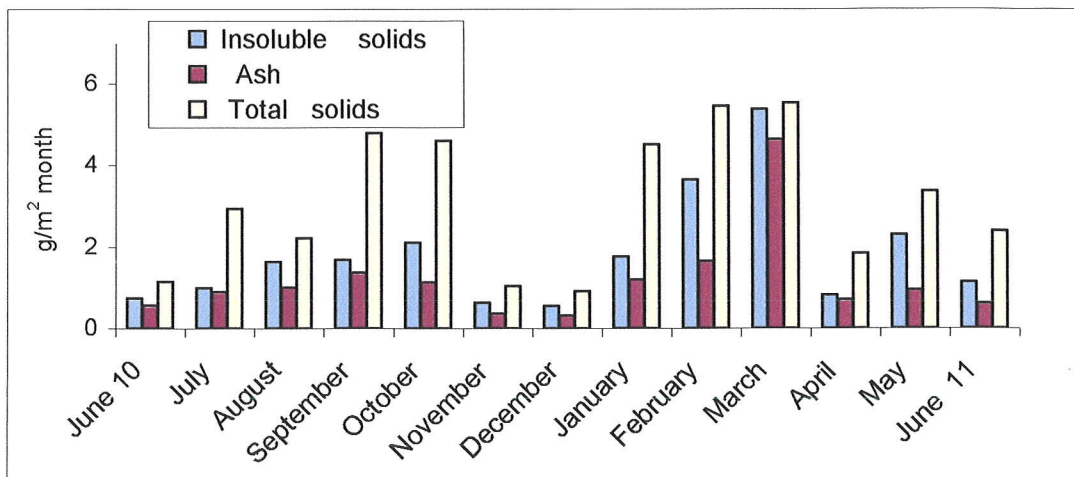
Dust Monitoring
Maroota Site 3
Jurd's House

	Insoluble solids	Ash	Total solids
June 10	0.94	0.51	1.46
July	1.50	1.22	3.06
August	2.42	1.62	4.32
September	2.16	1.80	4.46
October	3.59	2.13	5.97
November	3.34	2.00	4.45
December	2.59	1.23	3.64
January	2.46	1.66	5.49
February	5.25	2.86	7.95
March	1.34	0.96	1.82
April	1.16	0.83	2.77
May	4.65	2.01	5.31
June 11	1.92	1.12	4.41



Dust Monitoring
Maroota Site 4
Lot 3 Attard's

	Insoluble solids	Ash	Total solids
June 10	0.73	0.57	1.14
July	0.99	0.89	2.94
August	1.64	1.00	2.22
September	1.68	1.37	4.79
October	2.11	1.13	4.60
November	0.62	0.36	1.03
December	0.55	0.32	0.91
January	1.76	1.19	4.51
February	3.64	1.65	5.45
March	5.36	4.63	5.52
April	0.82	0.71	1.83
May	2.29	0.94	3.36
June 11	1.14	0.61	2.38



PM10 Dust Action Plan

Background

As Dixon Sands have a PM10 monitoring location at Maroota on the property adjoining the Maroota Public School they have agreed to contact us in the event the rolling 24-hour average PM10 result nears or exceeds 42 ug/m³ in working hours. (This is after Dixon's themselves are notified by their consultants.) We have agreed to the following Plan in the event we become aware of high PM10 dust recordings in the Maroota area. The aim is to determine whether PF Formation operations could be a source or contributor to the high results and if this is the case and if there could be a potential impact on the school to take measures to reduce this potential impact.

Plan

In the event PF Formation are contacted by Dixon Sands advising that the PM10 result is near or exceeds the trigger then:

1. John Graham, Peter Watt, Joshua Graham, Luke Graham and Peter Cummins (management team) are all to be advised by telephone/two-way immediately
2. The current wind direction is to be assessed by them at the weather monitoring station.
3. If the wind direction is from our operations to the Dixon monitoring location then action must be taken to reduce PF Formation's PM10 emissions.
4. The management team are to advise all staff to assess all dust generating activities for all areas that could impact the Maroota Public School except for activities solely undertaken to reduce dust impacts
5. The management team is to evaluate the conditions, liaise with Dixon Sands regarding the status of the rolling 24-hour PM10 average and undertake necessary dust suppression activities such as watering roads, exposed areas and stockpiles.
6. If the dust levels have not reduced to allowable levels within 1 hour of ceasing dust generating activities and it is within school hours plus 30 minutes then all dust generating activities within the relevant area must stop.

Attachment 5E

Weather Condition Results

PF FORMATION WEATHER CHART

JUL 10

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/07/2010	5	14	0-0	SSW-S	1027.6	0	CLOUDY
2/07/2010	6	11	0-0	SSW-SSW	1028.9	0	CLOUDY
3/07/2010	5	15	0-0	WW-SSW	1027.5	2	CLOUDY
4/07/2010	-	-	-	-	-	-	-
5/07/2010	8	13	0-0	EES-S	1031.1	0	CLOUDY
6/07/2010	8	15	0-5	EES-S	1020.3	1	RAIN
7/07/2010	8	14	5-0	EES-S	1024	0	CLOUDY
8/07/2010	8	13	0-9	S-S	1028.5	2	RAIN
9/07/2010	9	14	0-0	S-SSE	1032	5	RAIN
10/07/2010	8	13	0-0	E-E	1030.6	0	CLOUDY
11/07/2010	-	-	-	-	-	-	-
12/07/2010	9	14	0-0	W-WW	1025.5	0	FOG-CLOUDY
13/07/2010	13	16	0-0	WW-WWN	1022.8	2	RAIN
14/07/2010	14	14	0-14	WWN-WWN	1008.2	1	RAIN
15/07/2010	8	17	0-9	W-SSW	1015.5	0	CLOUDY
16/07/2010	3	18	0-0	EES-S	1029.1	0	FINE
17/07/2010	4	14	0-0	SSW-SSW	1030.3	0	FINE
18/07/2010	-	-	-	-	-	-	-
19/07/2010	6	15	0-0	NNE-EES	1019.6	0	CLOUDY
20/07/2010	7	15	0-0	EES-EES	1022.5	0	CLOUDY-FINE
21/07/2010	6	15	0-0	E-S	1027.8	0	RAIN
22/07/2010	3	14	0-0	EES-ES	1031.3	0	FINE
23/07/2010	5	14	0-0	S-S	1034.9	0	CLOUDY
24/07/2010	9	15	0-0	EE-EE	1031.1	3	RAIN
25/07/2010	-	-	-	-	-	-	-
26/07/2010	8	16	0-0	SSE	1034	4	RAIN
27/07/2010	10	15	0-0	EES-NNE	1038.1	0	CLOUDY
28/07/2010	10	15	0-0	NNE	1039.9	15	RAIN
29/07/2010	15	15	0-0	W-WW	1022.4	4	RAIN
30/07/2010	11	19	0-11	W-N	1019-2	0	CLOUDY
31/07/2010	14	0	0-0	N	1013.6	8	RAIN
Measurements taken at weighbridge							

PF FORMATION WEATHER CHART

AUG 10

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR		RAIN	CONDITION
1/08/2010	7.1	17.9	6.4	NW	1019.4	0.0	-
2/08/2010	5.9	13.7	6.1	NW	1016.4	7.4	CLOUDY
3/08/2010	7.3	16.2	7.7	S	1019.2	1.6	RAIN
4/08/2010	5.2	17.4	1.9	NW	1018.8	0.0	FINE
5/08/2010	4.9	15.2	2.7	NW	1018.5	0.0	CLOUDY
6/08/2010	3.2	14.8	1.9	S	1022.1	0.0	FINE
7/08/2010	2.2	14.5	2.1	S	1026.2	0.0	FINE
8/08/2010	3.1	15.8	1.6	NW	1023.2	0.0	-
9/08/2010	3.3	17.7	1.1	ENE	1024.3	0.0	FINE
10/08/2010	6.8	13.3	0.5	WNW	1018.8	5.8	RAIN
11/08/2010	10.8	14.8	10.5	NW	1008.4	0.2	CLOUDY
12/08/2010	10.2	15.4	7.7	WSW	1004.4	0.2	CLOUDY
13/08/2010	5.8	17.6	2.4	S	1014.8	0.0	FINE
14/08/2010	4.9	19.1	4.8	NW	1014.4	0.0	FINE
15/08/2010	10.8	18.8	6.6	NW	1006.8	0.0	-
16/08/2010	10.4	16.9	7.4	W	1014.1	0.0	FINE
17/08/2010	3.6	16.6	1.6	NE	1022.9	0.0	FINE
18/08/2010	3.3	20.0	3.9	N	1019	0.0	CLOUDY
19/08/2010	12.3	22.9	9.5	NW	1008.2	0.0	CLOUDY/FINE
20/08/2010	8.2	17.4	5.5	W	1013.4	0.0	FINE
21/08/2010	5.7	14.9	5.1	W	1018.8	0.0	CLOUDY /FINE
22/08/2010	4.1	16.2	1.4	NE	1024.9	0.0	-
23/08/2010	8.1	11.9	1.3	NW	1015.9	2.0	CLOUDY
24/08/2010	6.6	17.9	5.0	WNW	1012.7	0.0	FINE
25/08/2010	9.2	16.0	6.6	WNW	1008.7	0.0	CLOUDY
26/08/2010	9.4	14.7	10.5	NW	1004.7	0.0	CLOUDY
27/08/2010	8.5	16.9	6.8	NW	1011.1	0.0	CLOUDY
28/08/2010	4.6	16.8	1.8	S	1024.2	0.0	FINE
29/08/2010	4.4	18.0	1.6	NW	1030.1	0.0	-
30/08/2010	7.7	18.6	1.4	NE	1027.4	0.0	CLOUDY
31/08/2010	7.8	21.2	2.9	NW	1024.3	0.0	CLOUDY
Measurements taken off new weather station at weighbridge							

PF FORMATION WEATHER CHART

SEPT 10

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	CONDITION
1/09/2010	13.3	23.6	4.8	NW	1016.8	0.0	CLOUDY
2/09/2010	12.4	18.9	2.7	SSE	1015.9	2.2	CLOUDY
3/09/2010	10.6	14.6	2.1	S	1027.3	8.8	RAIN
4/09/2010	11.9	19.7	6.6	N	1013.5	11.2	RAIN
5/09/2010	13.0	18.7	12.4	WNW	1012.5	0.0	
6/09/2010	7.8	18.7	3.1	WSW	1020.2	0.0	FINE
7/09/2010	6.6	16.3	2.6	SSE	1025	0.0	CLOUDY
8/09/2010	5.1	17.9	1.6	SE	1027.5	0.0	FINE
9/09/2010	6.7	16.2	4.0	NW	1016.4	5.0	CLOUDY
10/09/2010	11.1	22.4	6.3	NW	1004.1	0.2	CLOUDY
11/09/2010	8.1	20.7	2.1	NE	1019.5	0.0	FINE
12/09/2010	5.9	19.7	2.4	NE	1022.4	0.0	-
13/09/2010	11.8	21.7	2.3	WSW	1016.5	0.0	CLOUDY
14/09/2010	11.6	17.7	1.4	SE	1015.6	8.6	CLOUDY
15/09/2010	9.3	21.4	4.5	SW	1012.4	0.2	FINE
16/09/2010	7.1	19.1	6.0	W	1015.2	0.0	CLOUDY
17/09/2010	4.1	19.2	2.1	NW	1021.6	0.0	CLOUDY
18/09/2010	5.7	22.0	2.9	NW	1017.5	0.0	FINE
19/09/2010	8.2	17.5	1.4	SSE	1023.2	0.0	-
20/09/2010	8.2	20.2	2.1	SSE	1025.5	0.0	CLOUDY
21/09/2010	7.8	24.2	3.5	SE	1023.1	0.2	FINE
22/09/2010	11.1	22.3	3.4	NW	1025.2	1.0	CLOUDY
23/09/2010	10.8	18.5	1.6	NE	1024.7	0.2	FINE
24/09/2010	10.8	26.1	2.7	NE	1021.1	0.0	FINE
25/09/2010	12.1	25.6	3.9	NW	1015.7	0.0	CLOUDY
26/09/2010	9.9	23.8	2.1	NE	1020.6	0.0	-
27/09/2010	11.5	26.4	4.2	NW	1013.3	0.0	FINE
28/09/2010	11.7	26.2	4.7	SW	1012.5	0.0	FINE
29/09/2010	6.7	17.7	4.8	SSE	1017.8	0.0	CLOUDY
30/09/2010	4.7	18.8	1.9	NE	1025.5	0.0	FINE
Measurements taken off new weather station at weighbridge							

PF FORMATION WEATHER CHART

OCT 10

DATE	TEMP -MIN	TEMP-MAX	WIND SPEED	DIR	BAR	RAIN
1/10/2010	5.9	18.1	1.4	ENE	1030.3	0.0
2/10/2010	11.2	17.9	1.0	ENE	1030.3	6.0
3/10/2010	12.9	17.9	1.8	NE	1029.4	14.4
4/10/2010	13.9	20.1	1.3	SE	1025	7.2
5/10/2010	14.8	22.8	1.1	NE	1024.4	0.4
6/10/2010	14.7	21.0	1.3	NE	1018.9	4.0
7/10/2010	12.7	23.0	2.3	SSE	1024.1	0.0
8/10/2010	12.2	20.8	1.9	S	1027.3	0.0
9/10/2010	13.1	16.3	0.8	SE	1029.8	1.0
10/10/2010	12.7	20.2	2.7	SSE	1035	4.2
11/10/2010	11.9	20.2	2.6	NE	1033.9	2.0
12/10/2010	12.7	22.9	2.4	NE	1025	0.0
13/10/2010	13.7	25.5	3.9	NW	1015.1	0.0
14/10/2010	15.9	26.9	5.8	NW	1009.8	1.4
15/10/2010	15.8	24.4	59.5	NW	992.5	13.2
16/10/2010	8.2	16.2	11.9	W	1014.2	0.0
17/10/2010	6.3	23.2	3.4	NW	1019	0.0
18/10/2010	7.5	24.6	2.6	SW	1022.1	0.0
19/10/2010	8.3	15.8	1.4	SE	1031	0.2
20/10/2010	10.2	22.2	2.4	NE	1028.2	0.0
21/10/2010	9.6	24.6	2.6	NE	1024.3	0.0
22/10/2010	11.9	26.4	3.2	NE	1020.1	0.0
23/10/2010	14.9	27.9	3.5	NW	1020.4	10.0
24/10/2010	10.8	15.3	5.6	S	1023.9	25.2
25/10/2010	11.2	18.9	4.3	S	1021.4	0.0
26/10/2010	12.2	25.8	3.1	NE	1017.7	0.0
27/10/2010	13.1	25.3	1.9	SE	1021.4	5.4
28/10/2010	11.7	18.3	1.3	SE	1023.3	0.4
29/10/2010	11.7	19.1	0.8	SE		0.0
30/10/2010						
31/10/2010						
Measurements taken off new weather station at weighbridge						

PF FORMATION WEATHER CHART

NOV 10

[illegible]

PF FORMATION WEATHER CHART

DEC 10

[illegible]

PF FORMATION WEATHER CHART

JAN 11

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	
1/01/2011	26.3	28.9	4.6	99	1012.9	0	
2/01/2011	22.6	26.4	3.8	160.8	1012.4	1.6	
3/01/2011	17.6	25.8	2.5	186	1014.9	1.2	
4/01/2011	17.6	26.1	2.9	172.6	1013.9	0.1	
5/01/2011	18.8	25.9	2.5	101.5	1008.8	0.4	
6/01/2011	19.5	26	3.2	172.5	1012	0.8	
7/01/2011	20	26	4.2	168.5	1014.4	3.4	
8/01/2011	22.3	26.1	4	90.4	1014	1.3	
9/01/2011	22.6	26.1	5.4	148.5	1014.9	5.3	
10/01/2011	21.2	25.9	5.7	93	1015.9	3.6	
11/01/2011	21.5	25.8	4.7	80.7	1013.7	0.8	
12/01/2011	23.6	26.1	4	89	1012.3	0	
13/01/2011	23.4	26.1	3.6	83.8	1014.1	0	
14/01/2011	23.4	26.2	3.1	82.2	1011.4	0	
15/01/2011	22.8	26	1.8	182.6	1009.3	2.2	
16/01/2011	22.4	25.9	0.9	126.9	1009.6	1.7	
17/01/2011	23.4	27.3	3.8	129	1003.9	0.1	
18/01/2011	20.7	27.3	5.5	157.6	1008.1	0	
19/01/2011	21.1	26.5	3.7	143.5	1010.5	0.6	
20/01/2011	20	27	0-8	E-NNE	1013.8	0.2	
21/01/2011	18	31	0-0	WWN-S	1014.9	0	
22/01/2011	19	30	0-0	N-WWN	1016	0	
23/01/2011	SUNDAY				1011.8	0	
24/01/2011	20	33	0-23	WW-WWN	1005.2	0	
25/01/2011	21	32	0-0	W-N	1008.4	0	
26/01/2011	AUST DAY				1011.2	0	
27/01/2011	24	35	0-	EE-ESE	1013.3	0	
28/01/2011	21	26	0-4	N-N	1019.5	1	
29/01/2011	17	24	0-0	E-EES	1022.4	0	
30/01/2011	SUNDAY				1019.7	0	
31/01/2011	20	39	0-0	EES-E	1015.2	0	
All data taken from Dixons as ours was struck by lightning & some off OLD weather station							

PF FORMATION WEATHER CHART

FEB 11

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	
1/02/2011	21	39	3.5	NE-W	1011.2	0	
2/02/2011	27	37	4.5	WNW-SSW	1013.5	0	
3/02/2011	28	34	5.1	WNW-	1010.7	0	
4/02/2011	23	37	3.5	N-NE	1014.2	0	
5/02/2011	26	38	6.1	WNW-WNW	1010.3	0	
6/02/2011	SUNDAY		3.3			1	
7/02/2011	17	19	1.7	SSW-SSW	1025.1	0.6	
8/02/2011	18	28	2.5	NE-	1019.9	0	
9/02/2011	18	28	1.9	-	1024.3	0	
10/02/2011	19	28	2.5	N-	1023.8	0.3	
11/02/2011	19	34	3	N-W	1017	0	
12/02/2011	23	28	1.7	N-	1010.9	4.3	
13/02/2011	SUNDAY		1.6		1019.5	1	
14/02/2011	17	21	2	ESE-ESE	1023.2	0.5	
15/02/2011	17	22	2.3	N-NE	1023.9	0.3	
16/02/2011	18	26	1.9	ESE-ESE	1020.4	0	
17/02/2011	21	29	1.9	N-NE	1013	3.5	
18/02/2011	20	22	1.9	S-	1016.2	0.5	
19/02/2011	21	28	2.9	NE-	1012.1	0	
20/02/2011	SUNDAY		2.8		1007.2	0	
21/02/2011	21	27	2.8	ESE-ESE	1011.8	0	
22/02/2011	17	22	2.5	S-ESE	1021.3	0	
23/02/2011	17	28	2.2	S-	1023.6	0	
24/02/2011	15	29	2.6	ESE-	1021.1	0	
25/02/2011	16	27	1.6	N-NE	1014.6	0	
26/02/2011	18	31	1.8	NE-WS	1011.8	0	
27/02/2011	SUNDAY		1.4			0.2	
28/02/2011	21	29	3.7	NE-N	1010	5.8	

1/3 of the measurements taken off NEW weather station at weighbridge & 2/3 off Dixons & some off OLD weather stati

PF FORMATION WEATHER CHART

MAR 11

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	
1/03/2011	18.0	31.2	6.6	NW	1005.5	0	
2/03/2011	17.3	18.1	1.4	SE	1016.3	0	
3/03/2011	17	31	0	ESE	1009.8	0	
4/03/2011	18	31	0-10	E	1011.8	0	
5/03/2011	15.5	20.4	1.4	SSE	1020.3	0	
6/03/2011	11.8	21.7	1.6	SSE	1028.1	0	
7/03/2011	12.8	24.6	1.6	NE	1024.8	0	
8/03/2011	13.8	28.8	2.6	NE	1017.6	0	
9/03/2011	18.3	28.9	1.4	NE	1015.6	0	
10/03/2011	19.8	26.3	1.8	N	1013.9	0	
11/03/2011	18.3	26.4	1.3	NE	1016.4	3.6	
12/03/2011	18.1	29.6	1.1	W	1020.3	0.2	
13/03/2011	18.0	32.2	1.3	NNW	1020.1	1.2	
14/03/2011	18.1	28.3	4.5	SSE	1021.2	0.2	
15/03/2011	16.1	25.3	1.9	SSW	1020.5	0.4	
16/03/2011	16.3	29.1	1.9	SE	1017.1	1.4	
17/03/2011	18.7	24.3	1.4	S	1018.7	0.2	
18/03/2011	17.8	23.0	2.9	SSE	1016	0.2	
19/03/2011	17.2	21.8	3.1	S	1013.8	7.8	
20/03/2011	17.7	20.7	2.7	SSE	1011.9	42.2	
21/03/2011	19.5	25.4	1.0	NE	1005.3	15.4	
22/03/2011	19.5	30.3	1.3	NW	1001	0.2	
23/03/2011	16.4	29.0	3.4	SW	1002.4	0	
24/03/2011	14.7	23.8	5.5	WNW	1006.1	0	
25/03/2011	13.9	24.6	3.1	SSE	1010.2	0.2	
26/03/2011	13.9	20.6	4.7	SSE	1021.4	0	
27/03/2011	13.1	20.2	2.6	SSE	1026.6	0.8	
28/03/2011	14.3	22.8	1.4	SSE	1027.3	0.4	
29/03/2011	14.5	24.9	2.3	N	1024.4	0	
30/03/2011	15.2	27.4	1.9	NW	1018.2	11	
31/03/2011	14.2	20.1	2.7	SSE	1024.4	0.8	
Measurements taken off new weather station at weighbridge							

PF FORMATION WEATHER CHART

APR 11

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	
1/04/2011	13.3	22.8	1.4	NE	1023.8	0.2	
2/04/2011	13.7	21.5	2.4	SE	1022.4	0	
3/04/2011	11.5	24.1	1.1	SW	1024.4	0	
4/04/2011	14.3	21.3	3.9	SSE	1027.2	0.8	
5/04/2011	12.6	19.1	3.2	SSE	1031.3	2.8	
6/04/2011	12.5	20.5	2.9	S	1030.7	0.8	
7/04/2011	12.8	20.9	2.1	SSE	1031.1	2	
8/04/2011	13.1	21.9	1.6	SE	1030.1	0	
9/04/2011	11.7	25.3	2.1	NW	1023.3	0.2	
10/04/2011	14.6	25.9	5.3	NW	1010.2	9.4	
11/04/2011	9.8	20.1	1.9	NW	1011	0	
12/04/2011	8.9	19.2	4.5	NW	1013.7	0	
13/04/2011	11.6	21.9	3.7	NW	1013.8	0	
14/04/2011	10.8	22.2	2.3	SW	1013.2	0	
15/04/2011	8.9	20.9	2.1	S	1017	0	
16/04/2011	13.3	15.6	4.7	S	1020.8	28.8	
17/04/2011	11.5	19.6	1.8	SSE	1025	4	
18/04/2011	9.1	21.1	1.4	NNE	1022.4	1.6	
19/04/2011	10.6	22.8	0.8	WNW	1020.4	0.8	
20/04/2011	11.6	19.9	0.6	N	1019.3	0.4	
21/04/2011	12.6	24.3	1.3	SSW	1013.9	0	
22/04/2011	12.4	24.6	3.1	SW	1011.5	0.2	
23/04/2011	9.2	15.3	1.4	S	1022.8	0.2	
24/04/2011	11.3	20.8	0.6	SSW	1025	0	
25/04/2011	14.4	16.6	2.7	SSE	1027.6	0.2	
26/04/2011	12.9	19.1	2.7	SSE	1030.8	0	
27/04/2011	12.6	17.1	3.5	SSE	1030.4	0.2	
28/04/2011	12.4	16.9	3.2	S	1026.8	0	
29/04/2011	12.9	18.2	4.7	S	1025.3	0.2	
30/04/2011	14.1	20.2	2.3	S	1021.8	0.2	
Measurements taken off new weather station at weighbridge							

PF FORMATION WEATHER CHART

MAY 11

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	
1/05/2011	11.4	20.3	1.9	S	1018.1	0	
2/05/2011	9.3	17.1	0.3	S	1017.2	10	
3/05/2011	12.3	16.7	1.3	SSW	1016.2	0.2	
4/05/2011	10.7	19.8	2.9	S	1017.3	0	
5/05/2011	8.4	17.1	2.4	SSE	1023	0	
6/05/2011	7.8	17.6	1.6	SSE	1023.5	0.2	
7/05/2011	6.4	18.7	1.6	NNW	1018.5	0	
8/05/2011	6.3	19.2	1	NNW	1013.9	0	
9/05/2011	6.2	15.1	4	S	1015.5	0	
10/05/2011	6.3	16	4.2	S	1016	0	
11/05/2011	5.9	14.3	4.7	NW	1009	0	
12/05/2011	4.5	14.9	2.9	WNW	1012.3	0	
13/05/2011	7.2	18.8	4	WNW	1011.8	0	
14/05/2011	6.8	15.1	4	SW	1018.3	0	
15/05/2011	3.2	16.6	1.3	N	1030.7	0	
16/05/2011	3.2	18.9	0.8	NNE	1029.3	0	
17/05/2011	4.2	17.2	1	SE	1030.4	0	
18/05/2011	6	19	0.6	E	1032.4	0	
19/05/2011	9.1	19.9	1.4	NNE	1031.1	0	
20/05/2011	9.3	21.3	1	NE	1027.5	0	
21/05/2011	8.9	22.4	1.4	ENE	1024.1	0	
22/05/2011	10.9	21.8	1.3	NNE	1019.1	0	
23/05/2011	11.9	19.8	7.4	NW	1004.2	3	
24/05/2011	9.4	17.2	1.9	NW	1005.8	0	
25/05/2011	10.2	14	9.7	S	1012.6	2	
26/05/2011	8.2	17.4	4.2	S	1017.9	0	
27/05/2011	5	15.5	1.4	WSW	1019.9	0	
28/05/2011	4.3	16.2	1.1	SE	1024.8	0	
29/05/2011	9.9	14.3	1.6	SSE	1025.2	0	
30/05/2011	11.1	13.3	5	S	1020.8	38	
31/05/2011	13.1	16.3	3.5	SSE	1020.6	0	
Measurements taken off new weather station at weighbridge							

PF FORMATION WEATHER CHART

JUN 11

DATE	TEMP-MIN	TEMP-MAX	WIND-SPD	WIND-DIR	BAR	RAIN	
1/06/2011	11.1	17.2	2.4	SSE	1026	0.0	
2/06/2011	10.3	18.6	2.1	SSE	1024.7	24.2	
3/06/2011	7.5	18.1	1	NNW	1018.2	0.0	
4/06/2011	10.7	18.3	1.6	NNW	1015.7	0.4	
5/06/2011	6.2	16.8	1.9	NW	1016.6	0.0	
6/06/2011	6.6	16.7	2.1	WNW	1017.2	0.0	
7/06/2011	4.8	13.2	4.7	NW	1016.2	0.0	
8/06/2011	4.2	12.7	4.5	W	1015.4	0.0	
9/06/2011	3.2	15.2	2.7	WSW	1014.1	0.0	
10/06/2011	5.4	15.2	2.7	S	1018	0.0	
11/06/2011	8.3	13.7	4.7	S	1026.1	4.0	
12/06/2011	9.6	12.6	6	S	1025.9	17.0	
13/06/2011	8.7	14.3	4.2	S	1023.7	3.8	
14/06/2011	10.4	14.6	6	SSE	1020.9	18.4	
15/06/2011	10.7	16.3	5	SSE	1023	11.2	
16/06/2011	7.7	14.4	2.7	S	1019.4	3.2	
17/06/2011	6.8	15.8	4.5	W	1007.8	0.2	
18/06/2011	5.3	16.3	2.1	W	1012.8	0.0	
19/06/2011	5.2	17.2	1	SW	1017.4	0.0	
20/06/2011	7.8	17.4	2.4	NW	1015.1	0.0	
21/06/2011	7.2	18.4	8.2	NW	1002.5	0.0	
22/06/2011	6.5	14.2	4.2	W	1012.7	0.0	
23/06/2011	6.3	18.7	1.8	NW	1018.6	0.0	
24/06/2011	4.4	16.4	0.6	WNW	1026.7	0.0	
25/06/2011	4.6	16.4	0.8	NW	1030.7	0.0	
26/06/2011	6.6	18.8	2.9	NW	1026.1	0.2	
27/06/2011	5.3	17.1	0.8	NW	1029.2	0.0	
28/06/2011	6.3	15.3	2.4	SSE	1034.7	2.4	
29/06/2011	9.6	13.8	1.9	S	1037.7	5.4	
30/06/2011	9.9	14.5	1.0	SSE	1038.1	0.2	
Measurements taken off new weather station at weighbridge							

Chapter Six

GROUND & SURFACE WATER MANAGEMENT

Introduction

The groundwater monitoring program included in the Water Management Plan approved by the Director-General of the Department of Planning on 8 July 2009 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 URS Australia and their full report follows in **Attachment 6A**.

In July 2011 URS Australia updated 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 in **Attachment 6B**.

From the wet weather groundwater levels URS Australia has prepared an updated Maximum Extraction Depth Map for the project and this is **Attachment 6C**.

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 2A**. No significant changes have occurred in these areas in the last year as discussed in Chapter 2.

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 50 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). The Lot 198 DP 752025 dam was emptied in December 2009 and cleaned out in January 2010. Silt and sediment had built up over the years in this dam and this material was removed to increase the capacity. A sediment trap system has now 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 67% at the time of inspection. Water can be balanced between the two sites as necessary. (**Attachment 2C – Photos 7, 8 & 9**)

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 3.5 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 6D**. The PH (4.9 to 6.2), electrical conductivity and oil and grease results were all within the expected ranges. We did change our collection procedures for the sample collected on 28 June 2011 by using a new company. We believe the sample may have been contaminated because of the procedures used and we have since returned to our previous collection method and supplier.

Dewatering of water pits

Of the commissioned ponds, Numbers 9 and 10 are currently in the tailings stream cycle with Numbers 5 and 7 currently drying prior to capping.

All other tailings ponds have been fully capped.

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

The tailings ponds on Lot 198 (Wisemans Ferry Road) are currently not used for tailings disposal.

Only one uncapped tailings pond remains in Area B and those in Area C are used for agriculture.

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.

Water levels within the existing water sump

Water levels and volumes within the sump are detailed in **Attachment 6A**. 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 6A**)

Conclusion

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

recommendations to the Planning Department. Within 3 months of submitting this copy PF Formation is required to update the environmental management and monitoring strategies/plans/programs and rehabilitation bonds to the satisfaction to the Director-General of the Planning Department.

- Extracts from the IEA Report being the Audit Conclusions and Audit Recommendations were handed out and each item was briefly discussed.
- The full report and PF Formation's response will be put on the website within 6 weeks.

Environmental Matters

- The monthly dust deposit results were handed out and discussed.
- It was noted that the site 'Vuck's House' is actually on Dixon's property next to their monitor at the site closest to the intersection of Hitchcock Road and Wisemans Ferry Road.
- Most monthly results were low but it was noted that February had the highest result at each location for the last 6 months.

Other Matters

- Truck accidents in the region were discussed. John Graham explained how the utmost care and responsibility is taken by PF Formation to the extent it can. Clearly little control exists over legal vehicles once they leave the site.
- As a general comment drivers appear to be getting more mindful of their responsibilities because most are employed by bigger companies who have their own safety and legal responsibilities.
- In a recent case where a dog trailer rolled over at Maroota a letter the transport company discussed with their staff was read out. It also noted that the driver had his employment terminated. The seriousness of the situation and the effort to have drivers act in a responsible matter was made clear.
- A new representative for Maroota Primary School has been found to attend the Dixon Sands Community Meetings replacing Marianne Scheumack. Kristine McKenzie is to see if she has Peter Hawkins contact details and she or Peter Cummins are to investigate whether he would be willing to attend the PF Formation meetings representing the residents.

Site Visit

- A site inspection including the Lot 1 DP595538 Old Northern Road Maroota site was conducted.

Next Meeting

- 10.00 am Wednesday 2 November 2011