

# Wagga Wagga Quarry

## ANNUAL REVIEW

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July 2015

## Document Control

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## Contents

List of Figures.....	6
List of Tables.....	6
List of Abbreviations.....	7
1.0 Executive Summary.....	8
1.0 Introduction .....	10
1.1 Document Purpose .....	10
1.2 Project Overview.....	11
1.3 Consents and licensing.....	12
1.3.1 Project Approval .....	12
1.3.2 Environmental Protection Licence (EPL) No. 2433 .....	14
1.4 Environmental Management and Performance Criteria.....	14
1.4.1 Environmental Management Plans .....	14
1.4.2 Non-Compliance .....	16
1.5 Personnel Structure and Responsibilities.....	16
1.6 Organisational Structure .....	17
1.7 Competence, Training and Awareness .....	18
2.0 Summary of Operations during Reporting Period .....	20
2.1 Overburden Removal and Levy Bank Construction.....	20
2.2 Quarrying Activities .....	22
2.3 Rehabilitation .....	22
2.3.1 Status .....	22
2.4 Management Strategies .....	23
2.4.1 Weed Management.....	23
3.0 Environmental Management, Monitoring and Performance .....	23
3.1 Management Plans and Monitoring Programs .....	23
4 Noise Management.....	26
4.1 Compliance with Development Approval.....	26
4.1.1 Operating Hours .....	26
4.2 Current Operation Noise Management Measures .....	27
4.2.1 Hauling Trucks.....	27

4.2.2	Embankments.....	27
4.2.3	Mobile Equipment.....	27
4.3	Noise Monitoring.....	27
4.3.1	Operational Noise.....	27
4.3.2	Traffic Generated Noise.....	28
4.4	Noise Limits.....	29
4.5	Results.....	30
4.5.1	Noise Monitoring Assessment Criteria.....	30
4.6	Noise Management Non-Conformances.....	30
5	Air Quality Management.....	31
5.1	Compliance with Development Approval.....	31
5.2	Dust Generating Activities.....	31
5.3	Dust Management Controls.....	31
5.3.1	Hauling.....	32
5.3.2	Extraction.....	32
5.3.3	Processing.....	32
5.3.4	Wind Erosion.....	33
5.4	Dust Deposition Monitoring.....	33
5.5	Limits.....	34
5.6	Results.....	35
5.6.1	Deposition Results.....	35
5.6.2	PM <sub>10</sub> Results.....	38
5.6.2.1	Short Term PM <sub>10</sub> Monitoring.....	39
5.6.2.2	Annual Limits.....	39
5.6.3	Air Quality Management Non-Conformances.....	39
5.7	Comparison with previous years.....	40
6	Traffic Management.....	42
6.1	Compliance with Development Approval.....	42
6.2	Traffic Management Plan.....	42
6.3	Traffic Management Controls.....	42
6.3.1	General Requirements.....	42
6.3.2	Heavy Vehicle Speed.....	43

6.3.3	Heavy Vehicles Driver Fatigue .....	43
6.3.4	Heavy Vehicle Compression Braking .....	44
6.3.5	Heavy Vehicle Noise .....	44
6.3.6	Load Covering .....	45
6.3.7	Vehicle Departure and Arrival .....	46
6.3.8	Breakdowns and Incidents .....	46
6.3.9	Wiradjuri Walking Track and Pedestrians/Cyclists .....	47
6.4	Traffic Incident Register .....	47
6.5	Code of Conduct Register .....	47
6.6	Traffic Management Non-Conformances .....	47
7	Water Management .....	48
7.1	Water Management Practices .....	48
7.1.1	Development Approval .....	48
7.2	Flooding History at the Site .....	48
7.2.1	Levee Remediation Works .....	49
7.3	Limits .....	50
7.3.1	Licensing .....	50
7.4	Results .....	51
7.4.1	Usage .....	51
7.4.2	Licensed Water Usage Analysis .....	51
7.4.3	Groundwater Analysis .....	51
7.4.4	Surface Water Analysis .....	55
7.5	Water Quality Management Non-Conformances .....	55
8	Flora and Fauna Management .....	57
8.1	Clearing of Native Vegetation .....	57
8.2	Revegetation & Prevention of Feral Animals .....	57
8.3	Vegetation Management Plan for the Riverbank Repair .....	58
8.4	Weed Management .....	58
8.5	Flora & Fauna Management Non-Conformance .....	59
9	Community Relations .....	60
9.1	Stakeholder and Community Consultation .....	60
9.2	Complaints Handling .....	61

9.2.1	Summary of Complaints .....	62
9.3	Community Consultation Meetings.....	62
9.4	Community Relations Non-Conformances .....	62
10.	Activities Proposed for the 2014/2015 Annual Review Period.....	63
10.1	Water Management .....	63
10.1.1	Water Monitoring and Management Plan .....	63
10.2	Ecology.....	63
11.	Incident Reporting .....	63
12.	Competence, Training and Awareness .....	64
13.	Conclusion .....	64

## List of Figures

Figure 1: Murrumbidgee River.....	9
Figure 2: Site Location .....	11
Figure 3: Organisational Structure Environmental Responsibilities.....	18
Figure 4: Riverbank repair works - facing pit 1. ....	21
Figure 5: Riverbank repair works - upper bank.....	21
Figure 6: Existing Riverbank Environment at Wagga Wagga Quarry.....	23
Figure 7: Noise and Air Sensitive Receptors. ....	29
Figure 8: Dust Deposition Gauges Current Location on Site .....	34
Figure 9: PM <sub>10</sub> Monitoring Results, calculated as a daily average. ....	39
Figure 10: 2010 and 2012 Flooding of Wagga Wagga Quarry.....	49
Figure 11: Riverbank repair works (photographs taken June 2015).....	50
Figure 12: Borehole Monitoring 702 .....	53
Figure 13: Borehole Monitoring 704 .....	53
Figure 14: Borehole monitoring 705 .....	54
Figure 15: Borehole monitoring 707 .....	54
Figure 16: Location of Groundwater Monitoring Bores .....	55

## List of Tables

Table 1: Major Project Components .....	12
Table 2: Summary of Environmental Management Plans.....	15
Table 3: Roles and Responsibilities .....	16
Table 4: Summary of Environmental Monitoring.....	24
Table 5: Approved Operating Hours.....	26
Table 6: Noise Impact Assessment Criteria (dB(A) LA <sub>eq(15min)</sub> ) .....	29
Table 7: Air Quality Closest Sensitive Receptor Locations .....	31
Table 8: PM <sub>10</sub> - Annual Limits .....	35
Table 9: PM <sub>10</sub> - 24 hour Limits .....	35
Table 10: Deposited Dust - Annual and Monthly Limits .....	35
Table 11: Deposited Dust Exceedance between 2 g/m <sup>2</sup> /month – 4 g/m <sup>2</sup> /month .....	35
Table 12: Deposited Dust exceeding the Maximum Total Deposited Dust Level .....	37
Table 13: Duplication of Table 5 - Standard Operating Hours .....	44
Table 14: Traffic Incident Register.....	47
Table 15: Code of Conduct Register .....	47
Table 16: Licenced Water Usage .....	51
Table 17: Logger operational status .....	52
Table 18: Groundwater Characteristics .....	54
Table 19: Summary of Water Management Non-Conformances .....	55
Table 20: Summary of Complaints .....	62

## List of Abbreviations

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard
CCC	Community Consultative Committee
EA	Environmental Assessment
EMS	Environmental Management Strategy
EPA	Environment Protection Authority
ISO	International Organization for Standardization
NZS	New Zealand Standard
PA	Project Approval
NOW	NSW Office of Water
OEH	NSW Office of Environment & Heritage
RMS	Roads and Maritime Services



## **1.0 Executive Summary**

The effective management and monitoring of quarry processes is a fundamental element in ensuring favourable environmental outcomes, compliance with Development Approval, and the progressive integration of the development within the community and surrounding amenity. To ensure that the Wagga Wagga Extension Project (the project) is appropriately managed Hanson Construction Materials Pty Ltd (Hanson) has composed this Annual Review as per Development Approval Conditions. This document reviews the environmental performance of the project between the reporting period of 1 July 2014 – 30 June 2015.

### **Environmental Performance**

The major environmental concern over the reporting period has been the commencement of works for the remediation of the riverbank that was initially damaged in the December 2010 flood, and subsequently in the March 2012 flood. Hanson has been in consultation with Wagga Wagga City Council and the NSW Office of Water (NOW), and has been granted approval to undertake the necessary river bank repair works from both government bodies. An access road was constructed in early 2014 to facilitate access to the riverbank, enabling the riverbank remediation works to commence. The river bank repair work has been steadily progressing over the reporting period, and currently stands at approximately 70% complete. These works are expected to be completed during the following reporting period (1 July 2015 – 30 June 2016). Further progress of the riverbank repair works will be reported in the subsequent Annual Reviews.

### **Non Compliances**

The river remediation works are nearing completion and the Proponent has been able to prepare a draft Water Management Plan and Water Monitoring Program for the Project. This plan and program were finalised and submitted to the DP&E for approval. The Plan and Program are anticipated to be implemented as soon as practical upon completion of the riverbank repair works.

The project has had exceedances in monthly deposited dust. It is thought that deposited dust exceedances are linked with the river bank repair works, and predicted to reduce once the repair works are complete.

Hanson endeavours to maintain acceptable performance outcomes, thereby reducing potential impacts of the quarry on the surrounding amenity. The Project has not had any complaint reports during the reporting period.

### **Trends in the data**

To ensure that the Project is operating in accordance with progressive environmental outcomes, Hanson compares environmental data obtained during this reporting period with that of previous years to identify any trends or abnormalities. There were no identified major alteration in data projection from this reporting period in comparison to previous years and regional data.

### **Independent Audit**

Trevor Brown and Associates conducted an Independent Environmental Audit which was submitted to the department September 2014.

Overall, the project has maintained acceptable environmental outcomes whilst the quarry progresses through extraction stage one (1). These will be explored in more detail in the body of this Annual Review.



Figure 1: Murrumbidgee River

## 1.0 Introduction

Hanson Construction Materials Pty Ltd (Hanson) own and operate a sand and river gravel quarry located on the floodplain of the Murrumbidgee River five kilometres (km) west of the city of Wagga Wagga, in the Riverina region of NSW, approximately 460km southwest of Sydney (refer to **Figure 1**).

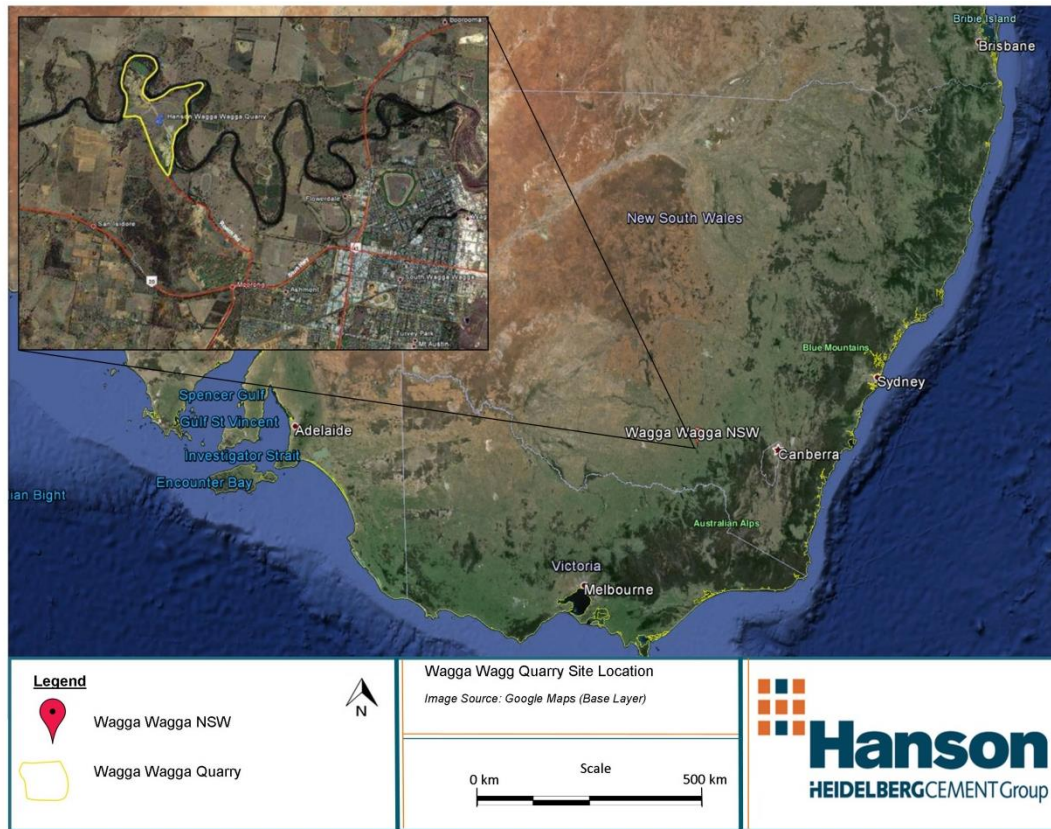
The Wagga Wagga Quarry Extension Project involves the extraction of up to 150,000 tonnes per annum (tpa) of construction aggregates over a project life of 25 years. Aggregates extracted from the site would be processed at the site and transported by road to regional customers in Wagga Wagga, Griffith, Mildura, Leeton, Canberra, Temora, Shepparton and as far south as Melbourne. The quarry directly employs 6 people during the reporting period, these being 3 operators, one truck driver, one casual plant operator and a quarry manager.

The Department of Planning and Environment (DP&E), formally the Department of Planning and Infrastructure, granted Project Approval 07 0069 subject to approval conditions on November 22, 2011. Under condition 3 of Schedule 5 of the Project Approval, an Annual Review is required to be submitted to the DP&E to review the environmental performance of the project. This Annual Review will detail the operational and environmental management activities of the project during the period 1 July 2014 to 30 June 2015.

### 1.1 Document Purpose

This Annual Review will address the environmental performance of the project. In accordance with condition 3, schedule 5 this document will;

1. *describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;*
2. *include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:*
  - a. *relevant statutory requirements, limits or performance measures/criteria;*
  - b. *monitoring results of previous years; and*
3. *identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;*
4. *identify any trends in the monitoring data over the life of the project;*
5. *identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and*
6. *describe what measure will be implemented over the next year to improve the environmental performance of the project.*



**Figure 2: Site Location**

## 1.2 Project Overview

The site is located on a floodplain bordering the Murrumbidgee River and privately held land. The total area of the site is 200 hectares (ha). Of this, 120ha is floodplain, 29ha is occupied by the extraction area, and 1.5ha is occupied by the plant and stockpile area. Access to the site is from Roach Road and McNickle Road off the Sturt Highway.

The quarry is approved to transport 150,000 tonnes per annum (tpa) of product from the site. The operational life of the quarry is expected to be in excess of 30 years. The quarry will be developed into a series of cells, over five (5) developmental stages.

There is little topsoil on the site, which is typically less than 0.5 meters (m) thick. Geologically, the substrate is comprised of sandy sediments and conglomerate gravel beneath the superficial 0.5 m topsoil layer. All useful material is stockpiled for rehabilitation works. Overburden will be placed back into exhausted cells for progressive and final rehabilitation. Overburden depth is approximately 4 m followed by fine-grained sand and gravel to a depth of 20 m.



Material is extracted from the reserves using a 40 tonne (t) excavator. Raw material is transported to the crushing plant via two dump trucks each with a 35 t capacity. Aggregate stockpiles normally contain approximately 20,000 t of aggregate for retail distribution.

The material is sold by loading into trucks via a front-end loader and quantified using a weighbridge. All processed material is hauled from the site, via a sealed access road (Roach Road) connecting to the Sturt Highway. Road trucks are typically truck and dog configurations carrying 33 t payloads. The distribution routes are either east or west along the Sturt highway.

Progressive rehabilitation of the quarried areas will be carried out by completing earthworks and covering the reclaimed area with topsoil and vegetation. The project seeks to recreate indigenous vegetation areas similar to those on the surrounding land. The excavated areas will naturally fill with water to create a series of dams.

### 1.3 Consents and licensing

Environmental monitoring and management for the site must also meet the requirements of the Project Approval conditions and Environmental Protection Licence. These are summarised in the following sections.

#### 1.3.1 Project Approval

The project was approved under Section 75J of the *Environmental Planning and Assessment Act 1979* (EP&A Act), (22 November 2011). The major components of the project are summarized in **Table 1**. The project is described in full in Hanson's Environmental Assessment (EA).

**Table 1: Major Project Components**

Aspect	Description
<b>Project summary</b>	<p>Continuation and expansion of the Wagga Wagga Quarry including:</p> <ul style="list-style-type: none"> <li>• Extraction of up to 150,000 tpa of sand and gravel (reaching a rate of up to 250,000tpa for short periods) from four new staged quarry pits;</li> <li>• Construction of haul roads, levee banks and sediment dams;</li> <li>• Processing and washing of raw quarried material;</li> <li>• Loading and dispatch by road of an average of 150,000 tpa (but with short term peaks of up to 250,000 tpa) of quarry products including concrete, aggregates, asphalt aggregates and road base;</li> <li>• Stockpiling of topsoil for reuse in rehabilitation works; and</li> </ul>

	<ul style="list-style-type: none"> <li>Progressive rehabilitation of the site.</li> </ul>
<b>Total Site Area</b>	200ha.
<b>Extraction Areas</b>	51.6 ha (proposed new extraction area, including up to 22.5 ha of quarry pits); 29 ha (previous extraction area, including up to 16.8 ha of exhausted quarry pits).
<b>Extraction Method</b>	40-tonne excavator.
<b>Extraction Rate</b>	Up to 150,000 tpa, with short term (project-related) peaks of up to 250,000 tpa.
<b>Extraction Staging</b>	Four separate quarry pits, operated as five successive extraction stages, starting from the north and extending southwards.
<b>Resource</b>	In excess of five million tonnes of sand and gravel.
<b>Depth of Extraction</b>	Approximately 22 m - 25 m below the existing land surface, to a maximum depth of 152 m AHD, approximately 15.5 m below the average height of the Murrumbidgee River.
<b>Processing and Facilities</b>	Operation of existing processing facilities including a primary feed crusher and screens, with connecting conveyor belts. The site contains an existing workshop and office amenities building. A weighbridge is located on the site access road.
<b>Water Management</b>	Water produced from licenced groundwater dewatering operations to be treated on-site (settled to <50 ppm suspended solids) then discharged to the Murrumbidgee as is current site practice.
<b>Main Products</b>	Concrete aggregates, asphalt aggregates, road base and sundry aggregates.
<b>Product Transport</b>	All products would be transported by road, via Roach Road and McNickle Road to the Sturt Highway and thence to market destinations.
	Maximum of 6 heavy vehicle movements per hour between 3 pm and 6 pm.
<b>Project Life</b>	Quarrying operations may take place at the site until 31 December 2036.
<b>Rehabilitation</b>	Rehabilitation is proposed to be a combination of wetlands, grassland and a revegetated riparian zone. Levee banks would be removed and the material returned to pits. Pit banks would be regraded and revegetated and all pits allowed to fill with water to a standing water level of 168m AHD (except Stage 1, which would be refilled to 1m above groundwater level). The final outcome would be a large grassed area, with five water-filled pits with vegetation around the perimeters.
<b>Employment</b>	The project would directly employ between 10 and 15 people during operation, and would support employment of an additional 10 subcontracted truck drivers.
<b>Capital Value</b>	\$0.5 million.
<b>Construction</b>	Construction of haul roads, levee banks and sediment dams, and surface water diversion banks (if required).
<b>Hours of Operation</b>	<p><b>Quarrying operations</b></p> <p>Monday – Friday: 6 am – 6 pm</p> <p>Saturdays: 8 am – 1 pm</p> <p>Sundays and Public Holidays: No Activities</p> <p><b>Transportation off-site</b></p>

Monday – Friday 6 am – 6 pm Saturdays: 8 am – 1 pm Sundays and Public Holidays: No activities
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### **1.3.2 Environmental Protection Licence (EPL) No. 2433**

EPM 2433 Applies to all scheduled activities undertaken by Hanson Construction Materials at Lot 2 DP 610795 and part Lot B DP 381991 (north of Roach Road). The license provides the following:

- Performance criteria for environmental management including pollutant concentration load limits, waste limits, noise limits, air quality (odour and dust) limits;
- Monitoring and record keeping requirements;
- Testing methods;
- Pollution complaints handling; and
- Reporting requirements.

## **1.4 Environmental Management and Performance Criteria**

### **1.4.1 Environmental Management Plans**

The following environmental management/monitoring plans have been prepared in accordance with the requirements of the Project Approval:

- Air Quality Management and Monitoring Plan (PAE Holmes; May 2012);
- Noise Monitoring Program (PAE Holmes, May 2012);
- Traffic Management Plan (Insite Planning, May 2012);
- Comprehensive Water Audit (Evans & Peck; June 2012);
- Water Improvement Program (Evans & Peck; March 2013)
- Waste Management Plan (Hanson Construction Materials; September 2014);
- Flora and Fauna Management Plan (M. Svinos, February 2012);
- Rehabilitation Plan (Hanson Construction Materials; September 2014)
- Water Monitoring Program (Martens and Associates; June 2015);
- Water Management Plan (Martens and Associates; June 2015) which includes;
  - Site Water Balance.
  - Erosion and Sediment Control Plan.
  - Surface Water Management Plan.
  - Flood Management Plan.
  - Contingency measures.

The resultant key environmental management and performance outcomes for the site are summarised in **Table 2** to create a single strategy for the site.

**Table 2: Summary of Environmental Management Plans**

Aspect	Element	Objective	Performance Outcomes
Water	Surface Water Demands	Reduce river water use	Comply with WAL entitlements.
		Provide access to available stored water	Provide pipelines to supply processing plant to eliminate evaporation
		Determine existing (baseline) water quality of discharge waters	Surface water sampling to be undertaken from EPL monitoring locations monthly
		Create water quality improvement program for future operations	Compliance with trigger values specified in the Water Improvement Program
	Surface Water Quality	Identify trigger values for remedial action	Exceedence of trigger values are reported and managed internally in accordance with the Water Monitoring Program
		Create a suitable treatment system for surface water to achieve compliance with TSS requirements as per the site's EPL.	Optimal TSS concentration at discharge points is achieved through implementation of recommendations of the Water Improvement Program
	Sediment and Erosion Control	Prevent transport of sediment off site during construction and operation	Extraction cells to be bunded with engineered levee banks and suitable fuse plugs
			Sediment basins should be appropriately designed to treat plant recycled water
Air	Air Quality	Control air quality impacts of the project	Compliance with air quality criteria as per Schedule 3, Condition 5 of the Project Approval
		Identify trigger values for remedial action	Management of dust levels through dust control practices listed in Section 3 of the Air Quality Management and Monitoring Plan.
		Outline a monitoring program for air quality (dust)	Dust and particulates monitored continuously at monitoring locations identified to protect nearby sensitive receptors
		Identify locations for continuous monitoring for fine particulates which represent sensitive	Any dust incidences to be reported internally and effectively managed No dust complaints from nearby sensitive receptors



		receptors	
Acoustics	Noise	Maintain current low potential for noise impacts to existing surrounding residential communities	Compliance with noise conditions specified in Schedule 3, Condition 1 of the Project Approval
		Provide a good practice noise management plan	Consistency with industry noise emissions factors for plant and machinery
			Monitoring of noise emissions from specified monitoring points.

### 1.4.2 Non-Compliance

Non-compliance is defined as an instance where environmental performance fails to meet the statutory limit. Governing procedures in the event of non-compliance are outlined in corresponding monitoring plans, however the general procedure is:

1. Non-compliance is reported by personnel to the site manager.
2. Under the site manager's direction, the source of the non-compliance is to be investigated and identified.
3. Mitigation works/measures are to be developed and actioned as soon as possible. Notify Regional Environmental Manager who contacts relevant government agencies.
4. Investigate possible amendments/alterations to treatment systems to avoid future non-compliance.
5. Prepare an incident report for the site manager to include in Annual Review for DP&E and Environmental Protection Authority (EPA). Additional reporting may also be required by government agencies or DP&E.

Where non-compliance is likely to cause significant environmental harm, relevant government agencies are to be notified promptly by the Regional Environmental Manager.

## 1.5 Personnel Structure and Responsibilities

**Table 3** summarises the organisational structure at Wagga Wagga Quarry and associated responsibilities.

**Table 3: Roles and Responsibilities**

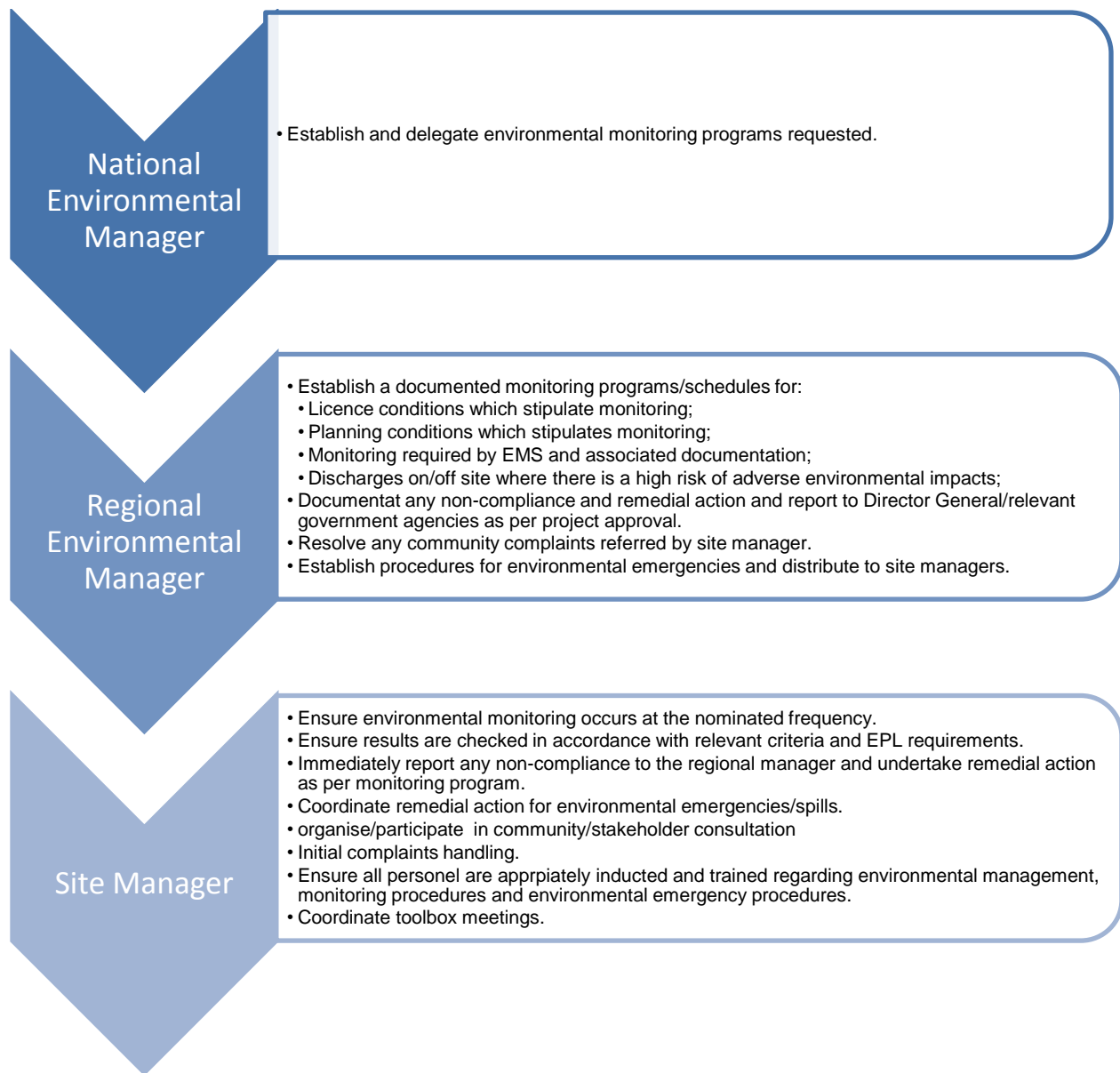
Roles	Responsibilities
Operations Manager	Will ensure adequate resources are available to enable implementation of this Strategy and all Environmental Management Plans and Program.
Quarry Manager	Accountable for the overall performance of the Project, including the

	<p>following.</p> <ul style="list-style-type: none"> <li>• Key performance outcomes of the Project;</li> <li>• Evaluation of Compliance;</li> <li>• Corrective and Preventative Actions;</li> <li>• Incident Reporting;</li> <li>• Dispute Resolution;</li> <li>• Review of the Project;</li> <li>• Consultation Strategies; and</li> <li>• Emergency preparation, response and investigation.</li> </ul>
Quarry Supervisor	<p>Ensure the implementation of all applicable strategies and policies, including the following.</p> <ul style="list-style-type: none"> <li>• Ensure employees are competent through training and awareness programs;</li> <li>• Monitoring;</li> <li>• Corrective Action and Preventative Action in consultation with the Quarry Manager;</li> <li>• Consultation Strategies; and</li> <li>• Complaints management.</li> </ul>
All personnel	<p>Ensure compliance with all applicable strategies and policies (i.e. Environmental Management Strategy) including consultation strategies approved by the Environmental Supervisor.</p>

## 1.6 Organisational Structure

The structure of environmental personnel and their roles/responsibilities within is shown in **Figure 2**. Although personnel have specific accountabilities at different levels of work, all staff members, contractors and visitors are accountable for:

- Complying with relevant legislation including EPL's;
- Complying with this EMS and associated documents as they apply;
- Communicating any information they become aware of in relation to environmental management; and
- Taking appropriate action to mitigate environmental impacts.



**Figure 3: Organisational Structure Environmental Responsibilities**

## 1.7 Competence, Training and Awareness

All personnel undergo environmental management awareness training as a component of the competency based site induction program. The following areas are covered in the induction:

- Noise management;
- Air quality management;
- Soil and water management, including hydrocarbon and chemical management;
- Landscape management; and

- Reporting of incidents.

The Quarry Supervisor is responsible for ensuring the appropriate Environmental Management training is included in the induction.

## 2.0 Summary of Operations during Reporting Period

The following provides a summary of the works associated with the project, for the reporting period 1 July 2014 to 30 June 2015 and significant events that have occurred during the compilation of this review.

### 2.1 Overburden Removal and Levy Bank Construction

#### **Stripping**

Stripping of overburden has occurred in previous reporting years and been stockpiled for use in the riverbank repair works.

#### **Timing of Works**

Under the *Water Management Act 2000* the Murrumbidgee River is a regulated river that receives planned environmental water for ecological and irrigation purposes during the spring and summer months. Additional flows during these periods significantly raise the water level of the Murrumbidgee River in the Wagga Wagga region. The levee bank remediation works require extended periods of low flow. Hence the works have been unable to be initiated until periods of low flow (i.e. over Autumn and Winter months). This has resulted in a delay in the progression of riverbank repair works.

#### **The Works**

The works require an access road to transport construction materials, construction/stability of the riverbank, and rehabilitation and revegetation of the Murrumbidgee riverbank. The access road was constructed in early 2014 to facilitate vehicular access to the work site, and has been maintained during this reporting period. The riverbank construction/stability works are 70% complete with oversize rock being used to stabilise the direct path for river overflow (see **Figure 4 and 5**).



Figure 4: Riverbank repair works - facing pit 1.



Figure 5: Riverbank repair works - upper bank

### **Completion**

The works have continued throughout the reporting period and at the time of writing, the riverbank repair works are approximately 70% complete.

### **Approvals**

A conceptual design and construction methodology from the levee bank remediation was developed in consultation with Wagga Wagga City Council and the NOW. Hanson sought the required Controlled Activity Approval from and in consultation with the NOW for authorization of the necessary works. This approval was received on 2 August 2013. Subsequent to this approval, the works have commenced.

## 2.2 Quarrying Activities

Extraction has commenced in Cell 1. Approximately 57,710 tonnes of material was extracted in the reporting period, some of which has been stockpiled for future export.

There has been no clearance during the reporting period.

## 2.3 Rehabilitation

Rehabilitation at Wagga Wagga quarry involves four major components;

1. **Maintain:** Predominately the site has maintained native vegetation where feasible. Vegetation along the river bank has for the most part of the quarry remained untouched. This vegetation is important to maintain structural stability along the river bank, particularly in times of high rainfall/river flows (**Figure 6**).
2. **Self-Seeding:** Self seeding has been successful over the site with saplings continuing to mature throughout the reporting period.
3. **Planting:** The project has not actively planted samplings during the reporting period. It is anticipated that saplings will be planted on the river bank upon completion of the repair works. This will be assessed in further detail at the time of riverbank completion; however it is proposed that endemic vegetation will be planted to ensure consistency with the local ecology.
4. **Monitoring:** quarry management monitors existing vegetation and the progression and success of self-seeding on site.

### 2.3.1 Status

Self-seeding has been the predominant rehabilitation strategy applied at Wagga Wagga quarry. **Figure 6** below illustrates the existing vegetation in the Murrumbidgee riparian zone at Wagga Wagga quarry. Mature *Eucalyptus camaldulensis* dominate the banks of the Murrumbidgee River (as seen in **Figure 6**). Pollination by insects, birds and small mammals, enables the species to release numerous fertilised seeds per year. Should the conditions be acceptable, these seeds will germinate into viable saplings. The succession of vegetation in these areas will develop soil structure integrity and promote associated ecological system benefits.





**Figure 6: Existing Riverbank Environment at Wagga Wagga Quarry**

## **2.4 Management Strategies**

### **2.4.1 Weed Management**

A Land Management Officer from Wagga Wagga City Council conducted a site visit to assess weeds at Wagga Wagga Quarry July 2014. The following was noted;

*“At the time of the noxious weeds inspection being undertaken, no significant weeds issues were identified. Some low priority class weeds were found including Horehound and Bathurst Burr but infestations did not warrant further action from Wagga Wagga City Council’s Vegetation management department. General hygiene practises on site were deemed satisfactory and actual excavation area free of weed material”.*

From this assessment, Wagga Wagga quarry will continue to operate as is current, which does not include active spraying or removal of weeds on site. Should weeds alter in terms of the species on site, or the spread of weeds, the quarry management will assess site applicable weed maintenance/removal measures.

## **3.0 Environmental Management, Monitoring and Performance**

### **3.1 Management Plans and Monitoring Programs**

As per the Project Approval, Hanson has developed Management Plans to provide ongoing guidelines for the life of the Project. Wagga Wagga Quarry has continued to implement Environmental Management Plans including;



- Comprehensive Water Audit (Evans & Peck; June 2012);
- Water Improvement Program (Evans & Peck; June 2012);
- Noise Management Plan (PAE Holmes, May 2012);
- Air Quality Management Plan (PAE Holmes; May 2012);
- Traffic Management Plan (Insite Planning, May 2012);
- Flora and Fauna Management Plan (M. Svinos, February 2012);

Wagga Wagga quarry has submitted the following plans during the reporting period;

- Rehabilitation Management Plan (Hanson Construction Materials; September 2014).
- Waste Management Plan (Hanson Construction Materials; September 2014).
- Water Monitoring Program;
- Water Management Plan which includes;
  - Site Water Balance.
  - Erosion and Sediment Control Plan.
  - Surface Water Management Plan.
  - Flood Management Plan.
  - Contingency measures.

Environmental monitoring programs are detailed in Hanson's Environmental Management Strategy for the site. Each monitoring program has been created in consultation with relevant guidelines/approvals to ensure compliance with relevant criteria is achieved. A summary of monitoring plans is provided in **Table 4**.

These include;

- Water Monitoring Program
- Noise Monitoring Program
- Air Quality Monitoring Program

**Table 4: Summary of Environmental Monitoring**

Plan	Monitoring Frequency	Monitoring
Surface Water Monitoring Plan	Monthly	TSS
Air Quality Management and	Monthly	Dust deposition

Monitoring Plan	Continuous	Particulate matter < 10 µm (PM10)
Noise Monitoring Program	Commencement of each stage of extraction/development.	Unattended noise monitoring at the nominated sensitive receivers (NMP) for 7 days (site must be operating normally during the monitoring period).
	Commencement of each stage of extraction/development.	Operator attended monitoring at the nominated sensitive receivers for a minimum of two 15 minute periods during hours of operation (site must be operating normally during the monitoring period).
	In response to complaints	Operator attended monitoring at the receiver where complaint was received for a minimum of two 15 minute periods during hours of operation (site must be operating normally during the monitoring period).

## 4 Noise Management

### 4.1 Compliance with Development Approval

Conditions 1 – 4, schedule 3 of the Development Approval stipulates environmental performance conditions for the monitoring and management of noise for the project. The project's Project Approval specifies; operating hours (**Table 5**), impact assessment criteria (**Table 6**), operating conditions and the preparation of Noise Management Plan. Noise management for the project is based on these criteria.

#### 4.1.1 Operating Hours

**Table 5** below specifies approved operating hours.

**Table 5: Approved Operating Hours**

Activity	Day	Time
All quarrying operations	Monday – Friday (except Public Holidays)	6am – 6pm
	Saturdays	8am – 1pm
	Sundays and Public Holidays	No activities
Transportation off-site	Monday – Friday (except Public Holidays)	6am – 6pm
	Saturdays	8am – 1pm
	Sundays and Public Holidays	No activities

## 4.2 Current Operation Noise Management Measures

Identification of unacceptable noise impacts will be triggered by an operator's observation during quarry operation or a noise complaint from adjacent neighbours. Identification of any significant sources of noise by investigation of operations will be undertaken and if required, activities and processes will be modified. Upon identification of an unacceptable noise impact event, corrective actions are implemented by the Site Manager. The following is an overview of the current practices employed on site to reduce noise.

### 4.2.1 Hauling Trucks

Speed limits are between the site office and Roach Road are maintained internally at 20km/h. The current speed limit of McNickle Road and Roach Road is 80km/h. These limits are adhered to by all drivers accessing the site thereby lessening the likelihood of increased noise impacts from fast moving vehicles. The haul road constructed for the new extraction area will create less internal traffic noise because it is designed to run a shorter distance between the processing plant and the extraction area.

### 4.2.2 Embankments

Embankments are established using the topsoil and overburden removed from the extraction zone at a height of 3.2 metres. The location of these bunds acts to block the direct line-of-sight to the nearest residence and will be completed before extraction in stage one takes place.

### 4.2.3 Mobile Equipment

All mobile equipment is turned off when not in use.

## 4.3 Noise Monitoring

Condition 3 and 4, schedule 3 of the Project Approval require the project to conduct regular assessment of noise monitoring. The Project Approval states that the proponent shall ensure that the noise generated by the project during operation does not exceed the criteria as replicated in **Table 6**. 'Day' is defined as the hours between 6:00am and 6:00pm Mondays to Friday and 8:00am to 1:00pm on Saturday but does not include public holidays. Approved operating hours are shown in **Table 5**. Only a dewatering pump will run outside of these hours and the noise levels from this source must remain below background noise emission levels.

### 4.3.1 Operational Noise

Noise monitoring will be approached in accordance with environmental noise monitoring as outlined in **Table 4**. As shown in **Table 4**, noise monitoring is required at each development

stage. The project has not progressed from development stage 1 during the reporting period and hence Hanson has not undergone noise monitoring assessments during the reporting period

#### **4.3.2 Traffic Generated Noise**

The Wagga Wagga Quarry Noise Management Plan comprised of an Impact Assessment which was based on a worst-case traffic noise level approach on all affected public roads. This Impact Assessment suggested that ongoing monitoring of traffic generated noise was unnecessary. Therefore continuous or regular traffic monitoring will only be considered if complaints are made. In this case supplementary action will occur. During the reporting period there were no complaints related to noise exceedance and therefore continuous noise traffic assessments are not proposed.

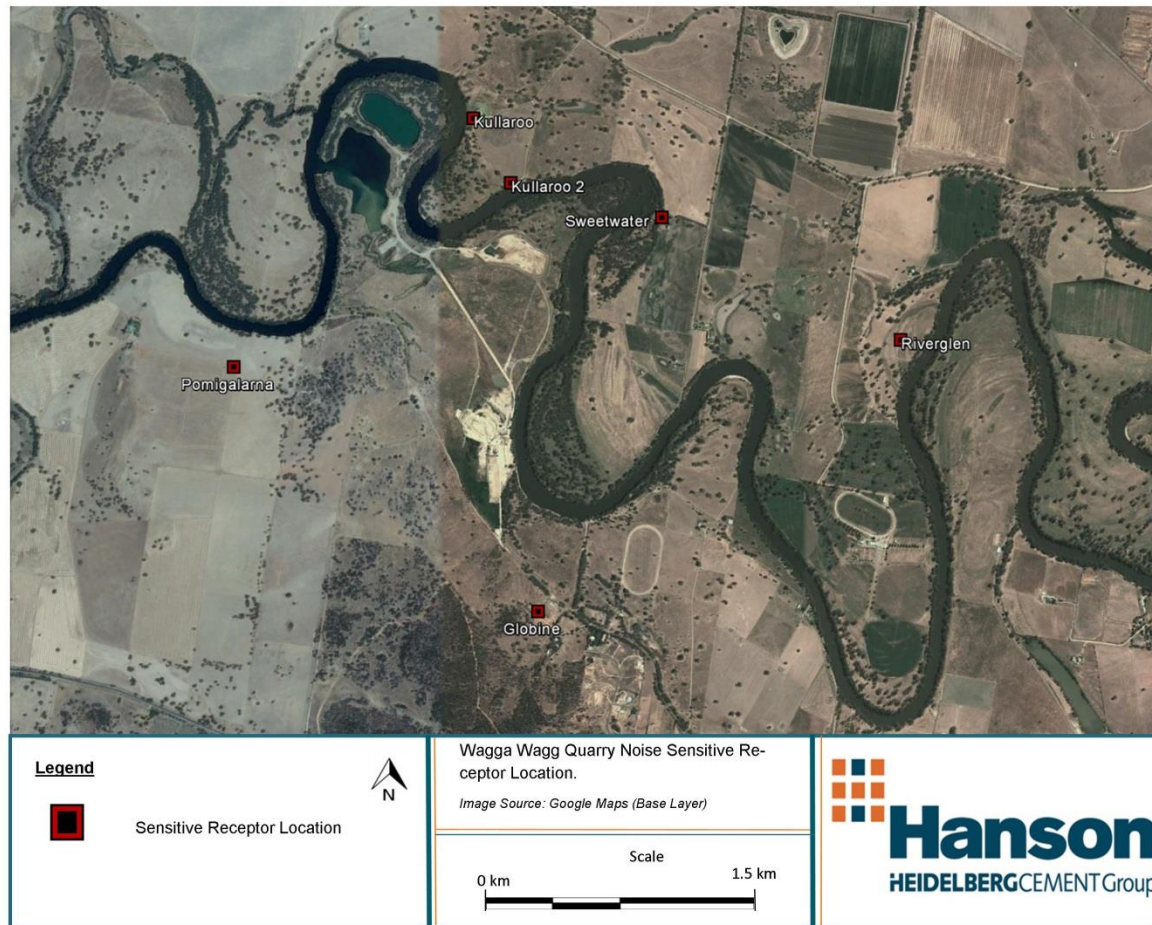


Figure 7: Noise and Air Sensitive Receptors.

## 4.4 Noise Limits

**Table 6** depicts a duplication of noise limits as per Project Approval condition 1, schedule 3.

**Table 6: Noise Impact Assessment Criteria (dB(A)  $LA_{eq(15min)}$ )**

Location	Day
Kullaroo 2	39
Riverglen	40
All other privately owned land	36

## **4.5 Results**

### **4.5.1 Noise Monitoring Assessment Criteria**

As real-time data was not conducted during the reporting period. Noise monitoring assessment is made from, operator's observation, complaints from adjoining neighbours, and complaints pertaining to traffic generated noise emissions. Using an agglomeration of this data a reliable assessment of noise conformance has been made for the period from 1 July 2014 – 30 June 2015.

There were no traffic related noise complaints; therefore no further noise monitoring was conducted for traffic generated noise.

### **4.6 Noise Management Non-Conformances**

There were no non-conformances or noise complaints during the reporting period.

## 5 Air Quality Management

### 5.1 Compliance with Development Approval

Conditions 5 - 7, Schedule 3 of the Development Approval stipulate the environmental performance conditions for the monitoring and management of air quality for the project. The Development Approval stipulates air quality impact assessment criteria, operating conditions and specifications for the preparation of an air quality management plan.

### 5.2 Dust Generating Activities

The following activities have been identified as key areas for potential dust generation;

- Wheel generated dust from movement of vehicles on unsealed roads within the site;
- Movement of machinery at the processing plant (front end loaders, excavators and dump trucks);
- Scraping of overburden;
- Crushing and screening of aggregate;
- Materials handling and conveying;
- Emplacement of materials within the site; and
- Wind erosion of stockpiles/exposed areas.

The locations of the closest sensitive receptors are identified in **Table 7**. The locations of these receptors relative to the site are shown in **Figure 7**. Note Kullaroo 2 has been demolished. The project site comprises of two lease areas, the old extraction area located to the north-northwest of the processing plant and the new extraction area located north-northeast of the processing plant.

**Table 7: Air Quality Closest Sensitive Receptor Locations**

Residence ID	Distance to Site Boundary	Distance to Processing Plant (m)	East (m)	North (m)
Kullaroo	0.2	1.7	527572	6117801
Sweetwater	0.2	1.4	528569	6117275
Riverglen	0.7	1.2	529831	6116625
Globine	0.5	1.0	527908	6115201
Pomigalarna	0.4	1.5	526301	6116493

### 5.3 Dust Management Controls

A dust event will be identified based on the below criteria;



- Visible fugitive emissions on the site; and/or
- Dust complaint from adjacent neighbours; and/or
- Exceedance in pre-determined trigger level of 0.2mg/m<sup>3</sup> as measured by the PM<sub>10</sub> Dustrak Monitor on site (see **Figure 8**).

Upon identification of a dust incident, one or more of the following corrective actions will be implemented by the Site Manager;

- Identification of any significant sources of emissions by visual inspections will be undertaken.
- If required activities and processes will be modified.
- If requested, air quality monitoring should be conducted at the complainant's property.
- Inspection of the DDT monitor to ensure accurate machine operation.

Specific dust management practices and mitigation measures in place to address sources are identified in Section 2.1 of the *Air Quality Management Plan* and are summarised below.

#### 5.3.1 Hauling

When dusty conditions are identified by the Site Manager the water cart is sent out to water the haul roads. The frequency of watering is determined by the availability of staff to operate the water cart.

- Speed restrictions between the public road and site office are applied at 20 km/h;
- Loads are required to be covered when haul trucks exit the site;
- The new haul road (currently under construction) minimises the distance travelled by taking the most direct route from the new extraction area to the processing plant;
- The public road is sealed from the site entrance resulting in less wheel-generated dust from product haul trucks on public roads; and
- Speed limit on the public road is restricted to 80 km/h.

#### 5.3.2 Extraction

- Due to the location of the quarry operation, the sand and aggregate is being extracted from below the water table therefore the moisture content of the product is high. This reduces the dispersion on dust around the site.

#### 5.3.3 Processing

- Bins in the processing plant have three sided enclosures.
- Two of the four screens onsite have water piping that can be used to dampen the material during the screening process, if required
- Transfer of sand from the processing plant to the stockpile is occurs using a pipe that mixes the sand with water; therefore no emissions are produced during this process.

#### 5.3.4 Wind Erosion

- The planting of the wildlife park adjacent to the operation acts as a windbreak near the stockpiles and other exposed areas.
- Overburden stockpiles are seeded during the course of the operation to reduce wind erosion.
- Progressive rehabilitation acts as a soil stabiliser, thereby reducing erosion rates and subsequent wind generated transfer of dust around site.

#### 5.4 Dust Deposition Monitoring

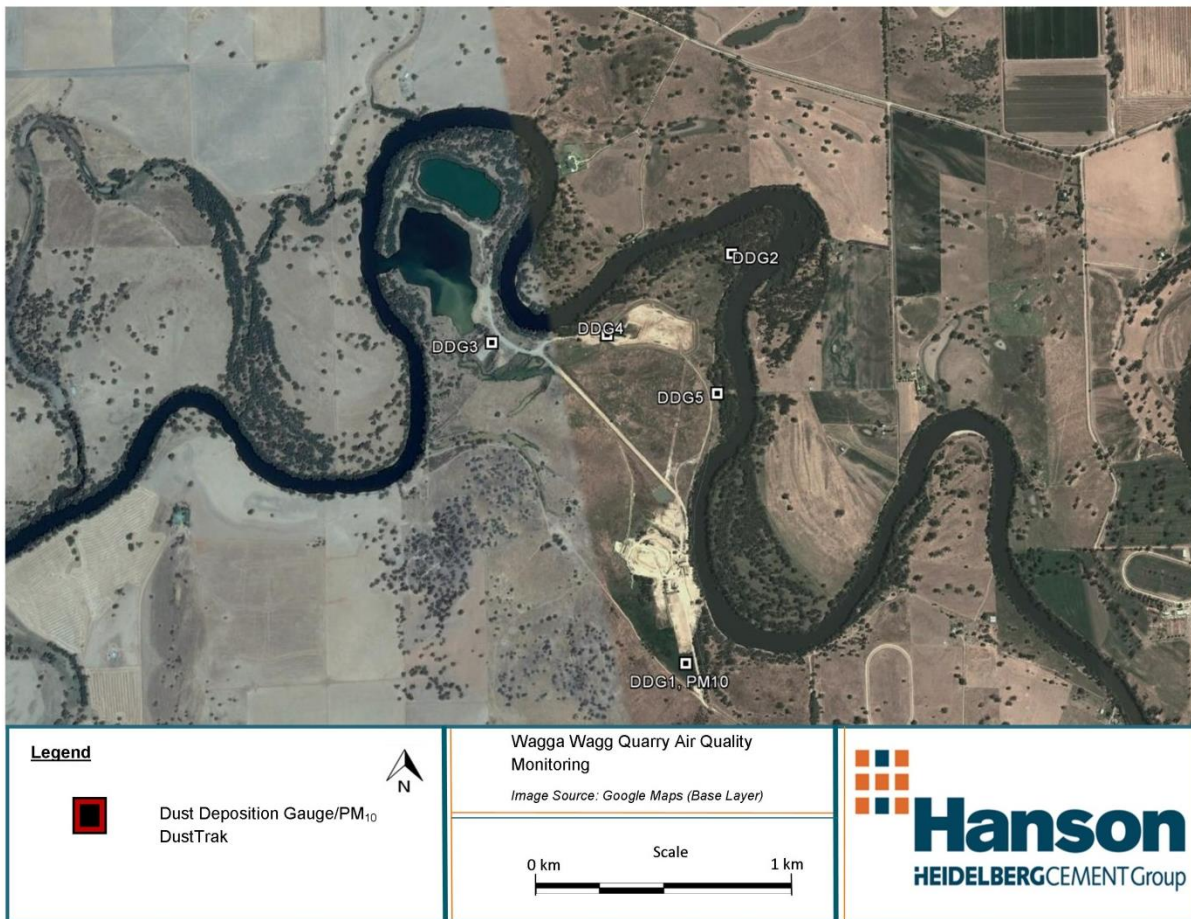
Five (5) dust deposition gauges have been maintained at the site since 2001 to determine dust deposition levels at the site. Dust deposition gauges (DDGs) are operated in accordance with:

- NSW OEH Approved methods for the sampling and analysis of air pollutants in NSW (*NSW DEC 2005*).
- Australia/New Zealand Standard: Methods for sampling and analysis of ambient air.

Monthly monitoring for dust deposition is conducted at five sites. The current locations of each dust deposition gauge (DDG) are illustrated in **Figure 8**.

The DustTrak monitoring device measures particulate matter <10µm (PM<sub>10</sub>), taking data readings continuously every 15 minutes.

DDG1, DDG2, DDG3, DDG4 and DDG 5 are dust deposition gauges, that are externally analysed monthly by Charles Sturt University, providing results for Deposited Matter including ash, combustible matter, insoluble solids, soluble solids and total matter.



**Figure 8: Dust Deposition Gauges Current Location on Site**

## 5.5 Limits

The operation of the quarry must comply with conditions of air quality impact assessment criteria (Condition 5 of schedule 3 of the Project Approval), operating hours (condition 2 of schedule 3 of the Project Approval) and air quality management (conditions 6 and 7 of schedule 3 of the Project Approval). All reasonable and feasible avoidance and mitigation measures must be employed so that particulate matter emissions generated by the project do not cause an exceedence of the criteria shown in **Tables 8, 9 and 10**.

**Table 8: PM10 - Annual Limits**

Pollutant	Averaging Period	<sup>d</sup> Criteria
Total Solid Particulates (TSP)	Annual	<sup>a</sup> 90 µg/m <sup>3</sup>
Particulate matter <10 µm (PM <sub>10</sub> )	Annual	<sup>a</sup> 30 µg/m <sup>3</sup>

**Table 9: PM10 - 24 hour Limits**

Pollutant	Averaging Period	<sup>d</sup> Criteria
Particulate matter <10 µm (PM <sub>10</sub> )	24hr	<sup>a</sup> 50 µg/m <sup>3</sup>

**Table 10: Deposited Dust - Annual and Monthly Limits**

Pollutant	Averaging Period	Maximum Project Contribution	Maximum Total Deposited Dust Level
<sup>c</sup> Deposited Dust	Annual	<sup>b</sup> 2 g/m <sup>2</sup> /month	<sup>a</sup> 4 g/m <sup>2</sup> /month

## 5.6 Results

### 5.6.1 Deposition Results

The Maximum Total Deposition Dust Level of 4g/m<sup>2</sup>/month has been adopted as the exceedance level reported in this annual review. Maximum Project Contribution is 2g/m<sup>2</sup>/month and the dates of these occurrences has been indicated in **Table 11** below but further explanation is not provided as these exceedances are deemed low. Any readings 4 g/m<sup>2</sup>/month and above are elaborated upon in which provide a description of the site activities being undertaken in the vicinity of the dust gauges has been included.

**Table 11: Deposited Dust Exceedance between 2 g/m<sup>2</sup>/month – 4 g/m<sup>2</sup>/month**

Month	DDG	DDG Exceedance reading (g/m <sup>2</sup> /month)
<b>September</b>	3	2.8
<b>October</b>	1	3.5
	2	3.8
	3	2.2
<b>November</b>	1	3.7
	2	2.2
	4	3.3
	5	3.6
<b>December</b>	4	3.1
<b>January</b>	3	3.6
	4	2.8

	5	2.9
<b>February</b>	1	2.7
	3	3.2
<b>April</b>	1	2.9
	2	2.1
<b>May</b>	3	2.5
	4	2.4

**Table 12: Deposited Dust exceeding the Maximum Total Deposited Dust Level**

Month	Location	Result	Comments
July 2014	DDG4	5.8 g/m <sup>2</sup> /month	The location of DDG4 ( <b>Figure 5</b> ), is such that the gauge is directly exposed to high dust generating activities from the quarry pit. The close proximity to the pit exposes DDG4 to high dust concentrations. Additionally an alternate haul road was being used until the currently operational haul road was put into service. The alternate haul road exposed DDG4 to elevated quantities of deposited dust.
	DDG3	5.8g/m <sup>2</sup> /month	DDG3 is located along the access road utilised in the river redemption repair works. Dust deposition exceedances at DDG3 are temporary and are expected to fall within compliance limits upon completion of the river redemption works.  Three instances of 60+km/h winds in November from the west may have contributed to high readings at DDG3.
December	DDG2	5.6 g/m <sup>2</sup> /month	DDG2 is located at the northern most point of the quarry. It unusual for DDG2 to experience exceedances, however likely related to northerly wind patterns.
	DDG3	7.7 g/m <sup>2</sup> /month	DDG3 is located along the access road utilised in the river redemption repair works. Dust deposition exceedances at DDG3 are temporary and are expected to fall within compliance limits upon completion of the river redemption works.  The water truck was being re-built over the summer reducing the application of dust suppression on site.
January	DDG1	5.1 g/m <sup>2</sup> /month	The location of DDG1 is near the quarry plant. Slight exceedance in deposited dust at this gauge is indicative of high production levels and regional climatic conditions. Prevailing winds from the WNW at the sampling time transport increased dust into the DDG1 recording vicinity.  The water truck was being re-built over the summer reducing the application of dust suppression on site.

	DDG2	4.8 g/m <sup>2</sup> /month	DDG2 is located at the northern most point of the quarry. It unusual for DDG2 to experience exceedances, however likely related to northerly wind patterns.
<b>February</b>	DDG2	5.1 g/m <sup>2</sup> /month	DDG2 is located at the northern most point of the quarry. It unusual for DDG2 to experience exceedances, however likely related to northerly wind patterns.  The water truck was being re-built over the summer reducing the application of dust suppression on site.
<b>April</b>	DDG3	4.8 g/m <sup>2</sup> /month	DDG3 is located along the access road utilised in the river redemption repair works. Dust deposition exceedances at DDG3 are temporary and are expected to fall within compliance limits upon completion of the river redemption works.

### 5.6.2 PM10 Results

The DustTrak monitor as shown in **Figure 8** was commissioned on 30 October 2012. The DustTrak real-time data monitoring operates as an online system, whereby the site manager and regional management are alerted to a “dust event” by email when the pre-determined trigger level is exceeded. DustTrak readings are available at all times via a username & password operated website.

There are circumstances when the DustTrak produces erroneous data. Erroneous data is that that is a negative number. These values have been excluded from both the short term 24hr average and long term annual average calculations expressed in Project Approval Schedule 3 condition 5. Data from the following dates over the reporting period produced erroneous values between -0.001 and -0.06;

- 1 July 2014 – 4 July 2014
- 18 July 2014
- 22 July 2014 - 12 July 2014
- 22 December 2014 – 8 January 2015
- 21 January 2015 – 22 January 2015
- 16 February 2015 – 17 February 2015
- 4 May 2015
- 6 May 2015 – 13 May 2015

These readings were excluded from all calculations.

### 5.6.2.1 Short Term PM<sub>10</sub> Monitoring

The DustTrak monitor records PM<sub>10</sub> readings every 15 minutes. There was one exceedance in the 24 hour PM<sub>10</sub> averaging period. The DustTrak monitor recorded 63.9 µg/m<sup>3</sup> on the 17<sup>th</sup> April 2015 over a 9 hour period between midnight and 9am (**Figure 5**). Winds during this time were blowing from the ENE and would blow dust from the exposed ground to the north to the monitor. Otherwise there are no environmental or climatic factors explain high readings at this time. All other PM<sub>10</sub> readings over the reporting period (1 July 2014 – 30 June 2015) comply with the 50 µg/m<sup>2</sup> average daily limits which are shown in **Table 9**.

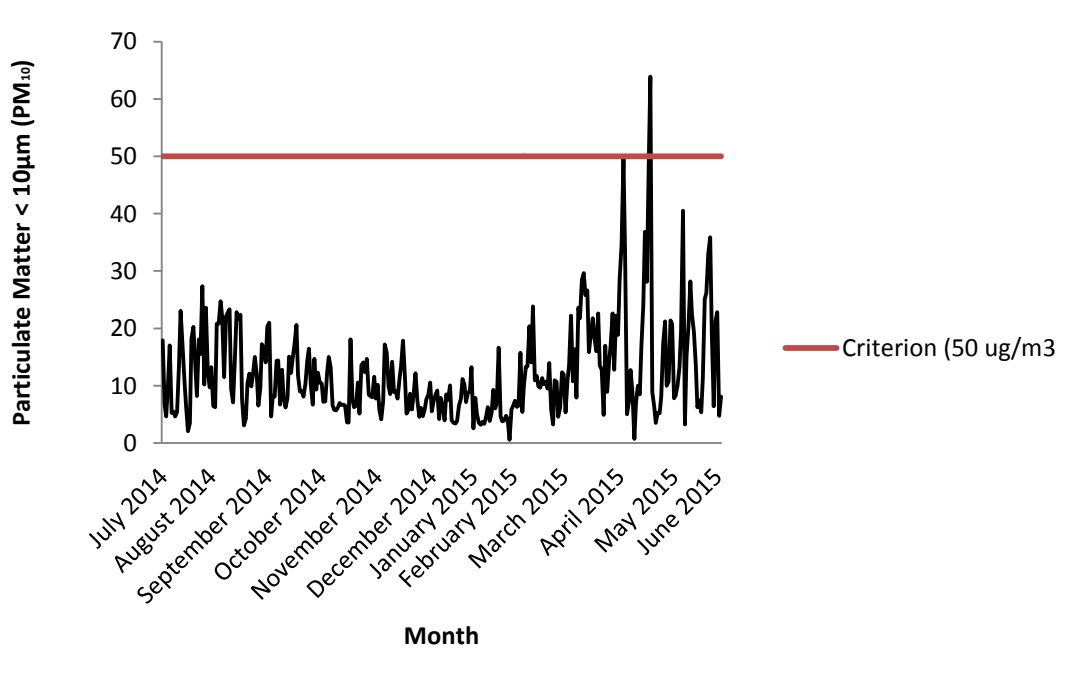


Figure 9: PM<sub>10</sub> Monitoring Results, calculated as a daily average.

### 5.6.2.2 Annual Limits

The average PM<sub>10</sub> reading from the period 1 July 2014 – 30 June 2015 was obtained from the DustTrak data. Readings are taken every 15 minutes, all non-erroneous data was included in the annual calculation. The annual average for PM<sub>10</sub> for the reporting period was 12.5 µg/m<sup>2</sup>. This complies with the 30µg/m<sup>3</sup> annual limit as outlined in the Development Approval (**Table 8**).

## 5.6.3 Air Quality Management Non-Conformances

### Dust Deposition Gauges



There have been eight (8) occasions during the reporting period of exceedances of the deposition dust limits in the maximum total deposited dust level of  $4 \text{ g/m}^2/\text{month}$ . There have been eighteen (18) occasions during the reporting period of exceedances of the deposition dust limits in the maximum project contribution of  $2 \text{ g/m}^2/\text{month}$  (excluding  $4 \text{ g/m}^2/\text{month}$  exceedances). Exceedance events, as detailed in **Table 11 and Table 12**, are thought to be linked to the riverbank repair works, which has been an operational and environmental priority during the reporting period. Dust exceedances are expected to reduce during the next reporting period, when the riverbank repair works have been completed.

Non-conformances will be tracked over the next reporting period to determine if there are any trends relating to the location of the monitoring gauge, site activities and monthly rainfall.

There is no site or regional trends that have been detected in comparison to previous annual reports.

#### **PM<sub>10</sub>**

The site had one PM<sub>10</sub> limits exceedance event of the criterion set in the Development Approval over the reporting period.

The extended period of erroneous data was due machine malfunction. The remaining results suggest that PM<sub>10</sub> data falls well within department stipulated limits (**Table 8 and Table 9**). Therefore, whilst there are extended periods of data excluded from this annual report due to machine malfunctioning, it can be concluded that the project complies with targets outlined in **Table 8 and 9**.

### **5.7 Comparison with previous years**

#### **Dust Deposition Gauges**

The number of exceedances in maximum total deposited dust level is the same as in the last reporting period, 1 July 2013 – 30 June 2014. The highest exceedance in dust deposition levels in this reporting period is  $7.7 \text{ g/m}^2/\text{month}$  (December, DDG3), which is less than half of the previous reporting period which recorded the highest deposited dust value recorded at  $15.7 \text{ g/m}^2/\text{month}$ .

It is thought that this reduction is a reflection of effective management of the riverbank repair works. It is anticipated dust level exceedances will decrease to a manageable level as the riverbank repair works slow and conclude in the next reporting period.

#### **PM<sub>10</sub> (DustTrak)**

The previous reporting period did not record any PM<sub>10</sub> exceedances, whilst the 2014-2015 reporting period reported one exceedance. It is not entirely sure why there was such a high reading during this time, but it is thought to be linked to the wind patterns on the 17<sup>th</sup> April 2014.

Annual PM<sub>10</sub> of 12.5 µg/m<sup>2</sup> is lower than the previous reporting period.

There have been no identified dust patterns in conjunction with recorded data from previous reports.

## **6 Traffic Management**

### **6.1 Compliance with Development Approval**

Schedule 3, condition 17-20 of the Project Approval requires the proponent keep accurate records of transported product material, consult with the Roads and Maritime Services (RMS), Wagga Wagga City Council and the Community Consultative Committee (CCC) to appropriately reduce the speed limit along Roach Road, and to prepare and implement a Traffic Management Plan satisfying conditions stipulated within the Development Approval.

### **6.2 Traffic Management Plan**

To ensure compliance with Schedule 3, condition 19 of the Project Approval a Traffic Management Plan has been implemented which aims to;

- Encourage compliance and acceptance of the Truck Driver Code of Practice by all heavy vehicle drivers using the quarry;
- Minimise impacts on the community;
- Foster an understanding and awareness within the company of community expectations and legislative requirements;
- Protect and enhance public safety through compliance with relevant road rules; and
- Increase OH&S understanding in relation to fatigue, vehicle operation in public areas and obligation to the general public.

The objectives outlined in the Traffic Management Plan have been used in the reporting period (1 July 2013 – 30 June 2014) to appropriately manage project traffic and minimise its effect on the surrounding amenity and community.

### **6.3 Traffic Management Controls**

#### **6.3.1 General Requirements**

Heavy vehicle drivers hauling from Wagga Wagga Quarry must:

1. Have undertaken a Site Induction carried out by an approved member of the quarry staff or suitably qualified person under the direction of the quarry management;
2. Hold a valid driver's licence for the class of vehicle that you operate;
3. Operate the vehicle in a safe manner within and external to the quarry site; and
4. Comply with the direction of authorised site personnel when within the site.

### 6.3.2 Heavy Vehicle Speed

Vehicular speeding is a serious offence, of which Hanson takes very seriously internal and also in conjunction with the policy as developed by the RMS. Increased speed means not only an increased risk of crashing but also increased severity if a crash occurs.

Drivers and truck operators are made aware of the “Three Strikes Scheme” introduced by the RMS which applies to all vehicles over 4.5 tonnes. When a heavy vehicle is detected travelling at 15 km/h or more over the posted or relevant heavy vehicle speed limit by a mobile Police unit or fixed speed camera, the RMS will record a strike against that vehicle. If three strikes are recorded within a three year period, the RMS will act to suspend the registration of that vehicle (up to three months).

There are two types of speeding:

- i) Where a heavy vehicle travels faster than the posted speed limit; and
- ii) Where a driver travels within the speed limit but because of road conditions (e.g. fog or rain) this speed is inappropriate (RMS).

More information is available from the RMS website.

Vehicle speed on public roads is enforced by the NSW Police Service.

The speed limit within the quarry site is 20 km/h which is to be strictly maintained.

***Drivers are to observe the posted speed limits, with speed adjusted appropriately to suit the road environment and prevailing weather conditions, to comply with the Australian Road Rules. The vehicle speed must be appropriate to ensure the safe movements of the vehicle based on the vehicle configuration.***

### 6.3.3 Heavy Vehicles Driver Fatigue

Fatigue is one of the biggest causes of crashes for heavy vehicle drivers. The Heavy Vehicle Driver Fatigue Reform was therefore developed by the National Transport Commission (NTC) and approved by Ministers from all States and Territories in February 2007.

The heavy vehicle driver fatigue law commenced in NSW on 28 September 2008 and applies to trucks and truck combinations over 12 tonne GVM (however there are Ministerial Exemption Notices that can apply).

Under the law, industry has the choice of operating under three fatigue management schemes:

- i) Standard Hours of Operation
- ii) Basic Fatigue Management (BFM)
- iii) Advanced Fatigue Management (AFM)

***All heavy vehicle drivers operating out of the Wagga Wagga Quarry are to be aware of their adopted fatigue management scheme and operate within its requirements.***

#### 6.3.4 Heavy Vehicle Compression Braking

Compression braking by heavy vehicles is a source of irritation to the community generating many complaints especially at night when many residents are especially sensitive to noise.

In some instances compression braking is required for safety reasons however when passing through or adjacent to residential areas or isolated farmsteads a reduction in the speed of the vehicle is recommended to reduce the instances and severity of compression braking.

Due to the relative proximity to residential homes in Riverview Estate and along McNickle Road drivers are requested to limit the noise created in this area as much as possible.

***Brakes must be applied so as not to create excessive noise that could disturb local residents where possible. Compression braking within or adjacent to Riverview Estate or other residential areas or isolated residences should only be used if required for safety reasons.***

There has been one reported instance of the use of compression braking on McNickle Road; however residents have advised that it is not an ongoing occurrence. All drivers were reminded of the need to avoid compression braking, other than for safety reasons, in the vicinity of the residential development.

#### 6.3.5 Heavy Vehicle Noise

The operating hours for transportation of materials off-site are reported in **Table 5** and are reproduced below;

**Table 13: Duplication of Table 5 - Standard Operating Hours**

Activity	Day	Time
All quarrying operations	Monday – Friday (except Public Holidays)	6am – 6pm

	Saturdays	8am – 1pm
	Sundays and Public Holidays	No activities
<b>Transportation off-site</b>	Monday – Friday (except Public Holidays)	6am – 6pm
	Saturdays	8am – 1pm
	Sundays and Public Holidays	No activities

At commencement of the working day it is not unusual for drivers to arrive early and wait for opening. If this occurs drivers are to wait with engines off.

***To reduce the impact of vehicle noise at commencement of the working day heavy vehicles waiting for the quarry to open are to wait with engines off when possible.***

#### **6.3.6 Load Covering**

Loose material on the road surface has the potential to cause road crashes and vehicle damage.

***All trucks departing from the site loaded with material are required to have an effective cover over their load for the duration of the trip. The load cover may be removed upon arrival at the delivery site.***

***All care is to be taken to ensure that all loose debris from the vehicle body and wheels is removed prior to leaving the site.***

***Drivers must ensure that following tipping that the tailgate is locked before leaving the site.***

### 6.3.7 Vehicle Departure and Arrival

Heavy Vehicles travelling in close proximity on single lane public roads can be of concern to light vehicle drivers as well as increasing noise through or adjacent to residential areas. To alleviate public concern and increase road safety, heavy vehicles leaving the Quarry should be separated by a minimum five minute interval.

It is difficult to schedule arrivals to the Quarry (except at the commencement of work for the day) due to the different directions of approach from external jobs and the varying job completion times, however, when a driver becomes aware, through visual contact or two-way contact between trucks, that they will arrive at approximately the same time then they are to ensure that there is a suitable gap between vehicles.

***To alleviate public concern and increase road safety heavy vehicles leaving the Quarry should be separated by a minimum five minute interval.***

### 6.3.8 Breakdowns and Incidents

In the case of a breakdown the vehicle must be towed to the nearest breakdown point as soon as possible. All breakdowns must be reported to the RMS Transport Management Centre (TMC) on 131700 and the vehicle protected in accordance with the Heavy Vehicle Drivers handbook.

To ensure that traffic impacts are minimised in the event of an incident, rapid response from the haulage company is required. In order to ensure rapid response to incidents drivers must contact the RMS TMC on 131700, their shift manager and Wagga Wagga Quarry Manager as soon as the stranded vehicle and load is safely secured.

If there is a product spill while loading/unloading or en route the driver must:

- i) Immediately warn persons in the area who may be at risk;
- ii) Inform their shift supervisor/owner. If this occurs on McNickle Road or Roach Road or the vehicle is owned or contracted by Hanson Construction Materials Pty Limited the Wagga Wagga Quarry Manager must be immediately informed so that emergency services can be contacted and a clean-up initiated;
- iii) All spills must be adequately cleaned up and waste disposed of in an acceptable and environmental manner;
- iv) Put out warning triangles where it is safe to do so.



### 6.3.9 Wiradjuri Walking Track and Pedestrians/Cyclists

Drivers are to be aware of the Wiradjuri Walking Track which has a road crossing point for pedestrians/cyclists in McNickle Road at the Bagley Road intersection and continues north down McNickle Road on the east side past the Roach Road intersection.

The location of the walking track and potential need to slow down when in the vicinity of pedestrians and cyclists is highlighted in the Traffic Management Plan and Truck Driver Code of Practice.

## 6.4 Traffic Incident Register

Table 14: Traffic Incident Register

Date	Incident Details
	There have been no recorded traffic incidents during the reporting period.

## 6.5 Code of Conduct Register

The site has three main drivers regularly operating vehicles on site. These three employees have been signed up to the driver code of conduct. Additional employees will be signed up when required.

Table 15: Code of Conduct Register

Transport Company	Number of Drivers Signed up to Date
Hanson	Three (3)

## 6.6 Traffic Management Non-Conformances

There were no non-conformances in the reporting period. There were no non-conformances in the 2014 – 2015 reporting period.

## **7 Water Management**

### **7.1 Water Management Practices**

Wagga Wagga Quarry Water Management Plan and Water Monitoring Program have been submitted to the Department during the reporting period and will be progressively implemented over subsequent reporting periods.

Wagga Wagga Quarry uses the generally accepted fundamental settlement system approach to manage on site water. This approach is based on low hydraulic loading rate to allow settlement of the majority of silt while the water transits across the basin or pond.

#### **7.1.1 Development Approval**

Schedule 3, condition 8 of the Project Approval states that the proponent is required to compose and submit a Water Audit of current and approved water management practices.

Schedule 3, condition 9 of the Project Approval states that the proponent is required to compose and submit a Water Improvement Program. This Improvement program will include a recycled water target of at least 50%.

Schedule 3, condition 14 of the Project Approval states that the proponent is required to prepare and implement a Water Management Plan for the management of site water balance, erosion and sediment control, surface water and flood management.

Schedule 3, condition 15 of the Project Approval states that the Proponent is required to prepare and implement a Water Monitoring Program which shall monitor and record site water balance and ground water impacts.

### **7.2 Flooding History at the Site**

Wagga Wagga Quarry is located on the banks of a large meander of the Murrumbidgee River. Due to the locality of the quarry, it has been subject to two major flooding events.

- December 2010 where the Murrumbidgee River reached 9.702m (15.5 years ARI); and
- March 2012 in which the Murrumbidgee River reached 10.602m (58years ARI). Data was taken from the Wagga Wagga gauge (410001).

In both flooding events, inflow to Pit 1 occurred via the inlet spillway along the north-western side of the Pit, resulting in a free flowing opening between the Murrumbidgee River and quarry pit 2 (**Figure 7**).



**Figure 10: 2010 and 2012 Flooding of Wagga Wagga Quarry**

### **7.2.1 Levee Remediation Works**

Approval has been granted from both Wagga Wagga City Council (March 2013) the NSW Office of Water (August 2013) for the upgrade of access track, construction of new riverbank, rehabilitation and revegetation of the Murrumbidgee River bank. Hanson appointed Martens Consulting Engineers to perform the required works for levee remediation and the works are approximately 70% complete.





Figure 11: Riverbank repair works (photographs taken June 2015)

## 7.3 Limits

### 7.3.1 Licensing

Wagga Wagga Quarry currently holds licences from the following sources:

- 40BL190719 and 40BL190720 for groundwater extraction of 360 ML/year; and
- WAL 3661 and WAL 3788 (and the associated Water Supply Works Approvals) entitled the quarry to pump 100 ML/year from the Murrumbidgee River.

Although these two sources are licenced separately, the surface and groundwater at the site are so closely linked that they effectively constitute a single source.

The water balance analyses indicate that, for any of the proposed options described in this report, the net (extraction – return flow) would be significantly less than the available licensed volume (460 ML/year).

Details of usage are reported in the Section 7.4 below.

## 7.4 Results

### 7.4.1 Usage

**Table 16: Licenced Water Usage**

Location	Usage (ML)	Average/Month (ML)	% Increase from the past reporting period.
<b>8" Dewater</b>	378.44	31.5	28%
<b>River 1</b>	155.32	12.9	7%
<b>River 2</b>	81.6	6.8	10%
<b>Recycle</b>	Not used during the reporting period	Not used during the reporting period	n/a

#### Notes:

- The syphon is still installed but has not been used in this reporting period.
- The 6" dewater has been decommissioned and was not used in the reporting period.

### 7.4.2 Licenced Water Usage Analysis

During the last reporting period, the water usage recorded at "River 1" was incorrectly presented as 1890.5 ML, rather than 144.9 ML, and "River 2" as 159.5 rather than 73.54. This was due to an error in the spreadsheet, which has subsequently been rectified. Using the correct 2013 – 2014 data, it is apparent that there have been minor – moderate increases in the water usage between the past reporting period and this reporting period (**Table 16**). These increases will be monitored in the next reporting period.

### 7.4.3 Groundwater Analysis

Groundwater monitoring bores were installed in June 2012 to assist in monitoring the effectiveness of the Water Management Improvement Program.

Wagga Wagga Quarry has five (5) active dipperLoggers on site, which for the most part operate effectively and accurately. The ground water monitoring bore data is recorded continuously every hour. This data is stored in the DipperLogger and is able to be collected periodically and uploaded digitally. However the logger technology, at Wagga Wagga Quarry has malfunctioned at times especially over the past year and a half. An explanation of logger functionality is detailed in the table below;

**Table 17: Logger operational status**

Logger ID	Operational Dates	Explanation
<b>701</b>	n/a	Logger is faulty and data is unable to be extracted off the device
<b>702</b>	4/9/14 – 24/10/14 10/2/15 – 22/6/15	Logger stopped working on the 24 <sup>th</sup> October 2014. Replacement logger was commissioned on the 10/2/15.
<b>704</b>	1/7/14 – 22/6/15	Data complete
<b>705</b>	1/7/14 – 4/9/14 13/1/15 – 22/6/15	Logger stopped recording September. Most likely that that logger was not sent back on a mission when data was extracted in September.
<b>707</b>	1/7/14 – 4/9/14 10/2/15 – 22/6/15	Logger stopped recording September. Most likely that that logger was not sent back on a mission when data was extracted in September.

As the water bores have data missing they have been mapped individually in **Figures 12 - 15** below.

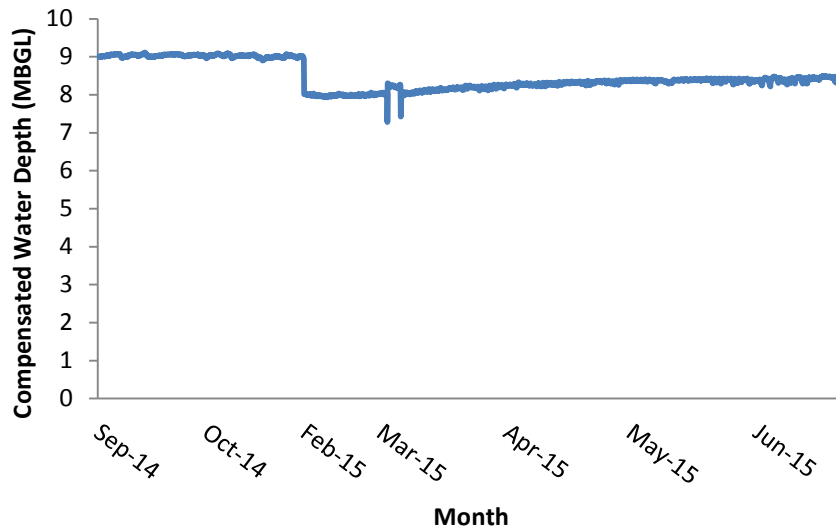


Figure 12: Borehole Monitoring 702

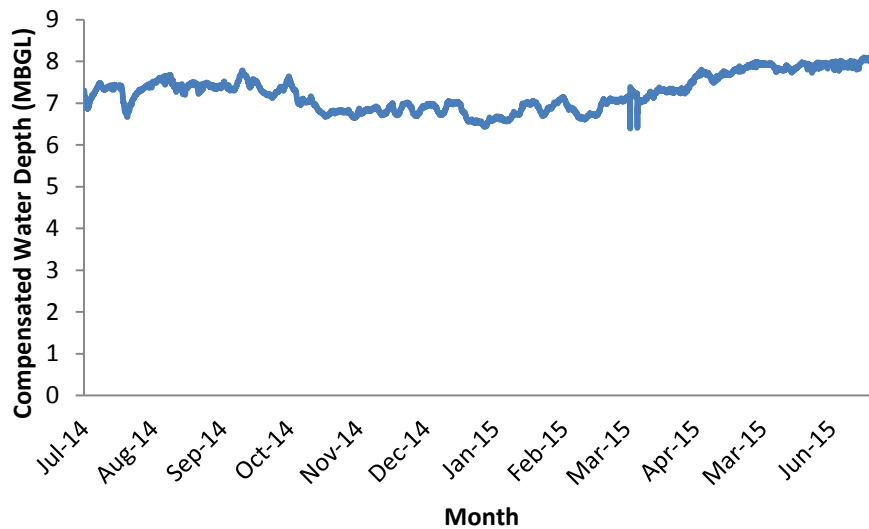


Figure 13: Borehole Monitoring 704



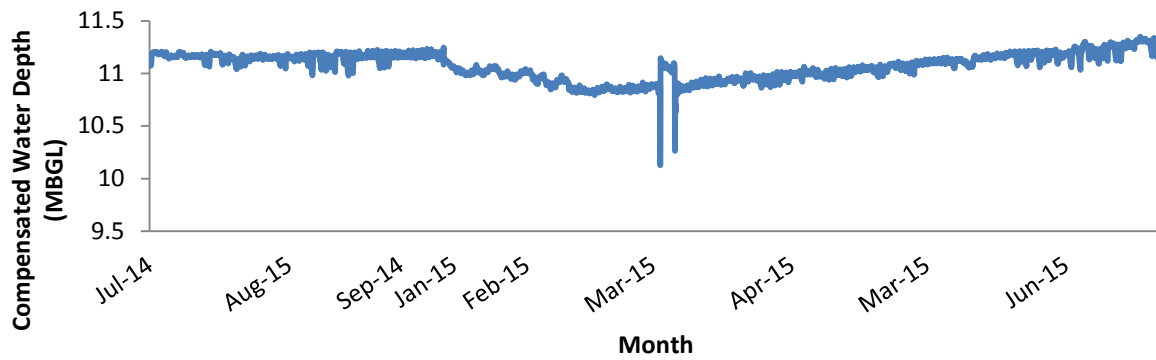


Figure 14: Borehole monitoring 705

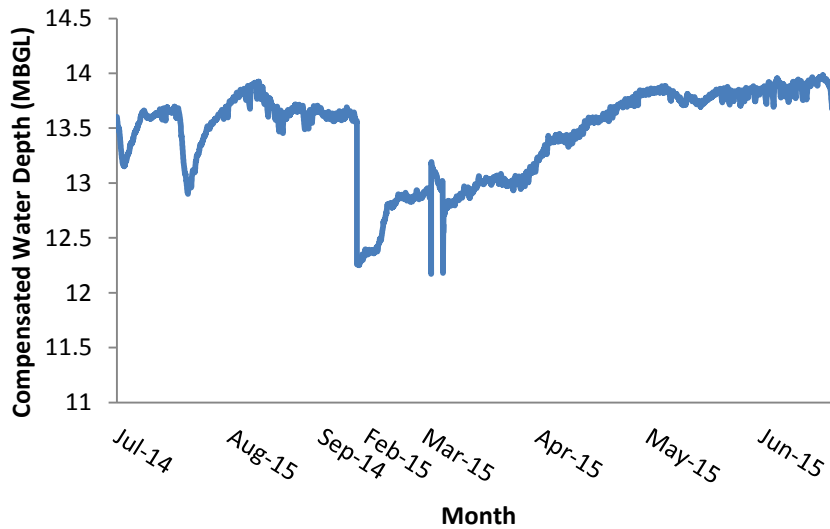


Figure 15: Borehole monitoring 707

Table 18: Groundwater Characteristics

Bore	Minimum Groundwater Level (mBGL)	Maximum Groundwater Level (mBGL)	Observed Range (m)
702	7.285	9.11	1.825
704	6.392	8.09	1.698
705	10.126	11.348	1.222
707	12.173	13.984	1.811



**Figure 16: Location of Groundwater Monitoring Bores**

#### 7.4.4 Surface Water Analysis

Water is tested monthly from the “Settling Pond” and the “River”. All results during the reporting period comply with the 50 mg/L EPL limits.

### 7.5 Water Quality Management Non-Conformances

**Table 19: Summary of Water Management Non-Conformances**

Development Approval	Plan/Program	Compliance
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<b>Schedule 3 Condition 8</b>	Comprehensive Water Audit	Yes: Findings presented in Evan's and Peck's Water Management Review.
<b>Schedule 3 Condition 9</b>	Water Improvement Program	Prepared in section 8 of Evan's and Peck's Water Management Review.  Yet to be implemented on site *
<b>Schedule 3 Condition 14</b>	Water Management Plan	Yes – Submitted to the Department June 2015
<b>Schedule 3 Condition 15</b>	Water Monitoring Program	Yes – Submitted to the Department June 2015

*\* Water Management Improvement Program was unable to be implemented during the reporting period due to constructability issues identified during the design & proposal process.*

The repair and return to pre-flood water management practices on site have been a high priority for the project. The Water Monitoring Program was not implemented during the reporting period due to delays in the repair of the levee bank that was breached during the 2010 and 2012 floods. The riverbank has been repaired to a sufficient level by which the Water Monitoring Program and Water Management Plan can be prepared to reflect applicable site practices. Therefore these aforementioned documents have been prepared and submitted to the Department. It is anticipated that the site will progressively implement the management practices recommended in these documents and will be reported on in subsequent reporting periods.

## **8 Flora and Fauna Management**

### **8.1 Clearing of Native Vegetation**

The clearing of vegetation is undertaken in accordance with the Flora and Fauna Management Plan. All native vegetation that is removed from the site is to be retained for use in the rehabilitation of the site. The following actions are to be undertaken:

- Any hollow logs currently present within Cell 1 of the proposal are removed and stockpiled for use in restoration following the completion of extraction at each stage. Logging waste will be stockpiled on the outer of Cell 1 (to the northeast) away from the area which is to be excavated for the quarry pit;
- Vegetation to be retained outside of the extraction areas will be fenced off to protect it from machinery;
- A bund wall will be constructed around the top wall of each cell/stage in order to prevent potential flooding;
- Top soil will be stockpiled and used in rehabilitation work as each stage is exhausted. It is expected that Cell 1 and about 80m to the south will be filled back to the existing ground level and revegetated on completion of extraction in Cell 1. The remainder of Cells 2 and 3 will be flooded and used for water storage upon their completion of extraction;
- Quarry sand and gravel material will be extracted using a 40T excavator and material will be transported to the crushing plant in the south of the property via 35T dump trucks;
- The banks of each stage will be revegetated with native plant species similar to the surrounding vegetation community (river red gum forest/woodland), ultimately resulting in a series of dams similar to the restored area in the north-west of the existing Pit 1; and
- A fauna expert/trained wildlife rescue person will be called in the event that any wildlife is found during the removal of the hollow bearing tree within Cell 4. This person will be trained in handling and identification of a range of fauna, particularly birds and bats and be vaccinated for rabies as protection against the bat lyssavirus.

All vegetation and topsoil that was stripped was transported to a designated stockpile area for the reconstruction of the levee at Pit 2 and the revegetation of this area.

No clearing of vegetation has been undertaken outside the extraction areas.

### **8.2 Revegetation & Prevention of Feral Animals**

The revegetation of cleared areas is to be undertaken in accordance with the Flora and Fauna Management Plan.

- Baiting of rabbits, foxes and cats within the confines of the quarry as required.

- Areas outside the quarry pit areas that are revegetated, including the riparian vegetation along the Murrumbidgee River, will be fenced to prevent cattle from entering. Fences will be maintained in good repair and will be regularly patrolled. The use of barbed wire will be avoided as squirrel gliders and other fauna are known to become tangled and could suffer a long and painful death.
- Revegetation will allow a natural regrowth of trees, shrubs and groundcovers. River Red Gums are likely to spread from local seed, however shrubs and groundcovers may need to be planted. Only species natural to the River Red Gum Forest/Woodland will be planted.
- New hauls roads will be constructed to eliminate and impact on existing riparian habitats.

The fences around the property were replaced following the 2012 Floods. The fences are inspected by quarry staff approximately every quarter. In addition, the adjacent landholder inspects fencing regularly as part of his cattle farming operations.

No haul roads have been constructed in the riparian zones.

Not baiting has been conducted in site to date.

### 8.3 Vegetation Management Plan for the Riverbank Repair

A Vegetation Management Plan for the Riverbank Repair was prepared June 2013 by Geoff Cunningham Natural Resource Consultants Pty Ltd. This plan suggested;

- The re-establishment of a native tree cover which is similar in composition and spacing, to that already present.
- Such species to be planted would comprise mainly *Eucalyptus camaldulensis* (River Red Gum) with a few trees of *Casuarina cunninghamiana* (River Oak).
- Any introduced shrubs and trees such as Blackberry, Briar Rose, fruit trees, exotic ornamentals or Willows should be treated with herbicide to remove them from the area being revegetated as soon as they appear.

As the levee remediation works are currently being undertaken, the Vegetation Management Plan is yet to be implemented. The works outlined in the plan will be implemented on completion of the levee remediation works, which is expected to occur during the next reporting period and will be recorded in the next Annual Review report (1 July 2015 – 30 June 2016).

### 8.4 Weed Management

Hanson will undertake a weed control spraying program in order to reduce the infestations and prevent spread. This will include;

- Systematic surveys and inspections of land within the control area;
- planned strategic weed management programs for the control area and keep records of such programs;
- treatment of weeds with herbicide in accordance with any permits;
- coordination and implementation of a weed management plan; and
- Controlled annual regrowth.

During the reporting period, Wagga Wagga Quarry was inspected for weeds by Wagga Wagga City Local Council. It was deemed that no significant weeds were identified on site and general hygiene practises on site were deemed satisfactory and actual excavation area free of weed material.

### **8.5 Flora & Fauna Management Non-Conformance**

There were no non-conformances during the reporting period. Weed management is adequate on site and the riverbank will be rehabilitated in accordance with the vegetation management plan when the works have been finalised.



## 9 Community Relations

### 9.1 Stakeholder and Community Consultation

The project implements constructive community consultation with relevant stakeholders to facilitate the exchange of information. This consultative process additionally facilitates the expression of reasonable viewpoints/issues and feedback relating to project environmental management as described in the *Environmental Assessment* and subsequent review of any approvals. All personnel are responsible for ensuring that any issues raised are dealt with through the appropriate pathways as stated by the relevant Management Plans.

Relevant stakeholders include, but are not limited to the following.

- Department of Planning and Infrastructure;
- Office of Environment and Heritage;
- NSW Office of Water;
- Community Consultative Committee; and
- Local community.

A communication, consultation and information dissemination strategy includes the following:

- Regular community newsletters and meetings;
- Regular meetings Community Consultative Committee;
- Individual meetings on request with surrounding landholders and interested community groups; and
- Placement of all relevant environmental management monitoring and other relevant documents on the Company's website.

The Wagga Wagga Quarry Community Consultative Committee (WWQCC) was established in accordance with the NSW Government *Guidelines for Establishing and Operating a Community Consultative Committee for Mining Projects* (Guidelines), (Department of Planning 2007). The committee is made up of representatives of the following:

- Riverview Estate – 4 representatives
- Hanson – 2 representatives, plus a minute taker
- Chair – Independent Chair
- Wagga Wagga City Council – 1 representative

In accordance with the Guidelines, an independent chair was selected by Hanson and endorsed by the Department of Planning and Infrastructure. The Independent Chair was nominated by the Wagga Wagga Rotary Club and is the current president of the Country Hope Trust.



Details of the meetings held to date are provided in Section 9.3 Community Consultation Committees.

## 9.2 Complaints Handling

In order to receive record and respond to any complaints in a timely manner, the Hanson has established the following mechanism for receiving complaints:

- Directly via the 24-hour, 7 day per week Hanson General Emergency Line (1800 882 478). This number will be advertised widely in the local media, on signage at the Site entrance and on the Company web site [www.hanson.com.au](http://www.hanson.com.au);
- Directly via a dedicated email address which will be advertised in a similar manner to the Community Information Line; and
- Indirectly via the relevant government agencies.

In addition, consultation will be held with the community as part of the Hanson's standard consultation procedures. These meetings will provide a further forum at which complaints maybe received.

All complaints will be registered in a database and responded to within one business day from the receipt the complaint. The following information will be recorded (where it can be reasonably obtained) in the database.

- The date / time the complaint was made;
- Complainant's name;
- Complainant's telephone number and/or email address; and
- Nature of complaint.

The nature of the response will depend on the nature and source of complaint but will include one or more of the following actions:

1. The complaint will be reviewed by the Quarry Manager or their delegate to determine the nature, date and time of the air quality emission.
2. Liaison with the complainant to ascertain all details and to identify the nature and source of the complaint and provide supplementary details for the log. Details recorded in the log will include:
  - the date and time of the complaint;
  - the method by which the complaint was made;
  - details of the person making the complaint;
  - the nature of the complaint;

- action taken in relation to the complaint including any follow-up contact; and
  - if no action, the reason why.
3. As appropriate, the initiation of monitoring or other investigations to verify or otherwise the exceedence or non-compliance with approval or licence condition(s).
  4. Initiation of appropriate changes in operating practices or procedures.
  5. Conducting a follow-up interview with the complainant to determine their level of satisfaction with the response and the resultant outcome.

A copy of the complaint report will be supplied to the complainant, if requested. The complaints database is updated on Hanson's website quarterly and a summary of the complaints received in each 12 month period will also be included in each *Annual Review*. The Quarry Supervisor will be responsible for the recording of the complaint, response action requirements and updating of the database and website.

### 9.2.1 Summary of Complaints

Table 20: Summary of Complaints

Risk Report Number	Date/Time	Complainant	Comments
There were no complaints during the reporting period			

### 9.3 Community Consultation Meetings

There have been no CCC meetings held during the reporting period. The agreement to discontinue meetings was due to lack of continued interest in the project. Should community interest escalate/return, Wagga Wagga quarry will resume meetings.

### 9.4 Community Relations Non-Conformances

There were no non-conformances relating to community relations during the reporting period.

## **10. Activities Proposed for the 2014/2015 Annual Review Period**

### **10.1 Water Management**

The riverbank repair works are expected to be completed during the next reporting period, until this time the site is operating under best practice water management initiatives.

#### **10.1.1 Water Monitoring and Management Plan**

The site will progressively implement the management initiatives presented in the water monitoring and water management plan dependent on the progression of the riverbank repair works.

### **10.2 Ecology**

The implementation of the *Vegetation Management Plan – Riverbank Repair* will be implemented upon completed of the riverbank repair works.

## **11. Incident Reporting**

Hanson shall notify the relevant government authorities of any incident associated with the Quarry immediately after the Company becomes aware of the incident, as per the Wagga Wagga Quarry Pollution Incident Response Management Plan. Within 7 days of the date of the incident, Hanson will provide the relevant agencies with a detailed report on the incident.

There have been no reportable incidents in the last reporting period.

## **12. Competence, Training and Awareness**

All personnel undergo environmental management awareness training as a component of the competency based site induction program. The following areas are covered in the induction:

- Noise management;
- Air quality management;
- Soil and water management, including hydrocarbon and chemical management;
- Landscape management; and
- Reporting of incidents.

The Quarry Supervisor is responsible for ensuring the appropriate Environmental Management training is included in the induction.

## **13. Conclusion**

Hanson has incorporated environmental monitoring and management as an integral component in the operations at Wagga Wagga Quarry. This is shown in Project Approval compliance and lack of complaints pertaining to the project. Hanson's major concern since the 2012 flooding event has been the repair of the riverbank to ensure project compliance and facilitation of the return to standard quarry practices. This reporting period has documented the commencement of these works. The completion of the riverbank repair is expected to occur during the next reporting period and will be reported on during subsequent reports. In such Hanson's Wagga Wagga Quarry has been operating based on a collegial relationship between the surrounding amenity, community and environment.