



Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ May 2016

Pacifico Project Number: WC2NH



A team consisting of RMS and Pacifico (ACCIONA Ferrovia JV) to upgrade the Pacific Highway at Warrell Creek to Nambucca Heads

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1. Introduction

Environmental Protection Licence (EPL) 20533 was issued to ACCIONA Infrastructure for the Warrell Creek to Nambucca Heads Pacific Highway Upgrade project on the 16th December 2014. Condition R1.8 of the EPL requires the licensee to provide the EPA with a monthly report containing the following information:

- a) details of all non-compliances with the conditions of this licence and measures taken, or proposed, to prevent a recurrence of such a non-compliance; and
- b) details of all discharges from the sediment basins where the water quality results exceed the limits prescribed by Condition L2.4 including the results of rainfall measurements to demonstrate compliance with Condition L2.5; and
- c) details of results of any acoustic investigation made in relation to Condition L4.2d); and

The report referred to in this condition must be received by the EPA within 10 working days of the end of each month.

This document has been prepared to fulfil the requirements of Condition R1.8.

1.1 Description of Works

The project's construction activities during May 2016 were limited to the following:

- Clearing and Grubbing
- Topsoil stripping
- Earthworks including crushing
- Production blasting
- Continuing bridge works including piling, headstock construction, pile caps, girder placement, deck unit installation and temporary work platforms
- Installation of permanent boundary fencing
- Fauna fence installation
- Installation of monitoring instruments – extensometers, inclinometers and piezometers
- Continuing culvert installation
- Scour rock installation
- Landscaping works
- Continuing utility works
- Batter stabilisation using hydromulch (permanent design seed mix)
- Girder deliveries to Nursery Road
- Site Survey
- Topsoil placement
- Sheet Piling Nursery Road
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Sealing
- Basin Decommissioning
- Girder Production

- Concrete Production
- Basin Maintenance including dewatering
- Installation of Erosion and Sediment Controls

Works scheduled for next month include

- Clearing and grubbing
- Topsoil stripping
- Earthworks including crushing
- Production blasting
- Continuing bridge works including piling, headstock construction, pile caps, girder placement, deck unit installation and temporary work platforms
- Installation of permanent boundary fencing
- Fauna fence installation
- Landscaping works
- Continuing culvert installation
- Scour rock installation
- Continuing utility works
- Batter stabilisation using hydromulch (permanent design seed mix)
- Girder deliveries to Nursery Road
- Site Survey
- Topsoil placement
- Sheet Piling Nursery Road
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Sealing
- Basin Decommissioning
- Girder Production
- Concrete Production
- Basin Maintenance including dewatering
- Installation of Erosion and Sediment Controls

1.2 Consultation Activities

The project's consultation activities during May 2016 included the following:

Table 1 – Consultation Activities

Groups	Date	Key Topics
Environmental Review Group	17/5/16	Construction Progress, Design Update, Upcoming works, EWMS discussion, Environmental Update, Monitoring update, Out of Hours Works, Incidents and Community Complaints

Community Information Sessions x 2	4/5/16 – Community Display Centre at Warrell Creek	Full range of topics discussed in sessions that were conducted with a different “free-ranging” format rather than a formal presentation. Very positive feedback from community.
	5/5/16 – Community Arts Centre Nambucca Heads	

Other Consultation Activities:

- Ongoing night-time girder delivery notifications
- Extensive letterbox drop to Gumma residents regarding changed traffic conditions near Nambucca river bridgeworks
- Letterbox drop to residents near changed traffic conditions for southern interchange, near Browns Crossing Road/Upper Warrell Road

At House Noise Treatments

The At House noise treatment program is currently being managed by RMS and is not part of the ACCIONA (Pacífico) Scope of Works and Technical Criteria.

Upcoming Community and stakeholder activities:

- Next quarterly community information sessions will be held August 3 and 4
- School visits including construction personnel and RMS representatives likely last quarter 2016
- Email to database of government approval for north facing ramps late June
- Letterbox drop entire Old Coast Road in relation to permanent traffic switch for Old Coast Road Central early July
- Change to quarterly OOHW notification to sensitive receivers likely to commence for period July to September

2. Weather

2.1 Discussion

The automatic recording weather stations at the main site compounds (north and south) records rainfall totals daily at 9AM. The total rainfall received for the month is as follows: -

Table 2 - Precipitation

Month	Total monthly rainfall	Location
01/5/16 – 31/5/16	12.0mm	Northern Compound
01/5/16 – 31/5/16	7.2mm	Albert Drive Compound

The site experienced a total of 1 rain days throughout the month of May 2016.

During May, rainfall received on site was lower than the May monthly average of 131.4mm. A summary of weather conditions recorded over the month for Smoky Cape by the Bureau of Meteorology is detailed below in Table 2.3.

The daily summaries for rainfall received in April at the Albert Drive Compound and Northern Compound are shown below in Table 2.1 and 2.2.

Table 2.1 – Rainfall recorded at Albert Drive Southern Compound Automated Weather Station

Date	Time	TOTAL Rain Gauge (mm)
1/05/2016	9:00:00	0
2/05/2016	9:00:00	0
3/05/2016	9:00:00	0
4/05/2016	9:00:00	12.8
5/05/2016	9:00:00	0
6/05/2016	9:00:00	0
7/05/2016	9:00:00	0
8/05/2016	9:00:00	5.8
9/05/2016	9:00:00	0.2
10/05/2016	9:00:00	0
11/05/2016	9:00:00	0.2
12/05/2016	9:00:00	0
13/05/2016	9:00:00	0
14/05/2016	9:00:00	0.2
15/05/2016	9:00:00	0.2
16/05/2016	9:00:00	0
17/05/2016	9:00:00	0
18/05/2016	9:00:00	0
19/05/2016	9:00:00	0
20/05/2016	9:00:00	0
21/05/2016	9:00:00	0.2
22/05/2016	9:00:00	0
23/05/2016	9:00:00	0
24/05/2016	9:00:00	0
25/05/2016	9:00:00	0
26/05/2016	9:00:00	0
27/05/2016	9:00:00	0
28/05/2016	9:00:00	0
29/05/2016	9:00:00	0
30/05/2016	9:00:00	0.2
31/05/2016	9:00:00	0

Table 2.2 – Rainfall recorded at the Northern Compound Automated Weather Station

Date	Time	TOTAL Rain Gauge (mm)
1/05/2016	9:00:00	0
2/05/2016	9:00:00	11
3/05/2016	9:00:00	0.2
4/05/2016	9:00:00	0
5/05/2016	9:00:00	0
6/05/2016	9:00:00	0
7/05/2016	9:00:00	0.2
8/05/2016	9:00:00	0.2
9/05/2016	9:00:00	0
10/05/2016	9:00:00	0
11/05/2016	9:00:00	0
12/05/2016	9:00:00	0
13/05/2016	9:00:00	0
14/05/2016	9:00:00	0
15/05/2016	9:00:00	0.2
16/05/2016	9:00:00	0
17/05/2016	9:00:00	0
18/05/2016	9:00:00	0
19/05/2016	9:00:00	0
20/05/2016	9:00:00	0
21/05/2016	9:00:00	0.2
22/05/2016	9:00:00	0
23/05/2016	9:00:00	0
24/05/2016	9:00:00	0
25/05/2016	9:00:00	0
26/05/2016	9:00:00	0
27/05/2016	9:00:00	0
28/05/2016	9:00:00	0
29/05/2016	9:00:00	0
30/05/2016	9:00:00	0
31/05/2016	9:00:00	0

Table 2.3: Weather conditions recorded in May 2016 at Smoky Cape by the Bureau of Meteorology.

May 2016			
Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/05/2016	20.8	24.8	0
2/05/2016	18.4	27.1	4
3/05/2016	16.5	27.4	0

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
4/05/2016	18.1	27	0
5/05/2016	18.5	26.5	0
6/05/2016	17.2	26.5	0
7/05/2016	18	26.8	0
8/05/2016	18	26	0
9/05/2016	21	25	0
10/05/2016	22.2	24.5	0
11/05/2016	16.8	25.5	0
12/05/2016	14.5	25.5	0
13/05/2016	15.5	26	0
14/05/2016	16	26	0
15/05/2016	16.6	26	0
16/05/2016	18.1	25.5	0
17/05/2016	19.2	26.6	0
18/05/2016	18.5	22.8	0
19/05/2016	15.5	25	0
20/05/2016	16.5	25.2	0
21/05/2016	16.5	24.2	0
22/05/2016	17.8	25.4	0
23/05/2016	17.6	27.5	0
24/05/2016	15.6	23.6	0
25/05/2016	14.8	23.1	0
26/05/2016	14.8	21.5	0
27/05/2016	16.8	21.8	0.4
28/05/2016	13.1	21	0
29/05/2016	12	20.7	0
30/05/2016	12	21.2	0
31/05/2016	13	22	0

3. Surface Water Monitoring

Pacifico have been provided trigger levels for baseline monitoring from RMS, these will be compared against monthly data as well as between upstream and downstream sites to determine works impact.

Monthly sampling was undertaken by ACCIONA (Pacifico):

Dry Sampling Event

A "dry" sampling event was undertaken on the 11th of May, field testing was undertaken. Results are available in Appendix A.

pH levels noted to be outside trigger levels at:

Lower Warrell Creek upstream (7.63) and downstream (7.14) recorded elevated pH levels. It is noted that levels decreased from upstream to downstream, and are thus unlikely to be attributed to construction impacts. Levels were also noted to be within ANZECC criteria (6.5-8.0).

Nambucca River upstream (7.63) and downstream (7.47) recorded elevated levels upstream and downstream. It is noted that levels decreased from upstream to downstream and are unlikely to be attributable to construction impacts. It is also noted that for this site trigger levels for pH are 7, with any deviation from this number resulting in a breach of trigger levels. Levels were also noted to be within ANZECC criteria (6.5-8.0)

Turbidity levels noted to be outside of trigger levels at:

Stony Creek downstream (12.2), upstream 3.5NTU. All controls for the area were verified to be in place, with no construction works being undertaken within the waterway. The permanent (soft scour treatment) diversion was open 06/05/2016.

Nambucca River upstream (25.1) and downstream (32.3). It is noted that no works were being undertaken in the waterway which could have impacted upon turbidity, with all controls verified to be in place. The source of the increase in turbidity is unknown and possibly due to natural variations.

Dissolved Oxygen levels noted to be outside of trigger levels at:

Stony Creek downstream (2.66mg/L). It is noted that this was only a minor decrease from the upstream site (2.91mg/L), with all controls verified to be in place and no activities being undertaken within the waterway. Decomposing vegetation within the waterway is likely contributed to the low levels.

Lower Warrell Creek upstream (3.15mg/L) and downstream (1.7mg/L). All controls were verified to be in place, with no works were being undertaken in the waterway that could have impacted on DO levels. The lower DO levels is attributed to decaying vegetative matter within the waterway.

Nambucca River upstream (5.37mg/L) and downstream (4.79mg/L) recorded lowered DO levels. All controls were verified to be in place for the site, with no works being undertaken in the waterway that could have impacted on DO levels. The low levels are therefore attributed to decaying vegetative matter within the waterway.

4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins between the 2nd and 31st of May 2016 after rainfall. Water pumped into basins was kept below the design Sediment Storage Zone and was treated and released as soon as possible, especially if rainfall was predicted in the 5 day forecast. A statistical correlation has been developed which identified the relationship between Turbidity (NTU) and Total Suspended Solids (TSS) for water quality in the WC2NH Project sediment basins in order to determine the NTU equivalent of 50mg/L TSS. This statistical correlation has been developed to meet EPL Licence No 20533 Condition L2.7 to determine

compliance with the Water and/or Land Concentration Limits Condition L2.4. A positive correlation has been calculated between Total Suspended Solids (TSS) and Turbidity (NTU) ($R^2 = 0.6095$, $p < 0.00001$, $n=90$). The regression equation for the analytical results calculates a turbidity (NTU) value of 132.648 for a TSS value of 50mg/L. A safety factor of 30% has been applied to the NTU result of the correlation, providing a turbidity (NTU) value of 92.854, rounded to an NTU value of 90. To measure NTU in the field a Horiba U-52G multi-parameter water quality meter has been utilised, which is maintained and calibrated in accordance with manufacturer's specifications. TSS sampling is being undertaken to ensure we maintain compliance with 1 in 10 sampling to validate the correlation.

Table 3 below has the water quality results recorded for the water release events:

Table 3 – Water Release Register

Date	Basin ID	Oil and Grease (visible) (Limit = No Visible)	pH (6.5 – 8.5)	Turbidity (NTU) (Limit <90 ntu)	Total Suspended Solids mg/L (Limit <50mg/L)	Approx Volume Discharged (kL)
2/05/2016	B49.45	N	7.55	10.1	24	850
2/05/2016	B48.3	N	6.95	22.2		50
2/05/2016	B48.46	N	7.83	12.4		400
2/05/2016	B59.78	N	7.76	42.3		200
3/05/2016	B59.60	N	8.13	13.1		312
4/05/2016	B61.20B	N	7.16	12.3		5
10/05/2016	B56.9	N	7.54	25.2	13	450
12/05/2016	B55.8	N	7.83	9.6		300
23/05/2016	B47.60	N	7.07	19.2		300
26/05/2016	B45.5	N	7.66	52.6		500
30/05/2016	B47.14	N	7.11	20.6		200
31/05/2016	B48.87	N	6.77	13.2		400

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 14th, 17th and 20th of May 2016 at eight locations near to construction works. Monitoring results are available in Appendix A, Table 2.

All sites were within predicted levels for the activity being undertaken.

6. Vibration Monitoring

Vibration monitoring was undertaken as part of blasting works during May 2016. Monitoring Results are available in Appendix A, Table 5.

6.1 Blasting

One (1) blasting event occurred in May 2016. No exceedances of overpressure or vibration limits occurred from this blast.

We are required to achieve less than 5% exceedance (of 5mm/s limit and 115dB (LinPeak)) within the reporting period for those sensitive receptors that have not agreed to the 25mm/s and 125dB limits. For the second reporting period commencing 16th December 2015, we have had twelve blasts (12) with no exceedances of these limits.

7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from the 6th April to 4th May 2016. DDG results are available in Appendix A.

All dust deposition gauges were below the level of concern (4g/m².month) during the monitoring period, with the exception of gauge DDG4, DDG5 and DDG5W.

DDG5 and DDG5W

DDG5W was installed in February due to elevated results in previous months DDG5 despite little works being undertaken. DDG5 recorded Total Insoluble Matter at 26.8g/m²/month, Ash Content (AC) was slightly lower with a reading of 24.6g/m².month. DDG5W recorded TIM of 372g/m²/month, with AC of 347g/m²/month. It was noted that DDG5E, on the other side of the alignment recorded significantly lower levels (1.1g/m²/month TIM, 0.5g/m²/month AC). It was noted during collection of the gauges (DDG5 and DDG5W) appeared to have clumps of dirt within them, which would be unlikely to be attributable to wind-blown dust from construction.

As agreed in the ERG 24 on 12/04/2016, the project community team has discussed issues around the gauges with the closest resident whose property the two dust gauges are located within to inform them that the gauges are there to provide information to the project and agencies that they can act upon. The extreme nature of the results given the level of construction works and controls render the information useless. Community has asked to be informed if any persons are seen tampering with gauges to contact Pacifico regarding the matter immediately.

DDG4

DDG4 recorded elevated TIM (4.4g/m²/month) level and the AC (3.6g/m²/month). The AC portion of TIM can be contributable to construction sources, with this complying with the performance criteria of 4g/m²/month. TIM and AC increased by 3 and 2.7 respectively on the previous months result.

Surfactant additives have been utilised and will continue to be utilised onsite in water carts to assist with dust mitigation. Water cart usage outside of standard construction hours has been utilised to assist with reducing dust emissions from

the project, during public holidays on Sundays throughout the Project. We are progressively stabilising cuts and fills that have reached their final profile.

8. Groundwater Monitoring

ACCIONA (Pacifico) have undertaken groundwater monitoring on the 26th of May 2016. The results from the groundwater monitoring is available in Table 4 of Appendix A.

The groundwater monitoring results have been provided to RMS to provide advice on the trigger levels determined during the baseline sampling. The finalised groundwater report from the baseline sampling has not been issued from RMS to Pacifico including groundwater triggers.

9. Acoustic Investigations

Acoustic Investigations (modelling) have been conducted and approved for several Out of Hours Works proposed to model impact on residents during the month of May 2016. A summary of these approvals is below in Table 4.

Acoustic Investigation (Field Monitoring) of Out of Hours works has not been undertaken in May 2016 due to no high-risk activities being undertaken. Field monitoring results will continue to be provided as these activities are undertaken.

Table 4 – May Out of Hours Works Acoustic Investigation (Modelled)

OOH Request Title	>5dB(A) above background	Approval Date
Jetty construction, servicing plant, vibro piling and drilling	N	6/5/2016
Traffic switch pacific highway sidetrack	N	19/5/2016
Vibration piling, drill out + concreting Floodplain Bridge 1 + 2	N	19/5/2016

10. Complaints

10.1 Summary of Complaints for the month

The following is a brief summary of environmental complaints received in May 2016.

Table 5 – Complaints

Date of Complaint	Issue	Area of Residence	Reason for contacting Community Team	Description & Action Taken	Date of first response by Community team	Date of Resolution
28-May-16	Dust	Letitia Close	Ongoing westerlies causing extreme wind conditions and therefore dust impacts	Water truck driver on duty all weekend, was contacted and applied water suppression to locations provided by resident.	28-May-16	28-May-16
28-May-16	Dust	Letitia Close	Ongoing westerlies causing extreme wind conditions and therefore dust impacts	Water truck driver on duty all weekend, was contacted and applied water suppression to locations provided by resident.	28-May-16	28-May-16
25-May-16	Dust	Letitia Close	Ongoing dust issue	Superintendent North, Senior Project Engineer, Enviro Manager and Community Manager all contacted and attended on-site property meeting with complainants and neighbours.	25-May-16	Ongoing
23-May-16	Dust	Letitia Close	Ongoing dust issue.	Northern construction team advised. Some equipment shut down. Works shifted to other locations. Water applied.	23 May 16 – Community Team advised caller that a Letitia Close neighbourhood meeting about this issue would be held later in the week with details TBC	23-May-16

20-May-16	Dust	Letitia Close	Ongoing dust issue. House is very dirty and so are the solar panels on the roof, as well as the pool.	Northern construction team advised. Some equipment shut down. Works shifted to other locations. Water applied.	20 May 16 – Community Team offer to visit to understand the issues.	Ongoing
20-May-16	Dust	Letitia Close	Does not believe Project is doing everything it can to mitigate against ongoing dust issue in this location	Northern construction team contacted again and took immediate action with water carts attending the area. Looking at other options	20 May 16 – Community Team keeping an eye on dust in that location	20-May-16
19-May-16	Dust	Letitia Close	Away for 2-week holiday and came home to dusty house.	Northern construction team contacted and took immediate action with water carts attending the area.	19 May 16 – Community Team offered house clean but declined.	N/A
13-May-16	Dust	Letitia Close	Dust is blowing around and the pool dirty	Northern construction team contacted and took immediate action with water carts attending the area.	13 May 16 – Community Team offered relocation (as husband is dying of lung cancer) but declined, now working on external and internal clean of house, ongoing pool cleaning option	Ongoing

11. Non-Compliance

11.1 Summary of Non-compliances

1 Non Compliance (AFJV-NCR-000458) against the ACCIONA Environmental Protection Licence (EPL) 20533 occurred in May 2016.

Description of Non Compliance

Rock was stockpiled on the old council access road between council's waste water treatment plant and the Project alignment. It had been assumed that the council access track was inside the Utilities works boundary, however it was discovered during an RMS / ER inspection of the area that the stockpile was located outside of the Project and EPL Boundary. Approximate chainage of incident is 51550 which is approximately 550m to Floodplain Bridge 2 and Nambucca River.

The 20 tonne of rock (product) was to be used to construct the piling platform and scour protection for Floodplain Bridge 2.

Prior to the project there was an existing track into the floodplain from the Council depot. The stockpile was placed on top of the disturbed area. As part of the MaCR for utilities outside of boundary, flagging tape was installed and a Permit to Disturb was issued. The flagging was not placed across the track as it was an access track to the area. To prevent construction vehicles when turning around from disturbing the existing vegetation, flagging tape was installed. The earthworks foreman mistook this to be the project boundary.

Incident was not confirmed until survey picked up the area post the RMS/ER inspection.

Possible Causes

An area outside of the Project and EPL Boundary was flagged incorrectly (flagged to prevent disturbance of existing vegetation from turning vehicles). Unfortunately the same colour flagging tape was installed that is used for defining clearing and project boundary limits.

Remedial Action

Stockpile of rock removed and area topsoiled and hand seeded. Flagging of utilities work area (Project Boundary) has been extended across the width of the previously disturbed area excluding the defined access track to clearly delineate the project boundary along the access track.

Corrective Action

Check the clearing and project boundaries are clearly signed and flagged in the correct locations. In the weekly toolbox talk communicate the requirements for flagging tape, PTD and project boundary and EPL boundary. Red / Yellow flagging tape is not to be used to delineate other areas.

Appendix A – Monitoring Results

Table 1a - Surface Water Sampling Results May 2016 – Dry Event

Location	Units	Levels of Concern	Upper Warrell Creek			Upper Warrell Creek			Stony Creek			Stony Creek			Lower Warrell Creek			Lower Warrell Creek			Unnamed Creek Gumma West			Unnamed Creek Gumma East			Unnamed Creek Gumma North			Nambucca River South			Nambucca River South		
			Upstream	Downstream	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result
Freshwater / Estuarine		ANZECC 2000 95% species protected	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	Freshwater	
Date of Sampling			11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16	11-May-16		
Time of Sampling		Freshwater / Marine	2:25 PM	2:45 PM	11:50 AM	12:00 PM	10:45 AM	10:55 AM	3:15 PM	3:30 PM	3:25 PM	10:05 AM	9:55 AM	Unable to sample - w ater level low																					
Type			80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result			
Field Physical data																																			
Temperature	C	-	24.86	14.99	20.49	25.1	16.3	23.8	24.4	16	19.01	26.46	15.94	18.85	27.9	18.4	21.64	27.9	18.4	20.84	26.5	16.3	21.18	26.5	16.3	19.67	26.5	16.3	NA	27.9	18.1	22.68	27.9	18.1	22.36
pH	pH	6.5-8	7.25	6.48	6.95	7.3	6.4	6.64	7.5	6.6	7.3	7.33	6.26	7.27	7.02	6.57	7.63	7.02	6.57	7.14	7	6.1	6.84	7	6.1	6.83	7	6.1	NA	7	7	7.63	7	7	7.47
Conductivity	mS/cm	0.125-2.2	0.316	0.232	0.208	0.348	0.227	0.278	0.348	0.227	0.27	0.3338	0.2168	0.263	20.946	0.679	18.00	20.946	0.679	16.2	0.808	0.4234	0.719	0.808	0.4234	0.848	0.808	0.4234	NA	47.32	29.44	41.7	47.32	29.44	42
Turbidity	NTU	50	10.96	4	1.4	9.9	3.5	5.3	9.9	3.5	7.4	5.97	3.74	12.2	6.82	1.83	3.6	6.82	1.83	3.5	52.78	11.3	33.8	52.78	11.3	15.8	52.78	11.3	NA	19.3	6.7	25.1	19.3	6.7	32.3
Dissolved Oxygen	mg/L	5	4.98	1.91	7.24	4.8	2.6	7.36	4.8	2.6	2.91	6.34	3.52	2.66	7.98	5.07	3.15	7.98	5.07	1.7	6.4	1.75	3.92	6.4	1.75	0.96	6.4	1.75	NA	9.1	7.4	5.37	9.1	7.4	4.79
Dissolved Oxygen	%		-	-	82.7	-	-	89.1	-	-	32.3	-	-	29.5	-	-	39.0	-	-	20.6	-	-	45.3	-	-	10.9	-	-	NA	-	-	74.3	-	-	66
TDS	g/L	-	-	-	0.135	-	-	0.181	-	-	0.175	-	-	0.171	-	-	11.20	-	-	10	-	-	0.46	-	-	0.543	-	-	NA	-	-	25.4	-	-	25.6
			Taken from ANZECC guidelines 95% protected species levels where no 80/20 trigger values provided																																
			Taken from alternative trigger levels provided in ANZECC Water Guidelines Volume 1 and Volume 2 where insufficient data was available for 95%																																
			Exceedances of trigger values																																

Table 2 – Noise Monitoring Results May 2016

Date	Time	Location	Rec ID	NCA	NML	Activity	Predicted levels for activity	Laeq	LAFMAX	LAFMIN	LCEQ	LAF05	LAF10	LAF50	LAF90	Principal sources/ operations	Measurements exceeding criteria, plant/ operations causing	Corrective actions	Notes
20/05/2016	4:08 PM	Albert Drive	74	1	50	Cut	62	58.4	82.2	43.7	70.2	59.8	57.6	53.2	48.3	Excavator loading moxy	NA	NA	Within predicted levels for activity
17/05/2016	2:45 PM	Cockburns Lane	16	1	50	Cut	65	55.4	74.7	42.3	63.8	61.7	59.6	49.4	45.5	Excavator loading rock	NA	NA	Within predicted levels for activity
20/05/2016	1:23 PM	Bald Hill Rd	197	3	50	Cut	72	56.7	79.6	41.8	64.1	59.8	53.8	47.7	44.7	Rock hammering	NA	NA	Within predicted levels for activity
17/05/2016	4:10 PM	Letitia Rd	406	4	59	Cut	74	59.3	73.6	45.5	70.6	66.2	63	53.8	49.8	Scraper, grader, excavators	NA	NA	Within predicted levels for activity
14/05/2016	4:08 PM	Mattick Rd	442	6	44	Cut	62	56.1	68.8	44.2	68.8	63	61.2	50.8	47.2	Scrapers	NA	NA	Within predicted levels for activity
17/05/2016	2:45 PM	Nursery Rd	415	4	59	NA	NA	60.1	77.1	47.7	64.7	64.5	62.1	57.1	53	NA	NA	NA	Construction not audible. Other noise sources - birds, highway
17/05/2016	3:45 PM	Wallace St	148	3	50	NA	NA	67.1	85.5	49	79.4	73.4	69.4	56.4	51.1	NA	NA	NA	Construction not audible. Other noise sources - highway, local traffic
20/05/2016	1:11 PM	Gumma Rd	383	3	50	Bridgeworks	67	52.6	77.1	44	68.3	55.8	53.7	48.9	46.2	Formwork, saw, grader, side tipper dumping, crane	NA	NA	Within predicted levels for activity

Table 3 - Dust Monitoring Results April/May 2016

			DDG ID	DDG1	DDG2	DDG3	DDG4	DDG5	DDG5E	DDG5W	DDG6	DDG7	DDG8	DDG9N	DDG9NE	DDG A1	DDG A2	
			Start date of sampling	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	6/04/2016	
			Finish date of sampling	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	4/05/2016	
Analyte	Time Period	Unit	Levels of Concern	LOR														
Ash Content	Current Month	g/m ² .month	4	0.1	0.2	0.5	1.6	3.6	24.6	0.5	347	0.5	0.4	1.3	0.5	0.3	----	----
		mg	N/A	1	4	9	26	59	405	8	5730	9	6	21	9	5	----	----
	Previous Month	g/m ² .month			0.5	0.6	0.7	0.9	203	2.3	220	8.1	1.2	NA	1	1.3	----	----
	Change	g/m ² .month	Increase of 2		-0.3	-0.1	0.9	2.7	-178.4	-1.8	127	-7.6	-0.8	NA	-0.5	-1	----	----
Combustible Matter	Current Month	g/m ² .month	N/A	0.1	0.3	0.2	0.6	0.8	2.2	0.6	24.3	0.5	0.2	1.5	<0.1	0.5	----	----
		mg	N/A	1	5	2	10	14	37	10	401	8	4	26	<1	8	----	----
Total Insoluble Matter (TIM)	Current Month	g/m ² .month	4	0.1	0.5	0.7	2.2	4.4	26.8	1.1	372	1	0.6	2.8	0.5	0.8	----	----
		mg	N/A	1	9	11	36	73	442	18	6130	17	10	47	9	13	----	----
	Previous Month	g/m ² .month		0.1	0.9	1	1.1	1.4	218	2.9	239	9.2	1.6	NA	1.3	1.7	----	----
	Change	g/m ² .month	Increase of 2	0.1	-0.4	-0.3	1.1	3	-191.2	-1.8	133	-8.2	-1	NA	-0.8	-0.9	----	----
Arsenic	Current Month	mg/L		0.001	----	----	----	----	----	----	----	----	----	----	----	----	<0.001	<0.001
Comments					Insects in gauge ants	Insects in gauge		Grass in gauge	Dirt in gauge		Dirt clumps in gauge						Wasp + grass in gauge	Grass in gauge

Table 4 – Groundwater Monitoring Results May 2016

Location	Units	Groundwater Investigation Levels (GILs) from Interpretive Report	4BH007	4BH008	4BH010	4BH011	4BH021	4BH022	4BH025	4BH026	4BH037	4BH038	1BH49	4BH058	4BH061	4BH062
Cut/Fill			Cut 4	Cut 4	Cut 6	Cut 6	Cut 11	Cut 11	Cut 12	Cut 12	Fill 15	Fill 15	Cut 17	Cut 17	Cut 26	Cut 26
Date of Sampling			26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Comments			DRY	DRY	DRY	DRY				DRY			DRY	Unable to sample	DRY	DRY
Field Physical data																
Depth to standing water level from TOC	m	-	-	-	-	-	8.51	2.00	8.37	-	0.82	0.97	-	-	-	-
pH	pH	-	-	-	-	-	6.72	7.29	8.00	-	6.33	7.36	-	-	-	-
Conductivity	mS/cm	-	-	-	-	-	0.136	0.671	0.116	-	7.010	10.8	-	-	-	-
Temperature	C	-	-	-	-	-	16.27	20.25	17.11	-	17.40	17.84	-	-	-	-

Table 5 – Blasting Monitoring Result May2016

Vibration and Overblast Tracking Register for Production Blasting

Date	Blast no.	Cut	BCM	Monitor 1 (PPV)	Monitor 2 (PPV)	Monitor 3 (PPV)	Monitor 1 (dB)	Monitor 2 (dB)	Monitor 3 (dB)	EPA Exceedances (5mm/s)	EPA Exceedances (10mm/s)	EPA Exceedance (120dB)	EPA Exceedance (115dB) 5%	No. of Blasts
30-Jun	11-001	11	1008	5.46	2.67	2.67	106.00	108.40	101.90	1				1

07-Jul	11-002	11	1622	5.77	3.51	2.35	108.00	103.50	108.40	1				2
27-Jul	11-003	11	7002	6.17	3.96	0.00	104.20	103.50	0.00					3
03-Aug	11-004	11	3616	11.64	3.43	1.03	113.10	107.00	95.92					4
06-Aug	10-001	10	8319	6.08	0.73	0.00	118.20	107.00	0.00					5
10-Aug	11-005	11	7006	14.67	7.68	2.45	114.60	115.60	104.20					6
13-Aug	10-002	10	3500	4.35	1.20	0.47	117.09	103.50	109.90					7
17-Aug	11-006	11	5382	12.99	6.45	1.79	118.20	118.60	104.20					8
20-Aug	10-003	10	10263	4.46	1.35	1.45	107.50	112.10	103.50					9
25-Aug	11-007	11	16100	6.21	1.78	0.00	115.60	98.84	0.00					10
31-Aug	11-008	11	14430	10.07	5.18	5.37	113.50	111.50	106.50	1				11
7-Sep	10-004	10	10281	9.76	1.94	0.70	119.90	112.30	98.84					12
17-Sep	10-005	10	7901.25	16.940	5.520	3.533	119.400	114.800	114.200					13
25-Sep	10-006	10	13200	19.490	6.092	-	113.800	118.800	-					14
1-Oct	11-009	11	8190	5.173	2.831	1.426	110.600	110.200	88.000					15
1-Oct	10-007	10	4485	10.240	1.308	-	118.500	88.000	-					16
13-Oct	10-008	10	6563.75	24.150	6.717	-	117.500	117.900	-					17
16-Oct	11-010	11	4641.25	3.126	1.926	-	109.200	1.926	-					18
20-Oct	10-009	10	9034.375	5.337	1.442	-	116.100	107.000	-					19
27-Oct	10-010	10	12247.5	5.039	3.297	-	97.500	117.500	-					20
27-Oct	11-011	11	11708.75	2.973	1.295	1.308	104.900	107.500	98.840					21
3-Nov	10-011	10	14462.5	6.971	2.012	0.684	124.000	117.200	102.800					22
12-Nov	10-012	10		3.919	0.933	-	88.000	116.300	-					23
16-Nov	8-001	8		*	8.638	4.591	*	112.300	108.800					24
24-Nov	8-002	8		8.875	1.308	1.000	124.900	98.840	107.000					25
26-Nov	10-013	10		12.100	1.024	-	119.800	106.500	-					26
1-Dec	10-014	10		8.371	-	-	120.600	-	-					27
2-Dec	8-003	8		15.39**	1.332	-	106.500	95.120	-					28
8-Dec	10-015	10		8.951	1.157	-	113.800	116.600	-					29
15-Dec	10-016	10		20.120	6.275	3.295	117.200	118.500	112.300					30
17-Dec	10-017	10		4.879	1.301	-	106.000	109.500	-					31
14-Jan	10-018	10		5.180	2.010	-	113.100	105.500	-					32
28-Jan	10-019	10		16.410	-	-	115.200	-	-					33
9-Feb	10-020	10		8.716	8.344	-	124.000	119.800	-					34
3-Mar	9-001	9		-	1.198	-	-	122.10	-					35
3-Mar	10-021	10		16.760	4.195	1.212	113.30	113.50	102.80					36
16-Mar	10-022	10		16.500	3.056	1.092	115.70	110.60	88.00					37
31-Mar	10-023	10		5.887	4.773	2.879	114.200	110.600	88.000					38
7-Apr	10-024	10		14.290	5.62	1.178	118.600	114	88.000					39
27-Apr	9-002	9		2.518	-	-	115.200	-	-					40
27-Apr	8-004	8		4.519	2.976	0.568	91.480	91.480	114.800					41
3-May	10-025	10		7.699	5.974	2.910	111.800	111.500	91.480					42
2-Jun	10-026	10		2.345	1.809	1.000	93.980	108.000	104.200					43

Note 17 July blasting criteria increase approved by DP&E with signed agreements **Totals No of Exceedances** 3 **EPL 2nd Reporting Period Exceedances** 0

16 December is Anniversary date of EPL

Monitor 3 is the only monitor where an agreement does not exist for 25mm/ from blast no. 3 onwards
DP&E Approval 26/02/16 to extend the duration of blasting up to 25mm/s and overpressure up to 125 dBA for cut 10 widening

**Current Percentage
exceedance
EPL Percentage
exceedance at 16th
December 2015**

6.98%

10.00%

* Flat Battery
** Power Pole

- Did not trigger