



Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ April 2015

Pacifico Project Number: WC2NH



A team consisting of RMS and Pacifico (ACCIONA Ferrovial 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 M4.1; 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 April 2015 were limited to the following:

- Demolition of existing structures;
- Vegetation clearing for installation of fencing;
- Installation of permanent boundary fencing;
- Vegetation clearing for access tracks;
- Vegetation clearing for sediment basins and other sediment controls;
- Mainline clearing and grubbing;
- Excavation for sediment basins and other sediment controls;
- Topsoil stripping;
- Installation of temporary waterway crossings;
- Trial blasting;
- Clearing through Flying Fox area;
- Site compound establishment;
- Installation of Frog Fencing;
- Geotechnical Investigations; and
- Site Survey

The works scheduled for next month include:

- Clearing and Grubbing;
- Topsoil stripping;
- Commencement of production blasting;
- Earthworks including crushing;
- Continuing clearing through the Flying Fox area;
- Commencement of bridge works including temporary work platforms;
- Installation of erosion and sediment controls;
- Installation of permanent boundary fencing;
- Commencement of culvert installation;

- Site compound establishment (Northern Compound);
- Geotechnical Investigations;
- Demolition of existing structures;
- Installation of temporary waterway crossings; and
- Site Survey.

1.2 Consultation Activities

The project's consultation activities during April 2015 included various community letterbox drop notifications and the following:

| Groups | Date | Key Topics |
|---|-----------------------|---|
| Environmental Review Group | 21/04/15 | Construction Progress, Design Update, Upcoming works, EWMS discussion, Environmental Update, Monitoring update. |
| Two Community Information Sessions (1 at Albert Drive Compound, 1 at Nambucca Entertainment Centre) | 22/04/15 and 23/04/15 | Construction Progress, Controlled Blasting, Flooding, At House Acoustic Treatments. |
| Estuary Committee Presentation | 23/04/15 | Flood modelling report, bridge construction methodology. |
| Nambucca Rotary Club | 29/04/15 | Project Update |

Other consultation activities:

Staffed display was organised for the Macksville Agricultural Show on Saturday 18 April 2015 with the aim to connect with the community, reinforce the existing communication channels in place reaffirming our availability and provide current information on the project.

At House Noise Treatments

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

Upcoming community and stakeholder activities for May 2015

- Consultation with residents within 200m of the controlled blasting zones
- Consultation with residents regarding increasing the blast limits
- Mail out of preconstruction condition reports to residents within controlled blasting zones.
- Notification to residents within controlled blasting zones as per Community Involvement Plan (letterbox drop, SMS, email)
- Consultation with Nambucca Rotary Club regarding the Nambucca River Festival planned for November 2015
- Consultation with property owners regarding property works
- Updating community displays at the various display locations

2. Weather

2.1 Discussion

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

| Month | Total monthly rainfall | Location |
|---------------------|------------------------|-----------------------|
| 01/04/15 – 31/04/15 | 121.2mm | Northern Compound |
| 01/04/15 – 31/04/15 | 128.6mm | Albert Drive Compound |

The site experienced a total of 14 rain days throughout the month of April 2015.

During April, rainfall received on site was lower than the April monthly average of 132.5mm. A summary of weather conditions recorded over the month for Smoky Cape by the Bureau of Meteorology is detailed below in Table 2.2.

Table 2.1 – Rainfall recorded at Albert Drive compound automated weather station

| Date | Time | TOTAL Rain Gauge |
|------------|---------|------------------|
| 1/04/2015 | 9:00:00 | 28.2 |
| 2/04/2015 | 9:00:00 | 0.4 |
| 3/04/2015 | 9:00:00 | 0.2 |
| 4/04/2015 | 9:00:00 | 31.2 |
| 5/04/2015 | 9:00:00 | 18.6 |
| 6/04/2015 | 9:00:00 | 6.6 |
| 7/04/2015 | 9:00:00 | 17.6 |
| 8/04/2015 | 9:00:00 | 0.2 |
| 9/04/2015 | 9:00:00 | 0 |
| 10/04/2015 | 9:00:00 | 0 |
| 11/04/2015 | 9:00:00 | 0.4 |
| 12/04/2015 | 9:00:00 | 1.8 |
| 13/04/2015 | 9:00:00 | 0 |
| 14/04/2015 | 9:00:00 | 0 |
| 15/04/2015 | 9:00:00 | 0 |
| 16/04/2015 | 9:00:00 | 0 |
| 17/04/2015 | 9:00:00 | 0.2 |
| 18/04/2015 | 9:00:00 | 0 |
| 19/04/2015 | 9:00:00 | 3.4 |

| | | |
|------------|---------|------|
| 20/04/2015 | 9:00:00 | 3 |
| 23/04/2015 | 9:00:00 | 0 |
| 24/04/2015 | 9:00:00 | 0 |
| 25/04/2015 | 9:00:00 | 0 |
| 26/04/2015 | 9:00:00 | 0 |
| 27/04/2015 | 9:00:00 | 0 |
| 28/04/2015 | 9:00:00 | 0 |
| 29/04/2015 | 9:00:00 | 0 |
| 30/04/2015 | 9:00:00 | 16.8 |

Table 2.2 – Rainfall recorded at the Northern compound automated weather station

| Date | Time | TOTAL Rain Gauge |
|------------|---------|------------------|
| 1/04/2015 | 9:00:00 | 21 |
| 2/04/2015 | 9:00:00 | 1.8 |
| 3/04/2015 | 9:00:00 | 0 |
| 4/04/2015 | 9:00:00 | 30.2 |
| 5/04/2015 | 9:00:00 | 27.2 |
| 6/04/2015 | 9:00:00 | 3.6 |
| 7/04/2015 | 9:00:00 | 11.6 |
| 8/04/2015 | 9:00:00 | 0 |
| 9/04/2015 | 9:00:00 | 0 |
| 10/04/2015 | 9:00:00 | 0 |
| 11/04/2015 | 9:00:00 | 0.8 |
| 12/04/2015 | 9:00:00 | 1.6 |
| 13/04/2015 | 9:00:00 | 0.2 |
| 14/04/2015 | 9:00:00 | 0 |
| 15/04/2015 | 9:00:00 | 0 |
| 16/04/2015 | 9:00:00 | 0 |
| 17/04/2015 | 9:00:00 | 0 |
| 18/04/2015 | 9:00:00 | 0 |
| 19/04/2015 | 9:00:00 | 0.2 |
| 20/04/2015 | 9:00:00 | 4.8 |
| 21/04/2015 | 9:00:00 | 0.6 |
| 22/04/2015 | 9:00:00 | 0 |
| 23/04/2015 | 9:00:00 | 0 |
| 24/04/2015 | 9:00:00 | 0 |
| 25/04/2015 | 9:00:00 | 0.2 |
| 26/04/2015 | 9:00:00 | 0 |
| 27/04/2015 | 9:00:00 | 0 |
| 28/04/2015 | 9:00:00 | 0 |
| 29/04/2015 | 9:00:00 | 0 |
| 30/04/2015 | 9:00:00 | 17.4 |

Table 2.2: Weather conditions recorded in April 2015 at Smoky Cape by the Bureau of Meteorology.

Observations from Smoky Cape Lighthouse.

April 2015

| date | min to 9am | anomaly | max from 9am | anomaly | rain to 9am |
|--------------------------------|------------|---------|--------------|---------|-------------|
| | °C | °C | °C | °C | mm |
| Wed 01/04/2015 | 17.9 | +1.2 | 24.8 | +0.6 | 70.0 |
| Thu 02/04/2015 | 19.0 | +2.3 | 27.1 | +2.9 | 7.2 |
| Fri 03/04/2015 | 20.1 | +3.4 | 26.4 | +2.2 | 0.0 |
| Sat 04/04/2015 | 18.4 | +1.7 | 19.4 | -4.8 | 31.0 |
| Sun 05/04/2015 | 17.6 | +0.9 | 25.9 | +1.7 | 24.0 |
| Mon 06/04/2015 | 19.0 | +2.3 | 27.7 | +3.5 | 2.0 |
| Tue 07/04/2015 | 16.8 | +0.1 | 26.9 | +2.7 | 20.6 |
| Wed 08/04/2015 | 15.0 | -1.7 | 25.0 | +0.8 | 0.0 |
| Thu 09/04/2015 | 16.6 | -0.1 | 25.0 | +0.8 | 0.0 |
| Fri 10/04/2015 | 15.4 | -1.3 | 24.5 | +0.3 | 0.0 |
| Sat 11/04/2015 | 15.3 | -1.4 | 24.5 | +0.3 | 4.6 |
| Sun 12/04/2015 | 16.3 | -0.4 | 26.2 | +2.0 | 1.0 |
| Mon 13/04/2015 | 16.0 | -0.7 | 24.5 | +0.3 | 0.0 |
| Tue 14/04/2015 | 16.0 | -0.7 | 25.3 | +1.1 | 0.0 |
| Wed 15/04/2015 | 17.9 | +1.2 | 27.0 | +2.8 | 0.0 |
| Thu 16/04/2015 | 19.0 | +2.3 | 26.2 | +2.0 | 0.0 |
| Fri 17/04/2015 | 19.4 | +2.7 | 28.1 | +3.9 | 0.0 |
| Sat 18/04/2015 | 21.1 | +4.4 | 26.6 | +2.4 | 0.0 |
| Sun 19/04/2015 | 19.8 | +3.1 | 21.2 | -3.0 | 4.0 |
| Mon 20/04/2015 | 16.3 | -0.4 | - | - | 1.2 |
| Tue 21/04/2015 | - | - | 25.2 | +1.0 | 0.0 |
| Wed 22/04/2015 | 14.0 | -2.7 | 24.8 | +0.6 | 0.0 |
| Thu 23/04/2015 | 16.8 | +0.1 | 26.3 | +2.1 | 0.0 |
| Fri 24/04/2015 | 18.1 | +1.4 | - | - | 0.0 |
| Sat 25/04/2015 | - | - | 28.0 | +3.8 | 0.0 |
| Sun 26/04/2015 | 14.9 | -1.8 | 20.3 | -3.9 | 0.0 |
| Mon 27/04/2015 | 14.7 | -2.0 | 23.1 | -1.1 | 0.0 |
| Tue 28/04/2015 | 14.6 | -2.1 | 23.1 | -1.1 | 0.0 |
| Wed 29/04/2015 | 13.2 | -3.5 | 22.9 | -1.3 | 3.8 |
| Thu 30/04/2015 | 14.1 | -2.6 | 20.1 | -4.1 | 4.2 |

3. Surface Water Monitoring

Sampling was undertaken by ACCIONA (Pacífico) on the 17th April during a dry period and 30th April during a wet period. Field tests and laboratory samples were taken. The results are available in Appendix A.

The laboratory sample results are currently still pending and will be provided in the next monthly report and at the monthly Environmental Review Group Meeting.

The April "Wet" event was monitored on the 30th of April after the site had received 17mm of rainfall.

Dissolved oxygen levels were noted to be below ANZECC criteria at:

- Upper Warrell Creek upstream (background ranges from 0.85 – 9.66mg/L);
- Stony Creek downstream (background ranges from 1.5 – 8.4mg/L);
- Lower Warrell Creek upstream and downstream (background ranges from 5 – 9.7mg/L);
- Gumma Wetlands upstream and downstream (background ranges from 0.6 – 13.6mg/L);
- Nambucca River upstream and downstream (background ranges from 6.8 to 10mg/L).

The low dissolved oxygen levels are consistent with baseline water quality data collected by RMS prior to the commencement of construction activities at Upper Warrell Creek, Stony Creek and Gumma Wetlands.

Low dissolved oxygen levels were recorded at Nambucca River and Lower Warrell Creek both upstream and downstream of the worksite. It is likely that the change in monitoring location between the baseline sampling and the construction sampling is the cause of the lower recorded dissolved oxygen levels.

A low pH level was also picked up at:

- Upper Warrell Creek downstream;
- Stony Creek downstream;
- Gumma Wetlands;

The low pH levels recorded are consistent with the baseline pre-construction monitoring undertaken.

The April "dry" event was monitored on the 17th of April.

Low pH was recorded at the following locations:

- Upper Warrell Creek;

- Stony Creek;
- Lower Warrell Creek Upstream;
- Gumma Wetlands.

The low pH levels recorded are consistent with the baseline pre-construction monitoring undertaken.

Low dissolved oxygen levels were recorded at:

- Upper Warrell Creek Downstream (background ranges from 1. – 7.1 mg/L);
- Lower Warrell Creek Upstream;
- Gumma Wetland

The low dissolved oxygen levels are consistent with the baseline pre-construction monitoring undertaken.

High turbidity levels were recorded at:

- Gumma Wetland (background ranges from 2.4 – 951ntu's);
- Nambucca River (background ranges from 3.8 – 98ntu).

The high turbidity levels are consistent with the baseline pre-construction monitoring undertaken.

4. Sediment Basin Water Monitoring

Water was released from sediment basins between the 10th April – 16th April after a rainfall event, further rain was received on the 11th – 13th April. Water was also released between the 20th – 29th April following a rainfall event. Table 4 below has the water quality results recorded for the water release events:

Table 4 – Water Release Register

Water Release Register



| Date | Basin ID | Oil and Grease (visible) | pH | Turbidity (NTU) | TSS (mg/L) | Approx Volume Discharged (kL) | Comments |
|------------|----------|--------------------------|------|-----------------|------------|-------------------------------|---|
| 10/04/2015 | B48.46 | N | 6.82 | 40.5 | 11 | 200 | 30% full - Commissioned |
| 10/04/2015 | B55.8 | N | 7.16 | 60.3 | 8 | 738 | Under construction - not yet receiving water from |

| | | | | | | | |
|------------|--------|---|------|------|-----|-------|--|
| | | | | | | | site |
| 10/04/2015 | B54.7 | N | 7.14 | 170 | 17 | 500 | Under construction - not yet receiving water from site |
| 11/04/2015 | B56.5 | N | 7.19 | 38.5 | 40 | 200 | Under construction - not yet receiving water from site |
| 11/04/2015 | B46.35 | N | 6.81 | 3.2 | 2 | 500 | Under construction - not yet receiving water from site |
| 13/04/2015 | B54.7 | N | 7.56 | 170 | 31 | 500 | Under construction - not yet receiving water from site |
| 13/04/2015 | B48.46 | N | 7.14 | 90 | 11 | 300 | 30% full - Commissioned |
| 13/04/2015 | B49.07 | N | 7.22 | 11.8 | 4 | 1,000 | Under construction - not yet receiving water from site |
| 14/04/2015 | B47.14 | N | 7.5 | 143 | 22 | 597 | Commissioned |
| 15/04/2015 | B46.35 | N | 7.03 | 150 | 21 | 500 | Under construction - not yet receiving water from site |
| 16/04/2015 | B56.5 | N | 7.19 | 38.5 | 40 | 400 | Under construction - not yet receiving water from site |
| 16/04/2015 | B46.35 | N | 6.56 | 150 | 21 | 500 | Under construction - not yet receiving water from site |
| 20/04/2015 | B54.7 | N | 6.74 | 6.5 | 17 | 1,000 | Under construction - not yet receiving water from site |
| 23/04/2015 | B55.8 | N | 7.8 | 93 | 50 | 738 | Under construction - not yet receiving water from site |
| 23/04/2015 | B56.9 | N | 7.9 | 9.8 | 5 | 500 | Under construction - not yet receiving water from site |
| 24/04/2015 | B56.75 | N | 7.63 | 27 | 13 | 200 | Under construction - not yet receiving water from site |
| 27/04/2015 | B56.9 | N | 7.8 | 43 | 9.8 | 500 | Under construction - not yet receiving water from site |
| 28/04/2015 | B54.3 | N | 8.26 | 30 | 16 | 150 | Only 1/4 full - released to install sed marker |
| 29/04/2015 | B47.6 | N | 6.54 | 60 | 15 | 200 | Only 1/4 full - Commissioned but catchment area not stripped or cleared. |

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 24th April at seven locations near to the construction works. Noise monitoring results are indicative of background noise levels. The Noise monitoring results are available in Appendix A.

6. Vibration Monitoring

Vibration monitoring in relation to the trial blasting was undertaken on the 15th April 2015, the results are shown in Table 6 below. The trial blast was set up to record a variety of different charge weights to determine production blast parameters. The trial blast program recorded several blasts over 5mm/s, however this is less than 5% of the overall blasts predicted to occur at each of the cuts. There were no blasts that recorded vibration levels over 10mm/s.

Due to the length of stemming used for each blast, airblast overpressure readings were not triggered for any of the trial blasts.

The Project is currently seeking written agreements from impacted receivers to increase the vibration limit in accordance with the Planning Approval.

Table 6 – Vibration results from trial blast.

| Location | Blast Hole Number | Time | Plugs | MIC (kg) | Monitor M1 | Monitor M2 | Monitor M3 | Monitor M4 |
|----------|-------------------|-------|-------|----------|------------------------|------------|------------|------------|
| | | | | | Vibration (PPV) | | | |
| Cut 8 | 1 | 11:10 | 5 | 5.675 | < 0.5 | 3.429 | 8.509 | < 0.5 |
| | 2 | 11:35 | 3 | 3.405 | < 0.5 | 1.27 | 3.937 | < 0.5 |
| Cut 9 | 1 | 12:32 | 5 | 5.675 | 0.889 | 0.889 | 1.651 | 0.889 |
| | 2 | 12:48 | 10 | 11.35 | 1.524 | 1.651 | 2.794 | 1.905 |
| | 3 | 13:07 | 20 | 22.7 | 1.905 | 2.032 | 4.699 | 2.921 |
| Cut 10 | 1 | 13:53 | 5 | 5.675 | < 0.5 | 1.397 | 4.445 | < 0.5 |
| | 2 | 13:59 | 5 | 5.675 | < 0.5 | < 0.5 | 5.715 | < 0.5 |
| | 3 | 14:10 | 5 | 5.675 | < 0.5 | < 0.5 | 6.477 | < 0.5 |
| Cut 11 | 1 | 14:41 | 3 | 3.405 | 2.286 | 2.286 | 3.175 | 0.889 |
| | 2 | 14:49 | 5 | 5.675 | 2.413 | 2.413 | 5.461 | < 0.5 |
| | 3 | 14:59 | 10 | 11.35 | 7.874 | 7.874 | NR | NR |

7. Dust Monitoring

Dust gauges were placed at nearby sensitive receivers on the 09/03/15 – 10/04/15. Dust gauge results are available in Appendix A. No exceedances were recorded.

8. Groundwater Monitoring

ACCIONA (Pacifico) have undertaken groundwater monitoring on the 04/05/15 after a handover with RMS. The results for the monitoring are still pending from the laboratory.

9. Acoustic Investigations

No acoustic investigations were undertaken in April 2015.

10. Complaints

9.1 Summary of Complaints for the month

The following is a brief summary of environmental complaints received in April 2015.

One environmental complaint dated Tuesday 21st April 2015 was received on Thursday 23rd April 2015 via mail from a resident of Old Coast Road regarding dust management and monitoring, and road maintenance. As the complaint followed a number of interactions and actions undertaken to address the resident's concerns, the community team is currently consulting with the resident to clarify the basis of the complaint. A letter was sent out on Monday 4 May to invite the resident to meet the community team and clarify what additional actions can be carried out to resolve his enquiries. The resident responded positively to the letter and contacted the community team to book a meeting. Meeting is to be held at 10am on Thursday 14 May 2015 at the Warrell Creek Community Display Centre.

11. Non-Compliance

10.1 Summary of Non-compliances

No non-compliances with the EPL conditions were recorded in April 2015.

Appendix A – Monitoring Results

Table 1 - Surface Water Sampling Results – 1 dry and 1 wet event.

April 2015 - Dry

Event

Weather: Fine

Low Tide:
1:08PM

| Location | | Levels of Concern | Upper Warrell Creek | Upper Warrell Creek | Stony Creek | Stony Creek | Lower Warrell Creek | Lower Warrell Creek | Flying Fox Gumma Wetlands E | Flying Fox Gumma Wetlands W | Flying Fox Gumma Wetlands N | Nambucca River | Nambucca River |
|----------------------------|-------|-------------------|---------------------|---------------------|-------------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| Type | Units | | Upstream | Downstream | Upstream | Downstream | Upstream | Downstream | Upstream | Upstream | Downstream | Upstream | Downstream |
| Date of Sampling | | TBA | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 | 17-Apr-15 |
| Time of Sampling | | | 11:15 AM | 10:51 AM | 10:11 AM | 9:30 AM | 11:38 AM | 11:53 AM | 1:16 PM | 1:30 PM | 1:42 PM | 12:40 PM | 12:20 PM |
| <i>Field Physical data</i> | | | | | | | | | | | | | |
| Temperature | C | na | 19.49 | 20.05 | 20.72 | 20.31 | 23.19 | 24.83 | 21.1 | 23.46 | 20.74 | 26.18 | 27.48 |
| pH | pH | 6.5-8.8 | 6.36 | 6.18 | 6.25 | 6.13 | 6.47 | 6.51 | 5.46 | 5.52 | 5.73 | 7.89 | 7.93 |
| ORPmV | ORPmV | na | 182 | 198 | 150 | 189 | 174 | 170 | 43 | 68 | 10.6 | 160 | 140 |
| Conductivity | mS/cm | 0.12-2.2 (FW) | 0.226 | 0.222 | 0.24 | 0.23 | 0.311 | 0.349 | 0.412 | 0.343 | 0.435 | 24.9 | 24.8 |
| Turbidity | NTU | 50 (FW), 10(SW) | 14.3 | 14.6 | 6.4 | 6.3 | 44.5 | 33 | 27 | 247 | 30.3 | 17.7 | 28.6 |
| Dissolved Oxygen | mg/L | >5 | 5.03 | 3.16 | 7.84 | 2.26 | 4.82 | 5.98 | 0 | 0 | 0 | 8.71 | 8.97 |
| TDS | g/L | 1.474 (FW) | 0.147 | 0.144 | 0.156 | 0.15 | 0.213 | 0.235 | 0.268 | 0.223 | 0.283 | 15.4 | 15.4 |

April 2015 - Wet

Event

Weather: Overcast With Showers

Low Tide:
12:23PM

| Location | | ANZECC Criteria | Upper Warrell Creek | Upper Warrell Creek | Stony Creek | Stony Creek | Lower Warrell Creek | Lower Warrell Creek | Flying Fox Gumma Wetlands E | Flying Fox Gumma Wetlands W | Flying Fox Gumma Wetlands N | Nambucca River | Nambucca River |
|----------------------------|-------|-----------------|---------------------|---------------------|-------------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| Type | Units | | Upstream | Downstream | Upstream | Downstream | Upstream | Downstream | Upstream | Upstream | Downstream | Upstream | Downstream |
| Date of Sampling | | TBA | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 | 30-Apr-15 |
| Time of Sampling | | | 2:08 PM | 1:47 PM | 11:34 AM | 11:05 AM | 1:38 PM | 1:48 PM | 10:32 AM | 9:56 AM | 9:21 AM | 9:09 AM | 9:25 AM |
| <i>Field Physical data</i> | | | | | | | | | | | | | |
| Temperature | C | na | 16.39 | 16.91 | 17.53 | 17.28 | 19.07 | 19.17 | 17.02 | 19.47 | 17.74 | 21.06 | 21.14 |
| pH | pH | 6.5-8.8 | 6.57 | 6.45 | 6.69 | 6.28 | 6.81 | 6.85 | 2.95 | 5.81 | 6.02 | 7.98 | 7.97 |
| ORPmV | ORPmV | na | -149 | -142 | -164 | -104 | -151 | -151 | -142 | -127 | -142 | -116 | -108 |
| Conductivity | mS/cm | 0.12-2.2 (FW) | 0.247 | 0.239 | 0.071 | 0.218 | 0.585 | 0.594 | 0.628 | 0.482 | 0.482 | 32.5 | 33.6 |
| Turbidity | NTU | 50 (FW), 10(SW) | 7.9 | 9.2 | 3.6 | 2.5 | 4.4 | 4.7 | 10.9 | 24.7 | 1.8 | 4.7 | 1.5 |
| Dissolved Oxygen | mg/L | >5 | 2.44 | 5.26 | 9.08 | 4.2 | 2.33 | 2.11 | 0.97 | 0.22 | 1.76 | 3.96 | 3.21 |
| TDS | g/L | 1.474 (FW) | 0.161 | 0.155 | 0.046 | 0.142 | 0.375 | 0.38 | 0.402 | 0.313 | 0.313 | 19.8 | 20.1 |

WCU = Upper Warrell Creek Upstream
 WCD = Upper Warrell Creek Downstream
 SCU = Stony Creek Upstream
 SCD = Stony Creek Downstream
 LWCU = Lower Warrell Creek Upstream
 LWCD = Lower Warrell Creek Downstream
 NRU = Nambucca River Upstream
 NRD = Nambucca River Downstream

Table 2 - Noise Monitoring Results

Monthly Noise Monitoring Results April

| Date | Time | Location | Rec ID | NCA | Laeq | LAFMAX | LAFMIN | LAF05 | LAF10 | LAF50 | LAF90 | Principal sources/ operations | Measurements exceeding criteria, plant/ operations causing | Corrective actions | NML | Notes |
|------------|-------|--------------|--------|-----|------|--------|--------|-------|-------|-------|-------|-----------------------------------|---|--------------------|-----|---|
| 24/04/2015 | 15:22 | Mattick Rd | 442 | 6 | 50.3 | 74 | 33.7 | 52.8 | 47.4 | 39.3 | 36.4 | BG: Private Traffic | Nil | NA | 44 | |
| 24/04/2015 | 10:58 | Letitia Cl | 410 | 4 | 55 | 77.6 | 38.6 | 62.2 | 58 | 45.7 | 41.6 | BG: Mower | Nil | NA | 59 | |
| 24/04/2015 | 15:49 | Nursery Rd | 415 | 4 | 57.2 | 77.8 | 47.3 | 61.3 | 58.7 | 53.6 | 50.9 | BG: Birds, Traffic on highway | Nil | NA | 59 | |
| 24/04/2015 | 16:17 | Gumma Rd | 383 | 3 | 63 | 82.8 | 42.5 | 68.4 | 61.8 | 61.8 | 45.7 | BG: Private vehicles driving past | Nil | NA | 50 | |
| 24/04/2015 | 16:44 | Bald Hill Rd | 197 | 3 | 54.3 | 78.9 | 36.4 | 57.5 | 53.6 | 43.4 | 39.8 | BG: Birds, road traffic | Nil | NA | 50 | Excavator visible, not audible |
| 24/04/2015 | 11:51 | Cockburns Ln | 13 | 1 | 55.6 | 77.6 | 43.9 | 56.6 | 55.7 | 52.2 | 48.1 | Concrete truck on road (53-55) | Concrete truck has caused marginal increase above NML. Truck moved from area to reduce noise. | NA | 50 | Concrete truck parked opposite receiver, moved after 5 mins |
| 24/04/2015 | 11:20 | Albert Dr | 74 | 1 | 57.3 | 78.2 | 42.2 | 55.7 | 51.2 | 49.7 | 45 | BG: Traffic, birds, dog | Nil | NA | 50 | |

Table 3 - Dust monitoring results

Monthly Dust Monitoring Results - March/April 2015

| | | Unit | Levels of Concern | LOR | DDG1 | DDG2 | DDG3 | DDG4 | DDG5 | DDG6 | DDG7 | DDG A1 | DDG A2 |
|--------|-------------------------|-------------------------------|---------------------------|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| DDG ID | | | | | DDG1 | DDG2 | DDG3 | DDG4 | DDG5 | DDG6 | DDG7 | DDG A1 | DDG A2 |
| Mar-15 | Start date of sampling | | | | 9/03/2015 | 9/03/2015 | 9/03/2015 | 9/03/2015 | 9/03/2015 | 9/03/2015 | 9/03/2015 | 9/03/2015 | 9/03/2015 |
| | Finish date of sampling | | | | 10/04/2015 | 10/04/2015 | 10/04/2015 | 10/04/2015 | 10/04/2015 | 10/04/2015 | 10/04/2015 | 10/04/2015 | 10/04/2015 |
| | Total Soluble Matter | g/m ² .month mg | N/A N/A | 0.1 1 | <0.1 1 | 1.3 24 | 0.3 5 | 2.1 39 | 0.3 5 | 0.2 2 | 0.2 3 | - - | - - |
| | Total Insoluble Matter | g/m ² .month mg | 4 or increase of 2 N/A | 0.1 1 | 0.9 16 | 0.5 10 | 1.1 20 | 0.8 14 | 0.2 4 | 0.5 9 | 0.4 8 | - - | - - |
| | Total Solids | g/m ² .month mg | N/A N/A | 0.1 1 | 0.9 17 | 1.8 34 | 1.4 25 | 2.9 53 | 0.5 9 | 0.6 11 | 0.6 11 | - - | - - |
| | Arsenic | mg/L | 0.001 | 0.001 | NA | NA | NA | NA | NA | NA | NA | <0.001 | <0.001 |
| | Comments | | | | | | | | | | | | |