



# Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

## ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ March 2017

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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 16<sup>th</sup> 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 March 2017 included the following:

- Bitumen sealing work
- Topsoil stripping
- Earthworks
- Continuing bridge works including girder placement, deck unit installation and deck concrete pours
- Continuing drainage works
- Scour rock installation
- Batter stabilisation using hydromulch (permanent design seed mix)
- Landscape Planting
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Basin Decommissioning
- Basin Maintenance including dewatering
- Installation of Erosion and Sediment Controls
- Pavement (Asphalt and Concrete)
- Line marking
- Operation of concrete and asphalt batch plants
- Removal of temporary jetty at Nambucca River Bridge

Works scheduled for next month include

- Earthworks including crushing
- Continuing bridge works including girder placement, deck unit installation and deck concrete pours
- Landscape Planting
- Continuing drainage works

- Scour rock installation
- Batter stabilisation using hydromulch (permanent design seed mix)
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Basin Decommissioning
- Basin Maintenance including dewatering and desilting
- Installation of Erosion and Sediment Controls
- Paving operations including Asphaltting and concreting
- Line marking Pavement (Asphalt and Concrete)
- Verge / Median Placement
- Commence removing rock platforms at Lower Warrell Creek and Nambucca River

## 1.2 Consultation Activities

The project's consultation activities during March 2017 included the following:

**Table 1 – Consultation Activities**

Groups	Date	Key Topics
Environmental Review Group	7 <sup>th</sup> March 2017	Construction Progress, Design Update, Upcoming Works, Environmental Update, Monitoring Update, Out of Hours Works, Incidents and Community Complaints
Toolboxes	Wednesday each week	Workforce behavioural issues examined and impact management tips provided, as appropriate. eg. mud impacts on local roads and near private properties, spraying in high wind, public perception.
North Facing Ramps group	10am Monday tri-weekly – session held 27 <sup>th</sup> March 2017	Three week look-ahead for construction activities and general project discussion.

### Other Consultation Activities:

- Conducted second Nambucca Shire Council liaison meeting at Southern Compound 28<sup>th</sup> March 2017;
- Invitation to 15<sup>th</sup> March 2017 Community Information Session emailed to database distribution list, along with phone and text invitations to those without email;
- Traffic Alert, letterbox drop and email notification to database distribution list for quarry access bridge girder lifts;
- Obtained 15 agreements for Out of Hours Work for temporary asphalt plant at Warrell Creek;
- Obtained one agreement for Out of Hours Work (Saturday afternoon) earthworks north of Mattick Road;

- Obtained one agreement for Out of Hours Work asphaltting Bald Hill Road to Floodplain Two bridge;
- Obtained one agreement for Out of Hours Work asphaltting Letitia Close to Mattick Road;
- Updated Acciona's project update on website;
- Distributed third edition of North Facing Ramps three-month look-ahead;
- Distributed RMS quarterly Project Update to email database and letterbox dropped to properties within 200m of alignment; and
- Ongoing and timely notifications and traffic alerts for night time girder deliveries through Macksville;

### At House Noise Treatments

The at house noise treatment program is currently being managed by RMS and is not part of the ACCIONA (Pacifco) Scope of Works and Technical Criteria.

### Upcoming Community and stakeholder activities:

- Conduct next Nambucca Shire Council liaison meeting 2 May 2017;
- Conduct next North Facing Ramps tri-weekly roadside community meetings scheduled for Monday 10 April 2017;
- Re-consult residents closest to Gate 3 stockpile in relation to future rock crushing activity
- Continue to consult stakeholders impacted by visual mounds along the entire alignment;
- Signposting communications plan (tie into mid-year Community Information Sessions); and
- Continue to identify community groups for specific presentation of key messages second half of 2017;

## 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 – Rainfall recorded at the two weather stations operated by Pacifco**

Month	Total monthly rainfall	Location
01/02/17 – 28/02/17	506.4mm	Northern Compound
01/02/17 – 28/02/17	483mm	Albert Drive Compound

The site experienced a total of 19 rain days throughout the month of March 2017.

During March, rainfall received on site was higher than the March monthly average of 183mm. 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 March 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

March 2017

Date	Time	TOTAL Rain Gauge (mm)
1/03/2017	9:00:00	23.6
2/03/2017	9:00:00	1
3/03/2017	9:00:00	0.2
4/03/2017	9:00:00	0
5/03/2017	9:00:00	7.8
6/03/2017	9:00:00	27.4
7/03/2017	9:00:00	0
8/03/2017	9:00:00	0
9/03/2017	9:00:00	3.2
10/03/2017	9:00:00	0.4
11/03/2017	9:00:00	0
12/03/2017	9:00:00	0
13/03/2017	9:00:00	0
14/03/2017	9:00:00	0.6
15/03/2017	9:00:00	38.8
16/03/2017	9:00:00	114.6
17/03/2017	9:00:00	0
18/03/2017	9:00:00	55.8
19/03/2017	9:00:00	122.6
20/03/2017	9:00:00	22.2
21/03/2017	9:00:00	2.6
22/03/2017	9:00:00	0
23/03/2017	9:00:00	0
24/03/2017	9:00:00	0
25/03/2017	9:00:00	1.4
26/03/2017	9:00:00	3.4
27/03/2017	9:00:00	0.2
28/03/2017	9:00:00	0
29/03/2017	9:00:00	0
30/03/2017	9:00:00	4.8
31/03/2017	9:00:00	52.4

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

March 2017

Date	Time	TOTAL Rain Gauge (mm)
1/03/2017	9:00:00	26.8
2/03/2017	9:00:00	3.4
3/03/2017	9:00:00	0
4/03/2017	9:00:00	0
5/03/2017	9:00:00	3
6/03/2017	9:00:00	40.6
7/03/2017	9:00:00	0
8/03/2017	9:00:00	0
9/03/2017	9:00:00	0.6
10/03/2017	9:00:00	0
11/03/2017	9:00:00	0
12/03/2017	9:00:00	0
13/03/2017	9:00:00	0
14/03/2017	9:00:00	1.4
15/03/2017	9:00:00	11
16/03/2017	9:00:00	113.6
17/03/2017	9:00:00	0.4
18/03/2017	9:00:00	76.2
19/03/2017	9:00:00	130.8
20/03/2017	9:00:00	26
21/03/2017	9:00:00	3.2
22/03/2017	9:00:00	0
23/03/2017	9:00:00	0
24/03/2017	9:00:00	0
25/03/2017	9:00:00	1.8
26/03/2017	9:00:00	3.2
27/03/2017	9:00:00	0.6
28/03/2017	9:00:00	0
29/03/2017	9:00:00	0
30/03/2017	9:00:00	4
31/03/2017	9:00:00	59.8



Table 2.3: Weather conditions recorded in March 2017 at Smoky Cape by the Bureau of Meteorology.

<b>March 2017</b>			
Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/03/2017	19	26.5	21.8
2/03/2017	19.4	29.8	6.4
3/03/2017	19.9	30.8	0
4/03/2017	20.5	29.4	0
5/03/2017	19.7	29.1	21
6/03/2017	19.6	27	6.8
7/03/2017	18.2	25.9	0
8/03/2017	17.3	26.5	0
9/03/2017	16.2	24.8	13.4
10/03/2017	16.9	25.3	0
11/03/2017	18.5	27.8	0
12/03/2017	18	28.4	0
13/03/2017	18.6	25.9	0
14/03/2017	20.4	23.3	1.6
15/03/2017	20.5	23.4	6
16/03/2017	20.8	26.8	180
17/03/2017	21.5	24	0.8
18/03/2017	19.6	24.1	58
19/03/2017	21.5	25.4	41
20/03/2017	21.3	24.8	29
21/03/2017	21.5	26.8	4
22/03/2017	21.5	26.8	0.4
23/03/2017	21.6	23.5	0
24/03/2017	20.5	21.2	2.4
25/03/2017	18.8	26	9
26/03/2017	19.4	28.2	16.2
27/03/2017	20.8	29	0
28/03/2017	21.2	28.4	0
29/03/2017	22.8		0
30/03/2017		28.4	
31/03/2017	17.4	23.8	42

### 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):

#### Wet Sampling Event

A "wet" sampling event (>10mm in 24 hours) was undertaken on the 6<sup>th</sup> March 2017, field testing and lab sampling was undertaken. Results are attached in Appendix A.

#### pH levels noted to be outside of trigger levels at:

Upper Warrell Creek downstream recorded elevated pH levels downstream (7.54). It is noted that there was only a minor increase from upstream levels (7.34) and that these levels are within ANZECC criteria (6.5-8.0). All controls were in place for the site, with no additional activities undertaken within the waterway.

Stony Creek recorded elevated pH levels upstream (7.56) and downstream (8.18). All controls were in place for the site, with no additional activities undertaken within or adjacent to the waterway.

Nambucca River recorded elevated pH levels upstream (7.65) and downstream (7.71). It is noted that levels only increased very slightly from upstream to downstream and were also very close to 80<sup>th</sup> percentile trigger levels (7.56 for both sites). All controls were in place for the site, with no additional activities undertaken within the waterway.

#### Conductivity note to be above trigger levels at:

Stony Creek downstream (0.314mS/cm). It is noted that this is only slightly above 80<sup>th</sup> percentile trigger levels (0.309mS/cm). All controls were in place for the site with no construction activity being undertaken within the waterway. Lower Warrell Creek upstream (28.0mS/cm) and downstream (29.6mS/cm). All controls were verified to be in place for the site, with no construction activities undertaken within the waterway.

#### Turbidity (NTU) noted to be above trigger levels at:

Stony Creek upstream (20.4 NTU) and downstream (61.7 NTU). All controls were in place for the site, with no activity being conducted within the waterway. It is noted that during the rainfall event, runoff from unsealed residential driveways on the downstream side of the site entered Stony Creek, which may have impacted the NTU levels downstream. The sediment basins adjacent to Stony Creek had also overtopped during the heavy rainfall events.

Nambucca River upstream (31.2 NTU) and downstream (43 NTU). All controls were in place for the site, with no additional activity being undertaken within the waterway. It was noted during sampling that wind chop was causing sediment to be disturbed along the banks of the Nambucca River, which may have resulted in elevated readings for both sites.

Dissolved Oxygen (DO) noted to be below trigger levels at:

Nambucca River upstream (5.37mg/L) and downstream (5.58mg/L). All controls were verified to be in place for the site, with no construction activities undertaken within the waterway. It is noted that levels increased from upstream to downstream and are thus unlikely to be due to construction impacts. Additionally, these levels are within ANZECC criteria (>5mg/L).

Metals noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of arsenic upstream (0.006mg/L) and downstream (0.005mg/L), manganese downstream (0.16mg/L). It is noted that levels for both sites decreased from upstream to downstream sites and are thus unlikely to be attributable to construction impacts. It is also noted that both manganese and arsenic levels are within ANZECC criteria (1.9mg/L for manganese, 0.024mg/L for arsenic). All controls were in place for the site, with no additional construction activities being undertaken within the waterway.

Stony Creek recorded elevated levels of arsenic upstream (0.005mg/L) and downstream (0.003mg/L) and zinc downstream (0.007mg/L). All controls were verified to be in place for the site, with no additional construction activities undertaken within the waterway. It is noted that arsenic levels decreased from upstream to downstream and are thus unlikely to be due to construction impacts. Zinc levels were also noted to be within ANZECC criteria (0.008mg/L).

Lower Warrell Creek recorded elevated levels of arsenic upstream (0.008mg/L) and downstream (0.01mg/L). All controls were verified to be in place for the site with no construction activities undertaken within the waterway. It is also noted that these levels are within ANZECC criteria (0.024mg/L).

Nutrients noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of total phosphorus downstream (0.05mg/L). All controls were verified to be in place for the site with no additional construction activities undertaken within the waterway. It is noted that these levels are level with ANZECC criteria (0.05mg/L).

Stony Creek recorded elevated levels of nitrite downstream (0.09mg/L). All controls were in place for the site with no additional construction activities undertaken within the waterway. It is noted that Stony Creek has a "soft" treatment with plantings and hydromulching undertaken.

Lower Warrell Creek recorded elevated levels of total nitrogen downstream (0.6mg/L). All controls were in place for the site with no construction activities undertaken within the waterway. It was noted that detritus was present at the monitoring site, which may have contributed to the elevated levels.

## 2<sup>nd</sup> Wet Sampling Event

An additional "wet" sampling event (>10mm in 24 hours) was undertaken on the 21<sup>st</sup> March 2017, field testing was undertaken. Results are attached in Appendix A.

### pH levels noted to be outside trigger levels at:

Upper Warrell Creek recorded low pH levels upstream (5.93) and downstream (5.94). It is noted that levels were consistent between upstream and downstream sites, and are unlikely to be attributable to construction impacts.

Lower Warrell Creek recorded low pH levels upstream (6.20) and downstream (5.56). All controls were in place for the site with no additional construction activity undertaken within the waterway.

Gumma Wetlands recorded low pH level upstream (5.8, 5.52) and downstream (5.79). All controls were in place for the site with no construction activity undertaken within the waterway. It is noted that pH levels were consistent between upstream and downstream sites and are thus unlikely to be attributable to construction impacts.

### Turbidity (NTU) noted to be above trigger levels at:

Nambucca River upstream (71.3 NTU) and downstream (68.8 NTU). It is noted that levels decreased from upstream to downstream sites and are thus unlikely to be attributed to construction impacts. It is also noted that wind chop along the bank was stirring sediment from the bank up, which may have increased NTU levels to above trigger levels.

### Dissolved Oxygen (DO) noted to be below trigger levels at:

Upper Warrell Creek upstream (1.45mg/L) and downstream (1.38mg/L). A potential reason for this is the large amount of rainfall before this wet event (approximately 362mm in the 8 days preceding the monitoring), resulting in decaying vegetative matter being washed into the waterway and reducing the DO levels.

Stony Creek upstream (1.74mg/L) and downstream (1.56mg/L). A potential reason for the low levels is the large amount of rainfall before this wet event (approximately 362mm in the 8 days preceding the monitoring), resulting in decaying vegetative matter being washed into the waterway and reducing the DO levels.

Lower Warrell Creek upstream (0.41mg/L) and downstream (0.41mg/L). It is noted that levels remained consistent from upstream to downstream sites and are thus unlikely to be attributable to construction impacts. A potential reason for the low levels is the large amount of rainfall before this wet event (approximately 362mm in the 8 days preceding the monitoring), resulting in decaying vegetative matter being washed into the waterway and reducing the DO levels.

Gumma Wetlands upstream (0.41mg/L, 0.04mg/L) and downstream (0.28mg/L). A potential reason for the low levels is the large amount of rainfall before this wet event (approximately 362mm in the 8 days preceding the monitoring), resulting in decaying vegetative matter being washed into the waterway and reducing the DO levels.

Nambucca River upstream (1.3mg/L) and downstream (1.31mg/L). Levels were consistent between upstream and downstream sites and are thus unlikely to be as a result of construction impacts. A potential reason for this is the large amount of rainfall before this wet event (approximately 362mm in the 8 days preceding the monitoring), resulting in decaying vegetative matter being washed into the waterway and reducing the DO levels.

#### Dry Sampling Event

A "dry" sampling event was undertaken on the 27<sup>th</sup> March 2017, field testing and lab sampling was undertaken. Results are attached in Appendix A.

#### pH levels noted to be outside of trigger levels at:

Lower Warrell Creek recorded low pH levels downstream (6.44). All controls were in place for the site. These levels were also consistent with the upstream site (6.74) and thus unlikely to be attributable to construction impacts.

Nambucca River recorded elevated pH levels upstream (7.71) and downstream (7.52). It is noted that the trigger levels for Nambucca River are pH 7, with anything outside of this result being outside of trigger levels.

#### Conductivity was noted to be outside trigger levels at:

Nambucca River upstream (10.4mS/cm) and downstream (10.4mS/cm). Levels were consistent from upstream to downstream sites and are thus unlikely to be attributable to construction impacts. A potential cause for the low levels is the high amount of rainfall in March 2017 (442.6mm to the 27<sup>th</sup> March), resulting in lower salinity levels of the waterway due to freshwater run-off entering the waterway.

Unnamed Creek Gumma East upstream (0.248mS/cm). All controls were in place for the site. As the result is upstream of the construction site it is unlikely to be attributable to construction impacts.

#### Turbidity (NTU) noted to be above trigger levels at:

Stony creek recorded elevated levels downstream (6.0 NTU). All controls were verified to be in place for the site Upstream recorded lower levels (1.2 NTU). It is noted that levels are only very slightly above trigger levels (5.97 NTU 80<sup>th</sup> percentile trigger level).

Lower Warrell Creek recorded elevated levels upstream (7.3 NTU) and downstream (12.9 NTU). All controls were verified to be in place for the site. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to this rain event.

Unnamed Creek Gumma West recorded elevated levels upstream (88.1NTU). All controls were verified to be in place for the site, with no active construction being undertaken within the waterway. As this location is upstream of the construction site it is unlikely that this elevated NTU reading is attributable to construction activities.

Nambucca River recorded elevated levels upstream (158 NTU) and downstream (85.2 NTU). All controls were verified to be in place for the site, with no activities

being undertaken within the waterway. It is noted that wind chop was stirring sediment up with the water along the edge of the Nambucca River, which may have contributed to the exceedance. It is also noted that levels decreased from upstream to downstream sites and are thus unlikely to be attributable to construction activities.

Dissolved Oxygen (DO) noted to be below trigger levels at:

Stony Creek downstream (2.98mg/L). All controls were verified to be in place for the site, with no construction activities undertaken within the waterway. The reduced levels may be due to decaying vegetative matter within the waterway.

Lower Warrell Creek upstream (4.21mg/L) and downstream (3.19mg/L). All controls were verified to be in place for the site. The reduced levels may be due to decaying vegetative matter within the waterway.

Nambucca River upstream (5.53mg/L) and downstream (5.21mg/L). All controls were verified to be in place for the site, with no construction activities undertaken within the waterway. The reduced levels may be due to decaying vegetative matter within the waterway. It is noted that these levels are within ANZECC criteria (5mg/L).

Unnamed Creek Gumma East upstream (0.46mg/L) and Unnamed Creek Gumma West upstream (0.45mg/L). The reduced levels may be due to decaying vegetation matter within the waterway. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to this rain event.

Temperature noted to be above trigger levels at:

Lower Warrell Creek upstream (28.36°C) and Lower Warrell Creek downstream (28.62°C). This is outside of the 80<sup>th</sup> percentile trigger value of 27.9°C, however only slightly. As both upstream and downstream temperatures were above the trigger value it is unlikely that this is attributable to construction activities. In addition, it should be noted that the temperature for both upstream and downstream were comparable.

Metals noted to be above trigger levels at:

Stoney Creek recorded elevated levels of manganese upstream (0.069mg/l) and downstream (0.053mg/l). Manganese levels were also noted to be within ANZECC criteria (1.9mg/l). It should also be noted that the level of manganese decreased from the upstream to downstream sample and therefore this elevated level of manganese is unlikely to be attributable to construction activities.

Lower Warrell Creek recorded elevated levels of Nickel (0.005mg/l) at both the upstream and downstream sample locations. As no change was found between upstream and downstream samples it is unlikely that this elevated level is attributable to construction activities. Zinc was also noted to be above trigger values (0.022mg/l) upstream and (0.02mg/l) downstream. It is noted that Zinc levels were within ANZECC criteria (0.008mg/l). Aluminium was also noted to be elevated downstream (0.1mg/l) which is above the 80<sup>th</sup> percentile trigger level of 0.06mg/l. It should be noted that this monitoring event occurred after a large

volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to this rain event.

Nambucca River recorded elevated levels of manganese upstream (0.147mg/l) and downstream (0.156mg/l). It should be noted that both upstream and downstream samples returned an elevated level of manganese above the 80<sup>th</sup> percentile trigger value of 0.03mg/l. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to this rain event.

Unnamed Creek Gumma West upstream returned elevated levels of Arsenic (0.007mg/l), Lead (0.929mg/l), Manganese (0.002mg/l), Zinc (0.01mg/l) and Iron (5.91mg/l). Unnamed Creek Gumma East upstream returned elevated levels of Aluminium (0.12mg/l), Arsenic (0.006mg/l), Lead (0.449mg/l), Manganese (0.004mg/l) and Zinc (0.007mg/l). All controls were verified to be in place for the site with no construction activities being undertaken attributable to these elevated readings. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to the adjacent agricultural and waste water treatment activities and associated runoff.

Nutrients noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of Total Nitrogen (0.7mg/l) and Nitrate (0.14mg/l) upstream. Upper Warrell Creek recorded elevated levels of Nitrate (0.09mg/l) downstream. It should be noted that although Nitrate was above the 80<sup>th</sup> percentile trigger level for Upper Warrell Creek that the level decreased from upstream to downstream and therefore is unlikely to be attributable to construction activities. It should also be noted that Total Nitrogen was also below trigger values at the downstream monitoring location.

Stoney Creek recorded elevated levels of Nitrate (0.17mg/l) upstream and (0.19mg/l) downstream. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to this rain event.

Lower Warrell Creek recorded elevated levels of Total Nitrogen (0.7mg/l) upstream and (0.8mg/l) downstream. Lower Warrell Creek also recorded elevated levels of Total Kjeldahl Nitrogen (0.6mg/l) upstream and (0.6mg/l) downstream. Lower Warrell Creek also recorded elevated levels of Nitrate (0.14mg/l) upstream and (0.19mg/l) downstream. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to this rain event.

Unnamed Creek Gumma East upstream recorded an elevated level of Total phosphorous upstream (0.15mg/l) which is slightly higher than the 80<sup>th</sup> percentile trigger level of 0.12mg/l. It should be noted that this monitoring event occurred after a large volume of rainfall (203.2mm from 18<sup>th</sup> to 21<sup>st</sup> March 2017) and these elevated results may be attributable to the adjacent agricultural and waste water treatment activities and associated runoff.

TSS noted to be above trigger levels at:

Stoney Creek downstream recorded an elevated TSS result of 6mg/l. This is just above the 80<sup>th</sup> percentile trigger value of 5.8mg/l. It should be noted that Stoney Creek upstream returned a TSS result of 8mg/l (within 80<sup>th</sup> percentile trigger level) and therefore as TSS has decreased from upstream to downstream it is therefore unlikely that this elevated level is attributable to construction activities.

## 4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins after rainfall events on the 1<sup>st</sup>-2<sup>nd</sup>, 5<sup>th</sup>-6<sup>th</sup>, 14<sup>th</sup>-21<sup>st</sup>, 25<sup>th</sup>-27<sup>th</sup>, and 30<sup>th</sup>-31<sup>st</sup> March 2017. 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) ( $R^2 = 0.5953$ ,  $p < 0.00001$ ,  $n=184$ ). The regression equation for the analytical results calculates a turbidity (NTU) value of 124.776 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 87.3432, rounded to an NTU value of 85. 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 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 March 2017**

Date	Basin ID	Oil and Grease (visible) (Limit = No visible)	pH (6.5-8.5)	Turbidity (NTU) (Limit <90 NTU)	TSS (mg/L) (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
2/03/2017	B42.80	N	6.81	25.2		600	
2/03/2017	B43.75	N	7.85	33.9		400	
2/03/2017	B44.44	N	7.77	66.4		600	
2/03/2017	B45.00	N	7.65	22.8		800	
2/03/2017	B45.64	N	7.46	41.7		300	
2/03/2017	B47.17	N	7.06	33.1	<5	200	
2/03/2017	B48.30	N	7.32	1.8		100	
2/03/2017	B49.20	N	7.54	19.7		300	
2/03/2017	B49.67	N	6.79	21.5	7	700	
2/03/2017	B60.87	N	7.96	49.3		300	
3/03/2017	B45.50	N	6.92	56.2		200	
3/03/2017	B47.96	N	6.75	33.2		300	
3/03/2017	B48.46	N	6.69	43.7		800	



Date	Basin ID	Oil and Grease (visible) (Limit = No visible)	pH (6.5-8.5)	Turbidity (NTU) (Limit <90 NTU)	TSS (mg/L) (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
3/03/2017	B49.67	N	6.82	11.7		800	
3/03/2017	B53.03	N	8.14	22	12	300	
3/03/2017	B58.45	N	8.06	75.6		900	
3/03/2017	B60.5	N	7.70	43.2	20	450	
3/03/2017	B60.58	N	7.86	69.3		200	
4/03/2017	B48.46	N	6.6	26.3		500	
4/03/2017	B49.67	N	6.78	12.1		600	
4/03/2017	B53.5	N	7.92	33.5		1000	
4/03/2017	B55.17B	N	8.01	26.3		300	
4/03/2017	B55.5	N	7.03	54.6		400	
4/03/2017	B57.7	N	7.55	39.3		700	
4/03/2017	B58.10	N	8.01	31.7		900	
4/03/2017	B58.6	N	7.76	21.6		700	
4/03/2017	B60.3	N	7.82	31.6		300	
4/03/2017	B60.85	N	6.92	49.3		400	
4/03/2017	B61.25	N	7.16	29.6		800	
7/03/2017	B53.5	N	7.35	52.8	<5	1000	
7/03/2017	B47.96	N	6.93	19.6	<5	300	
7/03/2017	B48.30	N	6.63	35.2	<5	100	
7/03/2017	B49.67	N	6.8	10.1	<5	700	
7/03/2017	B53.03	N	6.96	19.2		200	
7/03/2017	B60.5	N	7.30	79.6		480	
7/03/2017	B60.58	N	7.21	43.1		200	
8/03/2017	B41.20	N	6.98	61.7		600	
8/03/2017	B42.30	N	7.12	25.5		450	
8/03/2017	B42.80	N	7.68	10.2		700	
8/03/2017	B43.75	N	7.95	48.6		400	
8/03/2017	B44.44	N	8.16	58.3		300	
8/03/2017	B45.00	N	7.75	38.5	8	450	
8/03/2017	B45.50	N	7.32	42	5	500	
8/03/2017	B45.64	N	7.33	20.2	<5	400	
8/03/2017	B47.14	N	7.29	7.5		400	
8/03/2017	B47.96	N	6.82	17.1		300	
8/03/2017	B48.46	N	6.59	30	<5	400	
8/03/2017	B49.20	N	6.98	61.7		600	
8/03/2017	B49.67	N	7.01	29.9		800	
8/03/2017	B53.8	N	8.41	11.6		1700	
8/03/2017	B53.9	N	7.21	10.2		1500	
9/03/2017	B42.30	N	6.82	27		100	
9/03/2017	B48.46	N	6.95	32.3		250	
9/03/2017	B49.67	N	6.57	41		500	

Date	Basin ID	Oil and Grease (visible) (Limit = No visible)	pH (6.5-8.5)	Turbidity (NTU) (Limit <90 NTU)	TSS (mg/L) (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
9/03/2017	B55.17B	N	7.00	17.3		300	
9/03/2017	B57.70	N	7.12	56.3		600	
9/03/2017	B58.10	N	7.51	62.9		900	
9/03/2017	B58.45	N	8.01	83		800	
9/03/2017	B60.3	N	7.02	64.6		300	
9/03/2017	B60.87	N	7.12	34.6		300	
9/03/2017	B61.25	N	7.94	21.1		800	
10/03/2017	B53.9	N	7.62	72.6		2000	
10/03/2017	B58.6	N	8.21	46.4		600	
10/03/2017	B59.78	N	7.82	31.3		700	
10/03/2017	B59.85	N	7.81	63.2		900	
10/03/2017	B55.5	N	7.86	79.6	9	400	
11/03/2017	B55.0	N	7.86	72.1		1000	Decommissioned - sump
11/03/2017	B55.8	N	7.56	59.3		900	Decommissioned - sump
13/03/2017	B55.0	N	7.45	49.6		1000	Decommissioned - sump
16/03/2017	B42.80	N	6.73	28.9		500	
17/03/2017	B49.67	N	7.17	12.7		800	
17/03/2017	B48.30	N	7.62	25.6		300	
17/03/2017	B53.00	N	7.56	58		500	
20/03/2017	B42.80	N	6.68	41.9		800	
20/03/2017	B48.30	N	7.01	30.6		400	
20/03/2017	B53.8	N	7.51	25.1		1500	
21/03/2017	B45.64	N	6.64	22.7		800	
21/03/2017	B48.30	N	6.86	47.2		500	
21/03/2017	B49.45	N	6.59	71.1		1400	
21/03/2017	B49.67	N	6.78	38.7		800	
21/03/2017	B53.03	N	7.77	26.3		280	
22/03/2017	B42.30	N	6.69	22.4		800	
22/03/2017	B47.14	N	6.67	59.9		600	
22/03/2017	B48.46	N	6.58	16.4		800	
22/03/2017	B49.20	N	7.56	47.2		600	
22/03/2017	B60.58	N	7.8	41.9		230	
22/03/2017	B60.5	N	7.58	81.6		470	
23/03/2017	B42.30	N	6.72	26.7		800	
23/03/2017	B47.96	N	6.66	25.8		500	
23/03/2017	B59.78	N	7.88	51.2		870	
23/03/2017	B59.85	N	6.9	83.4		1000	
23/03/2017	B57.7	N	8.19	43.9		780	

Date	Basin ID	Oil and Grease (visible) (Limit = No visible)	pH (6.5-8.5)	Turbidity (NTU) (Limit <90 NTU)	TSS (mg/L) (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
23/03/2017	B53.9	N	7.73	76.9		1500	
23/03/2017	B53.00	N	7.29	74.6		1300	
23/03/2017	B53.50	N	6.8	66.3		2030	
23/03/2017	B60.85	N	8.13	27.8		440	
24/03/2017	B58.10	N	7.11	37		1020	
24/03/2017	B55.5	N	7.82	71.8		480	
24/03/2017	B55.17B	N	7.63	47.3		370	
24/03/2017	B53.9	N	7.39	67.8		1000	
25/03/2017	B61.25	N	7.11	80.2		850	
25/03/2017	B60.3	N	7.41	56		355	
25/03/2017	B58.6	N	7.29	49.6		700	
25/03/2017	B57.25	N	8	61.3		760	
25/03/2017	B53.00	N	6.81	59.9		1000	
27/03/2017	B60.87	N	6.91	46.9		355	
27/03/2017	B55.8	N	7.29	59.4		1000	Decommissioned - sump
28/03/2017	B55.0	N	6.99	74.8		2000	Decommissioned - sump
31/03/2017	B42.8	N	6.66	37.2		800	

## 5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 13<sup>th</sup> and 29<sup>th</sup> of March 2017 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 or were not the dominant noise source at the nearest residence.

## 6. Vibration Monitoring

No vibration monitoring was undertaken during the month of March 2017.

## 7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from 2<sup>nd</sup> February 2017 to 6<sup>th</sup> March 2017. DDG results are available in Appendix A.

All dust deposition gauges were below the level of concern for Total Insoluble Matter (TIM) and Ash Content (AC) (4g/m<sup>2</sup>.month or increase of 2g/m<sup>2</sup>/month) during the monitoring period, with the exception of DDG5 (located at Gumma

Road). This gauge recorded a level of 25.1g/m<sup>2</sup>.month for Total Insoluble Matter (TIM) and 22.7g/m<sup>2</sup>.month for Ash Content (AC). It is noted that the result is very unusual for the area due to the high amount of rainfall received during the monitoring period (169.4mm from 2<sup>nd</sup> February 2017 to 6<sup>th</sup> March 2017), with minimal construction activities being undertaken in the area, as well as the nearby abutment being hydromulched in October 2015 and a high cover percentage achieved. It is therefore unlikely that the source of the exceedance is due to construction activities. This gauge has had similar issues in the past (very high readings despite minimal activities in the area). Pacifico will investigate installing an additional gauge if the issue continues. Surfactant additives have been, and will continue to be utilised on site in water carts to assist with dust mitigation. Dust mitigation measures including water carts and wetting of quarry material before arrival to site will continue.

## 8. Groundwater Monitoring

ACCIONA (Pacifico) have undertaken groundwater monitoring on 23<sup>rd</sup> of March 2017. Field testing and lab sampling was undertaken. The results from the groundwater monitoring is available in Table 4 of Appendix A.

pH levels noted to be outside of trigger levels at:

4BH037a – Cut 12 (7.26). It is noted that this bore has been relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

Conductivity noted to be outside of trigger levels at:

4BH037a – Fill 15 (10.10mS/cm). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint.

## 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 March 2017. A summary of these approvals is below in Table 4.

**Table 4 – February Out of Hours Works approved under L4.2 (d) Acoustic Investigation (Modelled)**

OOH Request Title	>5dB(A) above background	Approval Date
Asphalt Batch Plant Night Deliveries	N	1/3/2017
Backfill Pergola	N	1/3/2017
Quarry Bridge Steelfixing and Formwork	N	1/3/2017
Installation of Bearing Pads at Floodplain Bridge 1	N	8/3/2017

OOH Request Title	>5dB(A) above background	Approval Date
Installation of Bearing Pads and Planks at Floodplain Bridge 1	N	8/3/2017
Crane Mobilisation Quarry Access Bridge	N	30/3/2017

Other works outside of standard construction hours already approved under section L4.2 (d) of the EPL that took place during March 2017 were:

- Water cart usage over the weekend;
- Running of various pumps and generators;
- Northern Earthworks extended hours in sparsely populated area in the northern zone;
- Nambucca River structures concreting works north of Pier 7 approved in previous months;
- SMZ conditioning through the northern portion of the Project;
- Concreting at Cut 2;
- Wet curing in the pergola at cut 2;
- Washout concrete paver CC05;
- Cut 21 long drainage, subsoil installation, SMZ trimming;
- Old Coast Road North Bridge concreting, formworks, steel fixing;
- Backfilling of Railway Pergola;
- Lower Warrell Creek Bridge deck pours;
- Washing out of tipper trucks;
- Refuelling in designated zones;
- Floodplain Bridge 2 concreting works; and
- Old Coast Road North Bridge concreting works;

## 10. Complaints

### 9.1 Summary of Complaints for the month of March 2017

06/03/2017 – Resident contacted Pacifico by email regarding two project vehicles used private driveway as a turn-around on the same day. Northern Superintendent and environment team counselled both vehicle drivers regarding inappropriate use of private driveways for the project activities. Project Wide reminder was also completed during the Toolbox on the same week.

15/03/2017 – Resident contacted Pacifico by phone regarding rainfall run-off is running into his dam from the alignment. Community attended site for inspection. Resident attended Community Information Session that evening to speak with construction managers and RMS personnel about the situation. Next day current drains were augmented to ensure flow re-directed away from property. Other mitigation measures applied to drains and vegetation. Water quality samples taken, results received with no water quality issues identified. Feed purchased for cattle. Permanent drain construction likely mid-April 2017.

16/03/2017 – Resident contacted Pacifico by phone regarding Rainfall run-off flowing off embankment and from basin onto their property causing a hazard. Northern superintendent inspected site immediately and advised driveway entrance was clean of silt and mud, not in a condition that could cause a hazard. Basin inlet was functioning correctly and concentrated water had not been washing across the road. Water was tested and flocking occurred under the normal process. When the basin met water quality standards it was pumped over the alignment to the south. RMS readvised that the Northern Superintendent would call the resident to close the issue out later on the day of the complaint.

16/03/2017 – Resident contacted Pacifico by email believes project vehicle related damaged to Old Coast Road had caused drainage and run-off issues impacting his property. The location is a natural “sag-point” on Old Coast Road and near a Council water main. For safety reasons Pacifico placed road signage for motorists and then contacted Council to notify of this damage. CM Pacifico reiterated to Council a day later that it is Council’s responsibility to clean culverts and maintain this type of issue. Resident advised of this outcome.

18/03/2017 – Resident contacted Pacifico by email regarding concerned about motorist’s safety on Old Coast Road because of damage he alleges is due to project vehicle related damage and lack of appropriate maintenance. Pacifico placed road signage a day after the complaint was made. Pacifico notified Council the road and culvert repairs and maintenance at this location were Council’s responsibility – it is a natural “sag-point” near Council culverts and water main. Resident was informed. A neighbourly gesture was also completed by AFJV and the nearby Council culvert was cleaned prior to large rainfall event, however, Resident was advised that Council see this as the property owners responsibility.

19/03/2017 – Resident contacted Pacifico by email regarding an ongoing matter requesting for repairs to be done inside property due to material placed by project June 2016. RMS requested Pacifico to place the material, No decision to repair has been made at this time, but options are being investigated and discussed by RMS and Pacifico. Community Team have inspected the site.

24/03/2017 – Resident contacted Pacifico by phone asked that the current syphon not be used as it was moving silt onto the rear of his property. He also asked why the nearby basin had not been emptied in the past eight days after the recent heavy rainfall event. Environmental Manager had inspected the site earlier on the day of the call from the resident. She noted several maintenance items such as the inlet that will be fixed in the next few weeks. The ground was wet after a significant rainfall event, but once safe to access the routine maintenance was carried out and a new syphon installed. Resident admitted to damaging the previous syphon.

At the time of his call the basin had been emptied but a small amount of water remained to ensure silt was not transferred to his property. Resident was called back and advised of this information two days later, after several attempts to contact him. Further issues were then discussed.

29/03/2017 – Resident contacted Pacifico by phone regarding dust. Requested a water truck to suppress dust near Albert Drive as they are currently selling their house and having buyer inspections. Superintendent immediately notified, truck dispatched to the location and dust suppressed.

## 11. Non-Compliance

### 11.1 Summary of Non-compliances

An incident was reported to ACCIONA by the EPA during the monthly ERG meeting on the 7<sup>th</sup> March 2017 in relation to a potential leak in a sediment basin B56.75. The basin was immediately dewatered to watercarts and the walls were shotcreted in an attempt to control the leak. However, after subsequent rainfall, it was noted that the basin was seeping into a nearby drainage line approximately 30m south of the basin. The basin was continuously dewatered to water carts. The catchment area entering the basin was stabilised with soil binder and hydromulch. A letter was provided by the Project Soil Conservationist so the basin could be decommissioned. The EPA have provided approval to decommission the basin in accordance with the EPL conditions. The basin is currently being decommissioned and backfilled. The basin will be replaced with local management area controls.







**Table 2 - Noise Monitoring Results March 2017**

Date	Time	Location	Rec ID	NCA	NML	Activity	Predicted levels for activity	Laeq	LAFMAX	LAFMIN	LAF10	LAF50	LAF90	Principal sources/ operations	Construction noise dominant?	Corrective actions	Notes
13/03/2017	4:35 PM	Albert Drive	74	1	50	Cut	62	52.4	74.6	38.7	53	47.3	42.9	Asphalt plant, excavator	N	NA	Within predicted levels. Dominant noise sources: local traffic, highway, birds
13/03/2017	4:55 PM	Cockburns Lane	16	1	50	Cut	65	46	65	42.3	47.3	45.8	44.2	Abutment works	N	NA	Construction not audible. Dominant noise sources: highway, birds, train
29/03/2017	3:23 PM	Bald Hill Rd	197	3	50	Cut	72	49.9	71	40.8	49.4	44.9	42.9	Excavator, street sweeper	N	NA	Dominant noise sources: birds, local traffic
29/03/2017	5:01 PM	Letitia Rd	406	4	59	Cut	74	57	74.2	48	60.6	53.4	50.7	Excavator, grader	Y	NA	Within predicted levels
29/03/2017	11:43 AM	Mattick Rd	442	6	44	Cut	62	45.2	63.7	36.4	48.3	42.5	39.1	Excavator, scraper, tractor	Y	NA	Within predicted levels
29/03/2017	4:40 AM	Nursery Rd	415	4	59	Cut	53	58.4	75.6	49.2	60.3	54.9	51.8	Trucks, excavator	N	NA	Construction not audible. Dominant noise sources: highway, birds, local traffic
29/03/2017	3:47 PM	Wallace St	148	3	50	Cut	47	60.8	75.6	47.6	64.6	55.1	51	Excavators	N	NA	Construction not audible. Dominant noise sources: highway, local traffic
29/03/2017	4:17 PM	Gumma Rd	383	3	50	Hauling material	60	51.6	66.5	42.5	54	48.4	45.7	Trucks, franna	N	NA	Dominant noise sources: local traffic, highway, crickets

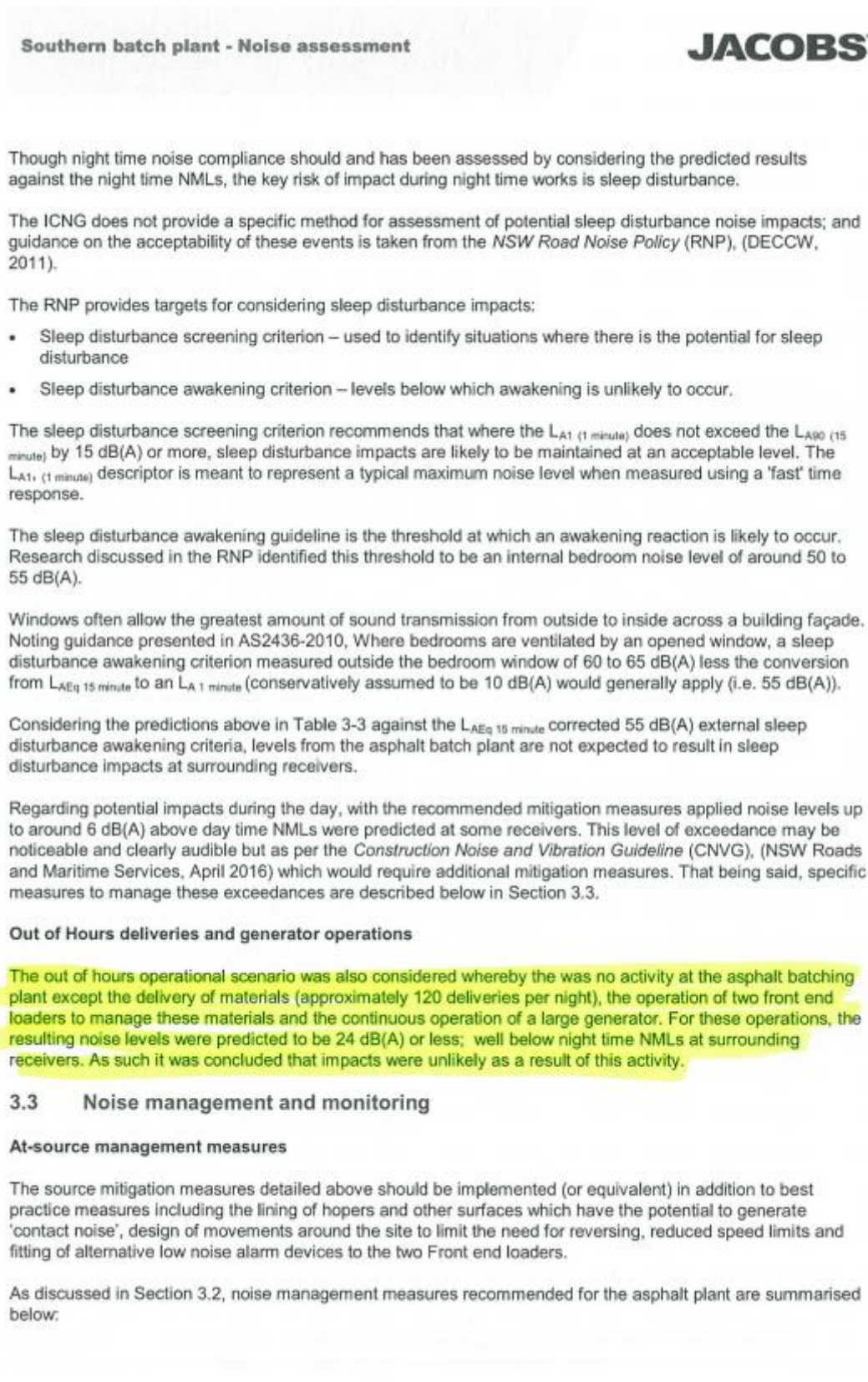
**Table 3 - Dust Monitoring Results February 2017 – March 2017**

Analyte	Time Period	Unit	DDG ID		DDG1	DDG2	DDG3	DDG4	DDG5	DDG6	DDG6N	DDG7	DDG8	DDG9NE	DDG9E	DDG A1	DDG A2	
			Start date of sampling	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017	2/02/2017
			Finish date of sampling	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017	6/03/2017
			Levels of Concern	LOR														
Ash Content	Current Month	g/m <sup>2</sup> .month mg	4 N/A	0.1 1	0.2 4	0.8 16	0.8 16	0.5 9	22.7 428	1.7 32	1.7 32	0.5 9	1 19	0.2 4	0.3 6	----	----	
	Previous Month	g/m <sup>2</sup> .month			0.3	0.6	0.6	0.5	0.5	1.8	1.2	0.5	0.9	0.3	0.2	----	----	
	Change	g/m <sup>2</sup> .month	Increase of 2		-0.1	0.2	0.2	0	22.2	-0.1	0.5	0	0.1	-0.1	0.1	----	----	
Combustible Matter	Current Month	g/m <sup>2</sup> .month mg	N/A N/A	0.1 1	0.4 8	0.5 9	1.1 20	0.4 8	2.4 46	0.6 11	0.4 8	0.2 4	0.6 11	0.2 4	0.2 4	----	----	
	Previous Month	g/m <sup>2</sup> .month			0.1	1.1	1	0.7	0.7	3.5	1.8	1	1.4	0.6	0.5	----	----	
Total Insoluble Matter (TIM)	Current Month	g/m <sup>2</sup> .month mg	4 N/A	0.1 1	0.6 12	1.3 25	1.9 36	0.9 17	25.1 474	2.3 43	2.1 40	0.7 13	1.6 30	0.4 8	0.5 10	----	----	
	Change	g/m <sup>2</sup> .month	Increase of 2	0.1	-0.4	0.2	0.9	0.2	24.4	-1.2	0.3	-0.3	0.2	-0.2	0	----	----	
Arsenic	Current Month	mg/L		0.001	----	----	----	----	----	----	----	----	----	----	----	<0.001	<0.001	
Comments													Overtopped					

Table 4 – Groundwater Monitoring Results March 2017

Location	Units	Groundwater Investigation Levels (GILs) from Interpretive Report	4BH010		4BH021		4BH022c		4BH025		4BH037a		4BH038		4BH057		4BH058c								
Cut/Fill			Cut 6 - West (DS)		Cut 11 - West (DS)		Cut 11 - East (US)		Cut 12 - West (DS)		Fill 15 - West		Fill 15 - East		Cut 17 - West (DS)		Cut 17 - East (US)								
Date of Sampling			23/03/2017		23/03/2017		23/03/2017		23/03/2017		23/03/2017		23/03/2017		23/03/2017		23/03/2017								
			Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results	Trigger levels 80 / 20%ile	Results							
Comments												Ants in casing						DRY							
<b>Field Physical data</b>																									
Depth to standing water level from TOC	m	-	16.802	16.50	8.7420	5.47	16.0140	1.15	8.4500	5.47	1.2000	0.58	1.3520	0.51	17.4120	-	13.8440	15.64							
pH	pH	-	6.264	4.736	6.09	6.7800	5.8100	6.36	7.0900	5.01	6.7780	6.2080	6.36	6.5080	5.9220	7.26	7.3040	6.7680	7.00	6.9800	5.2400	-	6.3960	5.5620	7.25
Conductivity	mS/cm	-	3630.000	0.27	111.300	0.128	231.000	3.40	0.342	0.128	5.550	10.10	8366.000	11.3	121.100	-	132.660	0.210							
Temperature	C	-	22.4420	22.39	22.3600	22.64	21.1500	25.10	22.6040	22.64	25.9820	22.82	22.5600	24.82	22.8200	-	23.1940	22.44							
		Exceedance of trigger level																							

Figure 1 – Acoustic Investigation (Modelling) Results March 2017



# SoundAdvice

Noise Prediction and Management Tool

Pacific Highway  
Warrell Creek  
Chainage

## Noise Impact Assessment Report

### Report Details

Report Date: 1/03/2017 Report Reference: Backfill Pergola  
Company: Pacific Prepared by: N.Rutherford

### Proposed Works

Date of Proposed Works: 06/03-21/04 Time of Proposed Works: 6pm-6am Work Duration:  
Description of Works

### Noise Prediction Details

Expected Meteorological Conditions  
Wind Speed: Strong (16 - 21) Wind Direction: South West  
Cloud Cover: Mostly Clear Temperature (Degrees C): 20 - 30 \* C  
Relative Humidity (%): 65 - 75% Time of Day: Night (7pm-6am M-F, 4

### Proposed Equipment

Location	Number of Plant	Equipment	Usage Factor	Total Sound Power
Location 5	1	Water Cart	0.75	106
Location 5	1	Isteer 850kg-Bobcat S185 Skid Steer Loader-Moving	0.75	112
Location 5	1	ad foot roller Vibratory 10T - 25T -Moving with alar	0.5	108
Location 5	2	9t Dumper	0.5	100
Location 5	1	Trench Rammer	0.5	105
Location 5	3	Daymakers (Tower lights)	1	93
Location 5	1	Excavator <10T - loading	0.5	96

### Noise Predictions

Receiver ID	Criteria	Predicted LAeq	Exceedance / Risk	Magnitude - dB(A)
1-760 UPPER WARRELL CREEK ROAD, CONGARINNI	40.0	3.4	No / Type 1	
3-800 UPPER WARRELL CREEK ROAD, CONGARINNI	40.0	3.5	No / Type 1	
4-4201 PACIFIC HIGHWAY, EUNGAI CREEK NSW 24	40.0	11.3	No / Type 1	
5-464 BROWNS CROSSING ROAD, WARRELL CREEK	40.0	11.3	No / Type 1	
6-4227 PACIFIC HIGHWAY, CONGARINNI NSW 244	40.0	12.5	No / Type 1	
10-4317 PACIFIC HIGHWAY, WARRELL CREEK NSW	40.0	17.2	No / Type 1	
11-4263 PACIFIC HIGHWAY, CONGARINNI NSW 244	40.0	18.8	No / Type 1	
12-4371 PACIFIC HIGHWAY, WARRELL CREEK NSW	40.0	12.5	No / Type 1	
16-DP755562, COCKBURNS LANE, WARRELL CREEK	40.0	31.6	No / Type 1	
19-73 COCKBURNS LANE, WARRELL CREEK NSW 24	40.0	25.4	No / Type 1	
22-4411 PACIFIC HIGHWAY, WARRELL CREEK NSW	40.0	9.7	No / Type 1	
39-4476 PACIFIC HIGHWAY, WARRELL CREEK NSW	40.0	5.6	No / Type 1	
45-4390 PACIFIC HIGHWAY, WARRELL CREEK NSW	40.0	10.4	No / Type 1	
51-196 ALBERT DRIVE, WARRELL CREEK NSW 2447	40.0	3.7	No / Type 1	
55-4478 PACIFIC HIGHWAY, WARRELL CREEK NSW	40.0	5.9	No / Type 1	
59-46 ROSEWOOD ROAD, WARRELL CREEK NSW 24	40.0	4.6	No / Type 1	
60-180 ROSEWOOD ROAD, WARRELL CREEK NSW 2	36.0	16.9	No / Type 1	
64-69 ROSEWOOD ROAD, WARRELL CREEK NSW 24	36.0	3.1	No / Type 1	
66-174 ROSEWOOD ROAD, WARRELL CREEK NSW 2	36.0	9.8	No / Type 1	
68-91 ROSEWOOD ROAD, WARRELL CREEK NSW 24	36.0	20.6	No / Type 1	

#### Risk:

- Type 1 - Complies with assessment criteria
- Type 2 - Low Risk - 0 to 2 dB(A) above assessment criteria
- Type 3 - Moderate Risk - 2dB(A) to 5dB(A) above assessment criteria
- Type 4 - High Risk - More than 5dB(A) above assessment criteria

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Position: \_\_\_\_\_  
 Required Mitigation Measures: \_\_\_\_\_

# SoundAdvice

Noise Prediction and Management Tool

P:  
W:  
C:

## Noise Impact Assessment Report

### Report Details

Report Date: 1/03/2017 Report Reference: Quarry Bridge farmwar  
 Company: Pacific Prepared by: M.Rutherford

### Proposed Works

Date of Proposed Works: 04/03-26/3 Time of Proposed Works: 7am-6pm Work Duration:  
 Description of Works:

### Noise Prediction Details

Expected Meteorological Conditions  
 Wind Speed: Medium (10 - 16) Wind Direction: South West  
 Cloud Cover: Mostly Clear Temperature (Degrees C): 10 - 20 ° C  
 Relative Humidity (%): 75 - 85% Time of Day: Night (7pm-6am M-F, 4

### Proposed Equipment

Location	Number of Plant	Equipment	Usage Factor	Total Sound Power
Location 13	1	Compressor	0.75	99
Location 13	1	Pressure Cleaner	0.75	99
Location 13	3	LV's	<25%	75
Location 13	1	Franss - 25T	0.5	100
Location 13	1	Small Generator	0.75	93
Location 13	1	Welding machine (no sub arc welder)	0.5	98
Location 13	2	Grinder (4-7 inch)	0.75	107
Location 13	1	Handtools - Electric	0.75	93

### Noise Predictions

Receiver ID	Criteria	Predicted LAeq	Exceedance / Risk	Magnitude - dB(A)
--273 UPPER WARRELL CREEK ROAD, CONGARINNI	40.0	2.6	No / Type 1	
74-73 ALBERT DRIVE, WARRELL CREEK NSW 2447	40.0	8.4	No / Type 1	
81-40 ALBERT DRIVE, DONNELLYVILLE NSW 2447	40.0	16.3	No / Type 1	
89-33 O'DELLS ROAD, DONNELLYVILLE NSW 2447	40.0	2.0	No / Type 1	
93-8 MAIN STREET, DONNELLYVILLE NSW 2447	40.0	6.1	No / Type 1	
97-4723 PACIFIC HIGHWAY, DONNELLYVILLE NSW :	40.0	12.5	No / Type 1	
100-17 ALBERT DRIVE, DONNELLYVILLE NSW 2447	40.0	7.5	No / Type 1	
101-OP1072289, HENRYS LANE, WARRELL CREEK N:	36.0	1.7	No / Type 1	
103-13 ALBERT DRIVE, DONNELLYVILLE NSW 2447	40.0	7.5	No / Type 1	
103-4 SCOTTS HEAD ROAD, WAY WAY NSW 2447	40.0	26.3	No / Type 1	
115-35 MAIN STREET, DONNELLYVILLE NSW 2447	40.0	6.6	No / Type 1	
151-72 SCOTTS HEAD ROAD, WAY WAY NSW 2447	40.0	17.8	No / Type 1	
112-4 SCOTTS HEAD ROAD, WAY WAY NSW 2447	40.0	29.4	No / Type 1	

Risk:  
 Type 1 - Complies with assessment criteria  
 Type 2 - Low Risk - 0 to 2 dB(A) above assessment criteria  
 Type 3 - Moderate Risk - 2dB(A) to 5dB(A) above assessment criteria  
 Type 4 - High Risk - More than 5dB(A) above assessment criteria  
 Notes:

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Position: \_\_\_\_\_  
 Required Mitigation Measures:

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Noise Prediction and Management Tool

## Noise Impact Assessment Report

### Report Details

Report Date: 7/03/2017 Report Reference: Floodplain Bridge 1 - Cc  
 Company: Pacifico Prepared by: N.Rutherford

### Proposed Works

Date of Proposed Works: 07/03/17 - 09/03/17 Time of Proposed Works: 6pm-8pm, 8am-7am Work Duration:  
 Description of Works: Concrete prep work for grout pads

### Noise Prediction Details

Expected Meteorological Conditions  
 Wind Speed: Medium (10 - 16) Wind Direction: South West  
 Cloud Cover: Mostly Clear Temperature (Degrees C): 10 - 20 ° C  
 Relative Humidity (%): 75 - 85% Time of Day: Night (7pm-6am M-F, 4

### Proposed Equipment

Location	Number of Plant	Equipment	Usage Factor	Total Sound Power
Location 7	2	Drills	0.5	107
Location 7	2	Compressor	0.75	92
Location 7	2	Scabbler	0.5	96

### Noise Predictions

Receiver ID	Criteria	Predicted LAeq	Exceedance / Risk	Magnitude - dB(A)
117-15 REID STREET, MACKSVILLE NSW 2447	39.0	3.6	No / Type 1	
118-241 WALLACE STREET, MACKSVILLE NSW 2447	39.0	2.2	No / Type 1	
148-1 REID STREET, MACKSVILLE NSW 2447	39.0	2.4	No / Type 1	
155-26 HARRIMANS LANE, MACKSVILLE NSW 2447	39.0	4.5	No / Type 1	
156-220 WALLACE STREET, MACKSVILLE NSW 2447	39.0	6.4	No / Type 1	
175-34 HARRIMANS LANE, NSW	39.0	6.4	No / Type 1	
180-58 HARRIMANS LANE, MACKSVILLE NSW 2447	39.0	11.6	No / Type 1	
184-21 WEDGEWOOD DRIVE, MACKSVILLE NSW 24	39.0	15.0	No / Type 1	
186-41 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	16.0	No / Type 1	
192-38 KERR DRIVE, MACKSVILLE NSW 2447	39.0	1.7	No / Type 1	
195-WEDGEWOOD DRIVE, MACKSVILLE NSW 2447	39.0	23.9	No / Type 1	
197-54 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	10.2	No / Type 1	
204-46 WALL STREET, MACKSVILLE NSW 2447	39.0	11.2	No / Type 1	
261-13 CONNORS CRESCENT, MACKSVILLE NSW 24	39.0	2.7	No / Type 1	
266-2 AINSWORTH CLOSE, MACKSVILLE NSW 2447	39.0	5.1	No / Type 1	
294-105 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	12.0	No / Type 1	
302-98 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	3.9	No / Type 1	
342-228 SCOTTS HEAD ROAD, WAY WAY NSW 244	36.0	4.3	No / Type 1	
353-117 BALD HILL ROAD, MACKSVILLE NSW 2447	36.0	20.8	No / Type 1	
356-122 BALD HILL ROAD, MACKSVILLE NSW 2447	36.0	8.0	No / Type 1	

#### Risk:

- Type 1 - Complies with assessment criteria
  - Type 2 - Low Risk - 0 to 2 dB(A) above assessment criteria
  - Type 3 - Moderate Risk - 2dB(A) to 5dB(A) above assessment criteria
  - Type 4 - High Risk - More than 5dB(A) above assessment criteria
- Notes:

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Position: \_\_\_\_\_

Required Mitigation Measures:

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Noise Prediction and Management Tool

## Noise Impact Assessment Report

### Report Details

Report Date: 8/03/2017  
 Company: Pacifico  
 Report Reference: Floodplain Bridge 1 - In N.Rutherford  
 Prepared By:

### Proposed Works

Date of Proposed Works: 09/03/17-17/03/17  
 Description of Works:  
 Time of Proposed Works: 6pm-7pm M-F, 8am-7pm Sat, 8am  
 Work Duration:

### Noise Prediction Details

#### Expected Meteorological Conditions

Wind Speed: Strong (16 - 21)  
 Cloud Cover: Mostly Clear  
 Relative Humidity (%): 65 - 75%  
 Wind Direction: South  
 Temperature (Degrees C): 20 - 30 °C  
 Time of Day: Night (7pm-6am M-F, 4

### Proposed Equipment

Location	Number of Plant	Equipment	Usage Factor	Total Sound Power
Location 7	2	Drills	0.5	107
Location 7	1	Mobile Crane - 400t	0.75	106
Location 7	2	Prime Mover	0.5	110
Location 7	1	Grinder (4-7 Inch)	0.5	105
Location 7	3	LV	<25%	75

### Noise Predictions

Receiver ID	Criteria	Predicted LAeq	Exceedance / Risk	Magnitude - dB(A)
117-15 REID STREET, MACKSVILLE NSW 2447	39.0	7.6	No / Type 1	
118-241 WALLACE STREET, MACKSVILLE NSW 2447	39.0	5.2	No / Type 1	
148-1 REID STREET, MACKSVILLE NSW 2447	39.0	5.3	No / Type 1	
155-26 HARRIMANS LANE, MACKSVILLE NSW 2447	39.0	7.6	No / Type 1	
156-220 WALLACE STREET, MACKSVILLE NSW 2447	39.0	12.3	No / Type 1	
175-34 HARRIMANS LANE, NSW	39.0	10.1	No / Type 1	
180-58 HARRIMANS LANE, MACKSVILLE NSW 2447	39.0	16.0	No / Type 1	
184-21 WEDGEWOOD DRIVE, MACKSVILLE NSW 24	39.0	21.6	No / Type 1	
186-41 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	20.6	No / Type 1	
192-38 KERR DRIVE, MACKSVILLE NSW 2447	39.0	2.9	No / Type 1	
195-WEDGEWOOD DRIVE, MACKSVILLE NSW 2447	39.0	32.1	No / Type 1	
197-54 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	14.5	No / Type 1	
204-46 WALL STREET, MACKSVILLE NSW 2447	39.0	16.3	No / Type 1	
261-13 CONNORS CRESCENT, MACKSVILLE NSW 24	39.0	3.9	No / Type 1	
266-2 AINSWORTH CLOSE, MACKSVILLE NSW 2447	39.0	7.1	No / Type 1	
294-105 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	14.7	No / Type 1	
302-98 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	5.5	No / Type 1	
342-228 SCOTTS HEAD ROAD, WAY WAY NSW 244	36.0	6.1	No / Type 1	
353-117 BALD HILL ROAD, MACKSVILLE NSW 2447	36.0	21.5	No / Type 1	
356-122 BALD HILL ROAD, MACKSVILLE NSW 2447	36.0	10.4	No / Type 1	

#### Risk:

- Type 1 - Complies with assessment criteria
- Type 2 - Low risk - 0 to 2 dB(A) above assessment criteria
- Type 3 - Moderate risk - 2dB(A) to 5dB(A) above assessment criteria
- Type 4 - High Risk - More than 5dB(A) above assessment criteria

#### Notes:

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Position: \_\_\_\_\_

#### Required Mitigation Measures:



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## Noise Impact Assessment Report

### Report Details

Report Date: 8/03/2017 Report Reference: Floodplain Bridge 1 - In  
 Company: Pacifico Prepared by: N.Rutherford

### Proposed Works

Date of Proposed Works: 09/03/17-17/03/17 Time of Proposed Works: 6pm-7pm M-F, 8am-7pm Sat, 8am Work Duration:  
 Description of Works:

### Noise Prediction Details

Expected Meteorological Conditions  
 Wind Speed: Strong (16 - 21) Wind Direction: South  
 Cloud Cover: Mostly Clear Temperature (Degree C): 20 - 30 °C  
 Relative Humidity (%): 65 - 75% Time of Day: Night (7pm-6am M-F, 4

### Proposed Equipment

Location	Number of Plant	Equipment	Usage Factor	Total Sound Power
Location 7	2	Drills	0.5	107
Location 7	1	Mobile Crane - 400t	0.75	105
Location 7	2	Prime Mover	0.5	110
Location 7	1	Grinder (4-7 inch)	0.5	105
Location 7	3	LV	<25%	75

### Noise Predictions

Receiver ID	Criteria	Predicted L <sub>req</sub>	Exceedance / Risk	Magnitude - dB(A)
117-15 REID STREET, MACKSVILLE NSW 2447	39.0	7.6	No / Type 1	
118-241 WALLACE STREET, MACKSVILLE NSW 2447	39.0	5.2	No / Type 1	
148-1 REID STREET, MACKSVILLE NSW 2447	39.0	5.3	No / Type 1	
155-26 HARRIMANS LANE, MACKSVILLE NSW 2447	39.0	7.6	No / Type 1	
156-220 WALLACE STREET, MACKSVILLE NSW 2447	39.0	12.3	No / Type 1	
175-34 HARRIMANS LANE, NSW	39.0	10.1	No / Type 1	
180-58 HARRIMANS LANE, MACKSVILLE NSW 2447	39.0	16.0	No / Type 1	
184-21 WEDGEWOOD DRIVE, MACKSVILLE NSW 24	39.0	21.6	No / Type 1	
186-41 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	20.6	No / Type 1	
192-38 KERR DRIVE, MACKSVILLE NSW 2447	39.0	2.9	No / Type 1	
195-WEDGEWOOD DRIVE, MACKSVILLE NSW 2447	39.0	32.1	No / Type 1	
197-54 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	14.5	No / Type 1	
204-46 WALL STREET, MACKSVILLE NSW 2447	39.0	16.3	No / Type 1	
261-13 CONNORS CRESCENT, MACKSVILLE NSW 24	39.0	3.9	No / Type 1	
266-2 AINSWORTH CLOSE, MACKSVILLE NSW 2447	39.0	7.1	No / Type 1	
294-105 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	14.7	No / Type 1	
302-98 BALD HILL ROAD, MACKSVILLE NSW 2447	39.0	5.5	No / Type 1	
342-228 SCOTTS HEAD ROAD, WAY WAY NSW 2447	36.0	0.1	No / Type 1	
353-117 BALD HILL ROAD, MACKSVILLE NSW 2447	36.0	21.5	No / Type 1	
356-122 BALD HILL ROAD, MACKSVILLE NSW 2447	36.0	10.4	No / Type 1	

#### Risk:

- Type 1 - Complies with assessment criteria
- Type 2 - Low Risk - 0 to 2 dB(A) above assessment criteria
- Type 3 - Moderate Risk - 2dB(A) to 5dB(A) above assessment criteria
- Type 4 - High Risk - More than 5dB(A) above assessment criteria

#### Notes:

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Position: \_\_\_\_\_

Required Mitigation Measures: