



# Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

## ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

■ July 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 July 2017 included the following:

- Bitumen sealing work
- Earthworks including material resizing
- Continuing bridge works including deck unit installation and deck concrete pours
- Continuing works in the Pergola area near Upper Warrell Creek
- Continuing long 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
- Installation of Erosion and Sediment Controls
- Pavement (Asphalt and Concrete)
- Line marking
- Decommissioning of the Precast Facility
- Concrete Lined Drains
- Verge / Median Placement
- Operation of concrete and asphalt batch plants
- Removal of rock platforms underneath Nambucca Bridge
- Decommissioning of the Precast Facility
- Continue removing rock platforms at Nambucca River
- Temporary waterway crossing removal

Works scheduled for next month include

- Earthworks including material resizing
- Continuing bridge works including deck unit installation and deck concrete pours
- Continuing long drainage works
- Scour rock installation
- Bitumen sealing work
- Batter stabilisation using hydromulch (permanent design seed mix)
- Topsoil Amelioration and Blending
- Concrete Lined Drains
- Basin Decommissioning
- Basin Maintenance including dewatering and desilting
- Permanent Basin Fit-out
- Decommissioning of the Precast Facility
- Crushing material
- Installation of Erosion and Sediment Controls
- Pavement (Asphalt and Concrete)
- Verge / Median Placement
- Asphalt milling and removal of highway diversion under Nambucca Bridge
- Temporary waterway crossing removal
- Topsoil placement (Medians)

## 1.2 Consultation Activities

The project’s consultation activities during July 2017 included the following:

**Table 1 – Consultation Activities**

Groups	Date	Key Topics
Environmental Review Group	Tuesday 11 July	Project update, environmental monitoring, upcoming out of hours, site inspection
Toolboxes	Wednesday each week	Environmental and community issues communicated to the workforce.
Nambucca Shire Council	Wednesday 12 July	Local road maintenance and repairs, traffic matters,
Community Information Sessions	Wednesday 26 July (Nambucca Heads) & Thursday 27 July (Warrell Creek)	Directional signage consultation, and other general construction topics
North Facing Ramps group	Monday 17 July	Matters pertaining to ongoing works nearby

### Other Consultation Activities:

- Roll out of directional signage consultation:
  - o Static displays at Macksville and Nambucca libraries, Scotts Head Bowling Club, Nambucca Plaza Shopping Centre, and Bowraville Community Technology Centre
  - o Drop-in sessions at Macksville Foodwork's and Nambucca Heads Woolworths
  - o Formal presentation at Bowraville Chamber of Commerce
- Final notification to email and text database announcing final night time girder movement for the project
- Distributed quarterly Port Macquarie to Coffs Harbour highway upgrade update to email database
- Notification to Letitia Close residents about night time saw cutting at the roundabout
- Email notification about, and invitation to attend directional signage displays and events
- Invitation to key stakeholder groups to have the project team deliver presentation on directional signage at their group meetings
- Three agreements sought for OOH Pacific Highway line-marking activity – only two obtained, activity undertaken under EPL Condition L4.5
- Ongoing notifications to various stakeholders impacted by paving and saw-cutting activities north of Mattick Road, and near Bald Hill works.

### 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 – 15<sup>th</sup> August;
- Conduct next North Facing Ramps tri-weekly roadside community meetings scheduled for Mondays 7<sup>th</sup> August and 28<sup>th</sup> August;
- Letterbox drop to within 200m of alignment, the approved June 2017 to August 2017 construction quarterly Project Update;
- Distribute notification for Rosewood Road bridge opening to traffic;
- Seek global agreements with potentially impacted residents for all anticipated Out of Hours construction works through until Christmas 2017;
- Continue to consult stakeholders impacted by visual mounds along the entire alignment.

## 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 Pacifico**

Month	Total monthly rainfall	Location
1/07/2017 – 31/07/2017	8.2mm	Northern Compound
1/07/2017 – 31/07/2017	8.6mm	Albert Drive Compound

The site experienced a total of seven rain days throughout the month of July 2017.

During July, rainfall received on site was lower than the July monthly average of 77.4mm. 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 July 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

**July 2017**

Date	Time	TOTAL Rain Gauge (mm)
1/07/2017	9:00:00	0
2/07/2017	9:00:00	0.2
3/07/2017	9:00:00	0
4/07/2017	9:00:00	0.4
5/07/2017	9:00:00	0.2
6/07/2017	9:00:00	0
7/07/2017	9:00:00	0.2
8/07/2017	9:00:00	0
9/07/2017	9:00:00	0
10/07/2017	9:00:00	0
11/07/2017	9:00:00	0
12/07/2017	9:00:00	0
13/07/2017	9:00:00	0
14/07/2017	9:00:00	0
15/07/2017	9:00:00	0
16/07/2017	9:00:00	7.2
17/07/2017	9:00:00	0.2
18/07/2017	9:00:00	0
19/07/2017	9:00:00	0.2
20/07/2017	9:00:00	0
21/07/2017	9:00:00	0
22/07/2017	9:00:00	0
23/07/2017	9:00:00	0
24/07/2017	9:00:00	0
25/07/2017	9:00:00	0
26/07/2017	9:00:00	0
27/07/2017	9:00:00	0
28/07/2017	9:00:00	0
29/07/2017	9:00:00	0
30/07/2017	9:00:00	0
31/07/2017	9:00:00	0

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

July 2017

Date	Time	TOTAL Rain Gauge (mm)
1/07/2017	9:00:00	0
2/07/2017	9:00:00	0
3/07/2017	9:00:00	0.2
4/07/2017	9:00:00	0
5/07/2017	9:00:00	0
6/07/2017	9:00:00	0
7/07/2017	9:00:00	0
8/07/2017	9:00:00	0.2
9/07/2017	9:00:00	0
10/07/2017	9:00:00	0
11/07/2017	9:00:00	0
12/07/2017	9:00:00	0
13/07/2017	9:00:00	0
14/07/2017	9:00:00	0
15/07/2017	9:00:00	0
16/07/2017	9:00:00	7
17/07/2017	9:00:00	0.4
18/07/2017	9:00:00	0
19/07/2017	9:00:00	0
20/07/2017	9:00:00	0
21/07/2017	9:00:00	0
22/07/2017	9:00:00	0
23/07/2017	9:00:00	0
24/07/2017	9:00:00	0.2
25/07/2017	9:00:00	0
26/07/2017	9:00:00	0
27/07/2017	9:00:00	0
28/07/2017	9:00:00	0
29/07/2017	9:00:00	0
30/07/2017	9:00:00	0.2
31/07/2017	9:00:00	0



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

<b>July 2017</b>			
Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/07/2017	9.5	17.6	0
2/07/2017	11.4	20	0
3/07/2017	10.7	20.7	0
4/07/2017	14.4	22.3	0
5/07/2017	15.2	21.8	0
6/07/2017	12.6		0
7/07/2017			0
8/07/2017		20.8	0
9/07/2017	11	20.7	0
10/07/2017	11	19.1	0
11/07/2017	10.9	20	0
12/07/2017	11	18	0
13/07/2017	10.7	20	11.8
14/07/2017	12.8	20.9	0
15/07/2017		17.2	0
16/07/2017	12	20.1	6.4
17/07/2017	10.2	21.5	0
18/07/2017	14.1	24	0
19/07/2017	12.5	17.8	0
20/07/2017	12.1	20.3	0
21/07/2017	9.1	18.5	0
22/07/2017	10.9	21.1	0
23/07/2017	12.8	22.1	0
24/07/2017	14		0
25/07/2017		23.5	0
26/07/2017	13.1	25.5	0
27/07/2017	12.2	20.4	0
28/07/2017	13.9	22.7	0
29/07/2017	10.5	21.2	0
30/07/2017	12.9	22.9	0
31/07/2017	16.1	22.5	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 12<sup>th</sup> July 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 recorded low pH levels downstream (6.20 recorded, 6.4 trigger), upstream was within trigger levels (6.54 recorded, 6.48 trigger). It is noted that downstream is only marginally below trigger levels.

Nambucca River recorded elevated levels upstream (7.93) and downstream (7.96). It is noted that trigger levels are 7.00, with any value outside of this being outside of trigger levels. It is also noted that these levels are within ANZECC criteria (6.5-8.0).

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

Upper Warrell Creek downstream (0.87mg/L recorded, 2.6mg/L trigger level). A potential cause for the low levels is decaying vegetation within the waterway and below average rainfall for the area (8.6mm received at Southern Compound in July, 77.4mm average).

Nambucca River upstream (4.07mg/L recorded, trigger level 7.4mg/L) and downstream (4.27mg/L recorded, trigger level 7.4mg/L). It is noted that levels increased between upstream to downstream sites and therefore are unlikely to be due to construction impacts. A potential cause for the lower levels is decaying vegetation within the waterway and below average rainfall for the area.

#### Metals noted to be above trigger levels at:

Stony Creek recorded elevated levels of manganese downstream (0.079mg/L recorded, 0.052mg/L trigger level). It is noted that these levels are well within ANZECC criteria (1.9mg/L). Results are consistent with previous dry periods e.g. January 2017 manganese level at Stony Creek downstream was 0.127mg/L.

Lower Warrell Creek recorded elevated levels of zinc upstream (0.039mg/L recorded, 0.006mg/L trigger) and downstream (0.034mg/L recorded, 0.006mg/L trigger). It is noted that levels decreased from upstream to downstream sites and are unlikely to be attributed to construction impacts. Gumma Wetlands recorded elevated levels of zinc upstream (0.021mg/L recorded, 0.005mg/L trigger) and downstream (0.024mg/L recorded, 0.005mg/L trigger) and nickel downstream (0.004mg/L recorded, 0.001mg/L trigger). It is noted that levels for zinc decreased from upstream to downstream sites and are unlikely to be as a result of construction impacts. It is also noted that nickel levels were within ANZECC criteria (0.011mg/L). Nambucca River recorded elevated levels of zinc upstream and downstream (0.009mg/L upstream, 0.007mg/L downstream, 0.005mg/L trigger). It is noted that levels decreased from upstream to downstream and were unlikely to be resulting from construction impacts.

Nutrients noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of nitrate upstream (0.08mg/L recorded, 0.04mg/L trigger) and downstream (0.2mg/L downstream, 0.03mg/L trigger). It is noted that these levels are well within ANZECC criteria (0.7mg/L). All controls were verified to be in place for the site.

Stony Creek recorded highly elevated levels of nitrate and nitrogen upstream (1100mg/L nitrogen recorded, 0.3mg/L trigger, 999mg/L nitrate, 0.03mg/L trigger). Downstream nitrate was also elevated (0.08mg/L recorded, 0.03mg/L trigger) while downstream nitrogen was within trigger values (0.4mg/L recorded, 0.41mg/L trigger). These levels decreased significantly from upstream to downstream sites and are not likely to be caused from construction impacts. A potential cause for the elevated levels is sampling error with agricultural matter being within the sample collected during the monitoring event. Additional testing was undertaken at the site on the 1<sup>st</sup> August 2017, nitrogen levels were below trigger levels (0.2mg/L recorded, 0.3mg/L trigger), nitrate levels were above trigger levels (0.11mg/L recorded, 0.03mg/L trigger), but are within results previously recorded at the site during dry events (e.g. 0.17mg/L March 2017).

Lower Warrell Creek recorded elevated levels of nitrate upstream and downstream (0.1mg/L recorded upstream, 0.07mg/L recorded downstream, 0.04mg/L trigger). It is noted that these levels decreased from upstream to downstream sites and are unlikely to be a result of construction impacts. It is also noted that levels are well within ANZECC criteria (0.7mg/L). All controls were verified to be in place for the site. A potential cause may be due to decaying vegetation within the waterway or nearby agricultural land, as well as the below average rainfall for the area. The results are also consistent with previous results for the site.

Gumma Wetlands recorded slightly elevated levels of ammonia downstream (0.05mg/L recorded, 0.04mg/L trigger). It is noted that these levels are well within ANZECC criteria (0.9mg/L). A potential cause for the elevated levels is decaying matter within the waterway, or nearby agricultural land. Results are consistent with previous dry event results for the site.

Nambucca River recorded elevated levels of ammonia upstream and downstream (0.06mg/L upstream, 0.08mg/L downstream, 0.03mg/L trigger). It is noted that levels are consistent between upstream and downstream sites and are therefore unlikely to be attributable to construction impacts.

## 4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins after rainfall events on the 28<sup>th</sup>-30<sup>th</sup> June 2017, 7<sup>th</sup> and 16<sup>th</sup> July 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) ( $R^2 = 0.4941$ ,  $p < 0.00001$ ,  $n=227$ ). The regression equation for the analytical results calculates a turbidity (NTU) value of

120.716 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 84.50, 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 July 2017**

Date	Basin ID	Oil and Grease (visible) (Limit = No visible)	pH (6.5-8.5)	Turbidity (NTU) (Limit <85 NTU)	TSS (mg/L) (Limit <50mg/L)	Approx Volume Discharged (kL)	Comments
1/07/2017	B53.03	N	7.1	15	<5	200	
1/07/2017	B53.90	N	7.5	33.1		200	
1/07/2017	B45.64	N	7.29	28.9		50	
3/07/2017	B58.10	N	7.75	37.8	18	600	
3/07/2017	B45.64	N	7.07	19.8		20	
4/07/2017	B47.96	N	6.63	38.4		650	
19/07/2017	B49.45	N	7.09	39.1		600	
28/07/2017	B53.03	N	8.25	33.5		50	Released for desilting

## 5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 11<sup>th</sup>, 13<sup>th</sup> and 17<sup>th</sup> of July 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

Vibration monitoring was undertaken during the month of July 2017. Vibration monitoring was undertaken on the 14<sup>th</sup> July 2017 at Nursery Road after concerns were raised by a resident regarding vibration from road traffic at certain parts of the road. Results were within 5mm/s vibration criteria (1.972mm/s peak value). Vibration monitoring was also undertaken on the 14<sup>th</sup> July 2017 at Old Coast Road in response to concerns raised by a resident nearby to vibratory rolling activities, results were within 5mm/s criteria (1.984mm/s peak value).

## 7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from 1<sup>st</sup> June to 3<sup>rd</sup> July 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.

Dust mitigation measures including water carts and wetting of quarry material before arrival to site will continue.

## 8. Groundwater Monitoring

ACCIONA (Pacifco) undertook groundwater monitoring on the 20<sup>th</sup> of July 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:

Cut 11 bores recorded low pH levels at both upgradient bore 4BH022c (5.51 recorded, 5.93 trigger) and downgradient bore (5.77 recorded, 5.81 trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that pH levels increased from upgradient to downgradient at the bore sites.

Cut 12 downgradient bore recorded low pH at bore 4BH025 (5.64 recorded, trigger 6.21). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also 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.

Fill 15 bores recorded low pH at 4BH037a (7.19 recorded, 6.51 trigger) and elevated pH at 4BH038 (6.68 recorded, 6.77 trigger). It is noted that 4BH037a 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 west of 9.40mS/cm (trigger value 5.55mS/cm). 4BH038 Fill 15 east recorded 1.10mS/cm. It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

### Water depth noted to be outside of trigger levels at:

4BH058c – Cut 17 downgradient bore recorded 14.25m (trigger value of 13.84m). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location. The upgradient bore 4BH057 was dry with no water depth recorded.

### Total Dissolved Solids (TDS) noted to be above trigger levels at:

4BH025 – Cut 12 downgradient bore recorded slightly elevated levels of TDS (0.20g/L recorded, 0.1326g/L trigger level). Bulk earthworks have been

completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a – Fill 15 west bore recorded elevated TDS (6.09g/L recorded, 0.1326g/L trigger level). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location. This is consistent with previous results for the bore e.g. 6.20g/L in April 2017, 5.74g/L in January 2017.

Metals noted to be outside of trigger levels at:

4BH010 – Cut 6 downgradient bore recorded elevated levels of manganese (0.2930mg/L recorded, 0.2258mg/L trigger) and iron (37.3mg/L recorded, 6.58mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor.

4BH022c – Cut 11 upgradient bore recorded elevated levels of aluminium (0.410mg/L recorded, 0.122mg/L trigger), cadmium (0.0096mg/L recorded, 0.0001mg/L trigger), copper (0.008mg/L recorded, 0.003mg/L trigger), manganese (2.38mg/L recorded, 0.4856mg/L trigger), nickel (0.129mg/L recorded, 0.0036mg/L trigger) and zinc (0.43mg/L recorded, 0.0085mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a – Fill 15 bore recorded elevated levels of lead (0.0020mg/L recorded, 0.0005mg/L trigger), nickel (0.0150mg/L recorded, 0.0068mg/L trigger) and zinc (0.0300mg/L recorded, 0.0186mg/L trigger). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH038 – Fill 15 bore recorded elevated levels of nickel (0.007mg/L recorded, 0.006mg/L trigger) and zinc (0.0920mg/L recorded, 0.0132mg/L trigger). It is noted that nickel levels are within ANZECC criteria (0.011mg/L). Bulk earthworks have been completed at this location.

Nutrients noted to be outside of trigger levels at:

Cut 11 recorded elevated nutrients at upgradient bore 4BH022c with nitrogen (2.7mg/L recorded, 0.5786mg/L trigger), nitrate (1.94mg/L recorded, 0.400mg/L trigger), ammonia (0.11mg/L recorded, 0.0940mg/L trigger) elevated. Downgradient bore 4BH021 levels were within trigger levels (0.3mg/L total nitrogen, 0.12mg/L nitrate, 0.03mg/L ammonia) and are not likely to be attributable to construction impacts. Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that bore 4BH022c had to be relocated from its original location due to it

being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH025 - Cut 12 downgradient bore recorded elevated total phosphorus (0.09mg/L recorded, 0.068mg/L trigger) and nitrogen (1.4mg/L recorded, 0.7mg/L). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a recorded elevated levels of nitrate (0.75mg/L recorded, 0.40mg/L trigger). It is noted that this bore had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

Major cations and anions outside of trigger levels at:

4BH010 – Cut 6 downgradient bore recorded slightly elevated calcium levels (7mg/L recorded, 5.99mg/L trigger level). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. Cut 11 recorded elevated major anions and cations at the upgradient bore 4BH022c for chloride (252mg/L recorded, 78.8mg/L trigger), sulfate (735mg/L recorded, 61.8mg/L trigger), sodium (197mg/L recorded, 72mg/L trigger), calcium (73mg/L recorded, 50.4mg/L trigger) and magnesium (90mg/L recorded, 11.8mg/L trigger). Downgradient bore 4BH021 levels were within trigger values except for chloride which had a minor exceedance (16mg/L recorded, 15.2mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that bore 4BH022c had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH025 – Cut 12 downgradient bore recorded elevated levels of chloride (53mg/L recorded, 24.4mg/L trigger), bicarbonate (27mg/L recorded, 18.4mg/L trigger), sodium (47mg/L recorded, 29.08mg/L trigger) and magnesium (1mg/L recorded, 0.928mg/L trigger). Bulk earthworks have been completed at this location with no groundwater ingress noted on the cut face or floor. It is also noted that bore 4BH025 had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location.

4BH037a – Fill 15 recorded elevated levels of chloride (1760mg/L recorded, 949mg/L trigger), sulfate (3700mg/L recorded, 2056mg/L trigger), bicarbonate (704mg/L recorded, 61mg/L trigger), sodium (1340mg/L recorded, 720mg/L trigger), potassium (75mg/L recorded, 41mg/L trigger), calcium (382mg/L recorded, 190mg/L trigger) and magnesium (564mg/L recorded, 306mg/L trigger). It is noted that bore 4BH037a had to be relocated from its original location due to it being within the construction footprint, with trigger levels not necessarily corresponding with the new bore location. Results are consistent with sampling events after the bore was relocated.

## 9. Acoustic Investigations

Out of Hours Works undertaken during the month of July 2017 under Condition L4.2(d) of the EPL are outlined in Table 4.

**Table 4 – July Out of Hours Works approved under L4.2 (d)**

<b>Out of Hours Activity</b>	<b>&gt;5dB(A) above background</b>	<b>Complete? Y/N</b>
Williamsons Creek Pumparound	N	N
Lower Warrell Creek Deck Pours	N	Y
Nambucca Bridge Works	N	Y
Rosewood Bridge Concrete Finishing Works	N	Y
Span 7 Concrete Pour - Nambucca River Bridge	N	Y
Rosewood Bridge Grouting Superstructure Handrail	N	Y
Cleaning Pavement and Bump Car	N	Y
Letitia Close Overbridge Parapet Installation	N	Y

Acoustic Investigations (field monitoring) have been conducted for Out of Hours Works during the month of July 2017, results are included in Appendix A.

## 10. Complaints

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

03/07/2017 – Resident contacted Pacifico regarding concerns about dust generation from haulage activities around Rosewood Bridge. Trucks were asked to slow down to reduce dust emissions and water cart attended site. Road washed down that afternoon and every day where trucks were operating. Closest dust gauge to this location has had no exceedance of compliance levels (4g/m<sup>2</sup>/month) in the last 12 months.

11/07/2017 – Resident at Old Coast Road contacted Pacifico via email regarding concerns about dust generated from Old Coast Road traffic. Investigation showed water truck was operating on the day. A vehicle survey by RMS the next day showed ratio of project vehicles not unusual. Water cart to continue to attend to site. Dust gauge has been installed on resident's property since May 2015, with no exceedances of compliance levels (4g/m<sup>2</sup>/month) in the last 12 months.

13/07/2017 – Resident at Nursery Road contacted Pacifico regarding concerns about vibration from trucks driving over road sag nearby to resident. Activity was confirmed with area superintendent to only be short-term, with driver toolboxed about reducing speed around this area with regular checks to monitor driver behaviour. Vibration monitoring was also undertaken at the location during trial worst-case scenario (truck 60km/h at worst sag point), results were well within 5mm/s limits (1.972mm/s maximum vibration level).



## 11. Non-Compliance

### 11.1 Summary of Non-compliances

No non-compliances against the ACCIONA Environmental Protection License occurred during July 2017.



**Table 2 - Noise Monitoring Results July 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
11/07/2017	4:07 PM	Albert Drive	74	1	50	Cut	62	54.9	79.3	48.4	55.6	53.3	51.2	Excavator, crusher	Y	NA	Within predicted levels, crusher placed behind stockpile of material to reduce noise levels. Consultation also undertaken with nearby residents in relation to crushing activity
11/07/2017	3:35 PM	Cockburns Lane	16	1	50	Cut	65	48.1	59.9	43.2	49.6	47.8	45.9	Excavator, concreting	N	NA	Construction not audible. Dominant noise sources: mill, highway, birds
11/07/2017	4:30 PM	Bald Hill Rd	197	3	50	Cut	72	56	76	48	56.9	53.4	50.6	Roller, positrack, grader, street sweeper	Y	NA	Within predicted levels. Stockpile in place on east side of alignment to reduce noise levels from construction activities.
17/07/2017	4:00 PM	Letitia Rd	406	4	59	Cut	74	50.8	69	44.7	51.6	48.4	46.8	Excavator, dozer	Y	NA	Within predicted levels. Regular consultation undertaken with residents impacted by NFR construction activities.
13/07/2017	3:59 PM	Mattick Rd	442	6	44	Cut	62	51.3	68.4	44.8	53.9	50	48.2	Excavators	Y	NA	Within predicted levels. Permanent noise mounds currently in place to reduce construction noise at sensitive receivers.
17/07/2017	4:20 PM	Nursery Rd	415	4	59	Cut	53	55.7	75.7	47.6	56.6	52.9	49.8	Excavator, trucks	N	NA	Construction not audible. Dominant noise sources: existing highway.
17/07/2017	5:00 PM	Wallace St	148	3	50	Cut	47	61.6	76.5	51.7	64	58.2	54.3	Excavator	N	NA	Construction not audible. Dominant noise sources: local traffic, highway.
17/07/2017	4:40 PM	Gumma Rd	383	3	50	Hauling material	60	53.3	76.1	44.7	54.9	51.5	49.4	Trucks, concreting	Y	NA	Within predicted levels.

**Table 3 - Dust Monitoring Results June-July 2017**

			DDG ID	DDG1	DDG2	DDG3	DDG4	DDG5	DDG6	DDG6N	DDG7	DDG8	DDG9NE	DDG9E	DDG A1	DDG A2	
			Start date of sampling	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	1/06/2017	
			Finish date of sampling	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	3/07/2017	
Analyte	Time Period	Unit	Levels of Concern	LOR													
Ash Content	Current Month	g/m <sup>2</sup> .month	4	0.1	0.2	0.2	0.8	0.2	0.4	1.6	0.9	0.5	0.3	0.2	1.7	----	----
		mg	N/A	1	4	3	15	3	8	30	17	10	6	4	32	----	----
	Previous Month	g/m <sup>2</sup> .month			0.1	0.4	1.2	0.3	0.7	0.8	0.6	0.5	0.2	0.2	1.5	----	----
	Change	g/m <sup>2</sup> .month	Increase of 2		0.1	-0.2	-0.4	-0.1	-0.3	0.8	0.3	0	0.1	0	0.2	----	----
Combustible Matter	Current Month	g/m <sup>2</sup> .month	N/A	0.1	0.1	0.1	0.5	<0.1	0.3	0.7	0.4	0.1	0.2	0.1	0.7	----	----
		mg	N/A	1	2	2	10	<1	5	13	8	1	3	2	14	----	----
Total Insoluble Matter (TIM)	Current Month	g/m <sup>2</sup> .month	4	0.1	0.3	0.3	1.3	0.2	0.7	2.3	1.3	0.6	0.5	0.3	2.4	----	----
		mg	N/A	1	6	5	25	3	13	43	25	11	9	6	46	----	----
	Previous Month	g/m <sup>2</sup> .month			0.1	0.4	1.4	0.4	0.7	1	0.9	0.7	0.4	0.2	1.7	----	----
	Change	g/m <sup>2</sup> .month	Increase of 2	0.1	-0.1	-0.1	-0.1	-0.2	0	1.3	0.4	-0.1	0.1	0.1	0.7	----	----
Arsenic	Current Month	mg/L		0.001	----	----	----	----	----	----	----	----	----	----	----	<0.001	<0.001
Comments								Lawn mowed around gauge									



**Table 5 – Vibration Monitoring Results July 2017**

Location	DATE	TIME	Triggered	Vector Sum	Comments
	[Date]	[Time]	[Src]	[mm/s]	
Nursery Rd	14/07/2017	15:27:00	Continuous	0.217	Background
Nursery Rd	14/07/2017	15:28:00	Continuous	0.582	2 x trucks slow middle of road
Nursery Rd	14/07/2017	15:29:00	Continuous	0.214	background
Nursery Rd	14/07/2017	15:30:00	Continuous	0.193	background
Nursery Rd	14/07/2017	15:31:00	Continuous	0.189	background
Nursery Rd	14/07/2017	15:32:00	Continuous	0.48	Loaded truck slow middle of road
Nursery Rd	14/07/2017	15:33:00	Continuous	0.443	Loaded truck slow middle of road
Nursery Rd	14/07/2017	15:45:00	Continuous	1.182	Unloaded truck slow southern edge
Nursery Rd	14/07/2017	15:46:00	Continuous	0.203	background
Nursery Rd	14/07/2017	15:47:00	Continuous	1.972	truck 60km/h unloaded southern edge of road
Nursery Rd	14/07/2017	15:48:00	Continuous	0.831	Unloaded truck slow southern edge
Nursery Rd	14/07/2017	15:49:00	Continuous	0.889	Unloaded truck slow southern edge
Nursery Rd	14/07/2017	15:50:00	Continuous	1.493	Unloaded truck fast southern edge
Nursery Rd	14/07/2017	15:51:00	Continuous	0.23	background
Nursery Rd	14/07/2017	15:52:00	Continuous	0.399	Loaded truck slow
Nursery Rd	14/07/2017	15:53:00	Continuous	0.347	Loaded truck slow

Location	DATE	TIME	Triggered	Vector Sum	Comments
	[Date]	[Time]	[Src]	[mm/s]	
Old Coast Road	2017-07-14	17:44:00	Continuous	1.045	Smooth roller vibrate
Old Coast Road	2017-07-14	17:45:00	Continuous	0.849	Smooth roller vibrate
Old Coast Road	2017-07-14	17:46:00	Continuous	1.133	Smooth roller vibrate
Old Coast Road	2017-07-14	17:47:00	Continuous	1.984	Smooth roller vibrate
Old Coast Road	2017-07-14	17:48:00	Continuous	0.546	Background
Old Coast Road	2017-07-14	17:49:00	Continuous	0.456	Background
Old Coast Road	2017-07-14	17:50:00	Continuous	1.834	Smooth roller vibrate
Old Coast Road	2017-07-14	17:51:00	Continuous	1.473	Smooth roller vibrate
Old Coast Road	2017-07-14	17:52:00	Continuous	0.352	Background

Table 5 – Field Monitoring for Out of Hours Works July 2017 (Acoustic Investigation)

Description of Works	Date	Time	Location	NCA	NML (dB(A))	Laeq (dB(A))	Distance to receiver (m)	Compliant	Notes
Lower Warrell Creek – Concrete Pour	1/7/2017	7:35am	Lower Warrell Creek	1	40	40.0	300	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Nambucca Bridge Hand Tools	1/7/2017	11:30 am	Nambucca Bridge north abutment	4	46	44.5	150	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Williamson Creek Pump around	1/7/2017	9:55am	Williamsons Creek	1	40	38.5	150	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Rosewood Bridge Finishing Works	3/7/2017	6:09pm	Rosewood Bridge	2	40	33.6	150	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Nambucca River Span 7 Deck Pour	8/7/2017	1:10pm	Nambucca Bridge South	3	39	31.9	160	Y	Bridge works not audible at project boundary
Asphalting Bald Hill Road	22/7/2017	1:43pm	Bald Hill Road	3	41	42.5	150	Y	Compliant (1.5dB(A) difference not discernible)
Nambucca Bridge Works	22/7/2017	7:15am	Nambucca Bridge north abutment	4	46	40	100	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Rosewood Bridge Grouting	22/7/2017	1:05pm	Rosewood Bridge	2	45	39	160	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Bump Car and Pavement Cleaning	28/7/2017	6:47pm	Cut 21	6	38	32.5	50	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Letitia Bridge Parapet Installation	29/7/2017	1:05pm	Letitia Close	4	46	31.1	200	Y	Noise monitoring undertaken to verify compliance with L4.2(d).