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Warrell Creek to Nambucca Heads – Pacific Highway Upgrade Project

ENVIRONMENT PROTECTION AUTHORITY MONTHLY REPORT

- June 2017

Pacifico Project Number: WC2NH

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

Contents

1. Introduction

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

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

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

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

1.1 Description of Works

The project's construction activities during June 2017 included the following:

- Bitumen sealing work
- Earthworks including crushing
- Continuing bridge works including girder placement, 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

Works scheduled for next month include

- Earthworks including crushing
- Continuing bridge works including girder placement, 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
- Installation of Erosion and Sediment Controls
- Pavement (Asphalt and Concrete)
- Verge / Median Placement
- Continue removing rock platforms at Nambucca River
- Decommissioning of the Precast Facility
- Temporary waterway crossing removal

1.2 Consultation Activities

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

Table 1 – Consultation Activities

Groups	Date	Key Topics
Environmental Review Group	June 6th	Construction Progress, Design Update, Upcoming Works, Environmental Update, Monitoring Update, Out of Hours Works, Incidents and Community Complaints
Toolboxes	Wednesday each week	Environmental issues communicated to the workforce.
Nambucca Shire Council	June 20	Directional signposting consultation
North Facing Ramps group	June 5, June 26	Three week look-ahead for construction activities and general project discussion.

Other Consultation Activities:

- Coordination of directional signage consultation static display with Macksville and Nambucca Libraries, Scotts Head Bowling Club and Bowraville Community Technology Centre
- Brief Eungai Pre-School tour of locations near several construction sites

- Notification about night time girder movements impacting south of Macksville in June
- Regular updated traffic alerts issued to client about night time girder movements impacting south of Macksville throughout June
- Daily texts about night time girder movements on each day of these movements, to distribution list
- Weekly email about night time girder movements to distribution list
- Distributed North Facing Ramps three-monthly look-ahead to residents
- Notification about night time saw cutting at the Bald Hill roundabout
- 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 (Pacifico) Scope of Works and Technical Criteria.

Upcoming Community and stakeholder activities:

- Conduct next Nambucca Shire Council liaison meeting focusing on landscaping and local road issues – 12 July;
- Conduct next North Facing Ramps tri-weekly roadside community meeting scheduled for Monday 17 July;
- Distribute approved June to August construction quarterly Project Update;
- Distribute notification for Rosewood Road bridge opening to traffic;
- Seek three agreements for Out of Hours line-marking activity on existing Pacific Highway;
- Continue to consult stakeholders impacted by visual mounds along the entire alignment;
- Co-deliver content of RMS signposting Communications Implementation Plan (when issued by RMS) including conducting shopping centre displays, setting up local government displays, and holding two specific Community Information Sessions rescheduled to 2 and 3 August.

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
1/06/2017 – 30/06/2017	213.8mm	Northern Compound
1/06/2017 – 30/06/2017	165.6mm	Albert Drive Compound

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

During June, rainfall received on site was higher than the June monthly average of 139.6mm. 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 June 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

June **2017**

Date	Time	TOTAL Rain Gauge (mm)
1/06/2017	9:00:00	0.2
2/06/2017	9:00:00	0
3/06/2017	9:00:00	0
4/06/2017	9:00:00	0
5/06/2017	9:00:00	0
6/06/2017	9:00:00	0
7/06/2017	9:00:00	0.2
8/06/2017	9:00:00	2
9/06/2017	9:00:00	1.6
10/06/2017	9:00:00	34
11/06/2017	9:00:00	52.8
12/06/2017	9:00:00	18.6
13/06/2017	9:00:00	18
14/06/2017	9:00:00	4.4
15/06/2017	9:00:00	2
16/06/2017	9:00:00	0.2
17/06/2017	9:00:00	1.8
18/06/2017	9:00:00	10.6
19/06/2017	9:00:00	0
20/06/2017	9:00:00	0.2
21/06/2017	9:00:00	0
22/06/2017	9:00:00	0.2
23/06/2017	9:00:00	0
24/06/2017	9:00:00	0
25/06/2017	9:00:00	0.8
26/06/2017	9:00:00	0
27/06/2017	9:00:00	0
28/06/2017	9:00:00	2.8
29/06/2017	9:00:00	9.2
30/06/2017	9:00:00	6

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

June 2017

Date	Time	TOTAL Rain Gauge (mm)
1/06/2017	9:00:00	0
2/06/2017	9:00:00	0
3/06/2017	9:00:00	0
4/06/2017	9:00:00	0
5/06/2017	9:00:00	0
6/06/2017	9:00:00	0
7/06/2017	9:00:00	0
8/06/2017	9:00:00	0.6
9/06/2017	9:00:00	1
10/06/2017	9:00:00	35.8
11/06/2017	9:00:00	65
12/06/2017	9:00:00	47.2
13/06/2017	9:00:00	18.2
14/06/2017	9:00:00	6.4
15/06/2017	9:00:00	1.8
16/06/2017	9:00:00	0.2
17/06/2017	9:00:00	3.4
18/06/2017	9:00:00	9.8
19/06/2017	9:00:00	0.4
20/06/2017	9:00:00	1
21/06/2017	9:00:00	0
22/06/2017	9:00:00	0
23/06/2017	9:00:00	0
24/06/2017	9:00:00	0.2
25/06/2017	9:00:00	0.2
26/06/2017	9:00:00	0.4
27/06/2017	9:00:00	0
28/06/2017	9:00:00	1.2
29/06/2017	9:00:00	14
30/06/2017	9:00:00	7

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

June 2017

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
1/06/2017	11	19	0
2/06/2017	11.6	19.6	0
3/06/2017	12.6	20.4	0
4/06/2017	12.7	20.8	0
5/06/2017	13.5	21.7	0
6/06/2017	13.6	21.4	0
7/06/2017	10.5	16.1	0.8
8/06/2017	9.9	19.7	4.6
9/06/2017	12.5	17.2	7.6
10/06/2017	12.9		66.6
11/06/2017		21	
12/06/2017	13.5	15.8	64
13/06/2017	13.6	22.2	27.2
14/06/2017	14.3	20.1	0.6
15/06/2017	14.3	21.2	3.2
16/06/2017	14.6	19.2	1.8
17/06/2017	14.7	16.6	1
18/06/2017	13.3	19.3	18.6
19/06/2017	13.6	19.5	9.4
20/06/2017	13.8	20.8	8.6
21/06/2017	14.5	21.9	0
22/06/2017	14.2	20.5	0
23/06/2017	13.7	21	0
24/06/2017	15.5	20.8	0
25/06/2017	12.1	20	0.6
26/06/2017	13.8	21.6	0
27/06/2017	13.2		0
28/06/2017		20	
29/06/2017	13.5	15.5	12.4
30/06/2017	*11*	*17.4*	*6.4*

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 2nd June 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 upstream (6.12) and downstream (6.17). It is noted that these levels are only marginally below trigger levels (6.48 upstream, 6.40 downstream). It is noted that levels increased from upstream to downstream sites and therefore are unlikely to be a result of construction impacts. All controls were in place for the site.

Lower Warrell Creek recorded elevated levels upstream (7.22) and downstream (7.32). It is noted that these levels are only marginally above trigger levels (7.02). All controls were in place for the site. It is noted that these levels are within ANZECC criteria (6.5-8.0)

Nambucca River recorded elevated levels upstream (7.35) and downstream (7.32). 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).

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

Lower Warrell Creek recorded elevated NTU levels upstream (10.6 NTU recorded, 6.82 NTU trigger) and downstream (12.7 NTU recorded, 6.82 NTU trigger). All controls were in place for the site.

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

Nambucca River upstream (5.13mg/L recorded, trigger level 7.4mg/L) and downstream (6.99mg/L recorded, trigger level 7.4mg/L). All controls were in place for the site. It is noted that levels increased from 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.

1st Wet Sampling Event

A "wet" sampling event (>10mm in 24 hours period) was undertaken on the 19th June 2017, field testing and lab sampling was undertaken. Results are attached in Appendix A

pH noted to be outside trigger levels at:

Lower Warrell Creek recorded low pH upstream (6.44) and downstream (6.36). It is noted that these levels are only slightly below trigger levels (6.46). All controls were in place for the site.

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

Lower Warrell Creek upstream (1.83mg/L) and downstream (4.91mg/L) both recorded levels below trigger levels (6.46 mg/L). All controls were in place for the site. Decaying vegetation within the waterway may have contributed to the reduced DO levels.

Nambucca River upstream (5.56mg/L) and downstream (4.72mg/L) both recorded DO levels below trigger levels (6.88mg/L). All controls were in place for the site. Decaying vegetation within the waterway may have contributed to the reduced DO levels.

Metals noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of aluminium upstream (0.25mg/L recorded, 0.0162mg/L trigger level) and downstream (0.28mg/L recorded, 0.016mg/L trigger level). As levels were consistent at both upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. All controls were in place for the site.

Stony Creek recorded levels of aluminium upstream (0.18mg/L) and downstream (0.14mg/L) above trigger levels (0.01mg/L). As levels decreased between upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. All controls were in place for the site.

Lower Warrell Creek recorded levels of aluminium upstream (0.36mg/L) and downstream (0.35mg/L) above trigger levels (0.01mg/L) as well as levels of iron upstream (0.66mg/L) and downstream (0.67mg/L) above trigger levels (0.05mg/L). As levels were consistent at both upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. All controls were in place for the site.

Gumma Wetlands recorded elevated levels of copper upstream (0.005mg/L) and downstream (0.003mg/L) above trigger levels (0.001mg/L), nickel upstream (0.006mg/L) and downstream (0.004mg/L) above trigger levels (0.001mg/L) as well as zinc upstream (0.053mg/L) and downstream (0.013mg/L) above trigger levels (0.005mg/L). As levels decreased or were consistent between upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. All controls were in place for the site.

Nutrients noted to be above trigger levels at:

Upper Warrell Creek recorded elevated levels of nitrate downstream (0.08mg/L recorded, trigger level 0.01mg/L). As levels were consistent at both upstream (0.07mg/L) and downstream (0.08mg/L) sites, the elevated levels are unlikely to be because of construction impacts. It is also noted that these levels are well within ANZECC criteria (0.7mg/L). All controls were in place for the site. A potential source of the elevated levels is runoff from agricultural land upstream of the site.

Stony Creek recorded elevated levels of nitrate upstream (0.26mg/L) and downstream (0.22mg/L) above trigger levels (0.01mg/L). As levels decreased between upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. All controls were in place for the site. A potential source of the elevated levels is runoff from agricultural land upstream of the site.

Lower Warrell Creek recorded elevated levels of nitrate upstream (0.12mg/L) and downstream (0.12mg/L) above trigger levels (0.01mg/L). As levels were consistent between upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. All controls were in place for the site. A potential source of the elevated levels is runoff from agricultural land upstream of the site.

Gumma Wetland recorded elevated levels of total nitrogen upstream (7.2mg/L) and downstream (4.2mg/L) above trigger levels (0.2mg/L). As nitrogen levels decreased between upstream and downstream sites, the elevated levels are unlikely to be because of construction impacts. The site also recorded elevated levels of nitrate downstream (0.05mg/L) above trigger levels (0.01mg/L). It is noted that nitrate levels were well within ANZECC criteria (0.7mg/L). All controls were in place for the site. A potential source of the elevated levels is runoff from agricultural land nearby to the site.

Nambucca River recorded elevated levels of total nitrogen upstream (2.2mg/L) and downstream (0.5mg/L) above trigger levels (0.2mg/L), nitrate upstream (0.14mg/L) and downstream (0.16mg/L) above trigger levels (0.01mg/L). As levels either decreased or were consistent between upstream and downstream sites, the elevated levels are unlikely to be due to construction impacts. It is noted that nitrate levels were well within ANZECC criteria (0.7mg/L). All controls were in place for the site. A potential source of the elevated levels is runoff from agricultural land upstream of the site.

2nd Wet Sampling Event

A “wet” sampling event (>10mm in 24 hours period) was undertaken on the 30th June 2017, field testing was undertaken. Results are attached in Appendix A.

<u>pH levels noted to be outside of trigger levels at:</u>

Lower Warrell Creek recorded elevated pH levels downstream (6.96) above trigger levels (6.46). It is noted that these levels are within ANZECC criteria. All controls were in place for the site.

Nambucca River recorded elevated levels upstream (7.84) and downstream (7.66). Levels decreased from upstream to downstream sites and are unlikely to be due to construction impacts. It is noted that trigger levels are 7.0, 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).

<u>Dissolved Oxygen (DO) noted to be below trigger levels at:</u>

Upper Warrell Creek recorded low DO levels downstream (2.25mg/L). It is noted that these levels are only marginally below trigger levels (2.28mg/L). It is also noted that levels were consistent with the upstream site (2.81mg/L). All controls were in place for the site. A potential cause of the low levels is decaying vegetation within the waterway.

Lower Warrell Creek recorded DO levels upstream (1.27mg/L) and downstream (1.8mg/L) below trigger levels (5.02mg/L). It is noted that levels increased from upstream to downstream locations and are therefore unlikely to be as a result of construction impacts. All controls were in place for the site. A potential cause of the low levels is decaying vegetation within the waterway.

Gumma Wetlands recorded DO levels upstream (1.73mg/L) and downstream (0.0mg/L) below trigger levels (1.78mg/L). All controls were in place for the site. A potential cause of

the low levels is decaying vegetation in the waterway, the low flow environment of the water body as well as weed present on the water surface preventing oxygen diffusion.

Nambucca River recorded DO levels downstream (5.03mg/L recorded downstream, 7.99mg/L upstream) below trigger levels (6.58mg/L). All controls were in place for the site. A potential cause of the low level is decaying vegetation within the waterway. It is noted that these levels are above ANZECC criteria (5.00mg/L)

4. Sediment Basin Water Monitoring

Water was released from commissioned sediment basins after rainfall events on the 10th-18th, 28th-29th June 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 June 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
13/06/2017	B42.80	N	6.65	32.5	7	800	
13/06/2017	B45.64	N	7.78	45.9	15	800	
14/06/2017	B53.8	N	7.53	6.5	6	1500	
14/06/2017	B53.03	N	7.71	46.3	30	250	
14/06/2017	B53.9	N	7.56	49.9		2500	
14/06/2017	B48.30	N	6.56	5	13	300	
15/06/2017	B53.5	N	7.5	64.4		2000	
15/06/2017	B47.96	N	7.49	28.7		700	
15/06/2017	B48.46	N	6.67	19.4		350	
16/06/2017	B58.45	N	7.56	48.6	18	800	
16/06/2017	B58.6	N	7.64	50.1		650	
16/06/2017	B58.10	N	7.52	56		900	
16/06/2017	B47.96	N	7.49	29.3		150	
16/06/2017	B49.45	N	6.82	69.9		600	

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
16/06/2017	B48.46	N	6.63	31.1		700	
16/06/2017	B42.30	N	7.04	51.6		200	
17/06/2017	B42.30	N	7.24	43.2		300	
19/06/2017	B58.45	N	7.54	56.9		400	
19/06/2017	B53.03	N	7.58	46.9		200	
20/06/2017	B53.00	N	7.39	52.3	24	1000	
20/06/2017	B53.5	N	7.45	43.2		1200	
21/06/2017	B53.5	N	7.52	49.1		1000	
22/06/2017	B54.00	N	7.67	61.6		1000	
26/06/2017	B53.03	N	7.61	45.1		50	Release for desilting

5. Noise Monitoring

Monthly routine construction noise monitoring was undertaken on the 5th, 7th. 20th and 21st June 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 June 2017.

7. Dust Monitoring

Dust deposition gauges (DDG) were placed at nearby sensitive receivers from 4th May to 1st June 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/m2.month or increase of 2g/m2/month) during the monitoring period.

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 7th of June 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:

4BH022c – Cut 11 upgradient bore recorded low pH of 5.77 (trigger level 5.93-7.09). The downgradient bore 4BH021 results were within trigger levels (5.85 recorded, 5.81-6.78 trigger level). It is noted that there is no unusual construction activities taking place in the area and there is no sign of groundwater ingress onto the Cut face. 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.

4BH038 – Fill 15 east recorded low pH of 5.90 (trigger value 6.77-7.3). Groundwater bore 4BH037a (Fill 15 west) levels were within trigger values (6.28 recorded, 5.92-6.51 trigger level).

4BH058c – Cut 17 downgradient bore recorded low pH of 5.19 (trigger level 5.56-6.40). The upgradient bore at this location was dry. It is noted that there is no unusual construction activities taking place in the area and there is no sign of groundwater ingress onto the Cut face. 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.

Conductivity noted to be outside of trigger levels at:

4BH037a – Fill 15 west of 10.05mS/cm (trigger value 5.55mS/cm). 4BH038 Fill 15 east recorded 2.25mS/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 14.80m (trigger value of 13.8m).. 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 and no water depth recorded

9. Acoustic Investigations

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

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

Out of Hours Activity	>5dB(A) above background	Complete? Y/N
Floodplain Bridge 2 Plank Installation (monitoring and results provided in May 2017)	N	Y
Lower Warrell Creek Bridge Works – Concrete pour preparation	N	Ongoing
Generator at Crib Sheds underneath Nambucca River Bridge	N	Y
Trucks entering Northern Batch Plant	N	Ongoing
Earthworks on Fill 15C	N	Ongoing

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

10. Complaints

9.1 Summary of Complaints for the month of June 2017

3/06/2017 – Resident contacted Pacifico regarding concerns about a generator associated with bridge works running overnight. The Structures foreman for the bridge attended the site and turned the generator off. The structures crew were toolboxed about the issue and to ensure that the generator will be switched off at the end of each shift. New signage was also installed in the area advising the generator to be switched off after every shift. Noise monitoring was undertaken at the site with noise levels compliant with the Noise Management Level for night works (results included in Appendix A).

11/06/2017 – Resident contacted Pacifico regarding concerns about run-off onto his property during a heavy rainfall event, requesting that site water be directed to a different location. The Community Team visited the resident and the Environmental Team inspected the site. All environmental controls were in place in accordance with the Progressive Erosion and Sediment Control Plan and working, some minor maintenance work was undertaken.

26/06/2017 – Resident contacted Pacifico regarding concerns about vibration resulting from 2 rollers operating on the North Facing Ramps. The northern superintendent was contact by Pacifico Community Team who removed one of the rollers. Vibration monitoring has been undertaken in this location with rollers active closer to the residences, all results were compliant with 5mm/s building damage criteria. Vibration monitoring will also be undertaken where vibratory rollers are required in the area in future.

28/06/2017 – Resident contacted Pacifico regarding concerns about noise produced from the northern batch plant outside of standard construction hours. Community and Environment Managers met with the stakeholder on 29/06/2017 and advised no works at the plant outside of construction hours was permitted. Investigation revealed that the plant had not been operational outside of approved hours, but that some concrete agitator trucks had arrived at the location prior to 7am in order to start work at 7am. Noise monitoring of the agitators was conducted which showed that the works were compliant. The subcontractor was instructed not to operate any equipment including agitators until approved start time of 7am.

11. Non-Compliance

11.1 Summary of Non-compliances

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

Appendix A – Monitoring Results

Table 1a – Surface Water Results June 2017 – Dry Event

Location	Units	Levels of Concern		Upper Warrell Creek			Upper Warrell Creek			Stony Creek			Stony Creek			Lower Warrell Creek			Lower Warrell Creek			Unnamed Creek Gumma West			Unnamed Creek Gumma East			Unnamed Creek Gumma North			Nambucca River South			Nambucca River South		
				Upstream			Downstream			Upstream			Downstream			Upstream			Downstream			Upstream			Upstream			Downstream			Upstream			Downstream		
Freshwater / Estuarine		ANZECC 2000 95% species protected		Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Estuarine			Estuarine		
Date of Sampling				2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17			2-Jun-17		
Time of Sampling		Freshwater	Marine	9:52 AM			9:42 AM			9:07 AM			9:20 AM			12:24 PM			12:16 PM			11:08 AM														
Comments																													Water level too low to sample			Wind chop stirring sediment			Wind chop stirring sediment		
Type				80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result
Field Physical data																																				
Temperature	°C	-	-	24.86	14.99	12.56	25.1	16.3	13.04	24.4	16	11.84	26.46	15.94	12.85	27.9	18.4	16.9	27.9	18.4	17.41	26.5	16.3	13.22	26.5	16.3	12.69	26.5	16.3	-	27.9	18.1	18.26	27.9	18.1	18.43
pH	pH	-	6.5-8	7.25	6.48	6.12	7.3	6.4	6.17	7.5	6.6	6.44	7.33	6.26	6.34	7.02	6.57	7.22	7.02	6.57	7.32	7	6.1	5.98	7	6.1	6	7	6.1	-	7	7	7.35	7	7	7.32
Conductivity	mS/cm	0.125-2.2	-	0.316	0.232	0.35	0.348	0.227	0.34	0.348	0.227	0.23	0.3338	0.2168	0.28	20.946	0.679	2.97	20.946	0.679	3.04	0.808	0.4234	0.7	0.808	0.4234	0.53	0.808	0.4234	-	47.32	29.44	40.0	47.32	29.44	39.88
Turbidity	NTU	50	10	10.96	4	8	9.9	3.5	5.1	9.9	3.5	5.2	5.97	3.74	2.7	6.82	1.83	10.6	6.82	1.83	12.7	52.78	11.3	62.2	52.78	11.3	13.6	52.78	11.3	-	19.3	6.7	17.8	19.3	6.7	7.1
Dissolved Oxygen	mg/L	5	5	4.98	1.91	4.28	4.8	2.6	3.80	4.8	2.6	6.94	6.34	3.52	7.43	7.98	5.07	4.37	7.98	5.07	5.86	6.4	1.75	2.61	6.4	1.75	1.51	6.4	1.75	-	9.1	7.4	5.13	9.1	7.4	6.99
Dissolved Oxygen	%			-	-	40	-	-	35.9	-	-	64	-	-	70.2	-	-	47	-	-	63.6	-	-	24.9	-	-	14.1	-	-	-	-	-	65.2	-	-	86.5
TDS	g/L	-	-	-		0.200	-		0.200	-		0.200	-		0.200	-		1.90	-		1.95	-		0.500	-		0.300	-		-	-		24.4	-		25.9

Taken from ANZECC guidelines 95% protected species levels where no 80/20 trigger values provided

Taken from alternative trigger levels provided in ANZECC Water Guidelines Volume 1 and Volume 2 where insufficient data was available for 95%

Exceedances of trigger values

Table 1b – Surface Water Results June 2017 – 1st Wet Event

Location	Units	Levels of Concern		Upper Warrell Creek			Upper Warrell Creek			Stony Creek			Stony Creek			Lower Warrell Creek			Lower Warrell Creek			Unnamed Creek Gumma West			Unnamed Creek Gumma East			Unnamed Creek Gumma North			Nambucca River South			Nambucca River South		
				Upstream			Downstream			Upstream			Downstream			Upstream			Downstream			Upstream			Upstream			Downstream			Upstream			Downstream		
Freshwater / Estuarine		ANZECC 2000 95% species protected		Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Estuarine			Estuarine		
Date of Sampling				19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17			19-Jun-17		
Time of Sampling		Freshwater	Marine	4:15 PM			4:05 PM			3:40 PM			3:15 PM			12:45 PM			12:40 PM			2:15 PM			2:50 PM			2:25 PM			11:58 AM			12:05 PM		
Comments																																				
Type				80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result
Laboratory data																																				
Metals																																				
Aluminium	mg/L	0.055	-	0.244	0.0162	0.25	0.194	0.016	0.28	0.098	0.02	0.18	0.114	0.01	0.14	0.28	0.01	0.36	0.28	0.01	0.35	0.25	0.02	0.24	0.25	0.02	0.08	0.25	0.02	0.07	0.11	0.01	0.02	0.11	0.01	0.02
Arsenic	mg/L	0.024	0.0023	0.001	0.001	<0.001	0.001	0.001	<0.001	0.002	0.001	<0.001	0.002	0.001	<0.001	0.001	0.001	<0.001	0.001	0.001	<0.001	0.002	0.001	<0.001	0.002	0.001	0.001	0.002	0.001	0.001	0.002	0.001	<0.001	0.002	0.001	0.001
Cadmium	mg/L	0.0002	0.0055	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	0.0002	0.0001	<0.0001	0.0002	0.0001	<0.0001	-	-	0.0002	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001
Chromium	mg/L	0.001	0.0044	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001
Copper	mg/L	0.0014	0.0013	-	-	<0.001	-	-	0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	0.001	0.001	0.005	0.001	0.001	<0.001	0.001	0.001	0.003	0.001	0.001	<0.001	0.001	0.001	<0.001
Lead	mg/L	0.0034	0.0044	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001
Manganese	mg/L	1.9	0.08	0.3	0.01	0.018	0.158	0.0178	0.013	0.0726	0.0218	0.026	0.083	0.0164	0.051	0.35	0.087	0.055	0.35	0.087	0.081	0.49	0.011	0.217	0.49	0.011	0.014	0.49	0.011	0.098	0.076	0.006	0.053	0.076	0.006	0.054
Nickel	mg/L	0.011	0.07	-	-	0.001	-	-	0.002	-	-	<0.001	-	-	<0.001	0.0034	0.001	0.003	0.0034	0.001	0.002	0.002	0.001	0.006	0.002	0.001	0.002	0.002	0.001	0.004	-	-	<0.001	-	-	<0.001
Selenium	mg/L	11	-	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01
Silver	mg/L	0.00005	0.0014	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001
Zinc	mg/L	0.008	0.015	0.007	0.005	<0.005	0.0062	0.0042	<0.005	0.0064	0.005	<0.005	0.006	0.005	<0.005	0.018	0.005	0.007	0.018	0.005	0.009	0.011	0.005	0.053	0.011	0.005	<0.005	0.011	0.005	0.013	0.005	0.005	<0.005	0.005	0.005	<0.005
Iron	mg/L	-	-	1.38	0.48	0.72	0.99	0.366	0.77	1.4	0.41	0.47	1.48	0.35	0.5	0.52	0.05	0.66	0.52	0.05	0.67	1.65	0.37	0.35	1.65	0.37	0.41	1.65	0.37	0.45	0.26	0.05	0.09	0.26	0.05	0.1
Mercury	mg/L	0.0006	0.0004	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	<0.0001
Total Recoverable Hydrocarbons																																				
Naphthalene	µg/L	16	50	16		NA	16		NA	16		NA	16		NA	16		NA	16		NA	16		NA	16		NA	16		NA	50		NA	50		NA
C6 - C10 Fraction	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
C6 - C10 Fraction minus BTEX (F1)	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
>C10 - C16 Fraction	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
>C16 - C34 Fraction	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
>C34 - C40 Fraction	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
>C10 - C40 Fraction (sum)	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
BTEX																																				
Benzene	µg/L	950	700	950		NA	950		NA	950		NA	950		NA	950		NA	950		NA	950		NA	950		NA	950		NA	950		NA	700		NA
Toluene	µg/L	180	180	180		NA	180		NA	180		NA	180		NA	180		NA	180		NA	180		NA	180		NA	180		NA	180		NA	180		NA
Ethylbenzene	µg/L	80	5	80		NA	80		NA	80		NA	80		NA	80		NA	80		NA	80		NA	80		NA	80		NA	5		NA	5		NA
m&p-Xylenes	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
o-Xylene	µg/L	350	350	350		NA	350		NA	350		NA	350		NA	350		NA	350		NA	350		NA	350		NA	350		NA	350		NA	350		NA
Xylenes - Total	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
Sum of BTEX	µg/L	-	-	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA	-		NA
Nutrients																																				
Total Phosphorus	mg/L	0.05	0.03	0.05	0.02	0.02	0.044	0.016	0.01	0.03	0.016	<0.01	0.034	0.01	<0.01	0.04	0.01	0.02	0.04	0.01	0.02	0.11	0.03	0.04	0.11	0.03	0.03	0.11	0.03	0.03	0.07	0.02	0.04	0.07	0.02	0.03
Phosphate (reactive phosphorus)	mg/L	-	-	0.01	0.0034	<0.01	0.01	0.004	<0.01	0.018	0.0022	<0.01	0.01	0.003	<0.01	0.011	0.006	<0.01	0.011	0.006	<0.01	0.013	0.005	<0.01	0.013	0.005	<0.01	0.013	0.005	<0.01	0.029	0.01	<0.01	0.029	0.01	0.01
Total Nitrogen	mg/L	0.5	0.3	0.56	0.3	0.4	0.52	0.2	0.5	0.48	0.2	0.4	0.63	0.2	0.2	0.54	0.31	0.5	0.54	0.31	0.5	3.1	0.9	7.2	3.1	0.9	1.6	3.1	0.9	4.2	0.46	0.2	2.2	0.46	0.2	0.5
Total Kjeldahl Nitrogen	mg/L	-	-	0.5	0.3	0.3	0.5	0.2	0.4	0.34	0.2	0.1	0.6	0.2	<0.1	0.5	0.2	0.4	0.5	0.2	0.4	2.8	0.8	7.2	2.8	0.8	1.6	2.8	0.8	4.1	0.3	0.2	2.1	0.3	0.2	0.3
Nitrate	mg/L	0.7	-	0.102	0.01	0.07	0.054	0.01	0.08	0.208	0.01	0.26	0.2	0.01	0.22	0.05	0.01	0.12	0.05	0.01	0.12	0.03	0.01	0.03	0.03	0.01	0.02	0.03	0.01	0.05	0.04	0.01	0.14	0.04	0.01	0.16
Nitrite	mg/L	-	-	-	-	<0.01	-	-	<0.01	-	-	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01
Ammonia	mg/L	0.9	-	0.036	0.01	0.01	0.02	0.01	<0.01	0.046	0.02	<0.01	0.062	0.012	<0.01	0.116	0.022	0.03	0.116	0.022	0.04	0.06	0.01	<0.01	0.06	0.01	<0.01	0.06	0.01	0.05	0.15	0.024	0.08	0.15	0.024	0.06
TSS																																				
TSS	mg/L	<40	<10	19	5	<5	12.8	5	<5	14.8	5	<5	8.7	5	<5	25	5.5	<5	25	5.5	11	350	9	10	350	9	8	350	9	6			8			<5
Field Physical data																																				
Temperature	°C	-	-	24.3	16.27	16.12	24.52	16.79	16.54	23.98	17.36	17.4	24.7	17.65	17.72	25.9	19.5	16.87	25.9	19.5	17.37	25.84	19.1	18.54	25.84	19.1	16.7	25.84	19.1	16.46	26.56	21.32	18.09	26.56	21.32	17.81
pH	pH	-	6.5-8	7.478	6.23	6.56	7.192	6.42	6.65	7.138	6.61	6.51	6.98	6.21	6.54	6.86	6.46	6.44	6.86	6.46	6.36	6.9	6.08	5.81	6.9	6.08	6	6.9	6.08	6.1	7.56	6.58	7.17	7.56	6.58	7.33
Conductivity	mS/cm	0.125-2.2	-	0.3204	0.20184	0.212	0.3242	0.19076	0.207	0.313	0.2024	0.205	0.309	0.20188	0.214	20.918	0.50928	0.41	20.918	0.50928	0.436	0.842	0.334	0.715	0.842	0.334	0.282	0.842	0.334	0.399	48.42	12.65	14.4	48.42	12.65	14.2
Turbidity	NTU	50	10	26.16	5.94	4.4	27.32	3.72	4.9	14.98	3.34	2.1	17.16	4.59	0.8	26.1	2.4	1.7	26.1	2.4	1.8	66.8	11.6	17.4	66.8	11.6	6.2	66.8	11.6	20.5	19.04	5.81	6.1	19.04	5.81	2.4
Dissolved Oxygen	mg/L	5	5	7.43	1.5	2.97	6.88	2.28	2.99	8.472	5.08	2.68	7.59	2.63	4.14	6.65	5.02	1.83	6.65	5.02	4.91	7.3	1.78	7.2	7.3	1.78	0	7.3	1.78	0	8.47	6.88	5.56	8.47	6.88	4.72
Dissolved Oxygen	%			-		31.1	-		31.6	-		28.8	-		44.8	-		19.5	-		52.9	-		95.5	-		0	-		0	-		63.5	-		53.6
TDS	g/L	-	-	-		0.138	-		0.135	-		0.133	-		0.139	-		0.266	-		0.284	-		0.461	-		0.183	-		0.259	-		8.9	-		8.8

Taken from ANZECC guidelines 95% protected species levels where no 80/20 trigger values provided

Taken from alternative trigger levels provided in ANZECC Water Guidelines Volume 1 and Volume 2 where insufficient data was available for 95%

Exceedances of trigger values

Table 1c – Surface Water Results June 2017 – 2nd Wet Event

Location	Units	Levels of Concern		Upper Warrell Creek			Upper Warrell Creek			Stony Creek			Stony Creek			Lower Warrell Creek			Lower Warrell Creek			Unnamed Creek Gumma West			Unnamed Creek Gumma East			Unnamed Creek Gumma North			Nambucca River South			Nambucca River South		
				Upstream			Downstream			Upstream			Downstream			Upstream			Downstream			Upstream			Upstream			Downstream			Upstream			Downstream		
Freshwater / Estuarine		ANZECC 2000 95% species protected		Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Freshwater			Estuarine			Estuarine		
Date of Sampling				30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17			30-Jun-17		
Time of Sampling		Freshwater	Marine	2:25 PM			2:12 PM			1:54 PM			1:35 PM			10:15 AM			10:05 AM			12:55 PM			1:19 PM			1:03 PM			9:35 AM			9:40 AM		
Comments																															Wind chop stirring sediment			Wind chop stirring sediment		
Type				80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result	80th %ile	20th %ile	Result
Field Physical data																																			
Temperature	°C	-	-	24.3	16.27	14.54	24.52	16.79	15.19	23.98	17.36	16.3	24.7	17.65	16.01	25.9	19.5	16.24	25.9	19.5	15.94	25.84	19.1	19.78	25.84	19.1	16.6	25.84	19.1	16.49	26.56	21.32	18.25	26.56	21.32	17.56
pH	pH	-	6.5-8	7.478	6.23	6.46	7.192	6.42	6.53	7.138	6.61	6.57	6.98	6.21	6.48	6.86	6.46	6.56	6.86	6.46	6.96	6.9	6.08	6.42	6.9	6.08	6.09	6.9	6.08	6.25	7.56	6.58	7.84	7.56	6.58	7.66
Conductivity	mS/cm	0.125-2.2	-	0.3204	0.20184	0.247	0.3242	0.19076	0.243	0.313	0.2024	0.215	0.309	0.20188	0.217	20.918	0.50928	0.589	20.918	0.50928	0.577	0.842	0.334	0.775	0.842	0.334	0.68	0.842	0.334	0.5	48.42	12.65	25.6	48.42	12.65	25.3
Turbidity	NTU	50	10	26.16	5.94	5.2	27.32	3.72	4.5	14.98	3.34	5.1	17.16	4.59	2.1	26.1	2.4	5.2	26.1	2.4	3.1	66.8	11.6	14.6	66.8	11.6	10.1	66.8	11.6	36.8	19.04	5.81	6.3	19.04	5.81	4.2
Dissolved Oxygen	mg/L	5	5	7.43	1.5	2.81	6.88	2.28	2.25	8.472	5.08	3.66	7.59	2.63	4.4	6.65	5.02	1.27	6.65	5.02	1.8	7.3	1.78	8.3	7.3	1.78	1.73	7.3	1.78	0	8.47	6.88	7.99	8.47	6.88	5.03
Dissolved Oxygen	%			-		28.5	-		23.1	-		38.5	-		46.1	-		13.4	-		18.8	-		93.6	-		18.3	-		0	-		95.5	-		59.3
TDS	g/L	-	-	-		0.161	-		0.158	-		0.14	-		0.145	-		0.377	-		0.369	-		0.496	-		0.435	-		0.325	-		15.9	-		15.7

Taken from ANZECC guidelines 95% protected species levels where no 80/20 trigger values provided

Taken from alternative trigger levels provided in ANZECC Water Guidelines Volume 1 and Volume 2 where insufficient data was available for 95%

Exceedances of trigger values

Table 2 - Noise Monitoring Results June 2017

Date	Time	Location	Rec ID	NCA	NML	Activity	Predicted levels for activity	L_{Aeq}	L_{AFMAX}	L_{AFMIN}	L_{AF10}	L_{AF50}	L_{AF90}	Principal sources/ operations	Construction noise dominant?	Corrective actions	Notes
20/06/2017	3:30 PM	Albert Drive	74	1	50	Cut	62	59.7	75.7	53.7	62.2	58.8	56.2	Crusher, excavator, front end loader, trucks	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
20/06/2017	4:04 PM	Cockburns Lane	16	1	50	Cut	65	51.9	76	44.3	51.3	48.2	46.1	Positrack, LVs	N	NA	Construction not audible. Dominant noise sources: mill, highway, birds
21/06/2017	2:25 PM	Bald Hill Rd	197	3	50	Cut	72	54.6	66	49	56.3	53.8	51.6	Excavator, grader	Y	NA	Within predicted levels. Stockpile in place on east side of alignment to reduce noise levels from construction activities.
7/06/2017	3:54 PM	Letitia Rd	406	4	59	Cut	74	50.5	71.8	40.9	50.9	46.5	44.2	Excavator, backhoe	Y	NA	Within predicted levels. Regular consultation undertaken with residents impacted by NFR construction activities.
7/06/2017	3:12 PM	Mattick Rd	442	6	44	Cut	62	52.6	65.9	45.8	55.7	50.8	48.4	Excavator, scraper, roller	Y	NA	Within predicted levels. Permanent noise mounds currently in place to reduce construction noise at sensitive receivers.
5/06/2017	1:05 PM	Nursery Rd	415	4	59	Kerb and concrete barrier	41	53.9	75.7	43.3	54.9	51.9	51.9	48.4	Crane	N	NA	Construction not audible. Dominant noise sources: lawn mower, birds.
21/06/2017	1:55 PM	Wallace St	148	3	50	Cut	47	58	75.2	44.2	60.7	51.9	46.6	Excavator, grader, trucks	N	NA	Construction not audible. Dominant noise sources: local traffic, highway.
5/06/2017	11:54 AM	Gumma Rd	383	3	50	Bridgework	66	64.5	87.6	55.5	65.4	62.3	59.4	Excavator loading material to trucks, air compressor	Y	NA	Within predicted levels. Equipment to be spread out on the fill as much as practical to reduce noise levels to nearby sensitive receiver.

Table 3 - Dust Monitoring Results May – June 2017

			DDG ID		DDG1	DDG2	DDG3	DDG4	DDG5	DDG6	DDG6N	DDG7	DDG8	DDG9NE	DDG9E	DDG A1	DDG A2
			Start date of sampling		4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017	4/05/2017
			Finish 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
Analyte	Time Period	Unit	Levels of Concern	LOR													
Ash Content	Current Month	g/m².month	4	0.1	0.1	0.4	1.2	0.3	0.7	0.8	0.6	0.5	0.2	0.2	1.5	----	----
		mg	N/A	1	2	6	19	5	12	13	10	8	4	4	24	----	----
	Previous Month	g/m².month			0.1	0.8	1.9	0.7	0.8	0.8	0.8	2.2	1	0.7	0.3	----	----
	Change	g/m².month	Increase of 2		0	-0.4	-0.7	-0.4	-0.1	0	-0.2	-1.7	-0.8	-0.5	1.2	----	----
Combustible Matter	Current Month	g/m².month	N/A	0.1	0.3	<0.1	0.2	0.1	<0.1	0.2	0.3	0.2	0.2	<0.1	0.2	----	----
		mg	N/A	1	4	1	4	1	<1	4	5	3	3	<1	4	----	----
Total Insoluble Matter (TIM)	Current Month	g/m².month	4	0.1	0.4	0.4	1.4	0.4	0.7	1	0.9	0.7	0.4	0.2	1.7	----	----
		mg	N/A	1	6	7	23	6	12	17	15	11	7	4	28	----	----
	Previous Month	g/m².month		0.1	0.2	1.2	2.4	0.9	1	0.9	1.4	2.7	1.3	0.8	0.5	----	----
	Change	g/m².month	Increase of 2	0.1	0.2	-0.8	-1	-0.5	-0.3	0.1	-0.5	-2	-0.9	-0.6	1.2	----	----
Arsenic	Current Month	mg/L		0.001	----	----	----	----	----	----	----	----	----	----	----	<0.001	<0.001
Comments					Insects in gauge								Insects in gauge		Insects in gauge		

Table 4 – Groundwater Monitoring Results June 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			7/06/2017			7/06/2017			7/06/2017			7/06/2017			7/06/2017			7/06/2017			7/06/2017			7/06/2017		
			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												DRY									DRY					
Field Physical data																										
Depth to standing water level from TOC	m	-	16.802		15.63	8.7420		6.95	16.0140		1.98	8.4500		-	1.2000		0.65	1.3520		0.73	17.4120		-	13.8440		14.80
pH	pH	-	6.264	4.736	5.41	6.7800	5.8100	5.85	7.0900	5.9300	5.77	6.7780	6.2080	-	6.5080	5.9220	6.28	7.3040	6.7680	5.90	6.9800	5.2400	-	6.3960	5.5620	5.19
Conductivity	mS/cm	-	3630.000		2.95	111.300		0.188	231.000		2.32	0.342		-	5.550		10.05	8366.000		2.25	121.100		-	132.660		0.105
Temperature	○C	-	22.4420		18.08	22.3600		18.56	21.1500		19.66	22.6040		-	25.9820		18.29	22.5600		18.84	22.8200		-	23.1940		18.44
		Exceedance of trigger level																								

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

Description of Works	Date	Time	Location	NCA	NML (dB(A))	Laeq (dB(A))	Distance to receiver (m)	Compliant	Notes
Generator – Nambucca Bridge Crib Shed	5/6/2017	11:45 am	Nambucca Bridge	3	39	32.2	110	Y	Noise monitoring undertaken to verify compliance with L4.2(d).
Earthworks in Fill 15C on a Saturday	22/6/2017	11:30 am	Nambucca Floodplain Fill 15C	3	41	33.9	290	Y	Verification of works undertaken under L4.2(c)
Lower Warrell Creek Concrete Pour Preparation	24/6/2017	7:10 am	Lower Warrell Creek	1	45	43.3	220	Y	Highway traffic dominant noise, construction noise inaudible
Agitator trucks at Northern Concrete Batch Plant	4/7/2017	7:30 am	Northern Batch Plant	6	37	34.5	300	Y	Taken during batch plant operation