

5.5 Additional Monitoring

In addition to monitoring overpressure and vibration levels at the most sensitive receiver as required by Condition 2.17 of the Project Approval, monitoring from several other locations will be undertaken to more accurately determine the compliance with required blasting parameters.

These blast monitors will consist of fixed monitors and mobile monitors depicted as the blue and red points within Figure 36 respectively. The fixed monitors will remain in place within the locations depicted within Figure 36 for the duration of blasting activities associated with the St Helena Tunnel. The mobile monitors would be relocated from time to time in order to ensure that they are positioned at locations around the tunnel between the blasting activities and the closest sensitive receivers that are likely to experience the greatest vibration, noise and overpressure exposure levels or to otherwise provide detailed information for monitoring/future blast design and complaints management.

The results of this monitoring, in addition to verifying compliance with Condition 2.17 of the Project Approval, will allow blasting to be progressively designed to minimise impacts on nearby sensitive receivers as the results of each individual blast become available.

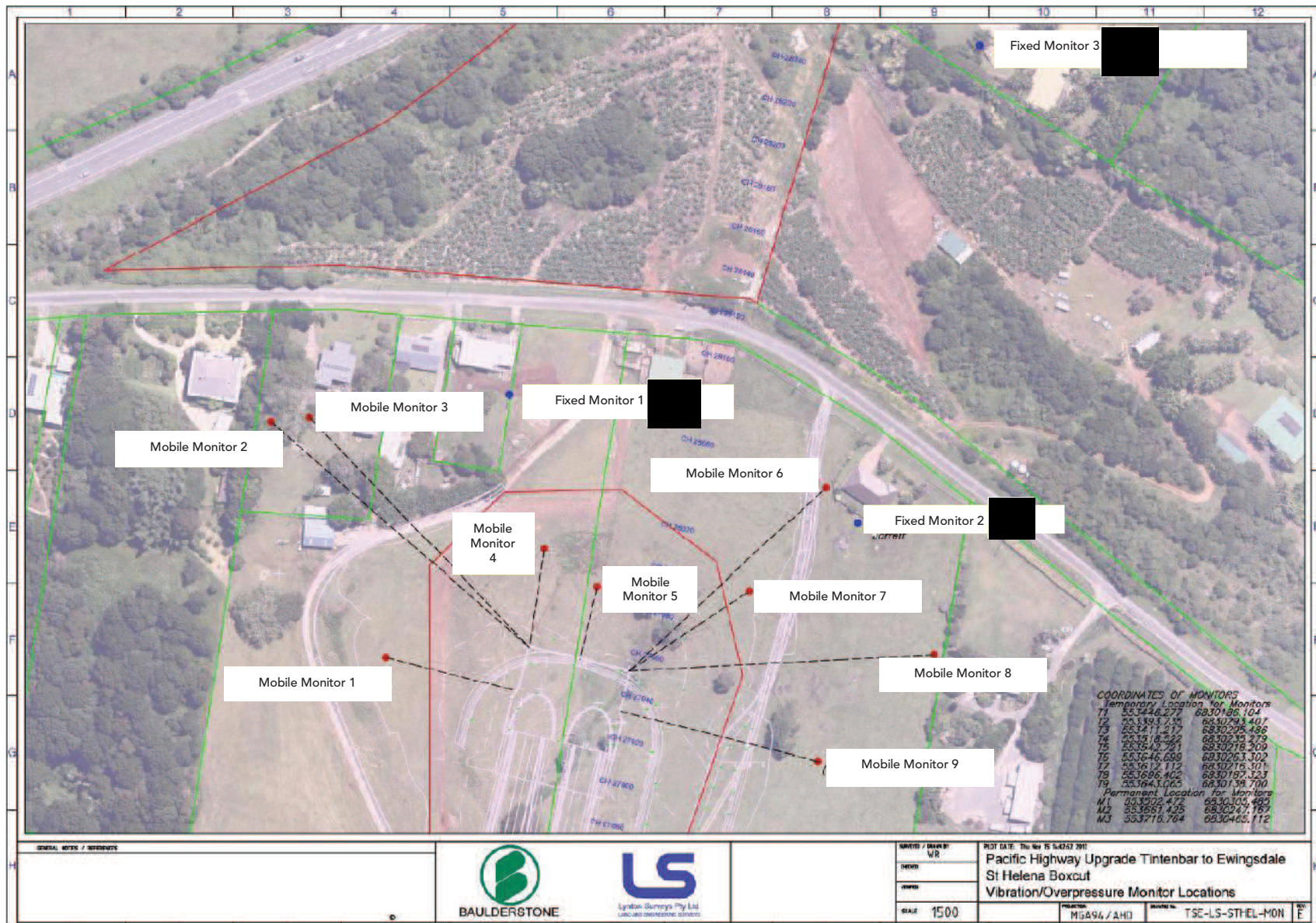


Figure 36 - Location of Blast Monitors

6 ENVIRONMENTAL MANAGEMENT

6.1 Construction Environment Management Plan

As previously stated, a CEMP has been developed to establish a framework for environmental management during the construction activities associated with the Approved Project. The CEMP was approved by the Department of Planning and Infrastructure on 10 September 2012. The purpose of the CEMP is to provide instructions regarding the environmental management actions, monitoring and reporting necessary to ensure that commitments made in the planning stage of the proposal are implemented during these activities. The CEMP provides details of responsibilities, training and induction requirements, incident response and emergency procedures, monitoring and stakeholder notification commitments. The CEMP has been prepared in accordance with the Guideline for the Preparation for Environmental Management Plans (DIPNR, 2004) prior to the commencement of construction. The implementation of the CEMP is the responsibility of each member of the Project team and their sub-contractors.

The PLAN-ENV-006 NVMS, developed as part of the CEMP, addresses the noise and ground borne vibration issues that will arise during the construction activities for the Project and, in particular, the blasting to be undertaken for the St Helena Hill tunnel works.

Similarly, the PLAN-ENV-002 AQMP has been developed to provide a system and procedures to ensure that best practice controls are established and maintained to manage potential air quality and dust impacts during the construction of the Project. The PLAN-ENV-002 AQMP sub-plan has been developed to:

- Ensure generation of dust during construction works is minimised, particularly in the vicinity of sensitive air quality receivers,
- Ensure Greenhouse Gas (GHG) and other air emissions are minimised during construction; and
- Prevent construction activities from causing air quality impacts that are hazardous or a nuisance to the community.

The PLAN-ENV-002 AQMP will be implemented throughout blasting activities associated with the St Helena Hill tunnel works.

6.2 Environment Protection Licence

Further to the above, an Environment Protection Licence (EPL 20138) has been issued for the regulation of pollution during the construction of the Project by the Office of Environment and Heritage. EPL 20138 has been issued in accordance with the requirements of Part 3 of the *Protection of the Environment Operations Act 1997* (POEO Act).

Provisions of EPL 20138 that relate to blasting include the following:

L3 Blasting

L3.1 The overpressure level from blasting operations at the premises must not exceed 120dB (LinPeak) at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L3.2 The overpressure level from blasting operations at the premises must not exceed 115dB (LinPeak) for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L3.3 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L3.4 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec for more than five per cent of the total number of blasts over each reporting period. Error

margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L3.5 To determine compliance with condition(s) L3.1 and L3.3 a) Airblast overpressure and ground vibration levels must be measured and electronically recorded at the most affected residence or noise sensitive location that is not owned by the licensee or subject to a private agreement between the owner of the premises or noise sensitive location and the licensee for all blasts carried out in or on the premises; and b) Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006.

L4 Hours of operation

L4.5 Blasting hours

Blasting operations at the premises may only take place between 9:00am and 5:00pm Monday to Friday and 9:00am and 1:00pm Saturday. (Where compelling safety reasons exist, the EPA may permit a blast to occur outside the above hours. A prior written request for approval of any such blast must be made to the EPA).

Amendments to the provisions of the above sections of EPL 20138 would be sought through an application to vary EPL 20138 by BPL. This variation would seek to ensure consistency between the Project Instrument of Approval issued pursuant to Part 3A of the *Environmental Planning and Assessment Act 1979* and EPL 20138 should the modification as detailed within this report be approved by the Department of Planning and Infrastructure.

6.3 Proposed Changes to Conditions of Approval

The proposed modification to blasting hours, vibration and overpressure limits relate to the Conditions of Approval as detailed within Table 26 below:

Table 26 - Proposed changes to Minister's Conditions of Approval

Condition number	Current condition	Proposed change (shown in italics)												
2.14	<p>Blasting associated with the project shall only be undertaken during the following hours:</p> <ul style="list-style-type: none"> a) 9:00 am to 5:00 pm, Mondays to Fridays, inclusive; b) 9:00 am to 1:00 pm on Saturdays; and c) at no time on Sundays or public holidays. <p>This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons to avoid loss of life, property loss and/or to prevent environmental harm.</p>	<p>Blasting associated with the project shall only be undertaken during the following hours:</p> <ul style="list-style-type: none"> a) 9:00 am to 5:00 pm, Mondays to Fridays, inclusive; b) 9:00 am to 1:00 pm on Saturdays; and c) at no time on Sundays or public holidays; <i>and</i> d) <i>7.00 am to 6.00 pm, Monday to Fridays, inclusive for the St Helena Hill tunnel works between Chainage 27800 and Chainage 28500.</i> <p>This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons to avoid loss of life, property loss and/or to prevent environmental harm.</p>												
2.17	<p>The proponent shall ensure that airblast overpressure generated by blasting associated with the project does not exceed the criteria specified in Table 1 when measured at the most affected residence or other sensitive receiver.</p> <p>Table 1 – Airblast Overpressure Criteria</p> <table border="1"> <thead> <tr> <th>Airblast Overpressure (dB(Lin Peak))</th> <th>Allowable Exceedance</th> </tr> </thead> <tbody> <tr> <td>115</td> <td>5% of total number of blasts over a 12 month period</td> </tr> <tr> <td>120</td> <td>Never</td> </tr> </tbody> </table>	Airblast Overpressure (dB(Lin Peak))	Allowable Exceedance	115	5% of total number of blasts over a 12 month period	120	Never	<p>The proponent shall ensure that airblast overpressure generated by blasting associated with the project does not exceed the criteria specified in <i>Tables 1a and 1b</i> when measured at the most affected residence or other sensitive receiver.</p> <p>Table <i>1a</i> – Airblast Overpressure Criteria</p> <table border="1"> <thead> <tr> <th>Airblast Overpressure (dB(Lin Peak))</th> <th>Allowable Exceedance</th> </tr> </thead> <tbody> <tr> <td>115</td> <td>5% of total number of blasts over a 12 month period</td> </tr> <tr> <td>120</td> <td>Never</td> </tr> </tbody> </table>	Airblast Overpressure (dB(Lin Peak))	Allowable Exceedance	115	5% of total number of blasts over a 12 month period	120	Never
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		<p><i>Table 1b - Airblast Overpressure Criteria, inclusive for the St Helena Hill tunnel works between Chainage 27800 and Chainage 28500 where consent has been granted by the owner/occupier that the subject limits may apply.</i></p> <table border="1"> <thead> <tr> <th><i>Airblast Overpressure (dB(Lin Peak))</i></th> <th><i>Allowable Exceedance</i></th> </tr> </thead> <tbody> <tr> <td><i>125</i></td> <td><i>5 % of total number of blasts over a 12 month period</i></td> </tr> <tr> <td><i>130</i></td> <td><i>Never</i></td> </tr> </tbody> </table>	<i>Airblast Overpressure (dB(Lin Peak))</i>	<i>Allowable Exceedance</i>	<i>125</i>	<i>5 % of total number of blasts over a 12 month period</i>	<i>130</i>	<i>Never</i>						
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<i>130</i>	<i>Never</i>													
<p>2.18</p>	<p>The proponent shall ensure that ground vibration generated by blasting associated with the project does not exceed the criteria specified in Table 2 when measured at the most affected residence or other sensitive receiver.</p> <p>Table 2 – Peak Particle Velocity Criteria</p> <table border="1"> <thead> <tr> <th>Peak Particle Velocity Criteria (mms⁻¹)</th> <th>Allowable Exceedance</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>5% of total number of blasts over a 12 month period</td> </tr> <tr> <td>10</td> <td>Never</td> </tr> </tbody> </table>	Peak Particle Velocity Criteria (mms ⁻¹)	Allowable Exceedance	5	5% of total number of blasts over a 12 month period	10	Never	<p>The proponent shall ensure that ground vibration generated by blasting associated with the project does not exceed the criteria specified in <i>Tables 2a and 2b</i> when measured at the most affected residence or other sensitive receiver.</p> <p>Table 2a – Peak Particle Velocity Criteria</p> <table border="1"> <thead> <tr> <th>Peak Particle Velocity Criteria (mms⁻¹)</th> <th>Allowable Exceedance</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>5% of total number of blasts over a 12 month period</td> </tr> <tr> <td>10</td> <td>Never</td> </tr> </tbody> </table>	Peak Particle Velocity Criteria (mms ⁻¹)	Allowable Exceedance	5	5% of total number of blasts over a 12 month period	10	Never
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10	Never													



Table 2b - Peak Particle Velocity Criteria, inclusive for the St Helena Hill tunnel works between Chainage 27800 and Chainage 28500 where consent has been granted by the owner/occupier that the subject limits may apply.

<i>Peak Particle Velocity Criteria (mms⁻¹)</i>	<i>Allowable Exceedance</i>
15	5 % of total number of blasts over a 12 month period
20	Never

7 CONCLUSIONS

In relation to tunnelling works, the benefits to the local community and other external stakeholders gained from the proposed modifications are as follows:

- Reduced construction traffic on St Helena Road,
- Reduced impact of noise and dust from construction related activities,
- Reduced number of blast events;
- Overall reduction in construction duration and therefore reduced overall timeframe over which residents may experience impacts.

In relation to the box cuts, the current schedule is based on the most efficient blasting that can be performed given the current MCoA. Similar to the tunnelling works, an increase in the vibration and airblast limits allows for more efficient excavation works. This has a resulting decrease in the construction duration and hence the benefits to the external community from decreases in the construction duration can be realised.

This would also reduce the total drilling meters from 33 kilometres of drilling to 28 kilometres of drilling. As the drilling is expected to be the bottleneck for the box cuts works and accounting for slower drilling rates for the larger holes, the reduced drilling requirements from the proposed modifications would reduce the time to complete the box cuts by approximately eight days.

The reduction in the total drilling meters means that the excavation can be undertaken faster than that originally planned. At the Southern Portal the construction duration would decrease from six weeks to five weeks. In the Northern Portal it is expected to reduce the total construction duration from 15 work days to 12 work days. In total this corresponds to an eight day reduction in the construction duration.

It is expected that the number of blasts that require the closure of either the Pacific Highway or St Helena Road would be reduced from six to three. This would result in a 50 per cent reduction in the number of closures to both the Pacific Highway and St Helena Road.

Furthermore, as the drilling would be more efficient it is expected that there would be a reduction in the total number of blasts for the box cuts to reduce from a total of 11 blasts to seven blasts combined.

In relation to the tunnel control centre, in the areas where blasting would be possible, it is likely that given the current MCoA, in order to comply with the limits for airblast and vibration the excavation would need to be taken in at least two benches due to the restriction on the maximum charge per hole. Unlike the box cuts, this could not be overcome through the use of blast hole decking as the stemming required to mitigate fly rock would make the charge ineffective in fragmenting the rock. As such, given the current MCoA the only viable option for the removal of the rock closest to the sensitive receivers – where charge weights below two kilograms are required, is to use hydraulic rock breaking hammers. However, the use of rock breakers results in a large impact to residences through disturbance from significant levels of noise, vibration and dust.

With the proposed changes to the MCoA, it is expected that the volume of rock that requires breakage using rock hammers could be broken using controlled blasting which is much more efficient and has less cumulative noise, vibration and dust impacts on nearby sensitive receivers. As such, the most significant benefit of the proposed changes to the MCoA is that it would reduce the total amount of rock hammering by an expected 40 days. Given the continuous noise and vibration expected from rock hammering the proposed modifications would significantly reduce the impact of the TCC works on nearby residences.

Further to the above benefits of the proposed modification with regard to tunnelling works, box cuts and the tunnel control centre, this report has shown that the modification of blasting hours, airblast overpressure and vibration limits would result in negligible negative impacts to the residents at St Helena Hill and on the surrounding environment. This is due to the proposed limits being well below those indicated in relevant standards and literature at which damage to property may occur. In relation to overpressure, AS 2187.2 Cl. J5.2 Human comfort limits states that, "...the factors that contribute to annoyance by impulsive sounds such as airblast are loudness, duration and number of events plus the time

of day and nature of disturbance". Considering the number of events may be the most significant factor, implementation of the proposed limits would reduce the number of events and have negligible effect on each of the other factors thus directly and significantly improving human comfort. It is also expected that these limits would be adhered to due to procedures being in place as prescribed by the Project blast management plans and post blast review procedures that will manage the design of blasting activities to ensure compliance.

These blast management plans and post blast review procedures are complimented with a comprehensive blast monitoring regime that is well in excess of monitoring requirements required by Condition 2.17 of the Project Approval and the Project Environment Protection Licence through blast monitoring from various locations in addition the closest sensitive receivers to more accurately determine the compliance with required blasting parameters.

These blast monitors would consist of fixed monitors and mobile monitors as detailed within Section 5.5 of this report. The fixed monitors will remain in place between the blast locations and the closest sensitive receivers for the duration of blasting activities associated with the St Helena Tunnel while the mobile monitors will be relocated from time to time in order to ensure that they are positioned at locations around the tunnel between the blasting activities and the closest sensitive receivers that are likely to experience the greatest vibration, noise and overpressure exposure levels or to otherwise provide detailed information for monitoring/future blast design and complaints management.

The results of this monitoring, in addition to verifying compliance with Condition 2.17 of the Project Approval, will allow blasting to be progressively designed to minimise impacts on nearby sensitive receivers as the results of each individual blast become available.

In summary, this report has demonstrated that the subject modification would result in various positive impacts to external stakeholders such as nearby residences, commuters, Local, State and Federal Government and the surrounding environment. These positive impacts are attributable to the changes in excavation methodology that can be achieved with the proposed modification. These positive impacts include, but are not limited to:

- A reduction in the total noise impact of the St Helena tunnelling works from reduced drilling and rock breaking,
- Improved traffic conditions due to fewer road closures from blasting and a reduced period during which construction traffic is operating in the area,
- A reduction in the total number of blasting events;
- Overall reduction in construction duration and therefore reduced overall timeframe over which residents may experience impacts.

The expected reduction of these activities over the entire St Helena tunnelling works is summarised below:

- 80 per cent reduction in the volume of rock requiring breakage by hydraulic hammers at the Tunnel Control Centre (TCC). This corresponds to 20 fewer days during which hammering is being undertaken for the TCC excavation,
- Approximately three week's reduction in total construction time for the excavation of the TCC. This would correspond to a 25 per cent reduction in the original programme of 12 weeks,
- 40 per cent reduction in the total number of blasts,
- An approximate eight day reduction in the construction time for the box cuts to 37 days from an expected 45 days,
- 32 day reduction in the construction schedule for the excavation of the tunnelling works, reducing the total construction time from approximately 210 days to 178 days.
- 15 per cent less drilling — reducing the duration of noise and vibration that residents would be exposed to.
- 50 per cent fewer rolling stoppages of the Pacific Highway reducing traffic delays.
- 50 per cent fewer closures of St Helena Road reducing traffic stoppages and delays.

This document shows that there has been extensive community consultation undertaken with residents within close proximity to the tunnelling works and the consultation demonstrates that the community is strongly in favour of a reduction in the construction duration. This is reflected by the 'letters of non-

**Modification request for an extension to blasting hours,
airblast overpressure and vibration limits**

Pacific Highway Upgrade - Tintenbar to Ewingsdale



objection' for extension to blasting hours, signed by 11 of the 14 affected residents and 'letters of consent' to increase vibration and airblast overpressure limits for St Helena tunnel construction, signed by all of the five affected residents, regarding the modifications that have been proposed.

In addition to the above letters of consent that have been received, in accordance with AS 2187.2 the proposed increased limits for vibration and overpressure would only be utilised where consent has been granted by the occupier of the potentially effected residence that the subject limits may apply. In the event that consent had not been granted by the occupier, the existing approved vibration and overpressure limits would apply to the subject residence.

8 REFERENCES

The following references were utilised in the preparation of this report:

- ANZECC (September 1990) 'Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration.
- Australian Standard AS2187.2-2006 – Explosives–Storage and use – Part 2: Use of explosives.
- Boulderstone Pty Ltd (2012) Construction Environmental Management Plan. Prepared by Boulderstone Pty Ltd.
- Boulderstone Pty Ltd (2012) Noise and Vibration Management Sub-Plan.
- DECC Atlas of NSW Wildlife. www.environment.nsw.gov.au/wildlifeatlas/about.htm.
- DECC (2009) Interim Construction Noise Guideline.
- DEC (2006) Assessing Vibration – a technical guideline.
- Federal Department of Environment, Water, Heritage and the Arts EPBC Online Database. www.environment.gov.au/.
- German Standard DIN 4150:1999 – Structural Vibrations in Buildings: Effects on Structures.
- Heilig, John (2011). Blast monitoring arrangements for T2E blasting. Report prepared by Heilig and Partners Consulting Engineers.
- Heilig, John (2011) T2E increase beyond the proposed 5mm/s criterion. Report prepared by Heilig and Partners Consulting Engineers.
- NSW RTA (2008) Tintenbar to Ewingsdale Upgrading the Pacific Highway Environmental Assessment Volumes 1-4. August 2008. Prepared by Arup Pty Ltd for the NSW Government Roads and Traffic Authority. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=1196
- NSW RTA (2009) Environmental Assessment Submissions Report and Preferred Project Report. May 2009. Prepared by Arup Pty Ltd for the NSW Government Roads and Traffic Authority. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=1196
- NSW DoP (2010) Part 3A EP&A Act Project approval instruments. Prepared by the NSW Department of Planning. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=1196
- BPL (2012) Communications Strategy for Controlled Blasting at St Helena Tunnel & Tunnel Control Centre. Prepared by Boulderstone Pty Ltd.

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.



The Hon Tony Kelly MLC
Minister for Planning

Sydney

29 JAN 2010 2010

File No: 9037893

SCHEDULE 1

Application No:	07_0051
Proponent:	NSW Roads and Traffic Authority
Approval Authority:	Minister for Planning
Land:	Land generally in the vicinity of the existing Pacific Highway between Ross Lane to the north east of Tintenbar north to Bangalow, and extending north east to the existing Ewingsdale interchange, west of the town of Ewingsdale within the Ballina and Byron local government areas.
Project:	The construction and operation of an approximately 17-kilometre four lane divided carriageway, comprising a tunnel, six twin bridges, three underpasses, a half interchange and upgrading an existing interchange, referred to as the Pacific Highway Upgrade - 'Tintenbar to Ewingsdale' Project
Major Project:	The proposal is declared a major project under section 75B(1)(b) of the <i>Environmental Planning and Assessment Act 1979</i> , by virtue of an order made by the Minister for Planning and gazetted on 5 December 2006.
Critical Infrastructure:	The proposal is declared to be critical infrastructure under section 75C of the <i>Environmental Planning and Assessment Act 1979</i> , by virtue of an order made by the Minister for Planning and gazetted on 5 December 2006.

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SCHEDULE 2

Act, the	<i>Environmental Planning and Assessment Act 1979</i>
Ancillary Facility	Temporary facility for construction, including for example an office and amenities compound, construction compound, batch plant (concrete or bitumen), materials storage compound, maintenance workshop, testing laboratory or material stockpile areas.
CEMP	Construction Environmental Management Plan
Conditions of Approval	The Minister's conditions of approval for the project.
Construction	Includes all work in respect of the project other than survey; acquisitions; fencing; investigative drilling or excavation; building/road dilapidation surveys; minor clearing (except where heritage, threatened species, populations or ecological communities would be affected); establishing ancillary facilities in locations meeting the criteria stated in these Conditions; or other activities determined by the Environmental Representative to have minimal environmental impact (e.g. minor access roads and adjustments to services / utilities, etc.).
Council	Ballina Shire Council and Byron Shire Council
DECCW	NSW Department of Environment, Climate Change and Water
Department, the	NSW Department of Planning
DEWHA	Commonwealth Department of the Environment, Water, Heritage and the Arts
Director General, the	Director General of the NSW Department of Planning (or delegate)
Director General's Approval	A written approval from the Director General (or delegate). Where the Director General's approval is required under a condition, the Director General will endeavour to provide a response within one month of receiving an approval request. The Director General may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for the Proponent to respond in writing will be added to the one month period.
EPL	Environmental Protection Licence
Feasible and Reasonable	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account mitigation benefits and cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
I&I NSW	Industry and Investment NSW (includes divisions such as Agriculture, Forestry, Fisheries and Minerals).
Minister, the	Minister for Planning
NOW	NSW Office of Water
Operation	Means the operation of the project, but does not include commissioning trials of equipment or temporary use of parts of the project during construction.

Project	The project that is the subject of Major Project Application 07_0051.
Proponent	NSW Roads and Traffic Authority
Publicly Available	Available for inspection in hard copy and/or electronic format by a member of the general public (for example available on the project website as well as at a local display site).
Relevant Aboriginal Stakeholders	The Local Aboriginal Land Council and registered Aboriginal stakeholders.
Sensitive Receiver	Residence, education institution (e.g. school, TAFE college), health care facility (e.g. nursing home, hospital) and religious facility (e.g. church).

1. ADMINISTRATIVE CONDITIONS

Terms of Approval

- 1.1 The Proponent shall carry out the project generally in accordance with:
- (a) Major Projects Application 07_0051;
 - (b) *Tintenbar to Ewingsdale – Upgrading the Pacific Highway - Environmental Assessment* (volumes 1, 2, 3 and 4), prepared by the RTA and dated August 2008;
 - (c) *Tintenbar to Ewingsdale – Upgrading the Pacific Highway – Environmental Assessment Submissions Report and Preferred Project Report*, prepared by the RTA and dated May 2009, including the revised Statement of Commitments contained therein; and
 - (d) the conditions of this approval.
- 1.2 In the event of an inconsistency between:
- (a) the conditions of this approval and any document listed from condition 1.1(a) to 1.1(c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and
 - (b) any document listed from condition 1.1(a) to 1.1(c) inclusive, and any other document listed from condition 1.1(a) to 1.1(c) inclusive, the most recent document shall prevail to the extent of the inconsistency.
- 1.3 The Proponent shall comply with any reasonable requirement(s) of the Director General arising from the Department's assessment of:
- (a) any reports, plans or correspondence that are submitted in accordance with this approval; and
 - (b) the implementation of any actions or measures contained in these reports, plans or correspondence.

Staging

- 1.4 The Proponent may elect to construct and/or operate the project in stages provided construction/ operation is consistent with the conditions of this approval. Where stages are proposed, the Proponent shall submit a Staging Report to the Director General prior to the commencement of the relevant construction or operation activities which:
- (a) describes the stages; and
 - (b) identifies the relevant conditions of approval for each stage and how these will be addressed across and between the stages of the project.

Limits of Approval

- 1.5 This approval shall lapse ten years after the date on which it is granted, unless works the subject of any related project approval are physically commenced on or before that date.

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Ecological Impacts

Bridge Design

- 2.1 The Proponent shall ensure that each bridge associated with the project is designed and constructed in consultation with DECCW and I&I NSW to:
- (a) provide fauna passage above the low flow channel on each watercourse embankment as identified in Table 5.1 of the document referred to under condition 1.1(b) of this approval, or not less than the distance under an existing adjacent bridge, whichever is greater;
 - (b) have a minimal impact on existing stream flows, taking into consideration the design requirements identified in Section 5.4.1 and Table 5.1 of the Environmental Assessment;
 - (c) provide separate bridging structures for each highway carriageway to facilitate light penetration into the crossing to encourage fauna use by minimising the "tunnel" effect; and

- (d) enable installation of suitable roosting structures for microbats consistent with the requirements of condition 2.5 of this approval.

Riparian Vegetation

- 2.2 The Proponent shall restore and rehabilitate riparian vegetation in and around watercourses affected by the project and on land acquired for the purpose of the project in consultation with DECCW and I&I NSW and with Rous Water for land within the drinking water catchments. Restoration and rehabilitation measures shall be developed in consultation with those agencies, including timeframes and reporting on completion of works.

Threatened Flora Species

- 2.3 Prior to the commencement of any construction likely to impact *Macadamia tetraphylla*, *Tinospora tinosporoides*, *Diploglottis camfieldii* and *Syzygium moorei* species, the Proponent shall develop and implement a strategy for the minimisation of impacts to these species. The strategy shall be developed in consultation with DECCW, to the satisfaction of the Director General and includes:
 - (a) consideration of options for avoiding direct impacts to known individuals during detailed design of the project, including in relation to ancillary infrastructure and works;
 - (b) translocation of affected individuals, where feasible, including identification and assessment of recipient sites, monitoring and maintenance requirements after translocation, and any reporting/ recording of the translocation process; and
 - (c) measures to avoid indirect impacts to known individuals in proximity to construction areas, including demarcation of construction zones and staff/ contractor education.
- 2.4 Prior to the commencement of construction between Stations 146000 and 148800 the Proponent shall develop a **Hairy Joint Grass Offset Package** in consultation with DECCW and DEWHA, to the satisfaction of the Director General. The Package shall include one or more of the following compensatory measures:
 - (a) land offsets intended for the conservation of existing *Arthraxon hispidus* individuals or translocation of individuals affected by the project; and/ or
 - (b) funding contributions towards the development and implementation of recovery plans for *Arthraxon hispidus*; and/ or
 - (c) funding contributions towards the development and implementation of research programs into *Arthraxon hispidus*; and/ or
 - (d) any other form of offset measure agreed by DEWHA.

Implementation of the Package shall commence prior to the disturbance of any *Arthraxon hispidus* individual, unless otherwise agreed by the Director General.

Fauna Roosting and Habitat Measures

- 2.5 Unless otherwise agreed with DECC, survey(s) shall be undertaken of microbats roosting in existing bridges and culverts at least 12 months in advance of planned demolition of these structures. If microbats or evidence of roosting are discovered during survey(s), the timing and number of bat boxes to be installed in an appropriate adjacent area as an alternative roosting site shall be determined by the Proponent in consultation with the DECCW and to the satisfaction of the Director General.
- 2.6 Prior to the commencement of vegetation clearing, the Proponent shall employ a suitably-qualified ecologist to undertake surveys for tree hollows within vegetation to be cleared as part of the project. Should any such hollows be located during the survey(s), the timing and number of nest boxes to be installed in an appropriate adjacent area as an alternative roosting site shall be determined by the Proponent in consultation with the DECCW and to the satisfaction of the Director General.

Water Quality and Hydrological Impacts

- 2.7 Where available and of appropriate chemical and biological quality, the Proponent shall use stormwater, recycled water or other water sources in preference to potable water for construction activities, including concrete mixing and dust control.
- 2.8 The Proponent shall convert all sediment basins in the Emigrant Creek dam catchment and Basins 34, 35, 36, 37, 46, 50 and 55 to bio-retention (sand filter) basins when use of the basins for construction purposes has ceased. However, this condition does not preclude the Proponent from implementing alternative water quality measures with an equivalent or higher level of treatment to achieve condition 2.9(f).
- 2.9 Prior to the commencement of construction of the project, or relevant parts of the project, the Proponent shall undertake detailed design of the construction stage and permanent stormwater, drainage and water management systems for the project in consultation with Council, DECCW and Rous Water. The detailed design of this infrastructure shall be developed to:
- (a) take into account relevant Council stormwater management policies and integration with existing Council drainage infrastructure where relevant;
 - (b) optimise the water quality performance of the final drainage strategy design configuration for the area north of Byron Creek and south of Tinderbox Road;
 - (c) ensure that the bio-retention (sand filter) basins or alternate permanent water quality measures will perform in the long term to achieve the water quality objectives of condition 3.2(e);
 - (d) include measures to minimise changes to afflux and flooding behaviour as a result of the project;
 - (e) include measures to minimise the impacts of any discharge from permanent water quality and other outlet points before entering the nearest waterway;
 - (f) confirm through MUSIC modelling, using pollutant concentrations and pollutant removal efficiencies appropriate to the design detail, that the designed works achieve a condition of not increasing the pollutant loads above pre project levels, off the road corridor during the operation of the project; and
 - (g) ensure the design of the permanent water quality measures optimises the performance of the permanent works in spill containment and retention of any contaminants sourced from the carriageway. The performance optimisation shall seek to reduce the potential risk of pollutants being discharged over the spillway when the basins are full of water.

Traffic and Access

- 2.10 Where approved access to a property is affected by either construction or operation of the project, the Proponent shall provide an alternative access of a standard that is at least equivalent to that currently existing and meets relevant road safety standards prior to commencement of construction or opening of the project to traffic, whichever is relevant. Details for provision of altered access for both construction and operation shall be determined in consultation with the landholder.

Property Impacts and Signage

- 2.11 The Proponent shall prepare a Business Signage Strategy, in consultation with the relevant stakeholders (including the relevant Council, the businesses at Newrybar and the Macadamia Castle). The draft Strategy shall be made available to all businesses in Newrybar, the Macadamia Castle and to the relevant local Council(s) for comment for a period of no less than 21 days. The final Strategy shall address the issues raised by the stakeholders and shall be submitted to the Department prior to the commencement of operation. A copy of the Strategy shall be made publicly available. Nothing in this condition limits the Proponent from incorporating the requirements of this condition into the Tourist Route and Signposting Strategy for the project.

Noise Impacts

Construction and Blasting Restrictions

- 2.12 Construction activities associated with the project shall only be undertaken during the following hours:
- (a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
 - (b) 8:00 am to 1:00 pm on Saturdays; and
 - (c) at no time on Sundays or public holidays.

This condition does not apply to:

- (i) any works that do not cause construction noise to be audible at any sensitive receiver; or
 - (ii) for delivery of materials required outside these hours by the police or other authorities for safety reasons; or
 - (iii) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.
- 2.13 Notwithstanding condition 2.12, certain construction activities may be allowed to occur outside the hours specified under that condition with the prior written approval of the Director General. Requests for out of hours approval will be considered for construction activities that cannot be undertaken during standard construction hours for technical or other justifiable reasons and will be considered on a case-by-case or activity-specific basis. Any request for out of hours works shall be accompanied by:
- (a) details of the nature and need for activities to be conducted outside standard construction hours;
 - (b) written evidence to the DECCW and the Director General that activities undertaken outside standard construction hours are justified, appropriate consultation with potentially affected receivers and notification of the relevant Council has been undertaken, issues raised have been addressed, and all feasible and reasonable mitigation measures have been put in place; and
 - (c) evidence of consultation with the DECCW on the proposed work outside standard construction hours.

For the purpose of this condition, the Director General may grant approval for out-of-hours construction works on a case-by-case or activity-specific basis through approval of a Construction Noise and Vibration Management Plan (refer to condition 6.5(d)).

- 2.14 Blasting associated with the project shall only be undertaken during the following hours:
- (a) 9:00 am to 5:00 pm, Mondays to Fridays, inclusive;
 - (b) 9:00 am to 1:00 pm on Saturdays; and
 - (c) at no time on Sundays or public holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons to avoid loss of life, property loss and/or to prevent environmental harm.

- 2.15 The Proponent shall consult with affected educational institutions and ensure that noise-generating construction works in the vicinity of the institutions are not timetabled during examination periods, unless other arrangements acceptable to the affected institutions are made at no cost to the affected institutions.

Construction and Blasting Limits

- 2.16 The Proponent shall implement all reasonable and feasible noise mitigation measures with the aim of achieving the construction noise management levels detailed in the *Interim Construction Noise Guideline* (DECC, 2009). Any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the Construction Noise and Vibration Management Plan required under condition 6.5(d) of this approval.

- 2.17 The Proponent shall ensure that airblast overpressure generated by blasting associated with the project does not exceed the criteria specified in Table 1 when measured at the most affected residence or other sensitive receiver.

Table 1 - Airblast Overpressure Criteria

Airblast Overpressure (dB(Lin Peak))	Allowable Exceedance
115	5% of total number of blasts over a 12 month period
120	Never

- 2.18 The Proponent shall ensure that ground vibration generated by blasting associated with the project does not exceed the criteria specified in Table 2 when measured at the most affected residence or other sensitive receiver.

Table 2 – Peak Particle Velocity Criteria

Peak Particle Velocity (mms ⁻¹)	Allowable Exceedance
5	5% of total number of blasts over a 12 month period
10	Never

Operational Noise

- 2.19 Unless otherwise agreed to by the Director General, the Proponent shall submit for the approval of the Director General a review of proposed operational noise mitigation measures identified in the documents listed under condition 1.1 within six months of commencing construction. The review shall take into account the detailed design of the project and, where feasible and reasonable, refine the proposed measures with the objective of meeting the criteria outlined in the *Environmental Criteria for Road Traffic Noise* (NSW EPA, 1999). The review shall be undertaken in consultation with the DECCW.

Air Quality Impacts

- 2.20 The Proponent shall construct the project in a manner that minimises or prevents the emission of dust including wind blown and traffic generated dust, including but not limited to:
- implementing practical measures for construction vehicles carrying loads; and
 - minimising tracking of material from construction sites onto public roads.

Heritage Impacts

- 2.21 This approval does not allow the Proponent to destroy, modify or otherwise physically affect human remains.
- 2.22 The Proponent shall not destroy, modify or otherwise physically affect sites A8, H18, H29, H30, H38, and H39.
- 2.23 Prior to the commencement of pre-construction and construction activities affecting Aboriginal sites A9 and A10 the proponent shall undertake a subsurface salvage program using a methodology prepared in consultation with the DECCW and the relevant Aboriginal Stakeholders.

The Salvage Program shall be approved by the Director General prior to the commencement of any salvage activities.

- 2.24 Prior to the commencement of pre-construction and construction activities affecting Aboriginal heritage the Proponent shall undertake a subsurface testing program at potential archaeological deposits 6, 7, 23, 24 and 25, (identified in Table 5.2 of the Environmental Assessment technical paper and as located in Figure 16.2 a-e of the Environmental Assessment) using a methodology prepared in consultation with the DECCW, the relevant Aboriginal Stakeholders and to the satisfaction of the Director General.

The results of the subsurface testing program shall be prepared in consultation with the DECCW and the relevant Aboriginal Stakeholders and submitted for the approval of the Director General one month prior to the commencement of pre-construction and construction activities affecting Aboriginal heritage.

The results of the subsurface testing program shall include, but not necessarily be limited to:

- (a) recommendations for the salvage of any Aboriginal sites identified through the subsurface testing program;
- (b) recommendation for any further investigations at potential archaeological deposits 1, 4, 5, 8, 9, 11, 13, 14, 17, 18, 21, 26, 27, 30, 31, 32, 33, and 34;
- (c) consideration of measures to avoid or minimise disturbance to Aboriginal sites, where significant Aboriginal objects are found to be present;
- (d) evidence of consultation with the relevant Aboriginal stakeholders; and
- (e) management and mitigation measures to ensure there are no additional impacts due to pre-construction and construction activities.

This condition does not preclude the subsurface salvage of sites A9 and A10, required under condition 2.23.

2.25 Prior to the commencement of construction work in proximity to the following items, the Proponent shall complete all archival recordings, including photographic recording, for H9, H13, H21, H23, H30, H31, H33 and H40. In addition detailed historical research shall be undertaken for H13 and H23. This work shall be undertaken by an experienced heritage consultant, in accordance with the guidelines issued by the Heritage Council of NSW. The areas containing these items shall be clearly identified and fenced until the completion of the archival recordings. Within six months of completing the above work, the Proponent shall submit a report containing the archival recordings and, where required the historical research, to the Heritage Council of NSW, the local Council and the local Historic Society.

Ancillary Construction Facilities

2.26 Unless otherwise approved by the Director General, the sites for ancillary facilities associated with the construction of the project shall:

- (a) be located more than 100 metres from a waterway;
- (b) have ready access to the road network;
- (c) be located in areas of low ecological and heritage conservation significance (including identified Aboriginal cultural value), and will not require any significant clearing of native vegetation beyond that already required by the project;
- (d) be located on relatively level land;
- (e) be separated from the nearest residences by at least 200 metres (or at least 250 metres for a temporary batching plant and stockpiling sites);
- (f) be above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented;
- (g) not unreasonably affect the land use of adjacent properties;
- (h) provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours; and
- (i) not impact on heritage sites beyond those already impacted by the project.

Ancillary sites identified within the documents listed under condition 1.1 of this approval that do not meet the above criteria should be assessed against this criteria and demonstrate how they will manage and mitigate any environmental impacts to the satisfaction of the Director General.

The location of ancillary facilities shall be identified within the relevant Construction Environmental Management Plan.

3. ENVIRONMENTAL MONITORING AND AUDITING

Water Quality and Hydrological Monitoring

- 3.1 The Proponent shall prepare and implement a **Groundwater Monitoring Program** to monitor the impacts of those cut structures on groundwater hydrology, groundwater quality and potentially-impacted groundwater-dependent ecosystems. The Program shall be developed in consultation with DECCW, Rous Water and NOW, and shall include but not necessarily be limited to:
- (a) identification of relevant tunnel or cut structures and other bulk excavation works with the potential to affect groundwater hydrology and/ or groundwater quality;
 - (b) identification of licensed bores and dams, watercourses, waterbodies and groundwater-dependent ecosystems that may be affected by changes in groundwater hydrology and/ or groundwater quality as a result of the cut structures or other bulk excavation works associated with the project;
 - (c) identification of representative groundwater monitoring points around the relevant components of the project, having regard to the location of potentially impacted licensed bores and dams, watercourses, waterbodies and groundwater-dependent ecosystems and including appropriate up-gradient and down-gradient monitoring locations;
 - (d) background monitoring of groundwater hydrology and groundwater quality parameters, and licensed bores and dams, watercourse, waterbody and groundwater-dependent ecosystem parameters (including floristic composition) for twelve months prior to the commencement of relevant excavation works;
 - (e) development and presentation of indicators or standards against which any changes to groundwater hydrology and groundwater quality will be assessed;
 - (f) development and presentation of indicators or standards against which any changes to licensed bores and dams, watercourses, waterbodies and groundwater-dependent ecosystems will be assessed;
 - (g) provision for periodic reporting and auditing of the data obtained through the Program for a period of at least five years after its implementation;
 - (h) consideration of any interactions or synergies with the surface water monitoring required under condition 3.2; and
 - (i) contingency and ameliorative measures in the event that adverse impacts to groundwater hydrology, groundwater quality, licensed bores and dams, watercourses, waterbodies or groundwater-dependent ecosystems are identified. Appropriate measures shall be developed in consultation with DECCW, Rous Water and NOW, to the satisfaction of the Director General.

The Program shall be submitted for the approval of the Director General twelve (12) months prior to the commencement of excavation works associated with the St Helena tunnel or any cut identified as an "A" type or a "B" type cut in the documents referred to under condition 1.1 of this approval, or as otherwise agreed by the Director General. A copy of the Program shall be submitted to DECCW, Rous Water and NOW prior to its implementation.

- 3.2 The Proponent shall prepare and implement a **Surface Water Monitoring Program** to monitor the impacts of the project on surface water quality during construction and operation. The Program shall be developed in consultation with DECCW, I&INSW, NOW and Rous Water, and shall include but not necessarily be limited to:
- (a) identification of a network of surface water quality monitoring locations, representative of the potential extent of impacts from the project and having regard to drinking water catchment areas and potentially-impacted watercourse and waterbodies;
 - (b) identification of works and activities during construction and operation of the project, including emergencies and spill events, that have the potential to impact on surface water quality;
 - (c) background monitoring of surface water quality parameters for twelve months prior to the commencement of relevant works or activities;
 - (d) implementation of all appropriate measures to prevent soil erosion and the discharge of sediments and pollutants from the project during construction consistent with *Managing Urban Stormwater - Soils and Construction Vols 1 and 2, 4th Edition* (Landcom, 2004)

- and *Managing Urban Stormwater Soils And Construction Vol 2d Main Road Construction* (DECC 2008);
- (e) development and presentation of indicators or standards against which any changes to surface water quality will be assessed, having regard to *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (ANZECC, 2000) for the operational period;
 - (f) provision for periodic reporting and auditing of the data obtained through the Program for a period of at least five years after its implementation;
 - (g) consideration of any interactions or synergies with the groundwater monitoring required under condition 3.1;
 - (h) contingency and ameliorative measures in the event that adverse impacts to surface water quality are identified; and
 - (i) periodic monitoring of measures incorporated to manage discharge from permanent water quality and other outlet points before entering the nearest waterway and corrective and ameliorative measures in the event that adverse impacts are identified.

The Program shall be submitted to the Director General for approval twelve (12) months prior to the commencement of construction of the project, or as otherwise agreed by the Director General. A copy of the Program shall be submitted to DECCW, I&I NSW, Rous Water and NOW prior to its implementation.

Noise Auditing

- 3.3 No later than one year after commencement of operation of the project, or as otherwise agreed by the Director General, the Proponent shall undertake operational noise monitoring to compare actual noise performance of the project against noise performance predicted in the review of noise mitigation measures required by condition 2.19 and prepare an Operational Noise Report. The Report shall include, but not necessarily be limited to:
- (a) noise monitoring to assess compliance with the operational noise levels predicted in the review of operational noise mitigation measures required under condition 2.19 and documents specified under condition 1.1 of this approval;
 - (b) a review of the operational noise levels in terms of criteria and noise goals established in the *Environmental Criteria for Road Traffic Noise* (EPA, 1999);
 - (c) methodology, location and frequency of noise monitoring undertaken, including monitoring sites at which project noise levels are ascertained, with specific reference to locations indicative of impacts on sensitive receivers;
 - (d) details of any complaints and enquiries received in relation to operational noise generated by the project between the date of commencement of operation and the date the report was prepared;
 - (e) any required recalibrations of the noise model taking into consideration factors such as noise monitoring undertaken and actual traffic numbers and proportions; and
 - (f) an assessment of the performance and effectiveness of applied noise mitigation measures together with a review and if necessary, reassessment of all reasonable and feasible mitigation measures; and
 - (g) any additional feasible and reasonable measures to those identified in the review of noise mitigation measures required by condition 2.19, that would be implemented with the objective of meeting the criteria outlined in the *Environmental Criteria for Road Traffic Noise* (NSW EPA, 1999), when these measures would be implemented and how their effectiveness would be measured and reported to the Director General and the DECCW.

The Proponent shall provide the Director General and the DECCW with a copy of the Operational Noise Report within 60 days of completing the operational noise monitoring referred to in (a) above, or as otherwise agreed by the Director General.

4 COMPLIANCE MONITORING AND TRACKING

Compliance Tracking Program

- 4.1 The Proponent shall develop and implement a program to track compliance with the requirements of this approval. The Program shall be submitted to the Director General for approval prior to the commencement of construction. The Program shall relate to both construction and operational stages of the project, and shall include, but not necessarily limited to:
- (a) provisions for periodic review of project compliance with the requirements of this approval, Statements of Commitment and documents referred to in Condition 1.1 of this approval) and reporting of compliance status to the Director General;
 - (b) provisions for the notification of the Director General prior to the commencement of construction and prior to the commencement of operation of the project;
 - (c) a program for independent environmental auditing in accordance with *ISO 19011:2003 - Guidelines for Quality and/ or Environmental Management Systems Auditing*;
 - (d) mechanisms for reporting and recording incidents and actions taken in response to those incidents;
 - (e) provisions for reporting environmental incidents to the Director General during construction and operation; and
 - (f) procedures for rectifying any non-compliance with the documents referred to in Condition 1.1 identified during environmental auditing or review of compliance.

5 COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

Access to Information

- 5.1 Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.
- 5.2 Prior to the commencement of construction, the Proponent shall establish and maintain a new website, or dedicated pages within an existing website, for the provision of electronic information associated with the project. The Proponent shall, subject to confidentiality, publish and maintain up-to-date information on the website or dedicated pages including, but not necessarily limited to:
- (a) a copy of the documents referred to under Condition 1.1 of this approval, and any documentation supporting modifications to this approval that may be granted from time to time;
 - (b) a copy of this project approval;
 - (c) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project;
 - (d) a copy of each current strategy, plan, program or other document required under this approval; and
 - (e) the outcomes of compliance tracking in accordance with the requirements of Condition 4.1.

Complaints and Enquiries Procedure

- 5.3 Prior to the commencement of construction, the Proponent shall ensure that the following are available for community complaints and enquiries during the construction period:
- (a) a telephone number on which complaints and enquiries about construction and operation activities may be registered;
 - (b) a postal address to which written complaints and enquiries may be sent; and
 - (c) an email address to which electronic complaints and enquiries may be transmitted.

The telephone number, the postal address and the email address shall be published in a newspaper circulating in the local area prior to the commencement of construction and prior to the commencement of project operation. The above details shall also be provided on the website (or dedicated pages) required by this approval.

The Proponent must prepare and implement a Construction Complaints Management System consistent with AS 4269 Complaints Handling prior to the commencement of

construction activities and must maintain the System for the duration of construction activities.

Information on all complaints received, including the means by which they were addressed and whether resolution was reached and whether mediation was required or used, must be maintained by the Proponent and included in a complaints register. The information contained within the System must be made available to the Director General on request.

Community Consultation

5.4 The Proponent shall prepare and implement a Community Communication Strategy for the project. This Strategy shall be designed to provide mechanisms to facilitate communication between the Proponent, the Contractor, the Environmental Representative, Council and local community (broader and local stakeholders) on the detailed design, progress and the related environmental management of the project. The Strategy shall include, but not necessarily be limited to:

- (a) identification of stakeholders to be consulted as part of the Strategy, including affected and adjoining landowners;
- (b) procedures and mechanisms for the regular distribution of information to stakeholders on the progress of the project, detailed design and matters associated with environmental management;
- (c) procedures and mechanisms through which stakeholders can discuss or provide feedback to the Proponent and/or Environmental Representative in relation to the environmental management, detailed design and delivery of the project;
- (d) the formation of community-based forums (focus groups) that focus on key design and environmental management issues for the project. The Strategy shall provide detail on the structure, scope, objectives and frequency of the community-based forums;
- (e) procedures and mechanisms through which the Proponent can respond to any enquires or feedback from stakeholders in relation to the environmental management, detailed design and delivery of the project; and
- (f) procedures and mechanisms that would be implemented to resolve any issues/disputes that may arise between parties on the matters relating to environmental management and the delivery of the project. This may include the use of an appropriately qualified and experienced independent mediator.

The Proponent shall maintain and implement the Strategy throughout construction of the project. The Strategy shall be approved by the Director General prior to the commencement of any construction associated with the project.

6 ENVIRONMENTAL MANAGEMENT

Environment Representative

6.1 Prior to the commencement of construction of the project, or as otherwise agreed by the Director General, the Proponent shall nominate for the approval of the Director General a suitably qualified and experienced Environment Representative(s) that is independent of the design and construction personnel. The Proponent shall employ the Environment Representative(s) for the duration of construction, or as otherwise agreed by the Director General. The Environment Representative(s) shall:

- (a) be the principal point of advice in relation to the environmental performance of the project;
- (b) be consulted in responding to the community concerning the environmental performance of the project;
- (c) monitor the implementation of all environmental management plans and monitoring programs required under this approval;
- (d) monitor the outcome of all environmental management plans and advise the Proponent upon the achievement of all project environmental outcomes;
- (e) have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval, and all other licences and approvals related to the environmental performance and impacts of the project;

- (f) ensure that environmental auditing is undertaken in accordance with the requirements Condition 4.1 and the project Environmental Management System(s); and
- (g) be given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

Urban Design and Landscape Management Plan

- 6.2 Prior to the commencement of construction of the project, or as otherwise agreed by the Director General, the Proponent shall prepare an Urban Design and Landscape Plan in consultation with the relevant Councils. The Plan shall include, but not necessarily be limited to:
- (a) sections and perspective sketches;
 - (b) location and identification of existing and proposed vegetation including use of indigenous and endemic species where possible (including enhancement of local access roads);
 - (c) location of mounds, bunds, structures (noise walls, bridges) or other proposed treatments, finishes of exposed surfaces (including paved areas) and form and fabric (noise walls, lighting, fencing and signage);
 - (d) location of cuttings and any proposed visual treatments (including plantings);
 - (e) design of St Helena Tunnel including approaches and plantings;
 - (f) progressive landscaping strategies incorporating other environmental controls such as erosion and sedimentation controls, drainage, noise mitigation; and
 - (g) monitoring and maintenance procedures.

The Plan shall be submitted for the approval of the Director General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director General. Construction works shall not commence until written approval has been received from the Director General.

Emergency Response Plans

- 6.3 The Proponent shall prepare and implement Emergency Response Plans for the construction and operation of the project to minimise risks to the drinking water catchments. The Plans shall clearly identify appropriate response measures to a range of incident types and magnitudes, identify responsibilities of parties and clearly identify protocols for communications and updating of the Plans. The Plans shall be prepared in consultation with DECCW, Rous Water, the relevant council and all emergency service providers. The Plans shall consider operation of the road corridor (both the upgrade and the existing Pacific Highway), the waterways and the extraction and treatment of drinking water.

The Construction Emergency Response Plan shall be submitted for the approval of the Director General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director General. Construction works shall not commence until written approval has been received from the Director General.

The Operational Emergency Response Plan shall be submitted for the approval of the Director General no later than six months prior to the commencement of operation of the project, or within such period otherwise agreed by the Director General. The Proponent shall not commence operation of the project until written approval has been received from the Director General.

Construction Environment Management Plan

- 6.4 Prior to the commencement of construction, the Proponent shall prepare and implement a Construction Environment Management Plan. The Plan shall outline the environmental management practices and procedures that are to be followed during construction, and shall be prepared in accordance with *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004). The Plan shall include, but not necessarily be limited to:

- (a) a description of all relevant activities to be undertaken during construction of the project including an indication of stages of construction, where relevant;
- (b) statutory and other obligations that the Proponent is required to fulfil during construction including all approvals, consultations and agreements required from authorities and other stake, and key legislation and policies;
- (c) a description of the roles and responsibilities for all relevant employees involved in the construction of the project;
- (d) details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts; and
- (e) complaints handling procedures during construction.

The Plan shall be submitted for the approval of the Director General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director General. Construction works shall not commence until written approval has been received from the Director General.

Where the Project ties into the approved Ballina Bypass project (chainage 134km750 to 135km930), nothing in this condition precludes the Proponent from updating the current version of the approved Ballina Bypass CEMP to meet this requirement, providing the CEMP demonstrates, to the satisfaction of the Director General, where the relevant conditions of this approval have been addressed.

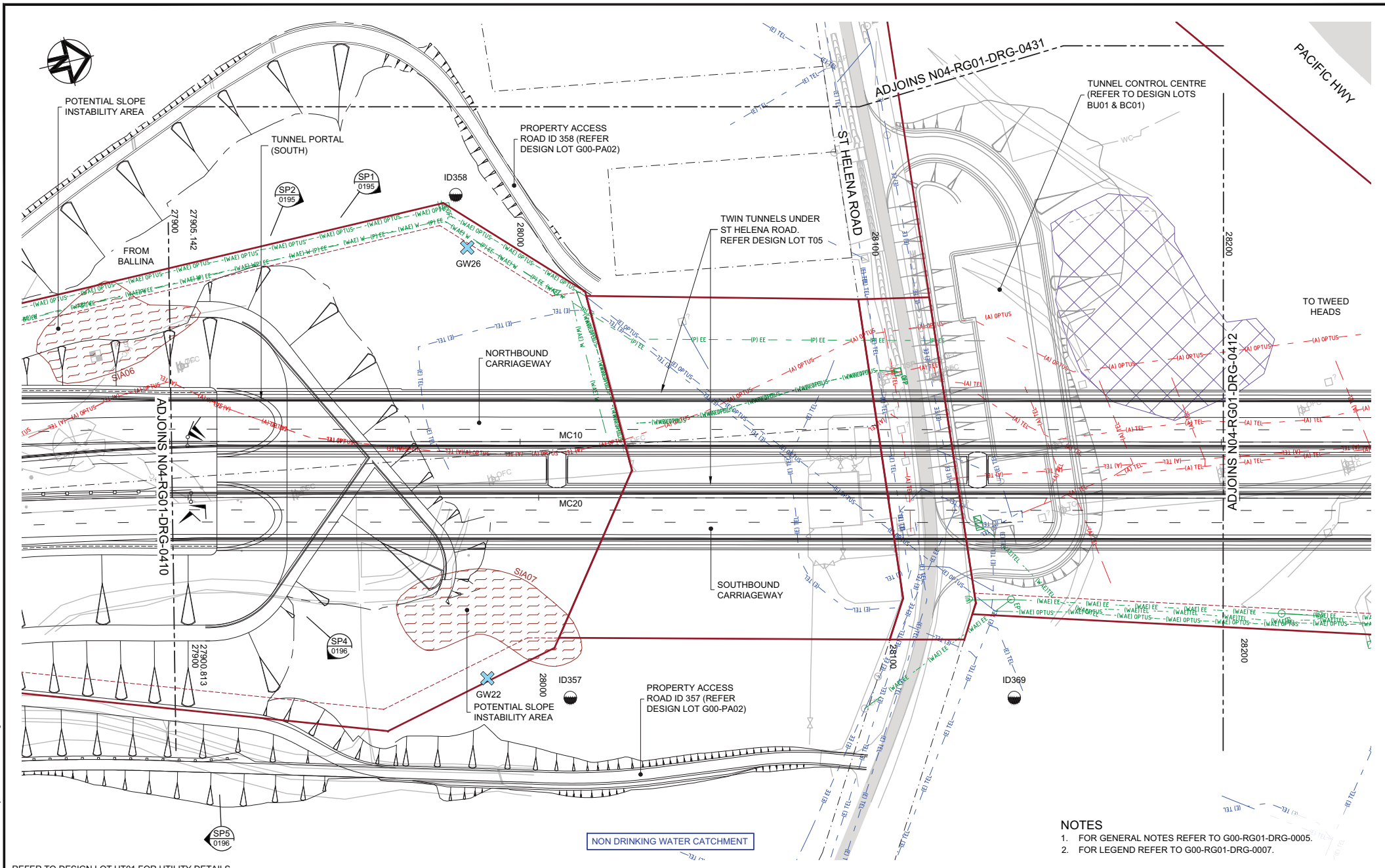
6.5 As part of the Construction Environment Management Plan for the project required under condition 6.4 of this approval, the Proponent shall prepare and implement the following sub plan(s):

- (a) a **Construction Traffic Management Plan**, prepared in accordance with the RTA's *QA Specification G10 – Control of Traffic and Traffic Control at Work Sites Manual* (2003) to manage disruptions to highway and local traffic movements as a result of construction activities (and associated construction traffic).
- (b) a **Construction Flora and Fauna Management Plan** to detail how construction impacts on ecology will be minimised and managed. The Plan shall be developed in consultation with DECCW and shall include, but not necessarily be limited to:
 - (i) details of work practices (such as fencing and construction worker education) to minimise the potential for damage to vegetation (particularly Endangered Ecological Communities and threatened flora species) and native fauna during construction. Measures shall also be included to minimise the extent of soil disturbance during construction;
 - (ii) weed management measures focusing on early identification of invasive weeds, identifying effective management controls and methods to measure effectiveness;
 - (iii) details of the mitigation measures to be implemented and associated procedures for the installation and monitoring of these measures; and
 - (iv) a description of how the effectiveness of the mitigation and management measures would be monitored during the proposed works and, if any non-compliance is detected, how any non-compliance would be rectified.
- (c) a **Construction Heritage Management Plan** to detail how construction impacts on Aboriginal and non-Aboriginal heritage will be minimised and managed. The Plan shall be developed in consultation with the Department's Heritage Branch and the DECCW and shall include, but not necessarily be limited to:
 - (i) a strategy for the storage of salvaged objects, both during construction and for the long term management;
 - (ii) specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items to minimise and avoid impacts on these items. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage along the project corridor;

- (iii) procedures to be followed should previously unidentified Aboriginal objects or heritage items be uncovered or additional impacts to sites identified;
 - (iv) procedure for continued consultation with Aboriginal stakeholders;
 - (v) procedures to be followed should non-compliance against any of the documents identified in condition 1.1 or this management plan be detected.
- (d) a **Construction Noise and Vibration Management Plan** to detail how construction noise and vibration impacts would be minimised and managed. The Plan shall be developed in consultation with the DECCW and include, but not necessarily be limited to:
- (i) details of and an indicative schedule for construction activities ;
 - (ii) identification of noise and/or vibration generating construction activities that would affect sensitive receivers, particularly residential areas;
 - (iii) procedures to ensure overpressure and vibration criteria are met during blasting, including a suitable blast program supported by test blast results;
 - (iv) a detailed description of the reasonable and feasible actions and measures to be implemented to ensure compliance with the relevant noise and vibration criteria/objectives;
 - (v) details of measures to reduce noise and vibration impacts on the Macadamia Castle property;
 - (vi) procedures for notifying sensitive receivers of construction activities likely to affect their noise and vibration amenity, as well as procedures for managing noise complaints; and
 - (vii) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, the locations where monitoring would take place, how the results of this monitoring would be recorded; and, procedures to be followed should non-compliance against any of the documents identified in Condition 1.1 or this management plan be detected.

Operational Environmental Management

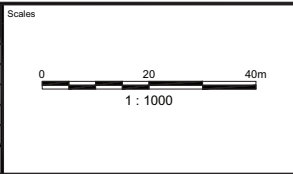
- 6.6 Prior to the commencement of operation of the project, the Proponent shall incorporate the project into its existing environmental management systems.
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- NOTES**
- FOR GENERAL NOTES REFER TO G00-RG01-DRG-0005.
 - FOR LEGEND REFER TO G00-RG01-DRG-0007.

REFER TO DESIGN LOT UT01 FOR UTILITY DETAILS.

Issue	Description	Date	Approved
D1	SUBSTANTIAL DETAILED DESIGN	18-05-12	DW
C1	PRELIMINARY DETAILED DESIGN	28-03-12	DW
B1	DEVELOPED CONCEPT DESIGN	17-01-12	DW

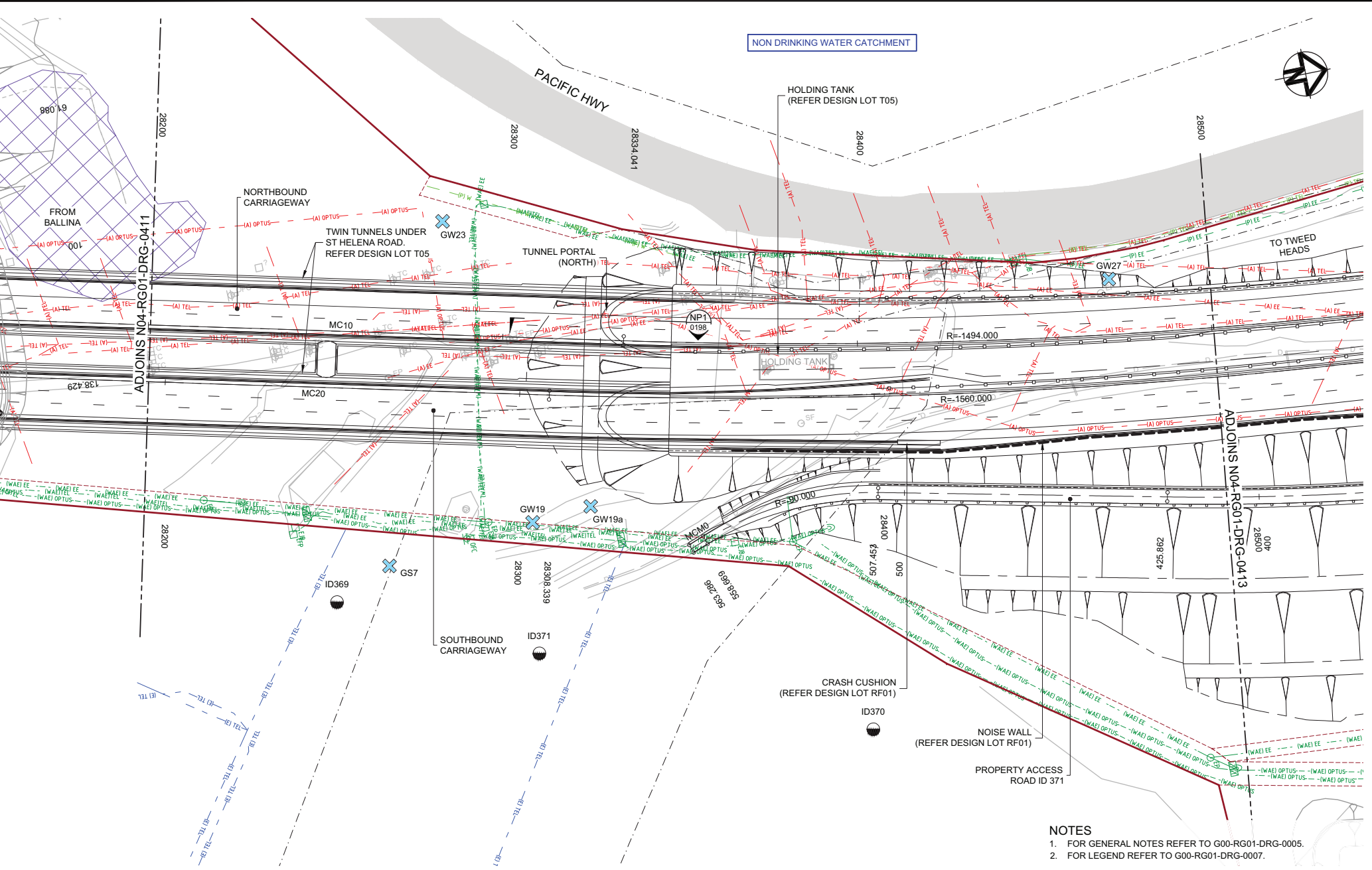


Hyder GHD
BAULDERSTONE CM+

Status PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION			
Original Size A3	Drawn JT	RMS Reg'n No DS2012/000308	
Coordinate System MGA ZONE 56	Designed NC/NJ	NSW Government Transport Roads & Maritime Services	
Height Datum AHD	Date Printed 17 May 2012 - 05:02PM	PACIFIC HIGHWAY UPGRADE TINTENBAR TO EWINGSDALE ROAD GEOMETRY GENERAL ARRANGEMENT STN 27900 TO SHEEN 28200 (MC10) SHEET 11	
File: N04-RG01-DRG-0411.dwg		Alignment Model No: DES T2E 12	

NSW Government Transport Roads & Maritime Services

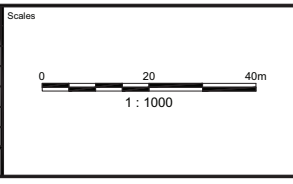
Zone N04	Lot Code RG01	Doc. Type DRG	Drawing No. 0411	Issue D1
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- NOTES**
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Hyder
BAULDERSTONE
CM+

Status: **PRELIMINARY ONLY**
NOT TO BE USED FOR CONSTRUCTION

Original Size: A3	Drawn: JT
Coordinate System: MGA ZONE 56	Designed: NC/NJ
Height Datum: AHD	Date Printed: 17 May 2012 - 05:03PM

File: N04-RG01-DRG-0412.dwg Alignment Model No: DES T2E 12

RMS Reg'n No: DS2012/000308

NSW GOVERNMENT
Transport Roads & Maritime Services

PACIFIC HIGHWAY UPGRADE
TINTENBAR TO EWINGSDALE
ROAD GEOMETRY
GENERAL ARRANGEMENT
STN 28200 TO STN 28500 (MC10)
SHEET 12

Zone: N04	Lot Code: RG01	Doc. Type: DRG	Drawing No: 0412	Issue: D1
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File Name: S:\Hyder\ECAD\01-DRG\CAD\A3-Zones\RG-Road\Geometry\N04-RG01-DRG-0412.dwg

50mm on Original