Foxground and Berry bypass

Princes Highway upgrade

Environmental assessment

Volume 2 – Appendix A

Director-General's requirements

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NSW GOVERNMENT | Planning

Our ref: MP 10_0240
File No: 10/17317-2

Mr Brad Turner
Regional Manager, Southern
NSW Roads and Traffic Authority
PO Box 477
WOLLONGONG NSW 2520

Dear Mr Turner,

Director-General's Requirements for a Project Application for the Princes Highway Upgrade – Foxground and Berry Bypass (MP 10_0240)

Thank you for your request for Director General's environmental assessment requirements (DGRs) for the above project.

I have attached a copy of the Director General's Requirements (DGRs) for the preparation of an Environmental Assessment for the project. These requirements have been prepared in consultation with relevant government authorities. I have also attached a copy of the government authorities' comments for your information. Please note that the NSW Office of Water have not provided their response. Once received, it will be forwarded to you separately.

The DGRs have been prepared based on the information you have provided to date. Please note that under section 75F(3) of the *Environmental Planning and Assessment Act 1979*, the Director General may alter these requirements at any time. If you do not submit an Environmental Assessment for the project within 2 years, the DGRs will expire.

Prior to exhibiting the Environmental Assessment that you submit for the project, the Department will review the document to determine if it adequately addresses the DGRs. The Department may consult with other relevant government authorities in making this decision. Please provide 3 hard copies and 3 electronic copies of the Environmental Assessment to assist this review.

If the Director General considers that the Environmental Assessment does not adequately address the DGRs, the Director General may require you to revise the Environmental Assessment. Once the Director General is satisfied that the DGRs have been adequately addressed, the Environmental Assessment will be made publicly available for at least 30 days.

If your project is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval would be in addition to any approvals required under NSW legislation and it is your responsibility to contact the Department of Sustainability, Environment, Water, Population and Communities.

If you have any enquiries about these requirements, please contact Mr Andrew Beattie on 02 9228 6384 or via e-mail at andrew.beattie@planning.nsw.gov.au.

Yours sincerely

11/2/11

Daniel Keary
Director
Infrastructure Projects
As delegate for the Director General

23-33 Bridge St Sydney NSW 2000 GPO Box 39 Sydney NSW 2001
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NSW GOVERNMENT | Planning & Infrastructure

Contact: Andrew Beattie
Phone: (02) 9228 6384
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Email: andrew.beattie@planning.nsw.gov.au

Our ref.: MP10_0240

Mr Brad Turner
Regional Manager, Southern
Roads and Traffic Authority
PO Box 477
WOLLONGONG NSW 2520

Dear Mr Turner,

Subject: Director-General's Requirements for the Princes Highway Upgrade - Foxground and Berry Bypass (MP10_0240)

I refer to your correspondence received via electronic mail on 16 May 2011 requesting an amendment to the Director General's Requirements (DGRs) for the above project which were issued on 11 February 2011.

The request relates to the "Noise and Vibration" section of the DGRs. In particular, replacing the outgoing *Environmental Criteria for Road Traffic Noise* (EPA 1999) document with the *Road Noise Policy* (DECCW 2011) document, which will become effective on 1 July 2011.

The Department has considered your request and has agreed to the amendment. I have attached a copy of the amended Director-General's Requirements (DGRs) for the preparation of an Environmental Assessment for the project (**Attachment 1**). These DGRs replace those issued on 11 February 2011.

The DGRs have been prepared based on the information you have provided to date. Please note that under section 75F(3) of the *Environmental Planning and Assessment Act 1979*, the Director-General may alter these requirements at any time. If you do not submit an Environmental Assessment for the project within 2 years, the DGRs will expire.

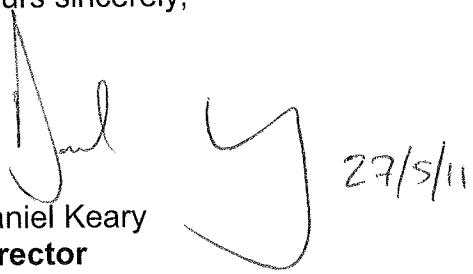
Prior to exhibiting the Environmental Assessment that you submit for the project, the Department will review the document to determine if it adequately addresses the DGRs. The Department may consult with other relevant government authorities in making this decision. Please provide 3 hard copies and 3 electronic copies [1] of the Environmental Assessment to assist this review.

If the Director-General considers that the Environmental Assessment does not adequately address the DGRs, the Director-General may require you to revise the Environmental Assessment. Once the Director-General is satisfied that the DGRs have been adequately addressed, the Environmental Assessment will be made publicly available for at least 30 days.

[1] File parts must be no greater than 5Mb each. File parts should be logically named and divided.

Your contact officer for this proposal, Andrew Beattie, can be contacted on 9228 6384 or via email at andrew.beattie@planning.nsw.gov.au. Please mark all correspondence regarding the proposal to the attention of the contact officer.

Yours sincerely,



Daniel Keary
Director
Infrastructure Projects

Director-General's Requirements

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

Application number	MP10_0240
Project	Princes Highway Upgrade – Foxground to Berry Bypass
Location	Approximately 11.6 kilometre length of dual carriageway from the junction of Toolijooa Road and the Princes Highway to the junction of Schofields Lane and the Princes Highway, south of Berry in the Kiama and Shoalhaven local government areas.
Proponent	NSW Roads and Traffic Authority
Date issued	27 May 2011
Expiry date	27 May 2013
General requirements	The Environmental Assessment (EA) must include the following: 1. an **executive summary**. 2. a **detailed description** of the Project including: • route alignment and corridor width; • design elements (requirements for bridges, culverts, Level of Service, pedestrian and cyclists, rest areas and service centres, etc); • clear identification of and/or options for the proposed location of ancillary facilities (e.g. compound site, batching plants, etc); • resourcing (e.g. construction material needs, spoil disposal, natural resource consumption including water supply sources); and • potential staging. 3. an **assessment of the key issues**, including an assessment of the worst case and representative impact for each issue for all aspects of the project (including the proposed locations of and/or options for the ancillary facilities) with the following aspects addressed for each key issue (where relevant): • describe the existing environment; • assess the potential impacts of the proposal at both construction and operation stages, in accordance with relevant policies and guidelines. Both direct and indirect impacts must be considered including potential interactions with the existing Princes Highway (as relevant); • identify how relevant planning, land use and development matters, (including relevant strategic and statutory matters), have been considered in the impact assessment and/ or in developing management/ mitigation measures; and • describe measures to be implemented to avoid, minimise, manage, mitigate, offset and/or monitor the impacts of the project and the residual impacts. 4. a **draft Statement of Commitments (SoC)**. The SoC must incorporate or otherwise capture all measures to avoid, minimise, manage, mitigate, offset and/or monitor impacts identified in the impact assessment sections of the EA and ensure that the wording of the SoC clearly articulates the desired environmental outcome of the commitment. The SoC must be achievable, measurable (with respect to compliance), and time specific, where relevant. 5. **certification** by the author of the Environment Assessment that the information contained in the Assessment is neither false nor misleading.
Key issues	▪ **Strategic Justification –** describe the strategic need, justification and objectives for the project taking into account the aims and objectives of relevant strategic planning and transport policies including the State Plan (2006), the Illawarra Regional Strategy and South Coast Regional Strategy.

- **Project Justification –** assess the alternatives considered (including an assessment of the environmental costs and benefits of the project relative to alternatives), and provide justification for the preferred project taking into consideration the objects of the *Environmental Planning and Assessment Act 1979* and the following:
  - the environmental, social and economic impacts of the project;
  - the suitability of the site; and
  - whether or not the project is in the public interest.

- **Traffic and Transport** - including but not limited to:
  - construction traffic impacts, including identification of construction routes and the nature of existing traffic on these routes, quantification of traffic volumes (including for spoil haulage), potential impacts to regional and local road network (including safety and level of service), and potential disruption to existing public transport services, access/ service lanes to local properties;
  - operational traffic and transport impacts to the local and regional road network, including:
    - changes to access arrangements/ service lanes to local properties;
    - changes to local road connectivity and access and impacts on local traffic arrangements and local road capacity/safety from traffic rerouting and modified access to the upgraded highway, including direct impacts from the replacement of the existing highway that currently passes through Berry. The assessment must take into account potential interactions with local traffic associated with the residential sub-division at Huntingdale Park, Berry (including future growth) and any severance impacts on local connectivity within Berry as a result of the proposed route. Consideration must be given to potential impacts of changed traffic arrangements on local and/or school bus services, access for emergency services and garbage trucks routes;
    - traffic capacity of the proposal and its ability to cater for predicted growth. Consideration should be given to what effect potential major land use changes in the locality may have on the traffic assessment outcomes; and
    - opportunity for the provision of cycle way connections along the highway and to adjoining communities.

- **Noise and Vibration -** including but not limited to:
  - a construction noise and vibration assessment including construction traffic noise, batch plants and blasting impacts. The EA must clearly identify nearest sensitive receptors and assess construction noise/ vibration generated by representative construction scenarios focussing on high noise generating works. Where work hours outside of standard construction hours are proposed, clear justification and detailed assessment of these work hours must be provided including alternatives considered and mitigation measures proposed. The assessment must further consider any cumulative impacts during construction, having regard to any other developments (both existing and approved) in the locality;
  - an operational road traffic noise assessment including consideration of local meteorological conditions (as relevant) and any additional reflective noise impacts from proposed noise mitigation barriers;
  - the assessment(s) must take into account the following guidelines as relevant: *Interim Construction Noise Guideline* (DECC 2009), *Road Noise Policy (DECCW 2011)*, *Environmental Noise Management Manual* (RTA, 2001), *Assessing Vibration: A Technical Guideline* (DEC, 2006); and *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990).

- **Flora and Fauna -** including but not limited to:
  - an assessment of all project components on flora and fauna and their habitat (both terrestrial and aquatic, as relevant) consistent with the *Draft Guidelines for Threatened Species Assessment* (DEC, 2005). The EA must provide details of the survey methodology employed including survey effort and representativeness for species targeted;
  - specific consideration of impacts to threatened species, populations, ecological communities and/or critical habitat listed under both State and Commonwealth legislation that have been recorded on the site and surrounding land;
  - details on the existing site conditions (both terrestrial and aquatic) and quantity and likelihood of disturbance (including quantifying the worst case extent of impact on the basis of vegetation type and total native vegetation disturbed);
  - as relevant, consideration of weed infestation and edge effects; habitat fragmentation; impacts to wildlife and riparian corridors; impacts to groundwater-dependent communities, riparian and aquatic habitat (including impacts on SEPP 14 wetlands and fish passage);
  - provide details of how flora and fauna impacts would be managed during construction and operation for all project components, including adaptive management and maintenance protocols and monitoring programs; and
  - demonstrate actions to be undertaken to avoid, mitigate or offset impacts associated with the project (all components) consistent with the principles of "improve or maintain". Sufficient details must be provided to demonstrate the availability of viable and achievable options to offset the impacts of the project, where offset measures are proposed to address residual impacts.

- **Surface and Ground Water -** including but not limited to:
  - water quality taking into account impacts from both accidents and runoff and considering relevant environmental water quality criteria specified in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000*. The assessment must describe measures to control erosion and sedimentation during construction activities and measures to capture and treat runoff from the site during the operational phase;
  - identify potential risks of the project on groundwater resources including: characterising existing local and regional hydrology; potential risks of drawdown; impacts to groundwater quality; discharge requirements; and implications for groundwater-dependent surface flows (including springs and drinking water catchments), groundwater-dependent ecological communities, and groundwater users;
  - identifying potential impacts of the project on existing flood regimes, consistent with the *Floodplain Development Manual* (Department of Natural Resources, 2005), including impacts to existing receivers and infrastructure and the future development potential of affected land, demonstrating consideration of the changes to rainfall frequency and/or intensity as a result of climate change on the project. The assessment shall demonstrate due consideration of flood risks in the project design; and;
  - waterways to be modified as a result of the project, including ecological, hydrological and geomorphic impacts (as relevant) and measures to rehabilitate the waterways to pre-construction conditions or better.

- **Landscape and Visual Amenity -** including but not limited to:
  - assessment of the visual significance of the area, including the escarpment and ridges and the township of Berry, and impact of the proposed alignment; and
  - design of the project (including noise barriers, retaining walls and

	landscaping) consistent with the existing (and desired) character of affected localities, including consideration of the *Noise Wall Design Guideline* (RTA, 2006). The assessment should also consider highway/street lighting and the potential lightspill impacts on nearby residents. ▪ **Aboriginal and Historic Heritage** – including but not limited to: • an assessment of the project on Aboriginal cultural heritage consistent with the draft *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC, July 2005), specifically considering artefacts, potential archaeological deposits and landscape cultural values. The EA must demonstrate effective consultation with indigenous stakeholders during the assessment and in developing mitigation options (including the final recommended measures). The EA must describe the actions that will be taken to avoid, mitigate or offset impacts; and • an assessment of the impact of the project on historic heritage values, in particular impacts on the historic township of Berry. ▪ **Land Use/Property, Social/Economic -** including but not limited to: • directly-affected properties and land uses adjacent to the project, including: impacts to land use viability and future development potential; and property allotment, land sterilisation and severance impacts. • the agricultural sector taking into account the fragmentation and potential loss of agricultural and farm viability including internal and external farm access arrangements both during construction and operation of the project; • local community socio-economic impacts associated with access, land use, property and amenity related changes; • business impacts including the overall viability, profitability, productivity and sustainability of businesses in the township of Berry associated with the changes to route alignment in Berry; and • impacts on recreational fishing access and opportunities in Broughton Creek, Broughton Mill Creek and Bundewallah Creek. **Environmental Risk Analysis –** notwithstanding the above key assessment requirements, the EA must include an environmental risk analysis to identify potential environmental impacts associated with the project (construction and operation), proposed mitigation measures and potentially significant residual environmental impacts after the application of proposed mitigation measures. Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of this additional key environmental impact must be included in the EA.
Consultation	You should undertake an appropriate and justified level of consultation with relevant parties during the preparation of the EA, including: • local, State or Commonwealth government authorities and service providers, including the NSW Office of Environment and Heritage; the NSW Office of Water; the Department of Trade and Investment, Regional Infrastructure and Services; Shoalhaven City Council; Shoalhaven Water and the Council of the Municipality of Kiama; • specialist interest groups including Local Aboriginal Councils; and • the public, including affected landowners. The EA must describe the consultation process, document all community consultation undertaken to date and identify the issues raised (including where these have been addressed in the EA).

NSW GOVERNMENT | Environment, Climate Change & Water

Your reference: DOC11/3638
Our reference: FIL11/518
Contact: Michael Heinze (02) 6229 7002

Attention: Mr Michael Young
Senior Planning Officer
Infrastructure Projects
Department of Planning
GPO Box 39
SYDNEY NSW 2001

31 January 2011

Dear Mr Young

RE: Princes Highway Upgrade - Foxground to Berry Bypass – Director-General's Environmental Assessment Requirements – Section 75F Environmental Planning and Assessment Act 1979

I refer to your letter dated 10 January 2011, requesting the Department of Environment, Climate Change and Water's (DECCW) requirements for the environmental assessment (EA) for the above proposal. DECCW understands that the project application for this proposal will be assessed by the Department of Planning (DoP) under Part 3A of the *Environmental Planning and Assessment Act 1979*.

If approved, the proposal would be a scheduled activity under the *Protection of the Environment Operations Act 1997* and would require an Environment Protection Licence under that Act. The proponent will need to make a separate application to DECCW to obtain this licence if planning consent is given.

DECCW has considered the details of the project and has identified the information it requires to assess the project (**Attachment 1**). The proponent should ensure that the EA is sufficiently comprehensive to enable DECCW to determine the extent of the impact(s) of the proposal. In summary these issues include:

- a clear description of the scope of the project;
- a description of the environmental impacts of the project: sufficient information must be provided to ensure the EA is sufficiently comprehensive to enable DECCW to determine the extent of the impacts of the proposal. In particular, the EA should address requirements of Section 45 of the *Protection of the Environment Operations Act 1997*;
- the impacts of the project on threatened species and their habitat (**Attachment 2**);
- the impacts on endangered ecological communities;
- the impacts of the project on Aboriginal Cultural Heritage values;
- the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts identified above; and
- other broad environment protection or conservation issues of concern in the proposed project.

PO Box 622, Queanbeyan NSW 2620
11 Farrer Place, Queanbeyan NSW
Tel: (02) 6229 7002 Fax: (02) 6229 7006
ABN 30 841 387 271
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In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in **Attachment 3** and any relevant industry codes of practice and best practice management guidelines.

The proponent should be aware that any commitments made in the EA may be formalised as approval conditions. Consequently pollution control or conservation measures should not be proposed if they are impractical, unrealistic or beyond the financial viability of the development. It is important that all conclusions are supported by adequate data.

DECCW also requests that the applicant is provided with a full unaltered version of DECCW's environmental assessment requirements and guidelines as set out in **Attachments 1-3**.

DECCW requests that 2 hard copies and an electronic copy of the EA are provided for assessment. These documents should be lodged at DECCW's South East Regional Office, 11 Farrer Place, Queanbeyan, NSW 2620.

If you have any queries regarding this matter please contact Mr Michael Heinze on 02 6229 7002.

Yours sincerely

JULIAN THOMPSON
Unit Head – South East Region
Environment Protection and Regulation Group

Attachment 1 – Department of Environment, Climate Change and Water Environmental Assessment Requirements

The environmental assessment must provide sufficient information for DECCW to be able to fully assess the development in so far as the impacts relate to environmental legislation administered by DECCW. The environmental assessment must include a comprehensive description of the construction processes, all discharges and emissions to the environment, an assessment of likely environmental impacts and a comprehensive description of any proposed control measures.

The proposal is scheduled under the *Protection of the Environment Operations Act 1997* and will require the issue of an Environment Protection Licence under that Act. Therefore, the requirements of Section 45 of the *Protection of the Environment Operations Act 1997* must be addressed.

In accordance with the relevant guidelines listed in **Attachment 3**, DECCW requires the following issues to be assessed, quantified and reported on in detail:

- Air issues
- Noise and vibration issues
- Water quality
- Contaminated land
- Waste and chemicals
- Soil contamination
- Threatened species
- Aboriginal cultural heritage
- Cumulative impacts

Air Issues

Dust is the primary air quality concern. Potential emission sources include open exposed areas, drilling and blasting, material processing and handling, loading and un-loading, stockpiles and haulage activities. Details must be provided on proposed dust management strategies for all potential sources of dust.

The environmental assessment must be conducted in accordance with the DECCW publication "*Approved Methods for Modelling and Assessment of Pollutants in New South Wales*". The environmental assessment must assess PM10 (24-hour and annual average), total suspended particulates and deposited dust impacts.

The environmental assessment must include a cumulative assessment that examines the impacts of the proposal combined with all existing and approved dust generating activities in the area.

Noise and vibration Issues

The environmental assessment should identify all potential noise sources and describe the extent to which noise emissions are likely to impact on any residential and/or other sensitive receivers in the vicinity of the site. The EPA publication *New South Wales Industrial Noise Policy* provides the methodology and assessment criteria applied by the EPA to assess the impacts and to determine project-specific noise planning levels. The environmental assessment should include a noise impact assessment in accordance with this Policy.

The noise impact assessment should take into account the construction phase of the development, clearly specify the proposed hours of operation, and take into account adverse weather conditions including temperature inversions. Sound power levels (measured or estimated) for all plant and equipment should be clearly stated and justified. There should be an assessment of cumulative noise impacts, having regard to any other developments existing and/or approved for the locality. Where adverse noise impacts are predicted, the impact assessment should provide details on proposed noise control measures.

Road transport to and from the premises has the potential to increase disturbance at residential properties along private or public haulage routes. To assess the extent of the impact, the noise impact assessment should identify the transport route(s) to be used, the hours of operation, anticipated traffic

movements, and expected increase in noise levels. The publication *Environmental Criteria for Road Traffic Noise* (EPA, 1999) describes the methods generally applied by DECCW to determine noise planning levels for road traffic noise in locations of varying sensitivity.

The method, data and assumptions used to assess the impact of road haulage on residential properties must be fully documented and justified. Where disturbance due to road transport is likely to exceed the recommended criteria, the environmental assessment must describe the measures proposed to mitigate the impacts and the extent to which the measures are likely to be effective in achieving the relevant criteria.

Blast induced vibration effects from the project must also be considered and a thorough assessment must take into account the *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration* (ANZECC 1990).

Water quality

The environmental outcomes for the project in relation to water should be:

- There is no pollution of waters (including surface and groundwater) during construction or occupation of the site by the final users;
- It is acceptable in terms of the achievement or protection of the River Flow Objectives and Water Quality Objectives.
- The EA should document the measures that will achieve the above outcomes.

The source of water for dust control is a major issue for this proposal. The proponent will need to clearly demonstrate where the water will be sourced from and quantities required for dust control and other activities.

Other water issues include erosion and sediment control during construction activities including pipelines, stormwater runoff control and chemical storage during operation.

If an off-site discharge is proposed for any or all wastewater streams, then the environmental assessment must address potential impacts and demonstrate that the discharges will not prejudice attainment of water quality objectives for the receiving water course. The NSW government has adopted Water Quality Objectives (WQO) for local waterways as part of the Drinking Water Catchments Regional Environment Plan (REP) No. 1 and its' supporting policies and guidelines, as a guide for the assessment of environmental impacts on aquatic ecosystems. These WQOs were developed from community consultation and the Healthy Rivers Commission (HRC) Inquiry into the Hawkesbury Nepean River System.

DECCW expects that this activity can be managed without discharging to waters and it is therefore unlikely that any discharge will be licensed.

The environmental assessment should describe measures for dealing with the following water pollution issues:

- Measures to control erosion and sedimentation during construction activities, Further guidance is available in the guideline *Managing Urban Stormwater - Soils and Construction"*, NSW Landcom, Fourth Edition, March 2004;
- Measures to capture and treat runoff from the site during the operational phase;
- Sealing areas of the site to prevent soil erosion;
- Spillage controls and bunding for materials used onsite.

Contaminated Land

Under the *Contaminated Land Management Act* 1997 there is a responsibility to notify the DECCW of sites that pose a significant risk of harm to human health or the environment.

The environmental assessment must document the management of any land contamination. This includes ensuring that land is not allowed to be put to a use that is inappropriate because of the presence of contamination, and incorporates mechanisms to ensure that:

- planning authorities consider contamination issues when they are making development decisions;
- local councils provide information about land contamination on planning certificates that they issue under section 149 of the *Environmental Planning & Assessment Act 1979*; and

- Land remediation is facilitated and controlled through State Environmental Planning Policy 55 – Remediation of Land (SEPP55).

The following documents should form the basis for the contaminated land assessment for the proposed development:

- Managing Land Contamination: Planning Guidelines - SEPP55 - Remediation of Land, Department of Urban Affairs and Planning and NSW EPA, 1998:
- Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites (Environment Protection Authority (EPA) 1997);
- Contaminated Sites – Guidelines on Significant Risk of Harm and Duty to Report (EPA, 1999).

Waste Issues

The environmental assessment should describe all wastes that will be generated by the proposal including, for each of the main waste streams, the process from which it will be generated; its quantity and composition; its classification under the *Protection of the Environment Operations Act 1997*; and the proposed arrangements for dealing with the waste.

Guidance on waste classification and management issues can be obtained from the publication *Waste Classification Guidelines* (DECCW, 2010). The environmental assessment should clearly identify methods of reducing waste volumes and recycling and reusing wherever possible.

The avenues for disposal of industrial/hazardous waste are limited within New South Wales at present and the proponent should detail the likelihood of generation of these wastes and anticipated storage/disposal methods.

The environmental assessment must identify any fuel or chemical storage areas to be established on the site and describe the measures proposed to minimise the potential for leakage or migration of pollutants into the soil, groundwater or surface water systems.

Monitoring Programs

The environmental assessment should specify and assess all monitoring programs for measuring noise, air quality and water quality monitoring during the construction phase and on-going operation of the facility. These monitoring programs should be capable of assessing whether or not the development achieves a satisfactory level of environmental performance. The evaluation should include a detailed description of the monitoring strategies, sample analysis methods and the level of reporting proposed.

Community Consultation

The environmental assessment should outline procedures for responding to breaches of environmental conditions and for reporting these incidents both to regulatory agencies and to the community. This includes complaint handling mechanisms and emergency response procedures.

Impacts of the project on threatened species and their habitat

A number of threatened entities are known to occur or have potential to occur in the Berry area. A complete fauna and flora survey should be conducted and documented in accordance with the draft *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004) and the *Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna, Amphibians* (DECC 2009) as it provides the assessment framework for threatened species issues associated with the site. All survey work should be undertaken at the appropriate time of year for each species to maximise the survey results.

The project area may support Endangered Ecological Communities (EECs). Development will need to avoid EECs and provide an appropriate buffer and asset protection zone. The EA must describe what actions will be undertaken to avoid or mitigate impacts caused by the development on all threatened species described at the site. Threatened species that could potentially occur onsite and should be considered include:

- Greater Broad-nosed Bat, Yellow-bellied Sheathtail-bat, Large-eared Pied Bat, Eastern Freetail-bat, Grey-headed Flying-fox, Southern Myotis

- Yellow-bellied Glider, Spotted-tailed Quoll
- Black Bittern
- Gang-gang Cockatoo, Glossy Black-cockatoo, Little Lorikeet
- Varied Sittella, Scarlet Robin
- Masked Owl, Powerful Owl
- Spotted Harrier
- Green and Golden Bell Frog
- Illawarra Greenhood, Leafless Tongue Orchid, Brittle Midge Orchid
- Illawarra Zieria
- Illawarra Socketwood
- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Illawarra Subtropical Rainforest in the Sydney Basin Bioregion
- Illawarra Lowlands Grassy Woodlands Grassy Woodland

The above list is not exhaustive and there is potential for a number of other threatened species to occur at the site. See **Attachment 2** for a list of relevant threatened species and associated assessment requirements for this project.

Likely impacts on regionally significant, protected, and threatened species and their habitats need to be assessed, evaluated and reported. The assessment should specifically report on the considerations listed in Step 3 of the Draft *Threatened Species Assessment Guidelines* (DECC and DPI, 2005) as stated below.

- **"Step 3, Involves identifying not only the magnitude and extent of impacts but also the significance of the impacts as related to the conservation importance of the habitat, individuals and population likely to be affected."**

The EA should clearly state whether it meets each of the key thresholds set out in Step 5 of the draft guidelines and describe the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on threatened species, populations, ecological communities, or their habitats. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after the measures are implemented.

Other vegetation clearing

The EA should clearly outline the extent to which the development footprint will impact on areas of native vegetation. It should also describe the tenure and conservation status of each parcel of land to be affected by the proposal or used as an offset.

Offsetting biodiversity and habitat loss would be required as identified in the threatened species guidelines. There are formulas associated with the "maintain and improve" principle of the Government's vegetation reforms that DECCW considers should apply.

Biodiversity Offset Principles

1. **Impacts must be avoided first by using prevention and mitigation measures**
   Offsets are then used to address remaining impacts. This may include modifying the proposal to avoid an area of biodiversity value or putting in place measures to prevent offsite impacts.
2. **All regulatory requirements must be met**
   Offsets cannot be used to satisfy approvals or assessments under other legislation, e.g. assessment requirements for Aboriginal heritage sites, pollution or other environmental impacts (unless specifically provided for by legislation or additional approvals).
3. **Offsets must never reward ongoing poor performance**
   Offset schemes should not encourage landholders to deliberately degrade or mismanage offset areas in order to increase the value from the offset.

4. **Offsets will complement other government programs**
A range of tools is required to achieve the NSW Government's conservation objectives, including the establishment and management of new national parks, nature reserves, state conservation areas and regional parks and incentives for private landholders.

5. **Offsets must be underpinned by sound ecological principles**
They must:

- include the consideration of structure, function and compositional elements of biodiversity, including threatened species
- enhance biodiversity at a range of scales
- consider the conservation status of ecological communities
- ensure the long-term viability and functionality of biodiversity.

Biodiversity management actions, such as enhancement of existing habitat and securing and managing land of conservation value for biodiversity, can be suitable offsets. Reconstruction of ecological communities involves high risks and uncertainties for biodiversity outcomes and is generally less preferable than other management strategies, such as enhancing existing habitat.

6. **Offsets should aim to result in a net improvement in biodiversity over time**
Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site.

Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset against the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation.

Offsets may include enhancing habitat, reconstructing habitat in strategic areas to link areas of conservation value, or increasing buffer zones around areas of conservation value and removal of threats by conservation agreements or reservation.

7. **Offsets must be enduring and they must offset the impact of the development for the period that the impact occurs**
As impacts on biodiversity are likely to be permanent, the offset should also be permanent and secured by a conservation agreement or reservation and management for biodiversity. Where land is donated to a public authority or a private conservation organisation and managed as a biodiversity offset, it should be accompanied by resources for its management. Offsetting should only proceed if an appropriate legal mechanism or instrument is used to secure the required actions.

8. **Offsets should be agreed prior to the impact occurring**
Offsets should minimise ecological risks from time-lags. The feasibility and in-principle agreements to the necessary offset actions should be demonstrated prior to the approval of the impact. Legal commitments to the offset actions should be entered into prior to the commencement of works under approval.

9. **Offsets must be quantifiable and the impacts and benefits must be reliably estimated**

Offsets should be based on quantitative assessment of the loss in biodiversity from the clearing or other development and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset. The methodology should include:

- the area of impact
- the types of ecological communities and habitat/species affected
- connectivity with other areas of habitat/corridors
- the condition of habitat
- the conservation status and/or scarcity/rarity of ecological communities
- management actions
- level of security afforded to the offset site.

The best available information/data should be used when assessing impacts of biodiversity loss and gains from offsets. Offsets will be of greater value where:

- they protect land with high conservation significance
- management actions have greater benefits for biodiversity
- the offset areas are not isolated or fragmented
- the management for biodiversity is in perpetuity (e.g. secured through a conservation agreement).

Management actions must be deliverable and enforceable.

10. **Offsets must be targeted**
They must offset impacts on the basis of like-for-like or better conservation outcome. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance condition by management actions and the removal of threats. Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets. One type of environmental benefit cannot be traded for another: for example, biodiversity offsets may also result in improvements in water quality or salinity but these benefits do not reduce the biodiversity offset requirements.

11. **Offsets must be located appropriately**
Wherever possible, offsets should be located in areas that have the same or similar ecological characteristics as the area affected by the development.

12. **Offsets must be supplementary**
They must be beyond existing requirements and not already funded under another scheme. Areas that have received incentive funds cannot be used for offsets. Existing protected areas on private land cannot be used for offsets unless additional security or management actions are implemented. Areas already managed by the government, such as national parks, flora reserves and public open space cannot be used as offsets.

13. **Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract**
Offsets must be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes.

Biobanking Assessment Methodology – Biodiversity Offsets

Recently adopted by DoP is the DECCW Interim policy on assessing and offsetting biodiversity impacts of Part 3A developments. The policy applies the Biobanking Assessment methodology (BBAM) to set the frame work to applying an appropriate offset to "maintain or improve" biodiversity values.

The question of suitable offsetting often arises in the context of these decisions. This policy seeks to provide a consistent and transparent approach to impact assessment and offsetting for projects assessed under Part 3A of the EP&A Act. This policy also provides the basis for aligning NSW and Commonwealth assessment and offsetting processes by providing an assessment pathway that is likely to satisfy both NSW and federal requirements provided that certain standards are met.

The Biobanking Assessment Methodology is available at: www.environment.nsw.gov.au

Impacts of the project on Aboriginal cultural heritage values

The EA should address and document the information requirements set out in the draft "Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation" involving surveys and consultation with the Aboriginal community.

The EA must identify the nature and extent of impacts on Aboriginal cultural heritage values across the project area.

Should the site be found to have significant Aboriginal cultural heritage values, the EA must describe the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on Aboriginal cultural heritage values. This should include an assessment of the

effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

The EA needs to clearly demonstrate that effective community consultation with Aboriginal communities has been undertaken in determining and assessing impacts, developing options and making final recommendations.

The EA should address and document the information requirements set out in the draft *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* involving surveys and consultation with the Aboriginal community.

Identify the nature and extent of impacts on Aboriginal cultural heritage values across the project area. Accordingly, the EA must describe the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on Aboriginal cultural heritage values. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

The EA needs to clearly demonstrate that effective community consultation with Aboriginal communities has been undertaken in determining and assessing impacts, developing options and making final recommendations.

Attachment 2 - Director General's Environmental Assessment Requirements for the evaluation of impacts on threatened species for the proposed Foxground to Berry Bypass.

INTRODUCTION

The purpose of these Directors General's requirements is to provide the assessment requirements to allow you, as the applicant, to identify the issues pertaining to threatened species, populations, ecological communities or their habitats, and provide appropriate amelioration for adverse impacts resulting from the action and to assist the consent or approval authorities in the assessment of your proposal pursuant to the *Environmental Planning and Assessment Act 1979* (EP&A Act).

DEFINITIONS

The definitions given below are relevant to these requirements:

- **Development** has the same meaning as in the EP&A Act.
- **Activity** has the same meaning as in the EP&A Act.
- **Proposal** is the development, activity or action proposed.
- **Subject Site** means the area directly affected by the proposal.
- **Study Area** means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account.
- **Locality** is the area within a 5km radius of the subject site
- **Subject Species, Populations or Ecological Communities** means those threatened species, populations or ecological communities that are known or considered likely to occur in the study area. The EVALUATION OF IMPACTS is to explicitly consider the impacts of the proposal on each of these entities.
- **Direct Impacts** are those that directly affect habitat and individuals, usually within the footprint of the proposal. They include, but are not limited to, clearing and habitat removal. Consideration must be given to all of the likely direct impacts of the proposed activity or development.
- **Indirect Impacts** occur when project-related actions affect species, populations or ecological communities in a manner other than direct loss, usually beyond the footprint of the proposal. Indirect impacts can include loss of individuals through predation by domestic and/or feral animals, deleterious hydrological changes (including increased runoff and raising or lowering of the water table), erosion, weed invasion, pollution, trampling or other impacts due to increased human activity within or directly adjacent to sensitive habitat areas, altered fire regimes, habitat fragmentation and disruption of wildlife movement corridors. As with direct impacts, consideration must be given to all of the likely indirect impacts of the proposed activity or development.
- **Life Cycle** is the series or stages of reproduction, growth, development, aging and death of an organism.
- **Viable** means the capacity to successfully complete each stage of the life cycle under normal conditions.
- **Risk of Extinction** is the likelihood that the local population of the species or local occurrence of the endangered population or ecological community will become extinct either in the short, medium or long-term as a result of direct or indirect impacts on the viability of that population and includes changes to the ecological function of communities.

- **Local Population** is the population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions.
  - The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.
  - The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.
  - The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time.

  In cases where multiple populations occur in the study area, each population should be assessed separately.
- **Local Occurrence** means the ecological community that occurs within the study area. However the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.
- **Composition** means both the plant and animal species present, and the physical structure of the ecological community. Note that while many ecological communities are identified primarily by their vascular plant composition, an ecological community consists of all plants and animals as defined under the *Threatened Species Conservation Act 1995* (TSC Act) that occur in that ecological community.

All other definitions are the same as those contained in the TSC Act.

1 CONTEXTUAL INFORMATION

1.1 Description of proposal, subject site and study area

A full description of the action proposed includes a description of all associated actions. These actions may occur on or off the subject site.

In describing the action proposed, the proportion of the subject site and the study area that will be affected is to be provided, including details of the location of any auxiliary infrastructure and all component parts of the proposal including, but not restricted to (i) roadworks and temporary access and egress routes, (ii) drainage and settling ponds, stockpile areas, diversion banks, vehicle parking areas (iii) changes in surface water flows (iv) utilities such as electricity, drainage, sewage, gas, (v) any actions necessary for fire management, (vi) stockpile areas, (vii) temporary buildings etc.

The type of action proposed shall be detailed, including the timetable for the construction of the proposal. If a staged construction approach is adopted then the timetable shall clearly indicate this.

If subsequent development of adjacent land is proposed by the proponent in the future, including any additional road construction then this shall be identified to the extent that it is known at the time of preparing the Environmental Assessment. If existing structures are to be relocated, this should also be described and assessed.

The vegetation within the study area that is to be retained is to be fully documented, and shown on the relevant plans and maps. The proposed management regimes for such areas are also to be documented.

2. PROVISION OF RELEVANT PLANS AND MAPS

A detailed plan of the *study area* shall be provided at a scale of 1:4000 or finer. This plan shall show the *proposal*, the location and type of vegetation communities present within the *study area*, the full

extent of vegetation clearing anticipated, and the scale of the plan. This plan shall also show the location of any key habitat resources for threatened species (e.g. hollow-bearing trees, identified feed trees, potential breeding sites, rock outcrops). Where the general habitat of each *subject species, population or ecological community* within the *study area* can be clearly delineated, this habitat shall be represented on the plan.

Colour aerial photography of the *locality* (or a reproduction of such a photograph) shall be provided. This aerial photograph shall clearly show the *subject site* and the scale of the photograph.

The locations of the *subject species, populations or ecological communities* recorded in any survey conducted for the purposes of the Environmental Assessment shall be represented on a map of the *study area* that shows the *proposal* (preferred scale 1:4000 or finer).

A topographic map of the general *locality* at a scale of 1:25000 is to be provided. This map is to detail the location of the action proposed, landscape features including rivers, swamps, wetlands, any locally significant sites of *subject species, populations or ecological communities*, and areas of high human activity such as townships and major roads. This map shall incorporate the area within a radius of 5km from the subject site. All available historical records are to be included of *subject species, populations of ecological communities* sourced from various databases and other sources are to be included on this map.

2.1 Land tenure information

The land tenure across the *study area* is to be described and any limitations to sampling across the *study area* resulting from this tenure (e.g. denied access to private land) shall be noted.

3 INITIAL ASSESSMENT

3.1 Identifying subject species and populations

For the purposes of this Evaluation of Impacts, the species listed in Table 1 are to be addressed as *subject species*:

Table 1. List of *subject species*.

SPECIES	SCIENTIFIC NAME	STATUS
FAUNA		
Green and Golden Bell Frog	*Litoria aurea*	Endangered
Greater Broad-nosed Bat	*Scoteanax rueppellii*	Vulnerable
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Vulnerable
Large-eared Pied Bat	*Chalinolobus dwyeri*	Vulnerable
Eastern Freetail-bat	*Mormopterus norfolkensis*	Vulnerable
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable
Southern Myotis	*Myotis macropus*	Vulnerable
Yellow-bellied Glider	*Petaurus australis*	Vulnerable
Spotted-tailed Quoll	*Dasyurus maculatus*	Vulnerable
Black Bittern	*Ixobrychus flavicollis*	Vulnerable
Gang-gang Cockatoo	*Callocephalon fimbriatum*	Vulnerable
Glossy Black-cockatoo	*Calyptorhynchus lathami*	Vulnerable
Little Lorikeet	*Glossopsitta pusilla*	Vulnerable
Varied Sittella	*Daphoenositta chrysoptera*	Vulnerable
Masked Owl	*Tyto novaehollandiae*	Vulnerable
Powerful Owl	*Ninox strenua*	Vulnerable
Scarlet Robin	*Petroica boodang*	Vulnerable

SPECIES	SCIENTIFIC NAME	STATUS
Spotted Harrier	*Circus assimilis*	Vulnerable
FLORA		
Illawarra Greenhood	*Pterostylus gibbosa*	Endangered
Illawarra Zieria	*Zieria granulate*	Endangered
Leafless Tongue Orchid	*Cryptostylis hunteriana*	Vulnerable
Brittle Midge Orchid	*Genoplesium baueri*	Vulnerable
Illawarra Socketwood	*Daphnandra* sp. C Illawarra	Vulnerable
ENDANGERED ECOLOGICAL COMMUNITIES		
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		
Illawarra Subtropical Rainforest in the Sydney Basin Bioregion		
Illawarra Lowlands Grassy Woodlands Grassy Woodland		

One of the roles of the Evaluation of impacts is to determine which species, populations or ecological communities may be utilising, or present, on a development site. The entities to be considered for inclusion in the list of subject species, populations and ecological communities are listed in Table 2. This list is not exhaustive and other entities may also need to be included for assessment on the basis of desktop and habitat analyses and the outcomes of fieldwork.

Table 2. List of other entities for consideration as *subject species, populations or ecological communities.*

SPECIES	SCIENTIFIC NAME	STATUS
FAUNA		
Regent Honeyeater	*Anthochaera phrygia*	Critically Endangered
Swift Parrot	*Lathamus discolour*	Endangered
Eastern Bristlebird	*Dasyornis brachypterus*	Endangered
Stuttering Frog	*Mixophyes balbus*	Endangered
Broad-headed Snake	*Hoplocephalus bungaroides*	Endangered
Australasian Bittern	*Botaurus poiciloptilus*	Endangered
Bush Stone-curlew	*Burhinus grallarius*	Endangered
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	Endangered
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	Vulnerable
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	Vulnerable
Golden-tipped Bat	*Kerivoula papuensis*	Vulnerable
Olive Whistler	*Pachycephala olivacea*	Vulnerable
Pink Robin	*Petroica rodinogaster*	Vulnerable
Eastern Pygmy Possum	*Cercartetus nanus*	Vulnerable
White-footed Dunnart	*Sminthopsis leucopus*	Vulnerable
Flame Robin	*Petroica phoenicea*	Vulnerable
Square-tailed Kite	*Lophoictinia isura*	Vulnerable
Giant Burrowing Frog	*Heleioporus australiacus*	Vulnerable
Littlejohn's Tree Frog	*Litoria littlejohni*	Vulnerable
Rosenberg's Goanna	*Varanus rosenbergi*	Vulnerable

SPECIES	SCIENTIFIC NAME	STATUS
Barking Owl	*Ninox connivens*	Vulnerable
White-fronted Chat	*Epthianura albifrons*	Vulnerable
Sooty Owl	*Tyto tenebricosa*	Vulnerable
Little Eagle	*Hieraaetus morphnoides*	Vulnerable
Koala	*Phascolarctos cinereus*	Vulnerable
FLORA		
Bristly Shield Fern	*Lastreopsis hispida*	Endangered
White-flowered Wax Plant	*Cynanchum elegans*	Endangered
	Solanum celatum	Endangered
Rainforest Cassia	*Senna acclinis*	Endangered
Dwarf Kerrawang	*Rulingia prostrata*	Endangered
Illawarra Irene	*Irenepharsus trypherus*	Endangered
Magenta Lilly Pilly	*Syzygium paniculatum*	Endangered
Nowra Heath Myrtle	*Triplarina nowraensis*	Endangered
Thick Lip Spider Orchid	*Caladenia tessellate*	Endangered
	Genoplesium superbum	Endangered
Warty Zieria	*Zieria tuberculata*	Endangered
Lesser Creeping Fern	*Arthropteris palistoii*	Endangered
Albatross Mallee	*Eucalyptus langleyi*	Vulnerable
Ettrema Mallee	*Eucalyptus sturgissiana*	Vulnerable
Square Raspwort	*Haloragis exalata* subsp. *exalata*	Vulnerable
Netted Bottle Brush	*Callistemon linearifolius*	Vulnerable
	Acacia baueri subsp. *aspera*	Vulnerable
Waterfall Greenhood	*Pterostylis pulchella*	Vulnerable
ENDANGERED ECOLOGICAL COMMUNITIES		
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		
Fresh Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin & South East Corner		

In determining whether the entities listed in Table 2, as well as other entities, should also be addressed as subject species, populations and ecological communities, consideration shall be given to the habitat types present within the study area, recent records of threatened species, populations or ecological communities in the locality and the known distributions of threatened species, populations and ecological communities. This analysis and its conclusion are to be documented in the Evaluation of Impacts.

Databases such as the DECCW Atlas of NSW Wildlife and BioNet, as well as databases held by the Australian Museum and Royal Botanic Gardens, should be consulted to assist in compiling the list of possible entities to be analysed. It should be noted that if the DECCW Atlas is the only database that is referred to, due to data exchange agreements, the data provided by DECCW will only include that for which DECCW is a custodian. In many cases, this may only be a small subset of the data available. Other databases must also be consulted to create a comprehensive list of entities for consideration as subject species, populations or ecological communities.

3.2 Identifying habitats

In describing the *study area*, consideration shall be given to the previous land uses and the effect of these land uses on the *study area*. Relevant historical events may include fire, clearing, logging, slashing, recreational use and agricultural activities.

A description of habitats including such components as the frequency of tree hollows, the presence of wetlands, the density of understorey vegetation, the composition of the ground cover, the soil type and the presence of heath and permanent or ephemeral swamps shall be given. The condition of these habitats within the *study area* shall be discussed, including the prevalence of introduced species. A description of the habitat requirements of threatened species, populations or ecological communities likely to occur in the *study area* shall be provided.

Any areas which may provide habitat connectivity between the *study area* and adjacent areas of likely habitat for *subject species, populations or ecological communities* shall be identified and described.

In defining the *study area*, consideration shall be given to possible *indirect impacts* of the proposed action on species/habitats in and surrounding the *subject site*. These could include impacts arising from altered fire and hydrology regimes, soil erosion or pollution, fencing, habitat fragmentation and disruption of wildlife movement corridors, edge effects, altered light and noise regimes, disturbance of roosting areas or other impacts due to increased use of the area by humans, and the impacts of increased levels of domestic and feral predators.

4 SURVEY

4.1 Requirement to survey

A flora and fauna survey is to be conducted in the *study area*. Targeted surveys shall be conducted for all *subject species, populations and ecological communities* determined in accordance with Section 3. Previous surveys and assessments may be used to assist in addressing this requirement. However, the efficacy of such previous surveys and assessments in meeting this requirement must be described in full. These previous surveys do not negate the need for the additional targeted survey work set out in Appendix 1 of these DGEARs.

Particular attention shall be paid to the timing and climatic conditions for conducting fauna surveys including invertebrates, as many of the *subject species* will only be present or detectable for a few months each year or during certain climatic conditions. Additional advice on these matters should be sought from the DECCW contact officer.

Identification of all species is essential. Identification to genus only is not acceptable. Species of taxonomic uncertainty shall be confirmed by a recognised authority such as the Australian Museum or National Herbarium at the Royal Botanic Gardens, Sydney.

4.2 Documentation of survey effort and technique

Survey technique(s) shall be described and a reference given, where available, outlining the survey technique employed.

Survey site(s) shall be identified on a map with a clear legend. The size, orientation and dimensions of quadrat or length of transect shall be clearly noted for each type of survey technique undertaken. Full AMG grid references for the survey site(s) shall be provided.

DECCW survey proformas are to be used by field staff when applying a range of standard fauna survey techniques. Copies of standard proformas are included in Appendix 2 to these DGEARs. Digital copies of these proformas can be requested from the nominated DECCW contact officer. These proformas shall be used by field staff when undertaking fauna surveys and completed data sheets are to be included as an appendix to the Evaluation of Impacts.

The time invested in each survey technique shall be summarised in the Evaluation of Impacts, based on completed proformas, e.g. number of person hours / transect, duration of call playback, number of nights that traps are set.

It is not sufficient to aggregate all time spent on all survey techniques. Effort must be expressed separately for each survey technique that is applied.

Personnel details including name of surveyor(s), contact phone number, qualifications and experience must be included. The person who identified records (e.g. Anabat, hair tubes, scat analysis) shall also be identified in this manner.

Environmental conditions during the survey shall be noted from the commencement of each survey technique until its completion. These conditions must be documented in the Evaluation of Impacts.

An assessment of the efficacy of each survey regime in detecting each species under the intensity utilised by the study is to be provided. The effect of the season and weather at the time of the field survey shall be considered with respect to the adequacy of survey results. An assessment will also be made of the adequacy of the survey and background information used to assess the likely area of use (home range) for each *subject species, population or ecological community*, and the areas providing habitat connectivity.

A full list of all flora and fauna species recorded during the course of surveys shall be included (such information is indicative of the habitat quality of the site). Completed Atlas of NSW Wildlife cards are to be provided for each threatened species record in any survey conducted for the purposes of the EA. For confidentiality, these cards are not to be included in the Evaluation of Impacts but rather shall accompany the Evaluation of Impacts when supplied to the DECCW.

4.3 Specific survey requirements

Appendix 1 details the specific survey requirements for the *subject species, populations or ecological communities* identified in Table 1 of these DGEARs. These survey requirements can determine the presence of *subject species, populations or ecological communities* known or likely to be in the *study area* and/or can provide contextual information on habitats to allow appropriate assessment of impacts at a broader scale. The flora and fauna survey of the *study area* must include the use of these survey methods.

You are advised that discussions between the consultant(s) engaged to prepare the Evaluation of Impacts and DECCW may be necessary in order to derive an appropriate survey regime for some of these requirements, and to confirm the survey regimes proposed for any additional *subject species, populations and ecological communities* derived by analysis as part of this Evaluation Of Impacts.

5 ASSESSMENT OF LIKELY IMPACTS ON THREATENED SPECIES, POPULATIONS AND ECOLOGICAL COMMUNITIES

For all *subject species, populations and ecological communities*, the Evaluation of Impacts shall describe the following:

a. the location, nature and extent of habitat removal or modification which will result from the action proposed;

b. the likely and potential impact of the removal of habitat. Particular attention shall be given to the loss of:

   i. River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions; Illawarra Subtropical Rainforest in the Sydney Basin Bioregion; and Illawarra Lowlands Grassy Woodlands Grassy Woodland.

   ii. Primary, secondary and important Koala trees.

   iii. the likelihood of and extent of loss of hollow-bearing trees, foraging habitat utilised for breeding, roosting or denning by threatened fauna such as micro-chiropteran bats, Yellow-bellied Gliders, Forest Owls and small woodland birds.

   iv. Similarly, attention is to be given to the likelihood of and extent of loss of food resources and the impact this may have on the *subject species, populations or ecological communities*.

c. Any direct and indirect impacts of the proposal including:

   i. Any potential indirect impact on the viability of breeding/ roosting habitat of micro-bats known to occur in and around the area.

ii. the fragmentation or isolation of *local populations* and/or *local occurrences*, and the increased distance required for the movement of individuals/genetic material between habitat patches.

iii. change in vegetation floristics and structure resulting from edge effects.

iv. altered hydrology regimes (including increased runoff and raising or lowering of the water table).

v. soil erosion and pollution.

vi. disturbance to feeding or nesting/breeding of species.

vii. trampling or other impacts due to increased use of the area by humans.

viii. habitat fragmentation and disruption of wildlife movement corridors and pollination mechanisms.

ix. altered light and noise regimes.

x. the likely contribution of the action proposed to the threatening processes already acting on populations of those *subject species or populations* and occurrences of *subject ecological communities* in the *locality*.

All of the above contextual information (which can be incorporated into Sections 5.1 - 5.5 below) will assist with the assessment of cumulative impacts on the *subject species, populations and ecological communities*.

5.1 Assessment of species likely to be affected

This requirement allows refinement of the list of *subject species or populations* (given the outcome of survey and analysis of likely impacts) in order to identify which threatened species or populations may be affected, and the nature of the impact.

The remaining requirements in this section (5.2 – 5.5) need only be addressed for those threatened species or populations that are likely to be affected by the proposal.

5.2 Discussion of local and regional abundance

5.2.1 Discussion of other known local populations

A discussion of other known *local populations* in the *locality* shall be provided. The long-term security of other habitats shall be examined as part of this discussion. The relative significance of the *subject site* for the *subject species, populations and ecological communities* in the *locality* shall be discussed. It is essential that the Evaluation of Impacts includes some surveys conducted beyond the *study area* to clarify the conservation significance of the *subject site* to the *subject species and populations.*

The need for off-site surveys to provide context to the anticipated impacts of the *proposal* may also be required for other threatened species recorded during the surveys of the *study area* for the Evaluation of impacts.

5.2.2 Discussion of habitat utilisation

An estimate of the number of individuals of each *subject species* utilising the *study area* shall be provided as well as a description of how these individuals use the *study area* (e.g. residents, transients, adults, juveniles, nesting, foraging). A discussion of the significance of these individuals to the viability of the *subject species* in the *locality* shall be provided.

5.2.3 Description of vegetation

The vegetation present within the *study area* and the surface area covered by each vegetation community shall be mapped and described. Reference to the vegetation classification system used (e.g. Specht, Benson, Keith) and to the ecological communities determined as endangered by the NSW Scientific Committee shall be provided. Classification must have regard to both structural and floristic elements.

5.2.4 Discussion of corridors

Particular attention shall be given to identifying movement corridors for *subject species* within the *study area*. The impact of the proposal on these corridors and the resulting impact on the resident *subject species* shall be discussed.

5.3 Assessment of habitat

5.3.1 Description of habitat values

Specific habitat features in the *study area* shall be described and quantified (e.g. frequency and location of stags, hollow bearing trees, culverts, rock shelters, rock outcrops, crevices, caves, drainage lines, soaks, area of ecological communities etc.), as well as the density of understorey vegetation and groundcover.

The condition of the habitat within the *study area* shall be discussed, including the prevalence of introduced species, species of weeds present and an estimate of the total weed cover as a percentage of each vegetation community, whether trampling or grazing is apparent, effects of erosion, prevalence of rubbish dumping, history of resource extraction or logging and proximity to roads. Details of the *study area's* fire history (e.g. frequency, time since last fire, intensity) and the source of fire history (e.g. observation, local records), shall be provided.

5.3.2 Distribution and condition of regional habitats

For the habitats of *subject species and populations* found in the study area, the Evaluation of Impacts shall discuss the distribution and condition of similar habitats in the region. For the *subject ecological communities* found in the study area, the Evaluation of Impacts shall discuss the distribution and condition of these ecological communities in the region. Regional information may be obtained from existing datasets and from other sources.

5.4 Discussion of conservation status

Assessment shall include reference to the threatening processes that are generally accepted by the scientific community as affecting the *subject species, population or ecological community* and which are likely to be caused or exacerbated by the *proposal.* Assessment shall also include reference to any approved or draft recovery plans which may be relevant to the *proposal*. Up-to-date lists and copies of approved and draft recovery plans are available on the DECCW website www.environment.nsw.gov.au by following the links to threatened species.

5.5 Description of feasible alternatives

All feasible alternative location for the wind turbines should be explored taking into account all known constraints.

6 IMPACT AMELIORATION

6.1 Description of ameliorative measures

In accordance with the Draft Guidelines for Threatened Species Assessment objective of Improve or Maintain, the ameliorative measures described for this development should meet the improve or maintain test for biodiversity values.

6.1.1 Long term management strategies

Consideration shall be given to the information contained in approved and draft recovery plans or threat abatement plans for existing taxa, known or likely to occur in the *study area*, and whether any recommendation is applicable to the *proposal.*

The development of long-term management strategies shall be considered to protect areas within the study area which are of particular importance for the *subject species, populations or ecological communities* likely to be affected by the *proposal*. This may include proposals to restore or improve habitat on site where possible. If mitigation is to include rehabilitation of the site, then the rehabilitation strategy shall be detailed.

Any measures proposed to mitigate the effect of the proposal on *local populations* of threatened species and populations and/or *local occurrences* of ecological communities shall be described. The potential effectiveness of any such amelioration in maintaining a viable *local population* and/or *local*

occurrence in the short, medium and long term shall be discussed (e.g. fauna underpasses, vegetation management).

6.1.2 Compensatory strategies

If significant modification of the *proposal* to minimise impacts on *subject species, populations or ecological communities* is not possible, then compensatory strategies shall be considered. These may include other off-site or local area proposals that contribute to long term conservation of the *subject species, populations or ecological communities*.

The areas proposed to be used for compensatory strategies must be described in full including a detailed description of their biodiversity, tenure and conservation status. These areas should be assessed in accordance with the Principles for the use of biodiversity offsets in NSW, which can be found on the following link on the DECCW significant local populations of *subject species and populations* or significant local occurrences of *subject ecological communities* as determined by the EVALUATION OF IMPACTS should aim to:

i. minimise the impacts by considering all possible alternatives to the *proposal*, such that a significant impact is not likely; and

ii. manage the remaining habitat (if any) to ensure that the *local population* and/or *local occurrence* continues to exist in the long term.

The translocation of *subject species, populations and ecological communities* is only supported by DECCW in specific conservation programs (e.g. recovery planning).

7 ADDITIONAL INFORMATION

7.1 Qualifications and experience

An evaluation of Impacts must include details of the qualifications and experience in threatened species conservation of the person preparing the statement and of any other person who has conducted research or investigations relied on in preparing the statement.

7.2 Licensing matters relating to flora and fauna surveys

Persons conducting flora and fauna surveys must have appropriate licences or approvals under relevant legislation. The relevant legislation and associated licences and approvals that may be required are listed below:

National Parks and Wildlife Act 1974:

- General Licence (Section 120) to harm or obtain protected fauna (this may include threatened fauna).
- Licence to pick protected native plants (Section 131).
- Scientific Licence (Section 132C) to authorise the carrying out of actions for scientific, educational or conservation purposes.

Threatened Species Conservation Act 1995:

- Licence to harm threatened animal species, and/or pick threatened plants and/or damage the habitat of a threatened species (Section 91).

Animal Research Act 1985:

- Animal Research Authority to undertake fauna surveys.

Appendix 1: Survey Requirements for Subject Species - DGEARs for Foxground to Berry Bypass

SPECIES	SURVEY REQUIREMENTS
Eastern False Pipistrelle, Eastern Bentwing-bat, Greater Broad nosed bat, Yellow Bellied Sheathtail-bat, Golden-tipped Bat, Large-eared Pied Bat, Southern Myotis and Eastern Freetail-bat	Surveys using Anabat recorders and stag watching should aim to identify the number and location of roost sites for the subject bats and identify important foraging habitat in the study area and the locality. If required, the DECCW can provide further advice on bat survey techniques to acquire this information. Surveys of the subject site, study area and locality shall be undertaken for hollow-bearing trees, bridges, caves, shafts, and buildings that may provide potential roosting/breeding habitat for microchiropteran bat species. Intensive searches for hollow-bearing trees and other potential roost/breeding habitats shall be undertaken in the subject site and study area. Representative sampling of the locality for hollow-bearing trees shall involve the use of transects in selected locations and the gathering of data in conjunction with ground-truthing for endangered ecological communities. The number of hollow-bearing trees recorded shall be used to provide context to the potential breeding habitat affected by the action proposed.
Grey-headed Flying-fox	Surveys are to be undertaken in potential habitat through the subject site for camp sites. The survey effort must include work to identify any maternity camp sites located within the subject site that may be impacted by the proposal. Surveys are to be undertaken between October – November. One hour surveys on dusk are to be undertaken in a position with a good view of the subject site. Surveys for this species should also be consistent with *DEC 2004, Draft Threatened Biodiversity Survey & Assessment Guidelines for Developments and Activities*.
Yellow-bellied Glider	Map the location of den sites and feed trees within and adjacent to the study area. All trees to be removed or isolated by the development must be assessed to determine if they are being used as den or feed trees. Map the location and size of the areas occupied by Yellow-bellied Glider family groups in the locality. Surveys must consist of stag watching, spotlighting, call play-back and habitat assessment. Spotlighting and call play-back surveys must be undertaken on foot. At each call play-back site, the call of the Yellow-bellied Glider should be played through a megaphone for 5 minutes, followed by at least 10 minutes of listening. An assessment of potential links between habitat on the subject site and habitats in the locality must be conducted particularly identifying routes used by resident Yellow-bellied Gliders within and adjacent to the subject site.

Appendix 1: Survey Requirements for Subject Species - DGEARs for Foxground to Berry Bypass

SPECIES	SURVEY REQUIREMENTS
Spotted tailed Quoll	Live cage traps using platform cat traps 30cmx 30cmx60cm. Trapping should be undertaken from late March over a 10 day period. Drainage lines should be targeted for surveys. Five cage traps per drainage lines should be placed 50 metres apart. Repeat surveys should be undertaken in May using the same methods in March. DECCW supports the use of cameras as a trade-off for cage trapping intensity, however the lower intensity cage trapping should comply with the *DEC 2004, Draft Threatened Biodiversity Survey & Assessment Guidelines for Developments and Activities.* Cameras should be fixed to the ground and installed in suitable habitat. Bait stations consisting of "chicken" should be established prior to camera installation to increase the chance of detecting Spotted-tailed Quolls. Cameras must be installed in the most suitable habitats. Surveys period - March – September.
Eastern Pygmy Possum and White-footed Dunnart	Surveys for these species must be conducted with pitfall traps. Pitfall trapping must be conducted with PVP or buckets with a minimum width of 150mm (at least 40 cm deep) set in clusters of 3 with each pit/trap in a cluster being approximately 10m apart. Drift fences (at least 30cm high) will be used between each pitfall trap and extending 10 beyond the last trap on either end. Each cluster will cover a minimum length of 40 metres. Pitfall traps to be set for a minimum of four nights and repeated through each stratification unit. Pitfall trapping must be conducted for a minimum of two (but preferably three) separate sessions of five consecutive nights. The status of the White-footed Dunnart and Eastern Pygmy Possum in the region is poorly known. If either of these species is found on the subject site, then additional surveys in the locality must be undertaken to determine the significance of the population on the subject site.
Gang Gang Cockatoo and Glossy Black-cockatoo	Undertake diurnal bird surveys across the study area and nesting assessments using a combination of stag-watching and listening for calls of the birds returning to nests in the late afternoon during the known breeding season of each species, to ascertain the locations of any nest sites in the study area. These surveys should target hollow-bearing trees with hollows of suitable size (>10cm diameter) for the species that are to be removed for the proposal or which lie within 50 metres of areas to be disturbed by the proposal. Estimate the availability, condition and security of potential breeding habitat for the species in the locality by ground-truthing existing vegetation mapping datasets.
Little Lorikeet, Olive Whistler, Pink Robin, and Varied Sittella.	Diurnal bird censuses shall be undertaken in the early morning and/or late afternoon within the *subject site* on three occasions each separated by a period of one week. Each census shall comprise observations for birds, including call recognition, for a period of 45 minutes at a minimum of three locations spread across the subject site. Surveys can be undertaken at any time of the year, but shall avoid high-wind and/or rainy days.

Appendix 1: Survey Requirements for Subject Species - DGEARs for Foxground to Berry Bypass

SPECIES	SURVEY REQUIREMENTS
Black Bittern	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Diurnal surveys to be undertaken in the early morning and/or late afternoon within suitable habitats in the *subject site* on three occasions each separated by a period of one week. Each census shall comprise observations for birds, including call recognition, for a period of 45 minutes at a minimum of three locations spread across the subject site. Diurnal searches for nest/roosting sites to be undertaken through suitable habitat within the study area. Search to be undertaken during the breeding season, from December to March. This species should also be targeted by spotlight survey within foraging habitat; the methodology and survey effort should be consistent with the Threatened Biodiversity Survey and Assessment: guidelines for development and activities (draft 2004).
Masked & Powerful Owl	Nocturnal call playback (one site per 100 ha) with an initial listening period of 10 min then play the call of each subject species separated by at least a 2 minute listening period, then finish with a 10 minute listening period. Identify and map all hollow-bearing trees (potential nest trees) on the subject site and estimate the availability of hollow-bearing trees in the locality. The number of nocturnal call playback surveys should be consistent with *DEC 2004, Draft Threatened Biodiversity Survey & Assessment Guidelines for Developments and Activities*.
Scarlet Robin, Flame Robin	Diurnal bird censuses shall be undertaken in the early morning and/or late afternoon within the *subject site* on three occasions each separated by a period of one week. Each census shall comprise observations for birds, including call recognition, for a period of 45 minutes at a minimum of three locations spread across the subject site. Additional opportunistic bird census shall be employed across the *study area* and *locality* during the course of other surveys for the EA. Surveys should be concentrated on ridges, hills and foothills. Surveys should be between July to January however can be undertaken at any time of the year, but shall avoid high-wind and/or rainy days.
Square-tailed Kite	Diurnal bird surveys across the subject area targeting woodland and forest for nesting sites. Potential nest sites should be surveyed during the July – Feb. Opportunistic surveys should be conducted in the locality given the large home range of the species.
Green and Golden Bell frog	Survey suitable habitat using spotlight/headlamp searches, call playback, diurnal visual searches and dip-netting surveys for tadpoles. Surveys must be conducted on three visits separated by at least two weeks. Small areas of habitat (<0.3 ha) should be surveyed for a minimum of 1 hr for both nocturnal (spotlight and call playback) and diurnal (visual searches and dip-netting) visits (i.e. 1 hr nocturnal survey, 1 hr diurnal survey X 3 visits). Larger areas should be surveyed at a rate of 3 hrs per ha of habitat. September and January but may call through to March in favourable weather. Calling and breeding is stimulated by rainfall.

Appendix 1: Survey Requirements for Subject Species - DGEARs for Foxground to Berry Bypass

SPECIES	SURVEY REQUIREMENTS
Orchids **(e.g.** *Cryptostylis hunteriana*, *Genoplesium baueri* and *Pterostylis gibbosa*)	These species can only be satisfactorily surveyed when it is flowering, although it is possible for experts to recognise stems of this species at the bud stage. The exact flowering time is unpredictable and the species can flower anytime between early December and mid March. Flowering should be confirmed ate the nearest known site prior to surveys being undertaken. Known Cryptostylis hunteriana sites in the Ulladulla area have been in flower in the week preceding 24 December in 2004-2007. Alternatively, searches of the study area at approximately three weekly intervals over this period could be undertaken. Systematic surveys using evenly spaced transects located about 5m apart through all areas of heath/shrubland and woodland with heath/shrubland understorey must be undertaken. Survey period - Early December and mid March
Illawarra Zieria	Systematic surveys using evenly spaced transects located about 10 metres apart through suitable habitat must be undertaken between the flowering period, spring to early summer.
Illawarra Socketwood	A rainforest tree to 20 metres tall. Occupies rocky hill sides and gullies of the Illawarra lowlands. Systematic surveys using evenly spaced transects located about 10 metres apart through vegetation associated with rainforest and moist Eucalypt forest must be undertaken.
River-Flat Eucalypt Forest, Illawarra Subtropical Rainforest, and Illawarra Lowlands Grassy Woodlands	Surveys shall identify the extent and condition of the ecological communities in the *subject site*, *study area* and *locality*. This shall involve the use of vegetation surveys in the *subject site* and the *study area*. The use of existing datasets held by DECCW in combination with ground-truthing of selected sites within areas mapped by DECCW as the ecological community is recommended for surveys of the *locality*. The sites sampled shall be used to provide context to the ecological community affected by the action proposed. Surveys can be undertaken at any time of the year under varied seasonal conditions. This methodology should apply to other EECs with potential to be impacted by the proposal.

Appendix 2: Examples of suitable survey proformas

DIURNAL HERPETOFAUNA CENSUS SURVEY PROFORMA

Survey Details

Date of survey _____

Name of surveyor _____ Contact number _____

Number of surveyors _____ _____

Total effort expressed in person-hours _____

Total effort expressed in number of rocks/logs rolled _____

Location Details

Location (including basic habitat) description _____

_____

_____

_____

Map number _____ Map name _____

Type of survey, e.g. transect or quadrat _____ AMG Zone _____

Active or passive search _____ Size of survey area (ha) _____

Survey area
Eastings (6 digits) _____ Northings (7 digits) _____

Eastings (6 digits) _____ Northings (7 digits) _____

Start time (24hr) _____ End time (24 hr) _____

Weather Details

At start of survey, record: Cloud cover* _____

Wind direction and speed* _____ Rain* _____

Temperature (°C) _____ Moon* _____

At end of survey, record: _____

Temperature (°C) _____

Comments _____

_____

Appendix 2: Examples of suitable survey proformas

Species name (Scientific/Common)	Ob. type*	MH type*	Grid reference (full AMGs i.e. Eastings and Northings)	Accuracy

* See Appendix 3: Standard reporting codes

Appendix 2: Examples of suitable survey proformas

DIURNAL BIRD CENSUS SURVEY PROFORMA

Survey Details

Name of surveyor _____ Contact number _____

Number of surveyors _____ Date of survey _____

Total effort expressed in person hours _____ Number of hectares covered or transect or point dimensions _____

Location Details

Location description _____

Map number _____ Map name _____

Full AMG reference(s) for survey site or transect AMG Zone _____

Start details _____ Finish details _____

Easting (6 digits) _____ Easting (6 digits) _____

Northing (7 digits) _____ Northing (7 digits) _____

Start time (24hr) _____ End time (24 hr) _____

Weather Details

At start of survey, record: Cloud cover* _____

Wind direction and speed* _____ Rain* _____

Temperature (°C) _____ Moon* _____

At end of survey record: _____

Temperature (°C) _____

Comments _____

Species name	Ob. type*	MH type*	Grid reference (full AMGs)	Accuracy

* See Appendix 3: Standard reporting codes

Appendix 2:Examples of suitable survey pro-formas

Species name	Ob. type*	MH type*	Grid reference (full AMGs)	Accuracy

* See Appendix 3: Standard reporting codes

Appendix 2: Examples of suitable survey proformas

DIURNAL HOLLOW-BEARING TREE CENSUS SURVEY PROFORMA

Survey Details

Date of survey _____

Name of surveyor _____ Contact number _____

Number of surveyors _____ _____

Total effort expressed in person-hours _____

Location Details

Location (including basic habitat) description _____

_____

_____

_____

Map number _____ Map name _____

Type of survey, e.g. transect or quadrat _____ AMG Zone _____

_____ Size of survey area (ha) _____

Survey area Eastings (6 digits) _____ Northings (7 digits) _____

Eastings (6 digits) _____ Northings (7 digits) _____

Start time (24hr) End time (24 hr) _____

Appendix 2: Examples of suitable survey proformas

Tree No.	Species (Scientific Name)	Number, sizes and types of hollows *	Grid reference (full AMGs i.e. Eastings and Northings)	Accuracy

* See Appendix 3: Standard reporting codes

Appendix 2: Examples of suitable survey proformas

DIURNAL TERMITE MOUND CENSUS SURVEY PROFORMA

Survey Details

Date of survey _____

Name of surveyor _____ Contact number _____

Number of surveyors _____ _____

Total effort expressed in person-hours _____

Location Details

Location (including basic habitat) description _____

_____

_____

_____

Map number _____ Map name _____

Type of survey, e.g. transect or quadrat _____ AMG Zone _____

_____ Size of survey area (ha) _____

Survey area Eastings (6 digits) _____ Northings (7 digits) _____

Eastings (6 digits) _____ Northings (7 digits) _____

Start time (24hr) End time (24 hr)

Termite mound no.	Grid reference (full AMGs)	Accuracy

Appendix 2: Examples of suitable survey proformas

Appendix 2: Examples of suitable survey proformas

VERTEBRATE FAUNA SURVEY OPPORTUNISTIC RECORDS

Survey name _____ Fauna surveyors _____
Surveyor's contact details _____ Call analysis _____

AMG Zone _____

Date	Time	Site #	Easting (full 6 digits)	Northing (full 7 digits)	Species Name	No Ind	Ob. type*	MH* type*	Notes/Field No**

* See over ** Include initials of observer and any other information that will help relocation of site.

Cloud cover. Record cloud cover in eights of sky.

Moon. Record using the following codes. 0=None, 1=1/4 moon, 2=1/2 moon, 3=3/4 moon, 4=full moon.

Wind direction and speed. Record wind direction to nearest cardinal point. Record wind speed using the following codes. 0=calm 1= Light, leaves rustle 2= Moderate, branches move 3=Strong, tops of trees move

Rain. Record using the following codes. 0=none, 1=drizzle - light, 2=drizzle - heavy 3=heavy rain

Sizes of hollows. Record using the following codes. S=Small (1-5cm diameter), M=Medium (5-15cm diameter), L=Large (greater than 15cm diameter).

Types of hollows. Record using the following codes. T=Trunk hollow, B=Branch hollow

Observation type

Use the following codes:

O	Observed (sighted)	R	Road kill	F	Tracks, scratching
W	Heard call	D	Dog kill	Z	In raptor/owl pellet
X	In scat	C	Cat kill	M	Miscellaneous
P	Scat	V	Fox kill	E	Nest or roost
T	Trapped or netted	K	Dead	B	Burnt
H	Hair or feathers	S	Shot	Y	Bones or teeth
A	Stranded/beached	I	Fossil/subfossil	N	Not located

MH (microhabitat) type

Use the following codes:

AC	Flying above canopy	IB	In burrow	OB	On (beach) sand
BR	In/on bridge	IC	In cave	OL	On log
BU	In building	IG	In grass	OR	On rock
CK	Crevice in rock	IH	In tree hollow	OW	Over water
CL	Crevice in log	IL	In litter	RD	On road
DA	Farm/fire dam	IR	In reeds	TK	On trunk
DT	In dead tree (stag)	IS	In soil	UB	Under bark
EW	Edge of water	IT	In (live) tree	UC	Upper canopy
FC	In/on post or stump	IW	In water	UG	Undergrowth
FL	Flying within canopy	LC	Lower canopy	UL	Under log
GR	On ground	LS	Low shrub	UR	Under rock
HS	High shrub	MC	Mid canopy	UT	Under iron
				WH	Waterhole

Attachment 3 - Guidance Material: Assessing Environmental Impacts

Guidance material

- Protocol for Working with Government Agencies on Major Infrastructure and Development Proposals
- Steps in the Assessment and Approval of Major Projects under Part 3A
- State Significant Sites – guidelines and checklist
- Criteria for declaration of Critical Infrastructure Projects
- What are Major Projects under Part 3A?
- Draft Criteria for Construction Projects under Major Projects SEPP
- Guidelines for Aboriginal Cultural Heritage Impact assessment and Community Consultation
- Guidelines for Threatened Species Assessment
- Assessment into Part 3A of the EP&A Act
- Independent Hearing and Assessment Panels
- Draft Guideline on Publication Notification
- Concept Plan Application Process under Part 3A
- Protocol for working with Councils on matters of Major Infrastructure and Development Proposals
- Assessment Guidelines
- EA procedures (e.g. Statement of Commitments, Community Consultation, etc.)
- Industry Sectors (e.g. mining, chemical industries, roads, marinas, etc.)
- Environmental Issues (e.g. air quality, noise, heritage, biodiversity, etc.)

Assessing Environmental Impacts

Air quality

- Protection of the Environment Operations (Clean Air) Regulation 2002
- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW
- Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales
- (Draft) Assessment and Management of Odour from Stationery Sources in NSW
- Action for Air (EPA, 1998)

Noise and vibration

- NSW Industrial Noise Policy (EPA, 1999)
- NSW Environmental Criteria for Road Traffic Noise (EPA, 1999)
- Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC 1990)
- Environmental Noise Control Manual (EPA 1994)
    - Section 19.3 Sleep Arousal Criteria
    - Section 171 Construction Noise Guideline.
- Environmental Noise Management Manual (RTA, 2001)

Water quality

- National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)
- NWQMS Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC 2000)
- Healthy Rivers Commission Report into Coastal Lakes and Statement of Joint Intent
- The relevant targets within the State Water Management Outcomes Plan

Wastewater

- National Water Quality Management Strategy: Guidelines for Sewerage Systems - Effluent Management (ARMCANZ/ANZECC 1997)
- National Water Quality Management Strategy: Guidelines for Sewerage Systems – Use of Reclaimed Water (ARMCANZ/ANZECC 2000)
- Environmental Guidelines for the Utilisation of Treated Effluent by Irrigation (NSW DEC 2004)
- Environment and Health Protection Guidelines: 'Onsite Sewage Management for Single Households', February 1998 (Silver Book)

Stormwater

- Managing Urban Stormwater: Soils and Construction (NSW Landcom, 2004)
- Managing Urban Stormwater: Council Handbook (EPA 1998)
- Managing Urban Stormwater: Source Control (EPA 1998)
- Managing Urban Stormwater: Treatment Techniques (EPA 1998)

Groundwater

- State Groundwater Policy Framework Document (DLWC 1997)
- The NSW State Groundwater Quality Protection Policy (DLWC 1998)
- (Draft) NSW State Groundwater Quantity Management Policy
- NSW State Groundwater Dependent Ecosystems Policy (DLWC, 2002)
- National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ & ANZECC, 1995)

Contaminated Land

- *Managing Land Contamination: Planning Guidelines - SEPP55 - Remediation of Land* (DUAP and EPA 1998);
- *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (EPA 1997);
- *Contaminated Sites – Guidelines on Significant Risk of Harm and Duty to Report* (EPA 1999).

Waste and Chemicals

- Guideline for the Use and Disposal of Biosolids Products (NSW EPA 1997)
- Environmental Guidelines: Solid Waste Landfills (NSW EPA 1996)
- Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)
- Waste Classification Guidelines (DECCW, 2010)
- Environmental Guidelines: Composting and Related Organics Processing Facilities (July 2004)
- Operations Guidance for Assessing Non-Standard Fuel Proposals – Version 1.2

Soil contamination

- Acid Sulfate Soils Manual (Acid Sulfate Soils Management Advisory Committee, 1998)
- National Strategy for the Management of Coastal Acid Sulfate Soils

Threatened Species

- Guidelines for Threatened Species Assessment;
- The Assessment of Significance: Threatened Species Assessment Guidelines;
- Threatened Biodiversity Survey and Assessment: guidelines for development and activities (draft 2004).
- Recovery Plans (www.nationalparks.nsw.gov.au/npws.nsf/Content/Recovery+plans)
- Threat Abatement Plans (www.nationalparks.nsw.gov.au/npws.nsf/Content/Threat+abatement+plans+by+doctype)

- Threatened Species Profiles (www.threatenedspecies.environment.nsw.gov.au/tsprofile/browse_allspecies.aspx)
- Priority Action Statements www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_PAS.aspx

Aboriginal Cultural Heritage

- Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation - Available from Dept of Planning.
- Aboriginal Cultural Heritage Community Consultation Requirements for Proponents (December 2009)

NSW GOVERNMENT | **Office of Water**

14 April 2011

Mr Michael Woodland
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attention: Kylie Seretis

c: Janne Grose
t: 02 4729 8262
f: 02 4729 8141
e: Janne.Grose@water.nsw.gov.au

Our ref : ER21486
Your ref: MP10_0240

Dear Mr Woodland

MP10_0240 – Princes Highway Upgrade – Foxground and Berry Bypass - Director General Requirements – Kiama and Shoalhaven LGAs

I refer to your letter of 10 January 2011 requesting key issues and assessment requirements from the NSW Office of Water (NOW) for the above project proposal.

NOW's key issues and assessment requirements for the project proposal are outlined in Attachment A and these include:

- the protection of watercourses as stable, natural systems; the protection and enhancement of riparian land and the protection of wetlands;
- water supply and water licensing requirements for the proposal;
- groundwater and groundwater dependent ecosystems.

NOW requests that all referrals from the Department of Planning (DoP) under Part 3A of the *Environmental Planning and Assessment Act 1979* for the project proposal include the following:

- referral **cover letter**; and
- one (1) **hard copy** and one (1) **CD** copy of the Environmental Assessment (EA) report and any other accompanying documentation.

I understand that it is DoP's internal policy to refer digital copies of Applications only, however, this is resulting in the transfer of costs associated with the printing of the EA to NOW. It would be appreciated if the Applicant could be advised of NOW's requirement for a hard copy of the EA and arrange for them to provide it direct to NOW's relevant assessing officer.

Contact Details:

If you require further information please contact Janne Grose on (02) 4729 8262 at the Penrith office.

Yours sincerely

Mark Mignanelli
Manager Major Projects and Assessment

ATTACHMENT A

NSW Office of Water Comments

Princes Highway Upgrade – Foxground and Berry Bypass - Director General Requirements

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Protection of Watercourses and Riparian Lands

The Preliminary Environmental Assessment (PEA) indicates that the Princes Highway upgrade crosses a number of creeks including Broughton Creek, Broughton Mill Creek and Bundewallah Creek. The Environmental Assessment (EA) needs to provide details (including scaled plans) on:

- all watercourses and riparian land within the study area and also those outside the study area potentially affected by the proposal including:
  a. the location of all watercourses
  b. top of bank
  c. minimum riparian corridor widths (measured from top of bank) to be protected and enhanced
  d. the footprint of the proposal in relation to the watercourses and riparian areas
  e. photographs at the watercourse crossings looking upstream and downstream and a plan showing the location that the photographs were taken

- potential impacts of the proposal on any watercourses and riparian areas, including areas of disturbance.

- safeguard measures to mitigate impacts, contingency plans for the remediation and rehabilitation of riparian areas in the event of potential adverse impacts and the long term management of the riparian lands.

Riparian land / riparian vegetation

Section 3.1.2 of the PEA indicates that the Illawarra Regional Strategy and the South Coast Regional Strategy apply to Kiama and Shoalhaven LGAs. Both the Illawarra Regional Strategy and the South Coast Regional Strategy outline that the Riparian Corridor Management Study (RCMS) should be used as the assessment approach to identify minimum riparian setback requirements along watercourses.

The EA needs to identify if the proposal is applying the RCMS in accordance with the regional strategies or the NOW Guideline for Controlled Activities to identify minimum riparian setbacks along watercourses potentially affected by the proposal. Riparian setback widths need to be provided in the EA to identify if basins, water quality structures, site compounds, etc are located outside the riparian areas and to identify the riparian areas disturbed by the proposal that require rehabilitation after construction.

Broughton Creek and Broughton Mill Creek are Category 1 watercourses and Bundewallah Creek Bridge is a Category 2 watercourse. The minimum riparian widths for Category 1, Category 2 and Category 3 watercourses are 50 m, 30 m and 10 m respectively each side of the creek (measured from top of bank).

Riparian land disturbed by the proposal should be rehabilitated in a two step process. The primary stage should rapidly stabilise disturbed riparian areas and the second phase should establish a permanent cover of vegetation that reflects the local native species that

occur in the vicinity of the site areas.

A Vegetation Management Plan needs to be prepared which provides details on the rehabilitation of riparian land. Details are required on maintenance periods of the riparian land. NOW recommends longer maintenance periods are applied rather than shorter periods as the longer the proponent maintains the riparian vegetation the better, as the vegetation becomes more established. As a minimum the riparian vegetation should be maintained for a minimum period of at least 2 years after final planting.

Watercourse Crossings
The PEA notes a bridge structure is to span Broughton Mill Creek and Bundewallah Creek (see Section 4), the project includes three bridge crossings of Broughton Creek (see Section 6.8.2) and each of the watercourses encountered would require bridges or culverts (see Section 7.2.2).

As noted above, Broughton Creek and Broughton Mill Creek are both Category 1 watercourses and Bundewallah Creek Bridge is a Category 2 watercourse. The NOW supports bridge crossings of these watercourses. At the proposed bridge crossing locations it is recommended:

- the structures are elevated and span the full width of the identified riparian zone.
- the bridge structures are designed to allow sufficient natural light and moisture to penetrate beneath the structures to allow for plant growth and assist in improving riparian connectivity and naturalised stabilisation or the design incorporates options for providing artificial moisture and lighting under the structures.
- the bridge piers or foundations are located outside the bed and banks of the main waterways (this will assist to mitigate future creek stability and maintenance costs).

At crossing locations where culverts are proposed it is recommended:

- box culverts are used instead of piped culverts
- the culverts have naturalised bases
- the design of the culverts consider fish passage and terrestrial fauna movement. Elevated "dry" cells are recommended to encourage terrestrial movement with a combination of recessed "wet" cells to facilitate fish passage.
- the cell size facilitates the movement of woody debris.

If any watercourses are required to be diverted as part of the proposal the EA needs to provide details. Any creek diversion should rehabilitate stable creek channels that emulate natural systems and riparian vegetation.

Works around watercourses should be managed to retain bed and bank stability and prevent erosion. Any stream bank rehabilitation types should be selected by a geomorphologist and the works designed by a river engineer. Areas of disturbance near watercourses should be inspected particularly after major rainfall events to ensure any stabilisation works have been effective. The rehabilitation phase should continue until all areas of disturbance near waterways are identified as stable by an independent suitably qualified certifier.

Construction Compound Sites

The EA needs to provide details if compound sites and other works associated with the proposal are proposed to be located within riparian land. The NOW recommends any construction compound sites are located outside the riparian areas, particularly areas with existing native riparian vegetation. If compound sites are required to be located within riparian land, the sites should be located in areas that have previously been cleared to mitigate further loss of native riparian vegetation.

The EA needs to identify whether riparian vegetation is required to be disturbed or removed as part of the proposal for compound sites/other works etc and provide details on proposed mitigation measures. Any riparian vegetation removed by the proposal should be rehabilitated and revegetated post-construction with plant species representative of the local endemic vegetation communities.

Water quality basins

Section 7.3.3 of the PEA makes reference to sedimentation basins being installed for the construction phase and notes these would be converted to water quality treatment basins for the operational phase. The NOW recommends the EA provides details on the proposed location of basins and that the basins are located outside the riparian areas. If it is not possible to locate the basins outside the riparian areas, it is recommended the basin sites are located in areas previously cleared of native riparian vegetation to mitigate disturbance of vegetation

Surface Water and Groundwater

The PEA has not identified if a water supply is required for the Princes Highway upgrade and the source(s) of the water supply. The EA needs to address any water use and nominate the source(s) of an adequate and secure water supply.

The EA needs to provide sufficient details for the NOW to assess any water licensing requirements under the Water Act 1912, including:

- water supply source(s) for the proposal,
- any proposed surface water extraction, including purpose, location of any existing and proposed pumps or storage ponds/ dams,
- any proposed groundwater extraction,
- volumes of water to be used,
- the function and location of all existing and proposed storages/ponds for the project.

If the proposal includes water management structures/dams, the EA needs to provide details on the following:

- any existing structure/s (date of construction, location, purpose, size and capacity, the legal status/approval for existing structure/s).
- any proposal to change the purpose of existing structure/s.
- if any remedial work is required to maintain the integrity of the existing structure/s.
- the purpose, location and design specifications for any proposed structure/s.
- size and storage capacity of the structure/s.
- calculation of the Maximum Harvestable Right Dam Capacity (MHRDC).

- if the structure/s is affected by flood flows.
- any proposal for shared use, rights and entitlement of the structure/s.
- if the proposed development has the potential to bisect the structure/s.

The NOW's Farm Dams Assessment Guide provides details on Harvestable Rights and the calculation of the Maximum Harvestable Right Dam capacity (MHRDC). Dams capturing up to the harvestable right capacity are not required to be licensed. Harvestable Right dams can be located on hillsides, gullies and minor watercourses that do not have permanently flowing waters and which are first and second order watercourses in accordance with the Strahler system of stream ordering. The Strahler system of stream ordering of watercourses is based on 1:25 000 scale topographic maps. Please refer to: http://www.water.nsw.gov.au/ArticleDocuments/35/trade_farmdams_do_you_need_licence.pdf.aspx.

The Harvestable Right gives landholders the right to capture and use for any purpose 10 % of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor.

The MHRDC includes the capacity of all existing dams on the property that do not have a current surface water licence. The location and estimated capacity of every dam must be shown. Any capacity of the total of all the dams on the property greater than the MHRDC may require a licence.

There are exemptions for dams related to the Harvestable Right. These include:

- Dams to control or prevent soil erosion;
- Dams to contain effluent and sediment;
- Flood detention basins;
- Dams built for environmental reasons (eg aesthetics, nutrient control, wildlife etc); and
- Dams which don't harvest runoff (eg. turkeys nest dams, ring tanks).

These exemptions are only applicable to the end use of the dam, even if the initial use is one of the above.

Groundwater

NOW is responsible for the management of the groundwater resources. The proposal needs to demonstrate that it is consistent with NSW State groundwater policy, does not impact on groundwater quality or the health of groundwater dependent ecosystems (GDEs).

The EA should consider and provide the following details:

- the predicted highest groundwater table at the site.
- any works likely to intercept, connect with or infiltrate the groundwater sources.

- any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- a description of the flow directions and rates and physical and chemical characteristics of the groundwater source.
- the predicted impacts of any final landform on the groundwater regime.
- the existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.
- an assessment of the quality of the groundwater for the local groundwater catchment.
- how the proposed development will not potentially diminish the current quality of groundwater, both in the short and long term.
- Measures for preventing groundwater pollution so that remediation is not required.
- protective measures for any groundwater dependent ecosystems (GDEs).
- proposed methods of the disposal of waste water and approval from the relevant authority.
- the results of any models or predictive tools used.

Where potential impact/s are identified the EA will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.
- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

Licensing

It is noted in Section 7.2.2 of the PEA that earthworks associated with the project have the potential to interrupt existing groundwater flows. The EA needs to identify if the proposal is likely to intercept groundwater. Any part of the development that intercepts or uses groundwater may require a water license under Part 5 of the *Water Act 1912*. The NOW will assess the need for a licence when more detailed groundwater assessment information is provided in the EA.

All proposed groundwater works, including bores for the purpose of investigation, extraction, dewatering, testing or monitoring must be identified in the proposal and an approval under relevant water legislation be obtained from NOW prior to their installation.

Groundwater Dependent Ecosystems

The EA should provide details on the presence and distribution of Groundwater Dependent Ecosystems (GDEs) in the vicinity of the study area and:

- demonstrate that the proposed development would maintain natural patterns of groundwater flow and not disrupt groundwater levels that are critical to GDEs;
- identify any potential impacts on GDEs as a result of the proposal including:
  - the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections;
  - the effect on the function of GDEs (habitat, groundwater levels, connectivity); and
- provide safeguard measures for any GDEs.

GDEs are ecosystems which have their species composition and natural ecological processes wholly or partially determined by groundwater. GDEs represent a vital component of the natural environment and can vary in how they depend on groundwater, from having occasional or no apparent dependence through to being entirely dependent. GDEs occur across both the surface and subsurface landscapes ranging in area from a few metres to many kilometres. Surface and groundwaters are often interlinked and aquatic ecosystems may have a dependence on both.

Ecosystems that can depend on groundwater and that may support threatened or endangered species, communities and populations, include:

- terrestrial vegetation that show seasonal or episodic reliance on groundwater;
- river base flow systems which are aquatic and riparian ecosystems in or adjacent to streams/rivers dependent on the input of groundwater to base flows;
- aquifer and cave ecosystems;
- wetlands;
- estuarine and near-shore marine discharge ecosystems; and
- fauna which directly depend on groundwater as a source of drinking water or live within water which provide a source.

Section 6.8.1 of the PEA notes there are a number of SEPP14 wetlands in the locality and Coomonderry Swamp is to the south of the study area (page 40). The EA should identify and provide detail on the following:

a. any wetlands within the study area (including SEPP14 wetlands) and also those outside the study area potentially affected by the proposal;
b. the footprint of the proposal in relation to the wetlands;
c. buffer setback widths around the wetlands (if applicable).

The EA should identify any potential impact on the wetlands, identify if the wetlands are groundwater dependent, assess the modification to the wetlands hydrologic regime/groundwater recharge and loss/degradation of habitat and provide safeguard measures to protect and minimise impacts on wetlands.

The SEPP 14 wetlands should not be impacted at all, that is no artificial lowering of the water table in a SEPP 14 wetland is the general principle the NOW upholds. Please see

the Groundwater Dependent Ecosystem Policy (2000) which can be downloaded off the NOW's web site www.water.nsw.gov.au

The EA needs to supply evidence that there would be no drawdown of significance that would impact the SEPP 14 wetlands. Some pump testing of the aquifer may be required and an assessment of groundwater volumes to be extracted should be determined. Please see a copy of the NOW's pump test standards for the coast attached. The EA needs to demonstrate that excavation below the water table and dewatering will not impact on a sensitive environment like GDEs, and also that there would be negligible interference on neighbouring bores. In addition a Dewatering Management Plan should address disposal of extracted groundwater.

Relevant Policies and Legislation

The following NSW Government legislation and policies implemented by the NOW are applicable to the proposal:

- *Water Management Act 2000*;
- *Water Act 1912*;
- NSW Groundwater Policy Framework Document – General;
- NSW Groundwater Quantity Management Policy;
- NSW Groundwater Quality Protection Policy;
- NSW Groundwater Dependent Ecosystem Policy
- NSW State Rivers and Estuaries Policy
- NSW Wetlands Management Policy
- NSW Farm Dams Policy

End Attachment A
14 April 2011

NSW GOVERNMENT | Industry & Investment

Michael Young
Senior Planning Officer
Infrastructure Projects
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Your ref: MP 10_0240

OUT11/554

Attention: Kylie Seretis

Dear Mr Young,

Re: Proposed Princes Highway Upgrade – Foxground and Berry Bypass (MP10_0240) - Section 75F(4) EP&A Act Consultation

I refer to your letter of 10 January 2011, and enclosed Preliminary Assessment report by the Roads and Traffic Authority (RTA) (dated December 2010), requesting Industry & Investment NSW (I&I NSW) key issues and environmental assessment requirements for the above major project application.

This response from I&I NSW provides comments on Fisheries and Agriculture requirements related to this proposal. I&I NSW advises that there are no issues related to Mineral Resources or State Forests.

Issues Related to Fisheries

I&I NSW is responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, the Department ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act respectively) and the associated *Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (1999)*. In addition the Department is responsible for ensuring the sustainable management of commercial and recreational fishing and aquaculture within NSW.

I&I NSW notes that the proposal includes new road crossings of Broughton Creek, Broughton Mill Creek and Bundewallah Creek.

Key Issues

The key issues of concern to I&I NSW in relation to this Major Project development are:

- direct impacts on aquatic environments and key fish habitat (including riparian vegetation, instream aquatic vegetation and large woody debris) from road construction.
- impacts on water quality during all road construction activities and from stormwater runoff and road drainage during the ongoing use of the upgraded highway.
- impacts on recreational fishing access and opportunities in Broughton Creek, Broughton Mill Creek and Bundewallah Creek.

Environmental Assessment Requirements

It is important that the Environmental Assessment (EA) assesses the full extent of potential impacts to the aquatic environment within the development area. Proposed measures to mitigate, rehabilitate or compensate for such impacts are to be detailed in accordance with the Department's Policy and Guidelines referenced above to ensure that there is 'no net loss' of aquatic habitats.

The Department advises that the environmental assessment for the proposed development should consider and provide information on the following specific issues:

- Description of aquatic and riparian environments in the vicinity of the development – particularly extent and condition of riparian vegetation and instream aquatic vegetation, water depth, and permanence of water flow and snags (large woody debris) within the footprint of the proposed highway upgrade.
- Analysis of any interactions of the proposed roadworks with aquatic and riparian environments and predictions of any impacts upon aquatic and riparian environments (including fish and aquatic and riparian vegetation) from the roadworks (both temporary and permanent). This should include assessment of both direct impacts (removal, disturbance, smothering) and indirect impacts (e.g. shading, permanent loss of habitat).
- Description of proposed environmental compensation measures to offset the permanent loss of riparian habitats in Broughton Creek, Broughton Mill Creek and Bundewallah Creek (e.g. funding for aquatic rehabilitation works, such as removal of fish passage barriers, elsewhere in the catchment as recommended by I&I NSW).
- Description of potential impediments to fish passage as a result of the works (e.g. temporary coffer dams, instream bunds or work platforms) and possible mitigation measures to be employed to negate these impacts.
- Predictions of impacts upon water quality of the proposed road development, including in Broughton Creek, Broughton Mill Creek and Bundewallah Creek, both during the construction and operational phases.
- Safeguards to mitigate any impacts upon aquatic species and environments and water quality during construction and operation of the highway upgrade. In particular, provide details on proposed revegetation of riparian areas, proposals for erosion and sediment control (to be incorporated into a Construction Environmental

Management Plan - CEMP) and proposed stormwater and road drainage management measures (e.g. sediment basins). Water quality management for the highway upgrade should be designed to achieve no nett increase in pollutant run-off to Broughton Creek, Broughton Mill Creek and Bundewallah Creek.

- An assessment of any impacts of the proposed development and construction works on recreational fishing in the area, especially in relation to fishing access arrangements (foreshore and boat based).

Issues Related to Agriculture

Most agricultural issues for a highway bypass have been included within the Draft Director General's requirements (23/12/10) attached to your letter.

However, as well as land use viability, development potential, land sterilisation and severance impacts included in the DG requirements, a critical issue that needs to be addressed is farm access.

Infrastructure proposals can result in interruptions to internal or external farm access and to farm services that may affect the efficient operation and sustainability of agricultural businesses. Farm businesses rely on access to road networks for supplies, employees, specialist support services and selling products. Access to infrastructure such as power, communication and water can also be critical for animal welfare and business survival. Reliable, effective access to the road network and services is particularly critical at peak selling or harvesting times and for intensive livestock operations (eg dairies, poultry), horticultural and vegetable enterprises. Internal access to water, pastures, feed storage and farm infrastructure (eg irrigation equipment) can also be vital for animal welfare and sustainable farming. Operating farms often comprise more than one allotment and need to access resources, livestock and crops spread across the holding.

Further information of this issue is available from the I&I NSW land use planning and development web portal: http://www.dpi.nsw.gov.au/environment/landuse-planning/agriculture. The relevant guideline that may assist you is: 'Infrastructure Proposals on Rural Land'.

If you have any queries with regard to agriculture matters please contact Wendy Goodburn on ph 4828 6600 or by email at wendy.goodburn@industry.nsw.gov.au.

Please ensure a copy of the Director-General's Requirements and the subsequent environmental assessment documents provided by the proponent for this major project are provided to I&I NSW for review and further comment. I&I NSW also requests that a copy of this correspondence is provided to the applicant for their information.

If you require any further information, please contact me on 02) 4478 9103.

Yours faithfully

Trevor Daly

Trevor Daly
Fisheries Conservation Manager, South Coast
Aquatic Habitat Protection

17 January 2011

City Administrative Centre
Bridge Road, Nowra NSW Australia 2541
Phone: (02) 4429 3111 • Fax: (02) 4422 1816 • DX 5323 Nowra
Address all correspondence to
The General Manager, PO Box 42, Nowra NSW Australia 2541

PCU019226

COUNCIL REFERENCE: 3A11/1000 (D11/22975)
CONTACT PERSON: John Britton
YOUR REF:

2 February 2011

Department of Planning - Major Project Assessments
GPO Box 39
SYDNEY NSW 2001

Attention: Mr M Young – Infrastructure Planning

Dear Sir

Princes Highway Upgrade – Foxground and Berry Bypass
Major Project MP10_0240

I refer to the above and provide Council's Key Issues submission for your consideration. The submission provides preliminary comments and Council requests they be conveyed to the proponent at this stage of the project application.

If you need further information about this matter, please contact Council's Part 3A Coordinator, John Britton, on (02) 4429 3432. Please quote Council's reference 3A11/1000.

Yours faithfully

John Britton
Part 3A Coordinator

SHOALHAVEN CITY COUNCIL

SUBMISSION TO THE NSW DEPARTMENT OF PLANNING
PART 3A, ENVIRONMENTAL PLANNING & ASSESSMENT ACT, 1979

KEY ISSUES SUBMISSION

MAJOR PROJECT APPLICATION MP 10_0240

PROPERTY: Land within the Shoalhaven local government area. Princes Highway Upgrade – Foxground and Berry Bypass

APPLICANT: Roads and Traffic Authority (RTA)

OWNER: Local and State road authorities and other private landowners

DEPARTMENT OF PLANNING REFERENCE:
MP10_0240 (Project)

COUNCIL REFERENCE: 3A11/1000

Introduction
The project is for the upgrade of the Princes Highway between Foxground and south of Berry. Part of the project is within the Kiama local government area and this Key Issues submission only relates to the project within the Shoalhaven local government area.

Council staff have been included in focus meetings and discussions with the RTA and the Department as the project proposal was prepared. Council has been provided with concept plans by the RTA to assist the Council's understanding of the works. The draft DGRs have been forwarded to Council.

Council's submission highlights additional maters that are requested as part of the DGRs to be satisfied before the public exhibition of the Environmental Assessment Report. These relate to Traffic, Water and Sewer Infrastructure and Consultation matters.

Traffic Planning Matters

(a) Council requests the RTA consider the following as part of the DGR –Traffic and Transport section:

Of particular concern are the following matters:

This project has been subject of ongoing discussions between Council and RTA since project inception, in particular the Berry Bypass and access options for Berry. Council has made a number of resolutions regarding design changes, most of which have now been addressed by RTA however some remain outstanding issues to be resolved.

In addition, now that plans are available for review along the full length of the Highway, other issues have also emerged that are required to be addressed.

At this point in time outstanding issues from observation of the plans RTA have made available include;

(i) The turnaround area proposed to be provided on the old section of Highway adjacent approx CH11150 is at the bottom of the "big dipper" which (being at the bottom of the hill) is a complete inconvenience to motorists who would have to travel down the hill, turnaround, then travel back up the hill to access the Highway. Larger vehicles doing this would impact other traffic as they crawled back up the hill (efficiency concerns and likely adverse safety consequences). This is also avoidable. This situation would not be accepted on the Highway and should not be accepted on what will be a local road when handed over to Council. Refer plan 15 of 50 (of RTA plans). Find attached a sketch prepared by Council Traffic Unit of an alternative arrangement which would be preferred (*"edits to plan 15 of 50.jpg"*)

(ii) The intersection arrangement proposed at Schofields Lane south of Berry is queried. The reason the intersection was moved further to the north years ago (as per the present situation) was to address unacceptable sight distance and the resultant crash history due to location of the crest directly adjacent to (to the south of) the former intersection. RTA have now proposed to move the intersection back to its former location. To do this the crest would either need to be removed completely or alternatively an acceleration lane would need to be provided for traffic exiting Schofield Lane. There are no levels provided on the RTA plans so it is not clear whether they (RTA) have proposed to level the crest to provide good sight distance. This issue needs to be addressed.

(iii) Similar to the issue at Schofields Lane, there are potential sight distance issues at the intersection Tindalls Lane with the new Highway to the north of Berry. An acceleration lane could also be needed at that location for traffic exiting Tindalls Lane to address sight distance concerns. There are no levels provided on the RTA plans so it is not clear exactly what the impact will be, however this issue needs to be addressed.

(iv) Council have been asking for a pedestrian / cyclists overbridge to connect both sides of North Street following the severance the upgraded Highway will create. In response to Council's concerns regarding severance of North Street the RTA have proposed shared path connections to Kangaroo Valley Road and Queen Street and also along the northern side of the Highway connecting back to town under the Highway near Berry Sports complex. These path details have not been shown on the plans made available by RTA, this is to be addressed. If built to RTA standards the northern pathway (which will be in excess of 1km in length just from Rawlings Lane) is likely to cost close to $1M. If included in the Highway upgrade contract a pedestrian overpass could be built for a similar cost and

provide a better accessibility solution for pedestrians and cyclists. This should be reconsidered.

(v) Also in relation to the severance of North Street, Council have been asking for a suitable bus and garbage truck turnaround on North Street where the RTA proposes to connect North Street to Rawlings Lane. The RTA has still not addressed this issue. Council and SITA have confirmed there are several properties in North Street (west end) and Rawlings Lane that have a garbage service that will be affected by the RTA proposal. A garbage truck will need to be able to turnaround at the southern end of Rawlings Lane. There are also currently school children in Rawlings Lane that catch the bus in North Street. This bus service will also be affected and Council have requested that the turnaround area be suitable also for school buses. Find attached a sketch prepared by Council Traffic Unit of a suitable turnaround arrangement (*"edits to plan 27 of 50.jpg"*)

(vi) Also in relation to the severance of North Street, there are three (3) properties that will be directly affected by the RTA proposal to provide a cul-de-sac in North Street at the eastern boundary of the Church Lot (Lot 1 DP86897, 80 North Street). Properties 72 North Street, and 74-76 North Street will be affected (immediately to the east of the upgraded Highway). The same sketch prepared by Council Traffic Unit (*"edits to plan 27 of 50.jpg"*) highlights this issue which needs to be addressed. Unless these properties are acquired by RTA they will need to be accessed and serviced.

(vii) There are no provisions in the plans to provide a left turn from Toolijooa Road direct to the Highway at the northern end of Toolijooa Road. The option provided is that motorists travel across the Highway (grade separated junction at Toolijooa Road) and traverse some 6km on the Old section of Highway before rejoining the new Highway at approximately Austral Park Road. This will lead to increased traffic on Toolijooa Road (SCC section) and Beach Road, Tannery Road which have safety issues and are sensitive to even small increases in traffic. This issue may not be so critical based on current levels of traffic on Toolijooa Road however providing direct access to the new Highway will provide some level of protection to Shoalhaven City Council's roads. It is recommended that left turn access be provided at Toolijooa Road on to the Highway, or that at the very least the design demonstrate that a left turn access to the Highway can be provided if necessary to accommodate a development such as service station or other type of development at the Toolijooa Road interchange or along Toolijooa Road, and land acquired at this time to accommodate the left turn out. Traffic can currently turn left out of Toolijooa Road on to the Highway and Council should not accept a reduced level of access that will impact Shoalhaven City Council roads.

(viii) One of the greatest deficiencies in the design (a current outstanding issue) is that RTA have not provided two (2) off ramps to Berry for traffic entering Berry from the south. The current proposal seeks to accommodate all of the traffic entering Berry "through" the residential sub-division at Huntingdale Park, the major residential growth area of Berry. Whilst the off ramp in this location has been planned for as part of the DCP for the area, in Council's view it was never planned for as the "only" entrance to Berry, and Council believes there is a fundamental planning flaw in the RTA proposing this as the only access for Berry from the south due to the adverse traffic and environmental impacts to the residential growth area of Huntingdale Park. It is estimated that at full development there will be no spare environmental capacity to accommodate the Highway traffic entering Berry at this point without an additional exit to Berry

further to the north to mitigate the impacts on the residential area. When this occurs Council and the community will not want to have to wait 18 years as has taken the RTA to provide the additional ramps in Kiama to address local traffic impacts. Council have proposed that a northbound exit to Berry be provided at Woodhill Mountain Road. Similarly a southbound access to the Highway should be provided from Woodhill Mountain Road. These measures will ensure the traffic impacts from the off ramp into Huntingdale Park would be kept to minimum possible levels and that as much through traffic as possible would be removed from the Berry town centre which is one of the primary objectives of the Bypass proposal.

Whilst the upgrade proposal in general is supported in principle and should be constructed at the earliest practical time, it is Traffic Unit's view that these outstanding issues are to be addressed by the applicant before Council can support the project to proceed.

Infrastructure
Council requests an additional DGR item be added, named ***"Infrastructure"***

This should require the proponent to (a) accurately identify existing infrastructure such as water, wastewater, sewer, gas, electricity and telephone facilities and services likely to be impacted by the proposal and (b) state the measures to be taken to relocate or otherwise treat to mitigate impacts, including maintaining operations during the constructing works are carried out.

Water and Wastewater
Council's Shoalhaven Water is the water and sewer authority. The proposal will affect critical Shoalhaven Water's water and wastewater assets and the following is requested be included within the DGRs and the proponent advised.

All works in close proximity/or over Shoalhaven Water's assets (including Water Service lines) will require approval by Shoalhaven Water. Shoalhaven Water advises that the minimum horizontal and vertical clearances are to be in accordance with WSA code for water supply and sewerage and where required compliant with Council's Building Over Sewers Policy; therefore works that are required to protect or relocate or augment such services are to be approved by Shoalhaven Water prior to works being undertaken and all works are to be at the developer's expense.

The applicant will be required to submit plans to Shoalhaven Water for determination for the whole extent of the works, the plans are to accurately show all existing Shoalhaven Water infrastructure that may be impacted upon by the proposed road works and associated works.

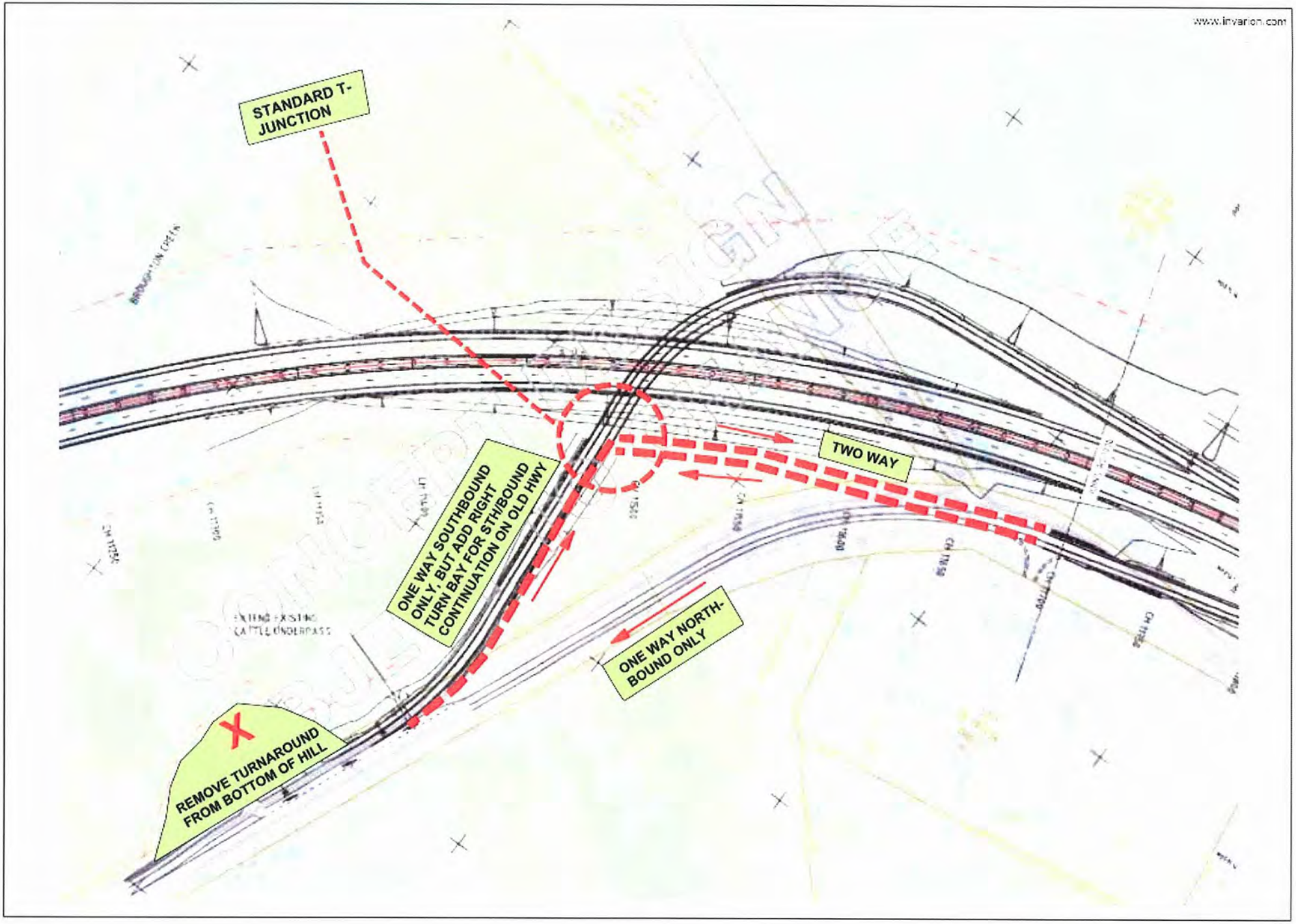
The applicant will be required to make written application for a Certificate of Compliance, under section 305 of the *Water Management Act 2000*, to Shoalhaven Water after consent has been granted and prior to works commencing.

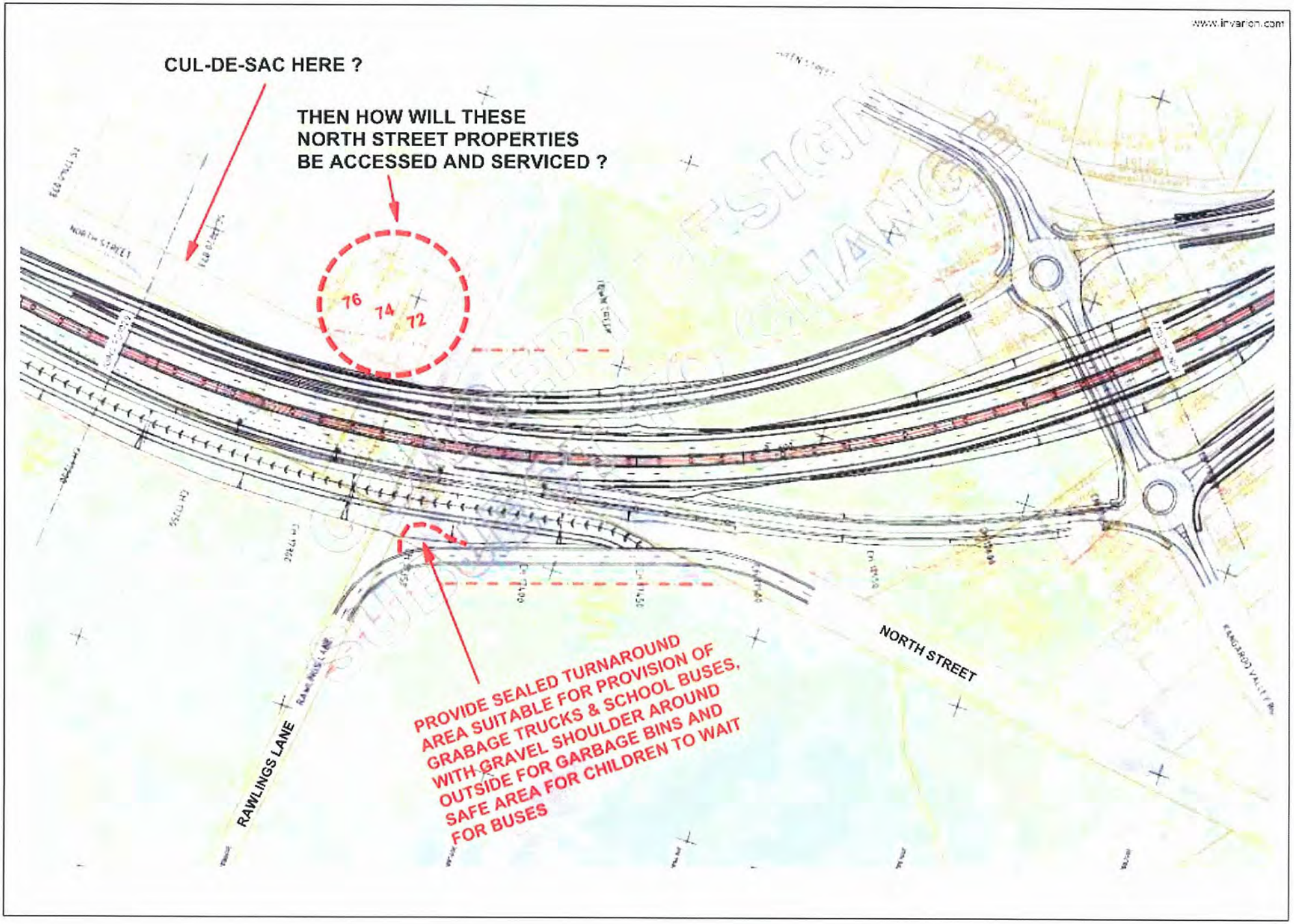
Consultation
Council requests that Shoalhaven Water be added to the list of agencies the proponent must consult with in the preparation of the studies required by the DGRs.

Conclusion
Council requests the details contained in the submission be favourably considered.

Further information may be obtained by contacting Council's Part 3A Coordinator, John Britton on 02-4429 3432 or britton@shoalhaven.nsw.gov.au

T Fletcher
Director
Development and Environmental Services Group
27 January 2011

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FOR BUSES

Andrew Beattie - Fwd: FW: Princes Highway Upgrade - ST.0248

From: Kylie Seretis
To: Andrew Beattie
Date: 2/2/2011 2:48 PM
Subject: Fwd: FW: Princes Highway Upgrade - ST.0248

>>> "Joanne Henry" <joanneh@kiama.nsw.gov.au> 17/01/2011 10:03 >>>

Morning Kylie

Please find following the information as requested by Michael regarding the Princes Highway Upgrade – Berry-Foxground.

Regards

Charmain North

Executive Assistant (Relief)

Engineering and Works
Kiama Municipal Council

P 4232 0483

F 4232 0497

A PO Box 75, Kiama NSW 2533

E joanneh@kiama.nsw.gov.au

W www.kiama.nsw.gov.au

Please consider the environment before printing

From: Joanne Henry
Sent: Monday, 17 January 2011 9:42 AM
To: 'Michael.Young@planning.nsw.gov.au'
Cc: Records; Bryan Whittaker
Subject: Princes Highway Upgrade - ST.0248

Michael

Thank you for the opportunity to provide comments on the Director Generals Requirements for the Environmental Assessment for the Upgrade of the Princess Highway, Foxground to Berry By-Pass.

The following additional items are considered to be relevant and Council respectfully requests their inclusion in the DGR's

- Air Quality – Both during and after Construction
- Land Acquisition – Minimisation of the acquisition of viable Agricultural land
- Local Property Access – Both during and after construction with consideration of the need for service lanes
- Transfer of redundant highway sections – Road Asset and Safety Audits and/or upgrade prior to transfer to Council
- Local Infrastructure – Impact on the local road and drainage infrastructure both during and after construction. Including detailed traffic modelling of construction phase and post construction conditions and the necessary provision of Traffic Management devices on the local network to accommodate changes.
- Visual Amenity – Highway / Street Lighting and impacts on adjacent residents
- Emergency Access – The provision of adequate turning opportunities for Emergency Service vehicles

Regards

Bryan Whittaker

Director Engineering and Works

Kiama Municipal Council

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Appendix A - DGR checklist

	DGR	Where addressed in the environmental assessment
	1. Executive summary (General requirement *)	
☒	The EA must include an executive summary.	Executive summary
	2. Certification (General requirement*)	
☒	The EA must include certification by the author of the environmental assessment that the information contained in the assessment is neither false nor misleading.	Page iv
	3. Strategic justification (Key issue 1*)	
☒	The EA must describe the strategic need, justification and objectives for the project taking into account the aims and objectives of relevant strategic planning and transport policies including the:	Sections 2.1-2.5 Section 11.1.1
☒	• State Plan (2006).	Section 2.1.2
☒	• Illawarra Regional Strategy.	Section 2.1.2
☒	• South Coast Regional Strategy.	Section 2.1.2
☒	• Other.	Section 2.1.2
	4. Project justification (Key issue 2*)	
☒	The EA must assess:	-
☒	• The alternatives considered.	Chapter 3 Chapter 11
☒	• The environmental costs and benefits of the project relative to alternatives.	Chapter 3 Chapter 11
	5. Description of the project (General requirement*)	
☒	The EA must include a **detailed description** of the project including:	Chapter 4
☒	• Route alignment.	Section 4.2.1
☒	• Corridor width.	Section 4.2.4
☒	• Design elements including:	Section 4.2
☒	– Requirements for bridges.	Section 4.2.7
☒	– Culverts.	Section 4.2.10
☒	– Level of service.	Section 4.2.3 Section 7.1
☒	– Pedestrians.	Section 4.2.17
☒	– Cyclists.	Section 4.2.17
☒	– Rest areas.	Section 4.2.15
☒	– Service centres.	Section 4.2.14
☒	– Other (if required).	Chapter 4 Sections 4.2.2, 4.2.5, 4,2,6, 4.2.8, 4.2.9, 4.2.11, 4.2.12, 4.2.13, 4.2.18 and 4.2.19

	DGR	Where addressed in the environmental assessment
☒	• Clear identification **of and/or options for** the proposed location of **ancillary facilities** including:	Section 4.4.7
☒	– Compound sites.	Section 4.4.7
☒	– Batching plants.	Section 4.4.7
☒	– Other (if required).	Section 4.2.16 Section 4.4.7
☒	• Resourcing including:	-
☒	– Construction material needs.	Section 4.4.4
☒	– Spoil disposal.	Section 4.4.5 Section 8.4
☒	– Natural resource consumption including water supply sources.	Section 4.4.6 Section 8.4
☒	– Other (if required).	-
☒	• Potential staging including:	Section 4.4.10
☒	– Construction.	Section 4.4.10
☒	– Operation.	Section 4.4.10
	6. Consultation (Consultation requirement*)	
☒	An **appropriate and justified level** of consultation must be undertaken with relevant parties during the preparation of the EA, including:	Section 6.2 Table 6-1 Appendix C
☒	• Local government including:	Section 6.2 Appendix C
☒	– Shoalhaven City Council.	Section 6.2 Appendix C
☒	– Council of the Municipality of Kiama.	Section 6.2 Appendix C
☒	• State government including:	Section 6.2 Appendix C
☒	– Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water).	Section 6.2 Appendix C
☒	– Department of Primary Industries (incorporating the former NSW Office of Water, and Industry and Investment NSW – Fisheries and Agriculture).	Section 6.2 Appendix C
☒	• Commonwealth Government.	Section 6.2 Appendix C
☒	• Service providers, including:	Section 6.2 Appendix C
☒	– Shoalhaven Water.	Section 6.2 Appendix C
☒	• Specialist interest groups including Local Aboriginal Land Councils.	Section 6.2 Appendix C
☒	• The public, including affected landowners.	Section 6.2 Appendix C
☒	The EA must describe the consultation process.	Section 6.2
☒	The EA must document all community consultation undertaken to date.	Chapter 6 Appendix C

	DGR	Where addressed in the environmental assessment
☒	The EA must identify the issues raised (including where these have been addressed in the EA).	Chapter 6 Appendix C
☒	The EA must address **all relevant issues raised (including those in the agency letters** accompanying the DGRs).	Chapter 6
	7. Key issues (General requirement*)	
☒	The EA must include an **assessment of the key issues,** including an assessment of the **worst case and representative impact** for each issue for all aspects of the project (including the **proposed locations of and/or options** for the **ancillary facilities**) with the following aspects addressed for **each key issue** (where relevant):	Chapter 7 Technical papers (Appendix D to M)
☒	• Describe the existing environment.	Chapter 7 Technical papers (Appendix D to M)
☒	• Assess the potential impacts of the proposal including:	Chapter 7 Technical papers (Appendix D to M)
☒	– At the construction stage.	Chapter 7 Technical papers (Appendix D to M)
☒	– At the operation stage.	Chapter 7 Technical papers (Appendix D to M)
☒	– In accordance with relevant policies and guidelines.	Chapter 7 Technical papers (Appendix D to M)
☒	– Consider direct impacts including potential interactions with the existing Princes Highway (as relevant).	Chapter 7 Technical papers (Appendix D to M)
☒	– Consider indirect impacts including potential interactions with the existing Princes Highway (as relevant).	Chapter 7 Technical papers (Appendix D to M)
☒	• Identify how relevant planning, land use and development matters, (including relevant strategic and statutory matters), have been considered in the impact assessment and/or in developing management/mitigation measures.	Chapter 4, Chapter 7 Technical papers (Appendix D to M)
☒	• Describe measures to be implemented to avoid, minimise, manage, mitigate, offset and /or monitor the impacts of the project and the residual impacts.	Chapter 7 Technical papers (Appendix D to M)
	8. Traffic and transport (Key issue 3*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.1 Appendix D
☒	The EA must include an assessment of **Construction traffic** impacts, including but not limited to:	Section 7.1.3 Appendix D 3
☒	• Identification of construction routes and the nature of existing traffic on these routes.	Section 7.1.3 Appendix D
☒	• Quantification of traffic volumes, including:	Section 7.1.3 Appendix D
☒	– Spoil haulage.	Section 7.1.3 Appendix D
☒	– Other	Section 7.1.3 Appendix D

	DGR	Where addressed in the environmental assessment
☒	• Potential impacts to regional and local road network, including:	Section 7.1.3 Appendix D
☒	– Safety.	Section 7.1.3 Appendix D
☒	– Level of service	Section 7.1.3 Appendix D
☒	– Other	Section 7.1.3 Appendix D
☒	• Potential disruption to existing:	-
☒	– Public transport services.	Section 7.1.3 Appendix D
☒	– Access/service lanes to local properties.	Section 7.1.3 Appendix D
☒	The EA must include an assessment of **Operational traffic and transport** impacts to the **local and regional road network** including but not limited to:	Section 7.1.3 Appendix D
☒	• Changes to access arrangements/service lanes to local properties.	Section 7.1.3 Appendix D
☒	• Changes to local road connectivity and access.	Section 7.1.3 Appendix D
☒	• Assessment of impacts (including direct impacts from the replacement of the existing highway that currently passes through Berry) on:	Section 7.1.3 Appendix D
☒	– Local traffic arrangements.	Section 7.1.3 Appendix D
☒	– Local road capacity	Section 7.1.3 Appendix D
☒	– Safety from traffic rerouting	Section 7.1.3 Appendix D
☒	– Modified access to the upgraded highway	Section 7.1.3 Appendix D
☒	• The assessment must take into account:	-
☒	– Potential interactions with local traffic associated with the residential sub-division at Huntingdale Park, Berry (including future growth).	Section 7.1.3 Appendix D
☒	– Any severance impacts on local connectivity within Berry as a result of the proposed route.	Section 7.1.3 Appendix D
☒	• Consideration must be given to potential impacts of changed traffic arrangements on:	-
☒	– Local and/or school bus services.	Section 7.1.3 Appendix D
☒	– Access for emergency services.	Section 7.1.3 Appendix D
☒	– Garbage truck routes.	Section 7.1.3 Appendix D
☒	• Traffic capacity of the proposal and its ability to cater for predicted growth.	Chapter 4 Section 7.1.3 Appendix D
☒	• What effect potential major land use changes in the locality may have on the traffic assessment outcomes.	Section 7.1.3 Appendix D

	DGR	Where addressed in the environmental assessment
☒	• Opportunity for the provision of cycle way connections along the highway and to adjoining communities.	Section 7.1.2 Appendix D
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.1 Appendix D
	9. Noise and vibration (Key issue 4*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.2 Appendix E
☒	The EA must include a **construction noise and vibration assessment,** including but not limited to:	Section 7.2 Appendix E
	• Assessment of:	-
☒	– Construction traffic noise.	Section 7.2.4 Appendix E
☒	– Batch plants.	Section 7.2.4 Appendix E
☒	– Blasting impacts.	Section 7.2.4 Appendix E
☒	• The EA (Construction noise and vibration assessment), must:	-
☒	– Clearly identify nearest sensitive receptors.	Section 7.2.4 Appendix E
☒	– Assess construction noise/vibration generated by representative construction scenarios focusing on high noise generating works.	Section 7.2.4 Appendix E
☒	• Where **work hours** outside **of standard construction hours** are proposed, provide:	-
☒	– clear justification;	Section 7.2.4 Appendix E
☒	– detailed assessment of the proposed work hours, including:	Section 7.2.4 Appendix E
☒	▪ Alternatives considered	Section 7.2.4 Appendix E
☒	▪ Mitigation measures proposed.	Section 7.2.5 Appendix E
☒	• The assessment must further consider **any cumulative impacts during construction**, having regard to any other developments (both existing and approved) in the locality.	Section 7.2.4 Appendix E
☒	The EA must include an **operational road traffic noise assessment** including but not limited to:	Section 7.2 Appendix E
☒	• Consideration of local meteorological conditions (as relevant).	Section 7.2.4 Appendix E
☒	• Any additional reflective noise impacts from proposed noise mitigation barriers.	Section 7.2.4 Appendix E
☒	The **Construction and Operational Noise and Vibration** assessments must take into account the following guidelines as relevant:	-
☒	• Interim Construction Noise Guideline (DECC 2009).	Section 7.2 Appendix E
☒	• Environmental Criteria for Road Traffic Noise (EPA 1999).	Section 7.2 Appendix E

	DGR	Where addressed in the environmental assessment
☒	• Environmental Noise Management Manual (RTA 2001).	Section 7.2 Appendix E
☒	• Assessing Vibration: A Technical Guideline (DEC 2006).	Section 7.2 Appendix E
☒	• Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC 1990).	Section 7.2 Appendix E
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.2 Appendix E
	10. Flora and fauna (Key issue 5*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.3 Appendix F Appendix G
☒	The EA must include a Flora and Fauna (terrestrial and aquatic) assessment, including:	Section 7.3 Appendix F Appendix G
☒	• An assessment that is consistent with the Draft Guidelines for Threatened Species Assessment (DEC 2005).	Section 7.3 Appendix F Appendix G
☒	• Details of the survey methodology employed including survey effort and representativeness for species targeted.	Section 7.3.1 Appendix F Appendix G
☒	• An assessment of all project components on:	-
☒	– Terrestrial flora and their habitats.	Section 7.3 Appendix F Appendix G
☒	– Terrestrial fauna and their habitats.	Section 7.3 Appendix F Appendix G
☒	– Aquatic flora and their habitats.	Section 7.3 Appendix F Appendix G
☒	– Aquatic fauna and their habitats.	Section 7.3 Appendix F Appendix G
☒	• Specific consideration of impacts to threatened species, populations, ecological communities and/or critical habitat (terrestrial and aquatic) listed under both State and Commonwealth legislation that have been recorded on the site and surrounding land.	Section 7.3.3 Appendix F Appendix G
☒	• Details on the existing site conditions (both terrestrial and aquatic) and quantity and likelihood of disturbance (including quantifying the worst case extent of impact on the basis of vegetation type and total native vegetation disturbed).	Section 7.3.2 Appendix F Appendix G
☒	• As relevant, consideration of:	-
☒	– Weed infestation.	Section 7.3.3 Appendix F Appendix G
☒	– Edge effects.	Section 7.3.3 Appendix F Appendix G

	DGR	Where addressed in the environmental assessment
☒	– Habitat fragmentation.	Section 7.3.3 Appendix F Appendix G
☒	– Impacts to wildlife and riparian corridors.	Section 7.3.3 Appendix F and G
☒	– Impacts to groundwater-dependent communities	Section 7.3.3 Appendix F Appendix G
☒	– Impacts to riparian areas	Section 7.3.3 Appendix F Appendix G
☒	– Impacts aquatic habitat	Section 7.3.3 Appendix F Appendix G
☒	– Impacts on SEPP 14 wetlands	Section 7.3.3 Appendix F Appendix G
☒	– Impacts on fish passage	Section 7.3.3 Appendix F Appendix G
☒	• Details of how:	-
☒	– Flora impacts would be managed during construction for all project components, including adaptive management and maintenance protocols and monitoring programs.	Section 7.3.4 Appendix F Appendix G
☒	– Fauna impacts would be managed during construction for all project components, including adaptive management and maintenance protocols and monitoring programs.	Section 7.3.4 Appendix F Appendix G
☒	– Flora impacts would be managed during operation for all project components, including adaptive management and maintenance protocols and monitoring programs.	Section 7.3.4 Appendix F and G
☒	– Fauna impacts would be managed during operation for all project components, including adaptive management and maintenance protocols and monitoring programs.	Section 7.3.4 Appendix F Appendix G
☒	• Demonstrate actions to be undertaken to avoid, mitigate or offset impacts associated with the project (all components) consistent with the principles of "improve or maintain". Sufficient details must be provided to demonstrate the availability of viable and achievable options to offset the impacts of the project, where offset measures are proposed to address residual impacts.	Section 7.3.4 Appendix F Appendix G
☒	• An assessment of **waterways to be modified** as a result of the project, including:	Section 7.3.3 Section 7.3.4 Section 7.4. Appendix G Appendix H
☒	– Ecological impacts.	Section 7.3.3 Section 7.3.4 Section 7.4. Appendix G Appendix H

	DGR	Where addressed in the environmental assessment
☒	– Hydrological impacts.	Section 7.3.3 Section 7.3.4 Section 7.4. Appendix G Appendix H
☒	– Geomorphic impacts (as relevant).	Section 7.3.3 Section 7.3.4 Section 7.4. Appendix G Appendix H
☒	– Measures to rehabilitate the waterways to pre-construction conditions or better.	Section 7.3.3 Section 7.3.4 Section 7.4. Appendix G Appendix H
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.3 Appendix F Appendix G
	11. Surface and groundwater (Key issue 6*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.4 Appendix H
☒	The EA must include an assessment of impacts to **Surface water quality** including but not limited to:	Section 7.4 Appendix H
☒	• The assessment must take into account:	-
☒	– Impacts from accidents.	Section 7.4.3 Appendix H
☒	– Impacts from runoff.	Section 7.4.3 Appendix H
☒	– Relevant environmental water quality criteria specified in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000.	Section 7.4.3 Appendix H
☒	• The assessment must describe:	-
☒	– Measures to control erosion and sedimentation during construction activities.	Section 7.4.4 Appendix H
☒	– Measures to capture and treat runoff from the site during the operational phase.	Section 7.4.4 Appendix H
☒	The EA must identify potential risks of the project on **groundwater resources** including:	Section 7.3 Section 7.4 Appendix G Appendix H
☒	• Characterising existing local and regional hydrology.	Section 7.4.2 Appendix H
☒	• Potential risks of drawdown.	Section 7.4.3 Appendix H
☒	• Impacts to groundwater quality.	Section 7.3.3 Section 7.4.3 Appendix G Appendix H
☒	• Discharge requirements.	Section 7.4.3 Section 7.4.5 Appendix H

	DGR	Where addressed in the environmental assessment
☒	• Implications for groundwater-dependent surface flows (including springs and drinking water catchments), groundwater-dependent ecological communities and groundwater users.	Section 7.3.3 Section 7.4.3 Appendix G Appendix H
☒	The EA must include an assessment of **waterways to be modified** as a result of the project, including:	Section 7.3 Section 7.4 Appendix G Appendix H
☒	• Ecological impacts.	Section 7.3.3 Section 7.3.4 Section 7.4.3 Section 7.5.4 Appendix G Appendix H
☒	• Hydrological impacts.	Section 7.3.3 Section 7.3.4 Section 7.4.3 Section 7.5.4 Appendix G Appendix H
☒	• Geomorphic impacts (as relevant).	Section 7.3.3 Section 7.3.4 Section 7.4.3 Section 7.5.4 Appendix G Appendix H
☒	• Measures to rehabilitate the waterways to pre-construction conditions or better.	Section 7.3.3 Section 7.3.4 Section 7.4.3 Section 7.5.4 Appendix G Appendix H
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.4 Appendix H
	12. Flooding (Key issue 6*)	
☒	The EA must identify potential impacts of the project on **existing flood regimes**, consistent with the Floodplain Development Manual (Department of Natural Resources 2005), including:	Section 7.5 Appendix H
☒	• Impacts to existing receivers and infrastructure.	Section 7.5.3 Appendix H
☒	• The future development potential of affected land.	Section 7.5.3 Appendix H
☒	• Demonstration of consideration of the changes to rainfall frequency and/or intensity as a result of climate change on the project.	Section 7.5.3 Appendix H
☒	• Demonstrate due consideration of flood risks in the project design.	Section 7.5 Appendix H
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.5 Appendix H

	DGR	Where addressed in the environmental assessment
	13. Landscape and visual amenity (Key issue 7*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.6 Appendix I
☒	The EA must include an assessment of **Landscape and visual amenity** impacts including but not limited to:	Section 7.6 Appendix I
☒	• Assessment of the visual significance of the area, including:	Section 7.6 Appendix I
☒	– The escarpment and ridges.	Section 7.6.2 Section 7.6.3 Appendix I
☒	– The township of Berry.	Section 7.6.2 Section 7.6.3 Appendix I
☒	– The impact of the proposed alignment.	Section 7.6.2 Section 7.6.3 Appendix I
☒	• Design of the project (including noise barriers, retaining walls and landscaping) consistent with the existing (and desired) character of affected localities, including consideration of:	Section 7.6 Appendix I
☒	– The Noise Wall Design Guideline (RTA 2006).	Section 7.6.3 Section 7.6.4 Appendix I
☒	– Highway/street lighting and the potential light spill impacts on nearby residents.	Section 7.6.3 Section 7.6.4 Appendix I
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.6 Appendix I
	14. Aboriginal cultural heritage (Key issue 8*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.7 Appendix J
☒	An assessment of the project on **Aboriginal cultural heritage** including but not limited to:	Section 7.7 Appendix J
☒	• The assessment is consistent with the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, July 2005).	Section 7.7 Appendix J
☒	• Specifically considers:	-
☒	– Artefacts.	Section 7.7.2 Section 7.7.3 Appendix J
☒	– Potential archaeological deposits.	Section 7.7.2 Section 7.7.3 Appendix J
☒	– Landscape cultural values.	Section7.7.2 Section 7.7.3 Appendix J
☒	The EA (and the Aboriginal cultural heritage assessment) must demonstrate **effective consultation** with indigenous stakeholders:	-
☒	• During the assessment.	Chapter 6 Section 7.7 Appendix C Appendix J

	DGR	Where addressed in the environmental assessment
☒	• In developing mitigation options (including the final recommended measures).	Chapter 6 Section 7.7 Appendix C Appendix J
☒	The EA must describe the actions that will be taken to avoid, mitigate or offset impacts.	Section 7.7.4 Appendix J
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.7 Appendix J
	15. Non-Aboriginal heritage (historic heritage) (Key issue 8*)	
☒	Addresses the relevant general requirements for key issues (section 7 above).	Section 7.8 Appendix K
☒	The EA must include an assessment of the impact of the project on **historic heritage values** including but not limited to:	Section 7.8 Appendix K
☒	• Impacts on the historic township of Berry.	Section 7.8.3 Appendix K
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.8 Appendix K
	16. Land use and property (Key issue 9*)	
☒	Address of the relevant general requirements for key issues (section 7 above).	Section 7.9 Section 7.10 Appendix L Appendix M
☒	The EA must include an assessment of impacts of the project on land use and property including:	Section 7.9.2 Section 7.10 Appendix L Appendix M
☒	Directly-affected properties and land uses adjacent to the project, including:	Section 7.9.2 Section 7.10 Appendix M
☒	Impacts to land use viability.	Section 7.9.2 Section 7.10 Appendix M
☒	Impacts to future development potential.	Section 7.9.2 Section 7.10 Appendix M
☒	Property allotment impacts.	Section 7.9.2 Section 7.10 Appendix M
☒	Land sterilisation impacts.	Section 7.9.2 Section 7.10 Appendix M
☒	Severance impacts.	Section 7.9.2 Section 7.10 Appendix M
☒	The agricultural sector including:	Section 7.9.2 Section 7.10 Appendix M
☒	Internal and external farm access arrangements during construction of the project.	Section 7.9.2 Section 7.10 Appendix M

	DGR	Where addressed in the environmental assessment
☒	Internal and external farm access arrangements during operation of the project.	Section 7.9.2 Section 7.10 Appendix M
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.9 Section 7.10 Appendix L Appendix M
	17. Socio-economic (Key issue 9*)	
☒	Address of the relevant general requirements for key issues (section 7 above).	Section 7.9 Section 7.10 Appendix L Appendix M
☒	An assessment of the **socio-economic impacts** of the project including but not limited to:	Section 7.9 Section 7.10 Appendix L Appendix M
☒	• The agricultural sector taking into account the fragmentation and potential loss of agricultural and farm viability including internal and external farm access arrangements:	Section 7.9.2 Section 7.10.3 Appendix L Appendix M
☒	• Local community socio-economic impacts associated with changes to:	-
☒	– Access.	Section 7.9.2 Section 7.10.3 Appendix L Appendix M
☒	– Land use.	Section 7.9.2 Section 7.10.3 Appendix M
☒	– Property.	Section 7.9.2 Section 7.10.3 Appendix M
☒	– Amenity.	Section 7.9.2 Section 7.10.3 Appendix M
☒	• Business impacts including:	Section 7.10.3 Appendix M
☒	– The overall viability of businesses in the township of Berry associated with the changes to route alignment in Berry.	Section 7.10.3 Appendix M
☒	– The overall profitability of businesses in the township of Berry associated with the changes to route alignment in Berry.	Section 7.10.3 Appendix M
☒	– The overall productivity of businesses in the township of Berry associated with the changes to route alignment in Berry.	Section 7.10.3 Appendix M
☒	– The overall sustainability of businesses in the township of Berry associated with the changes to route alignment in Berry.	Section 7.10.3 Appendix M

	DGR	Where addressed in the environmental assessment
☒	• Impacts on recreational fishing access and opportunities in:	Section 7.10.3 Appendix M
☒	– Broughton Creek.	Section 7.10.3 Appendix M
☒	– Broughton Mill Creek.	Section 7.10.3 Appendix M
☒	– Bundewallah Creek.	Section 7.10.3 Appendix M
☒	This section of the EA must address all relevant issues raised in agency letters accompanying the DGRs or through other consultation activities (see section 6 above).	Section 7.9 Section 7.10 Appendix L Appendix M
	18. Environmental risk analysis (Key Issue 10*)	
☒	The EA must include an environmental risk analysis to identify potential environmental impacts associated with:	Section 9
☒	• Construction of the project.	Section 9.2
☒	• Operation of the project.	Section 9.2
☒	• Proposed mitigation measures.	Section 9.2
☒	• Potentially significant residual environmental impacts after the application of proposed mitigation measures.	Section 9.2
☒	Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of this additional key environmental impact must be included in the EA.	Chapter 7 Chapter 9
	19. Draft Statement of Commitments (General Requirement*)	
☒	The EA must include a draft Statement of Commitments (SoC).	Chapter 10
☒	The SoC must incorporate or otherwise capture all measures to (for the impacts of the project and the residual impacts):	Chapter 10
☒	• Avoid.	Chapter 10
☒	• Minimise, manage, mitigate.	Chapter 10
☒	• Offset.	Chapter 10
☒	• Monitor	Chapter 10
	20. Justification and conclusion (Key issue 2*)	
☒	Provide justification for the preferred project taking into consideration the objects of the *Environmental Planning and Assessment Act 1979* **and** the following:	Section 11.1.2
☒	• The environmental impacts of the project.	Section 11.1.1
☒	• The social impacts of the project.	Section 11.1.1
☒	• The economic impacts of the project.	Section 11.1.1
☒	• The suitability of the site.	Section 11.1.1
☒	• Whether or not the project is in the public interest.	Section 11.1.1

** This checklist has the same structure as the Foxground and Berry bypass environmental assessment. The location of each section in the original DGR document is indicated in brackets.*