Vales Point Solar Project

Response to Submissions

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Vales Point Solar Project – Response to Submissions

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1. Introduction

1.1 Background

Sunset Power International Pty Ltd trading as Delta Electricity (Delta) are seeking to develop a solar photovoltaic (PV) generation facility with a capacity up to 55 megawatt (MW) and associated infrastructure in the local government areas (LGAs) of Lake Macquarie and the Central Coast (the project). The project would be located within the land holding of the existing Vales Point Power Station and specifically on the rehabilitated area of the Vales Point Ash Dam.

The project is a State Significant Development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011. As a SSD, an application for the project is required to be submitted under Part 4, Division 4.1 of the NSW Environmental Planning and Assessment Act 1979.

The Development Application (DA) and Environment Impact Statement (EIS) for the project were submitted to the NSW Department of Planning and Environment (SSD 8533) and placed on public exhibition during 16 February to 18 March 2018. Stakeholder engagement activities to promote community awareness for the opportunity for comment on the project EIS continued during this period and submissions were sought from the community, government agencies and other interested groups.

1.2 Objective of this Report

This report has been prepared by Delta to provide a response to issues raised in submissions made by the community, interest groups and government agencies during the public exhibition of the Environmental Impact Statement for the Vales Point Solar Project, and in doing so, satisfy the requirements of Section 115Z(6) of the *Environmental Planning and Assessment Act 1979.*

2.0 Project Overview

2.1 Summary of the Proposal

The project includes the construction, operation and decommissioning of a solar photovoltaic (PV) power station with a capacity of up to 55 megawatt (MW) on the rehabilitated areas of the Vales Point Ash Dam and connection to the National Electricity Market (NEM) as shown in Figure 1. The project covers approximately 80 hectares of land and extends across the LGA boundary of Lake Macquarie and Central Coast. The project site is entirely within the existing property boundary of the Vales Point Power Station and surrounded by vegetated buffer lands owned by Delta. The proposal remains consistent with the detailed description provided in Section 2 of the EIS.

2.2 Project Benefits

The project benefits remain unchanged from those presented in the EIS. While there would be some environmental impacts as a consequence of the project such as temporary traffic inconvenience, noise and vibration, ecology impacts, they have been avoided or minimised wherever possible through design and mitigation measures. The beneficial effects of renewable energy generation on land unsuitable for other development is considered to outweigh the mostly temporary adverse impacts and risks associated with the project.

Other key project benefits include:

- The placement of the project on a highly disturbed area is considered preferable to developing a similar project in a more natural or rural setting;
- Production of renewable energy, directly contributing to the State's renewable energy targets and the objectives of the NSW Government's Renewable Energy Action Plan (REAP);
- Creation of employment opportunities, including 100 full-time equivalents during construction and up to 5 during operations;
- Direct and indirect benefits to the local economy during the life of the project; and
- Increased energy security through valuable contributions to a more diverse energy mix.

3.0 Ongoing Consultation and Stakeholder Engagement

3.1 Overview

Delta is committed to the participation of all stakeholders in the development and environmental assessment of the Vales Point Solar Project and believes all stakeholders who may be affected by project decisions have a right to be involved in the decision-making process. Delta has developed the Vales Point Solar Project Community and Stakeholder Engagement Plan (CSEP, EIS - Appendix B) to ensure broad stakeholder interaction at all stages of the project from the development and assessment process, through construction and operation, and final decommissioning and closure phases of the project.

3.2 Summary of Engagement Actions Prior to Exhibition Period

Delta has been established within the local community since the main power station was built in the 1960's and has developed strong community relationships during this time. Delta maintains a community reference group known as the *Community and Regional Environment (CARE) Forum* which meets quarterly at Vales Point Power Station. The CARE Forum membership includes representatives from the surrounding community interest groups. Delta also supports a sponsorship program that focuses on local projects and community groups. The Vales Point Solar Project Community and Stakeholder Engagement Plan (CSEP) was developed to build on existing community communication pathways and tools to ensure ongoing and meaningful consultation occurs throughout the life of the solar project.

Consultation activities undertaken during the preparation of the EIS were detailed in Section 4 of the EIS and include:

- Quarterly updates provided to the Vales Point community reference group (CARE Forum) and Delta presented the key findings of the EIS assessment to the Mannering Park Precinct Committee on 18 December 2017;
- The development of a project information page on the Delta Electricity website (www.de.com.au/sustainability/projects/solar-project). The website is regularly updated, and community members can seek further information via email (info@de.com.au) or the Delta General Enquiries and Complaints (24 hours) phone line;
- The Delta Electricity Community Newsletter (November 2017) included an announcement of the project and provided details for community members to obtain further information;
- A site visit was held with the Local Aboriginal Groups to assess the heritage requirements for the project;
- Delta undertook a letter box drop and door-knock to the nearest residents on Summerhayes Road in November 2017 regarding the project and preparation of the EIS;
- Meetings were held with both Central Coast and Lake Macquarie Councils and consultation with interested Government agencies was completed through the SEARs process; and
- Other community consultation activities include printed articles in the local (Newcastle) newspaper which was accompanied with several local radio interviews to announce the project and commencement of planning approvals process in August 2017.

All issues raised during the pre-exhibition consultation period were considered and addressed in the preparation of the environmental assessments for the development application.

3.3 Summary of Engagement Actions During Exhibition Period

Ongoing engagement activities during the exhibition period included:

- Local media attention was generated to announce the commencement of the exhibition period on ABC Newcastle radio, ABC Central Coast radio and in the local newspapers.
- A letterbox drop to near neighbours was completed to advise of the details of the exhibition period and opportunity to provide comments through the submissions process;
- Planning staff from Lake Macquarie City Council (LMCC) attended a site visit in early March to discuss the EIS; and
- A community information session was held 8 March at Mannering Park Community Hall. Approximately 70 residents attended the drop-in session with the majority of comments supportive of the project as a good reuse of low value land.

4.0 Consideration of Submissions

4.1 Details of Exhibition

The EIS document was available for public viewing electronically on the NSW Department of Planning and Environment website during 16 February to 18 March 2018. Printed copies were also available for review at:

- Central Coast Council: Gosford Office – 49 Mann Street, Gosford and Wyong Office – 2 Hely Street, Wyong;
- Lake Macquarie City Council: 126-138 Main Road, Speers Point; and
- Nature Conservation Council: 14/338 Pitt Street, Sydney.

A letter was sent to neighbours with properties adjacent to the project to advise of the details of the exhibition period and that all interested stakeholders and community members had an opportunity to provide comments through the submissions process. The NSW DPE delivered a similar notification letter to near residents and advertised the details of exhibition period in the local newspaper.

4.2 Submissions Received

A total of 14 submissions were received by NSW DPE during the exhibition period. Three individual submissions were received from the public, two responses were from community groups and nine submissions from government agencies. Details of the submissions can be viewed on the NSW Major Projects website.

For Agency and Interest Group submissions:

http://www.majorprojects.planning.nsw.gov.au/?action=list_submissions&job_id=8533&title=EIS - Website Submissions&type=6

For Public submissions:

http://www.majorprojects.planning.nsw.gov.au/?action=list_submissions&job_id=8533&title=EIS - Website Submissions&type=2

Table 1 provides a summary of the submissions received. Delta's response to the issues raised in the submissions is detailed in Section 5 and Section 6 of this report.

Table 1: Summary of Submissions Received.

	Number of Submissions			
Stakeholder Group	**Total**	**Supports**	**Objects**	**Comments**
Public Feedback	3	1	1	1
Community Groups *Mannering Park Precinct Committee* *Northern Lakes Disability Tourism Precinct Committee*	2	0	1	1
Government Agencies *Crown Lands and Water Division, Sydney, NSW* *Lake Macquarie City Council, Speers Point, NSW* *Division of Resources & Geoscience, Hunter, NSW* *Rural Fire Service, Granville, NSW* *Fire and Rescue NSW, Greenacre, NSW* *Environment Protection Authority, Newcastle West, NSW* *Office of Environment and Heritage, Newcastle, NSW* *NSW Roads and Maritime, Newcastle, NSW* *Central Coast Council, Wyong, NSW*	9	0	0	9
Totals	14	1	2	11

5.0 Proponent's Response to Community Submissions

Submission ID	Details of Issue Raised	Delta's Response
246181	**Visual pollution** Concerns raised on potential visual impacts of wind farms in the local area.	The project does not propose to install wind turbines at Vales Point. The visual impact of the proposed solar field is considered negligible due to the existing vegetation buffer zone surrounding the ash dam area.
250442	**Transmission easements** A community member has raised the issue of a lack of consultation with land owners with existing transmission infrastructure on their property and requested compensation for ongoing use of existing easements.	The Project proposes to connect to the electricity network at Vales Point Zone Substation on Ruttleys Road. A short 33kV overhead transmission line is required to connect the solar field to the substation which will utilise an existing pipeline easement to minimise the requirement for vegetation clearing. No additional easement or access to private land is required for this connection and therefore no direct consultation with affected land owners was deemed necessary. The operation, protection and maintenance of existing electricity transmission infrastructure will continue to be managed by the network operator under the Electricity Supply Amendment (Protection of Electricity Works) Act 2006.
246274	**Traffic Management (Summerhayes Road)** Concerns raised for a potential increase in traffic movements along the unsealed section of Summerhayes Road.	Delta currently completes daily security inspections of the site perimeter fence along Summerhayes Road. The Project does not propose to use Summerhayes Road for access to the ash dam area during construction or operation of the solar field and current traffic volumes are unlikely to change. The construction of perimeter roads for access to the solar field will be entirely within the footprint of the existing rehabilitated areas of the ash dam. Access to these roads will be from the existing Ruttleys Road entrance.

6.0 Proponent's Response to Government Agency and Interest Group Submissions

6.1 Crown Lands and Water Division, Sydney, NSW

Submission ID	Details of Issue Raised	Delta's Response
251243	**Recommendations** The Construction Environmental Management Plan should be prepared in consultation with DoI Water and should include: i. further detail on drainage lines and the works proposed, and ii. further detail on protection, rehabilitation and maintenance of the existing freshwater wetlands. The Construction and Operation Environmental Management Plans should address pest/weed management and dust management. It is recommended that construction of the proposed drainage line across Pond 3 and works in proximity to existing drainage lines and the freshwater wetlands is conducted in accordance with the Guidelines for Controlled Activities on Waterfront Land (2012). This should include appropriate scour and erosion measures and revegetation of disturbed areas with local native species that achieve quick vegetative cover and root mass to maximise bed and bank stability.	Delta accepts the inclusion of this condition if the project is approved. A project specific Environment Management Plan will be developed to ensure that appropriate environmental management practices are followed during the construction and operation period. Site drainage works, management of existing wetland areas, soil erosion protection measures and revegetation of disturbed areas will be a key management focus with control measures developed and implemented in consultation with NSW Office of Water.

6.2 Mannering Park Precinct Committee Inc, Mannering Park, NSW

Submission ID	Details of Issue Raised	Delta's Response
249979	**Traffic** The Precinct Committee has identified issues with existing traffic behaviour – in particular, traffic congestion and merging with southbound traffic at the Pacific Highway and Ruttleys Road intersection. Concerns have been raised that the situation will worsen with additional construction traffic.	The Transport and Traffic Assessment (EIS, Appendix F) reviewed the site access route, site access point and likely transport impacts on the capacity and condition of roads for the project. The results indicate that all affected intersection would operate with acceptable levels of service during the construction peak periods. The

		operational stage will have minimal impact on the road network and therefore no mitigation measures are proposed to facilitate traffic movement. A Traffic Management Plan will be prepared for the construction and operational periods to ensure appropriate traffic measures are in place to minimise the impacts of vehicles on traffic efficiency and road safety within the vicinity. The Traffic Management Plan will include a Driver "Code of Conduct" to oversee driving behaviour and meet acceptable community standards. The project proposes to upgrade the entrance to the ash dam from Ruttleys Road to improve road safety at this intersection. It is also noted that the proposal to upgrade the Pacific Highway site entrance to reduce traffic movements along Ruttleys Road has been opposed by Roads and Maritime Services and consequently removed from the project scope.
	Community A Community benefit program has been suggested as a means of compensation for legacy environmental impacts associated with the coal-fired power station.	Delta currently supports a community sponsorship program and will continue to maintain this program with a strong focus on assisting local projects and community groups.

6.3 Lake Macquarie City Council, Speers Point, NSW

Submission ID	Details of Issue Raised	Delta's Response
251245	**Land Use Planning** The proposal is a permissible land use within the SP2 Infrastructure – Electricity Generation Works Zone of the Lake Macquarie Local Environment Plan 2014 (LMLEP). The proposal is consistent with the Council's Community Strategic Plan 2017-2027, Council's Lifestyle 203 Strategy (Strategic Direction 2 – equitable contribution to global sustainability and the Hunter Regional Plan 2036 (Direction 12 – diversify and grow the energy sector). The proposal is supported from a land use perspective.	Submission acknowledged.

	Flora and Fauna The conclusions and recommendations within the BAR are generally supported. Further justification is required regarding the PCT 1746 (Saltmarsh) in relation to its status as an EEC or threatened /vulnerable ecological community. It is acknowledged that the ash dams are the most appropriate location to avoid impacts to adjacent areas of known high biodiversity value. However, the loss of 9.9 ha of coastal saltmarsh (regardless of the condition and whether or not it constitutes a listed threatened community), remains substantial in relation to the availability of this habitat within the local area and wider Lake Macquarie shoreline. As a suggestion it is requested that biodiversity offsets are provided to compensate for the loss of coastal saltmarsh.	A detailed description of the saltmarsh vegetation present on Pond 2 is provided in Section 4.1 of the BAR. Pond 2 is an artificial created basin used historically for deposition of ash slurry over a period of about 30 years. The pond sits around 9 metres above the high-water level of Mannering Bay. Low-lying portions of this basin fill with surface water and storm water following high rainfall events, this is quickly evaporated or drained off the site via the open constructed linear drain which feeds a rip rap channel eventually discharging into the bay. There is no two-way flow through the channel feeding back to the pond and no direct connection to the tidal waters of the bay. When in operation saltwater was used to transport the ash to the ash dam resulting in accumulation of a shallow saline or brackish groundwater system. Following decommission of the pond, the site was capped and seeded with grasses. Further saline influence has developed from the final rehabilitation design of the dam that includes a low gradient contour to encourage slow water velocities and ponding to minimise erosion and movement of sediment. Saltmarsh vegetation has exploited this saline environment growing in a mosaic pattern in low-lying areas and particularly along the linear drain, while the fringes of the pond accumulate slightly fresher water that favours the introduced Juncus acutus. Remaining areas are bare mud flats. In its natural environment saltmarsh is a component of a saltwater estuarine complex which would typically be fringed by mangroves and or seagrass beds on the seaward side and is a component of the intertidal zone. The saltmarsh in the study area was found to comprise a number of characteristic vascular plant species found in the Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community listed under the BC Act (i.e. *Sarcocornia quinqueflora, Triglochin striatum,* and *Juncus kraussii*). However according to the listing advice, this community in

		its natural form occurs "*in the intertidal zone on the edges of estuaries and lagoons"*. It is evident that the community within the study area does not occur in an intertidal zone or on the edge of an estuary or lagoon. As such, this representation of saltmarsh is not considered to be part of this EEC. Further, in accordance with the Commonwealth Conservation Advice for Subtropical and Temperate Coastal Saltmarsh (Threatened Species Scientific Committee, 2013) the physical environment for the ecological community is noted as […*coastal areas under regular or intermittent tidal influence*]. This is not consistent with the saltmarsh vegetation that has established on the artificial ash pond. The project Biodiversity Offset Strategy is discussed further in Section 6.9 *Response to OEH Submission*.
	Noise Should consent be issued, a condition is suggested that requires the preparation of a noise management plan to manage construction and operational noise.	Delta accepts the inclusion of this condition if the project is approved. A Construction and Operation Noise Management Plan will be developed to ensure the mitigation measures defined in EIS Section 5.3.7 are implemented and monitored.
	Aboriginal Archaeology The Aboriginal Heritage Impact Assessment, including consultation with the local Aboriginal stakeholder, is consistent with Lake Macquarie Development Control Plan 2014 and the LMAHMS 2011. The recommendations contained in the assessment are supported.	Submission acknowledged.
	Lake and Foreshore Impacts The assessment with regard to the likely impacts of the development on surface water, groundwater resources and flooding adequately addresses the potential impacts of the development. Delta Electricity's existing EPL 761 to monitor and manage surface and groundwater quality should mitigate the potential for offsite impacts.	Submission acknowledged.

	Visual Impact The proposal is unlikely to result in a significant visual impact.	Submission acknowledged.

6.4 Division of Resources & Geoscience, Hunter, NSW

Submission ID	Details of Issue Raised	Delta's Response
251237	**Recommendations** GSNSW has reviewed the EIS for the project and has no resource sterilisation issues or concerns to raise at this stage.	Submission acknowledged.

6.5 Northern Lakes Disability Tourism Precinct Committee Inc., Lake Munmorah, NSW

Submission ID	Details of Issue Raised	Delta's Response
250376	**Project Objection** The Committee are unwilling to approve or support the proposal until several environmental concerns are addressed by Delta, namely: i. EPL compliance – Delta has breached their EPA licencing agreement in 2016 and were subsequently fined; ii. Air quality – concerns raised regarding lack of monitoring on the Central Coast; iii. Ash dam management – including rehabilitation methodology, groundwater and surface water management; iv. Solar panel mounting structures – concerns regarding disturbance of buried fly ash; and v. Lack of information regarding project decommissioning and future land use.	Delta acknowledges the submission from the Northern Lakes Disability Tourism Precinct Committee but notes that the general comments relate to existing power station operation and not to the proposal which is the subject of the development application. Delta takes its environmental responsibilities seriously and is committed to ongoing improvements to minimise the impact from its operations. Delta manages the Vales Point Power Station site under Environmental Protection Licence (EPL) 761 which is regulated by the NSW EPA. The Solar Proposal is sited within the Vales Point Power Station premises boundary to which environmental protection licence 761 (the licence) applies and therefore, the EPA will be the appropriate regulator for environmental pollution matters and will be able to regulate these by virtue of the licence.

		Delta provides the following comments to address the concerns raised by the Committee. i. <u>EPL compliance</u> Delta manages the Vales Point Power Station site, which includes the proposed solar project footprint, under Environmental Protection Licence (EPL) 761 and will continue to work with the community and the regulator to improve environmental performance of our operations. The accusation of multiple licence breaches and consequent fines is false and misleading which can be verified by reviewing the NSW EPA Public Register for penalty infringement notices, prosecutions and civil proceedings which confirms no such breach has occurred. ii. <u>Air Quality</u> Delta meets all monitoring and reporting requirements for assessing air quality under EPL761. The project may lead to temporary ground disturbance of rehabilitated areas during trenching and the installation of electrical collection and distribution infrastructure. Levels of air borne dust would be expected to be low and unlikely to cause concern to sensitive receivers provided standard mitigation measures are implemented. Mitigation measures are detailed in EIS Section 5.5.12. During operation, air quality impacts will be managed through the maintenance of adequate ground cover under panels and standard dust suppression activities during adverse conditions. iii. <u>Ash Dam Management</u> The construction of the project has limited potential to alter dam safety as described in EIS Section 5.5.10 with mitigation measures detailed in EIS Section 5.5.12. Delta will continue to meet all monitoring and reporting requirements for assessing surface and ground water quality under EPL761. Water quality

		erosion and sediment control measures for the construction and operation of the project are detailed in EIS Section 5.5.12. iv. <u>Solar Panel Mounting Structures</u> Both steel posts and concrete ballasted footings are being considered as mounting structures for the project. Geotechnical assessment, ground settlement issues, installation efficiency and project costs are the key factors influencing the final design. Mitigation measures to minimise ground disturbance are described in EIS Section 5.5.12 and erosion impacts are expected to be negligible. v. <u>Project Decommissioning and future land use</u> The project decommissioning strategy is detailed in the EIS (Section 2.5). The long-term goal of the ash dam rehabilitation project is to establish a diversely vegetated site which would act as a vegetation corridor between the surrounding bushland areas to the east and west of the ash dam, not negating any other future developments which may be able to be developed on the site. There is potential for further solar development on the rehabilitated ash dam areas, but this is outside the scope of the current proposal. The ash dam area is typically excluded in LGA future residential and industrial planning strategies as it is currently zoned for electricity generation works. With an estimated 25-30 year design life and entirely reversible environmental impacts post decommissioning, the site would retain potential for alternative developments in the future as land use needs change. The land will ultimately be returned to the State of NSW pursuant to the Vales Point Closure and Put and Call Option Deed (Handback Deed). As such, the State will have ultimate decision responsibility in relation to long term land use.

6.6 Rural Fire Service, Granville, NSW

Submission ID	Details of Issue Raised	Delta's Response
251247	**Recommendations** The NSW RFS has reviewed the information provided and raises no objections to the proposal subject to the conditions set out in our response dated 30 June 2017 (response to SEARs).	Submission is acknowledged, and Delta accepts the inclusion of this condition if the project is approved.

6.7 Fire and Rescue NSW, Greenacre, NSW

Submission ID	Details of Issue Raised	Delta's Response
251241	**Recommendations** 1. That a comprehensive Emergency Response Plan (ERP) is developed for the site. 2. That the ERP specifically addresses foreseeable on-site and off-site fire events and other emergency incidents (eg. fires involving solar panel arrays, bushfires in the immediate vicinity or potential hazmat incidents). 3. That the ERP detail the appropriate risk control measures that would need to be implemented in order to safely mitigate potential risks to the health and safety of firefighters and other first responders (including electrical hazards). Such measures would include the level of personal protective clothing required to be worn, the minimum level of respiratory protection required, decontamination procedures, minimum evacuation zone distances and a safe method of shutting down and isolating the photovoltaic system (either in its entirety or partially, as determined by risk assessment). 4. Other risk control measures that may need to be implemented in a fire emergency due to any unique hazards specific to the site should also be included in the ERP.	Submission acknowledged, and Delta accepts the inclusion of this condition if the project is approved.

	5. That two copies of the ERP be stored in a prominent 'Emergency Information Cabinet' which is located in a position directly adjacent to the site's main entry point/s. 6. Once constructed and prior to operation, that the operator of the facility make contact with the relevant local emergency management committee (LEMC) to assist in the development of comprehensive inter agency emergency procedures for the site.	

6.8 Environment Protection Authority (EPA), Newcastle West, NSW

Submission ID	Details of Issue Raised	Delta's Response
251239	**Recommendations** The EPA has reviewed the environmental assessment for the Proposal and the SEARs requirements and has no objection to the proposal and no comment to make regarding any identified problems. The key issues of concern for the EPA were noise and vibration impact during construction and operation of the Proposal and the potential for dust generation from the emplaced ash in the short and long term. The environmental assessment identifies appropriate mitigation measures to be adopted during construction and operational phases to address these. The Proposal falls within the Vales Point Power Station premises boundary to which environmental protection licence 761 (the licence) applies and therefore, the EPA will be the appropriate regulator for environmental pollution matters and will be able to regulate these by virtue of the licence.	Submission acknowledged. The Proposal is sited within the Vales Point Power Station premises boundary to which environmental protection licence 761 (the licence) applies and therefore, the EPA will be the appropriate regulator for environmental pollution matters and will be able to regulate these by virtue of the licence.

6.9 NSW Office of Environment and Heritage (OEH)

Submission ID	Details of Issue Raised	Delta's Response
251235	**Biodiversity Assessment of Non-Native Vegetation** OEH is satisfied with the biodiversity assessment of non-native vegetation and no further assessment is required.	Submission acknowledged.
	Ecosystem Credit Species A detailed comparison of the habitat components listed in the Threatened Species Profile Database that occur in each vegetation zone should be provided for each of the predicted ecosystem credit species removed from each of the zones.	A detailed summary of the predicted ecosystem credit species removed from each vegetation zone is included in Appendix A.
	Removal of ecosystem credit species from more than one vegetation Zone If the proponent proposes to remove predicted ecosystem credit species from more than one vegetation zone, separate credit calculator assessments will be required.	A revised credit calculation has been provided in Appendix B. This reflects the addition of ecosystem credit species assessed as potential to occur in the assessment included in Appendix A.
	Potential Wallum Froglet habitat The 'land within 40m of swamps, wet or dry heaths or sedge grassland' box should be selected under the 'Geographic/habitat features' tab in the credit calculator, to ensure that the wallum froglet is assessed appropriately.	This 'box' is selected in the revised credit calculation to reflect the proximity of the habitat for Wallum Froglet adjacent to the site. Note that the targeted surveys for threatened frogs were conducted during optimal conditions (i.e. season, month of survey and following a significant rainfall event >100mm in 24 hours). The diversity of frog species recorded is reflective of these optimal conditions. The Wallum Froglet was recorded calling adjacent to the project area, in a low-lying open forest habitat with heathy understorey that was inundated following the rainfall event. This habitat is widespread to the north of the project and throughout remnant areas surrounding the power station. The influence of saline soils in the ash pond environment is not conducive to the low pH environments preferred by this species and is it not expected within the ash pond area, nor was it recorded in this area during the survey, despite being heard calling from nearby areas.

	Biodiversity Strategy OEH recommends that a biodiversity offset strategy is provided that details the proposed offset mechanisms to be used in accordance with the requirements of the FBA.	A Biodiversity Offset Strategy is provided in Appendix C.
	Aboriginal Cultural Heritage OEH is satisfied with the Aboriginal cultural heritage assessment and no further assessment is required.	Submission acknowledged.

6.10 Central Coast Council, Wyong, NSW

Submission ID	Details of Issue Raised	Delta's Response
260687	**Aboriginal Heritage** The EIS has adequately addressed Aboriginal cultural heritage. In accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010)*, the works are considered unlikely to harm Aboriginal site/objects and can therefore, proceed with caution.	Submission acknowledged.
	Ecology Surveys have met the requirements of the FBA, including seasonal targeted survey for cryptic threatened flora. Biodiversity impacts are minimal as the works are located in areas that are already highly disturbed. Areas of high biodiversity value have been avoided, including vegetation in moderate/good condition and hollow bearing trees. Mitigation measures specific to biodiversity have been provided and are considered adequate.	Submission acknowledged.
	Noise To ensure that the predicted noise impacts are being adequately addressed, a conditional requirement for a post acoustic assessment at the closest residential properties, will ensure whether it is compliant or further attenuation measures are needed.	Submission acknowledged, and Delta accepts the inclusion of this condition if the project is approved.

	Traffic The information contained in the Traffic Assessment (EIS-Appendix F) does not adequately address the issue of safety of vehicles travelling on Ruttleys Road and potential conflicts with predominantly construction traffic entering and exiting the subject site. Additionally, the suggested traffic volumes for Ruttleys Road (6000 vehicles/day) are approx. 30% below Council's indicative traffic volumes. The road safety assessment appears to be an assessment of RMS crash data and not an assessment of crash risk which would be anticipated for a formal road safety assessment. Additionally, RMS has been in contact with Council concerning the safety performance of the existing access off the Pacific Highway into the development site. We trust the RMS will raise this issue as part of their submission. A formal road safety assessment should be undertaken to ensure the safety of all vehicles travelling along Ruttleys Road.	A formal road safety assessment has been completed for the proposed upgrade to the Ruttleys Road site entrance and is included in Appendix D. The recommendations from the safety assessment will be incorporated in the upgrade works application under Section 138 of the Roads Act (1993) to be developed in consultation with the Central Coast Council. The 6000 vehicles per day figure for Rutleys Road was an estimate based on peak hour traffic being 10% of the daily traffic volumes. The figure was intended to give context for the road traffic volume but was not used for any of the analysis or modelling completed in the EIS traffic assessment. The recommendations and mitigation measures from the traffic study remain unchanged. It is also noted that the proposal to upgrade the Pacific Highway site entrance has been opposed by Roads and Maritime Services and consequently removed from the project scope.
	Section 94A Contributions Section 94A contributions are applicable.	Section 94 of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) allows Council to charge developer contributions for public infrastructure necessary as a consequence of new development. It is Delta's position that s94A contributions are not applicable as the project is located within the existing Vales Point Power Station footprint and no additional public infrastructure is required as a consequence of the development.
	Water Connection A Section 305 application under the *Water Management Act 2000* is to be lodged with Central Coast Council, if any internal plumbing works are proposed or connection is required to the Central Coast water supply for water usage associated with the ongoing operation of the development in the event that the	Submission acknowledged, and Delta accepts the inclusion of this condition if the project is approved.

	nominated water supply sources are unable to cater for the ongoing maintenance of the development.	

6.11 NSW Roads and Maritime, Newcastle, NSW

Submission ID	Details of Issue Raised	Delta's Response
260685	**Recommendations** RMS has no proposal that requires any part of the property. RMS recommends that DPE consider requiring the rationalisation of access to the site by requiring all access be via the proposed upgraded intersection at Ruttleys Road. The Ruttleys Road intersection upgrade will be required to be approved by Central Coast Council as part of a s.138 application and any work to be undertaken outside the boundary of the property to be completed at full cost to the developer and no cost to RMS or Council. DPE has responsibility to consider the environmental impacts of any road works that are ancillary to the development. DPE should ensure that appropriate traffic measures are in place during the construction phase of the project to minimise the impacts of construction vehicles on traffic efficiency and road safety in the vicinity. All matters relating to internal arrangements on-site such as traffic/pedestrian management, parking, manoeuvring of service vehicles and provision for people with disabilities are matters for DPE to consider.	Submission acknowledged, and Delta accepts the inclusion of this condition if the project is approved. Delta withdraws the proposal to upgrade the Pacific Highway site entrance from the development application.

7.0 Proposed Modifications to the Project

No major modifications have been made to the project presented in the EIS. Additional information regarding the EIS Biodiversity Assessment Report (BAR) has been provided as requested by the submission from NSW OEH that does not result in any material change to the project development application. Some minor amendments have been made to the assessment of traffic impacts in response to submissions from the Central Coast Council and NSW Roads and Maritime Services.

The NSW Roads and Maritime Services submission has recommended that DPE consider requiring the rationalisation of access to the site by requiring all access be via the proposed upgraded intersection at Ruttleys Road. Consequently, the proponent withdraws the proposal to upgrade the Pacific Highway site entrance from the scope of work in the development application.

A road safety audit was completed for the proposed upgrade of the Ruttleys Road entrance to the ash dam in response to the Central Coast Council submission and is included in Appendix D. The audit identified some road safety deficiencies in the preliminary design that the Proponent has provided preliminary comments in Table 7.1.

Table 7.1: Recommendations from the Road Safety Audit (Ruttleys Road Entrance).

Issue	Identified Safety Deficiency	Risk Score	Proponents Comments
1.	Laden trucks leaving the ash dam to the west appear not to have enough acceleration length. This may have to the potential for rear-end or side swipe type crashes with approaching vehicles.	High	Existing traffic management protocol requires all trucks exiting the ash dam to turn right (heading east on Ruttleys Rd). The small volume of predominately light vehicles leaving ash dam to the west on Ruttleys Rd can enter the intersection with good visibility and accelerate safely to traffic speed. The Ruttleys Road accident review identifies none of the reported crashes were directly related to the ash dam egress intersection. No further intersection treatment is proposed for vehicles turning west on Ruttleys Road.
2.	Laden trucks leaving the ash dam to the east do not to have an acceleration lane. This may lead to rear-end type crashes	High	The intersection treatment required for trucks turning right from the ash dam and heading east on Ruttleys Rd will be addressed during the detailed design process. It is noted that the majority of trucks leaving the ash dam site are unladen.
3.	The proposed cycle lane directs cyclists into the site rather than to continue through the intersection and there is no defined transition for cyclist when they arrive at the access road. There is the potential for cyclists, believing that they are on a dedicated facility, to be struck by trucks entering the site.	Medium	Detailed design to include the bicycle lane to direct cycle traffic through the intersection.
4.	Due to the proposed high volume of heavy vehicle movements into and out of the site, advance warning signs “Trucks Entering’ should be placed on both approaches to the site access.	Comment	A review of existing advanced warning signage for turning vehicles to be completed for both approaches during the design process.

The configuration of the proposed modification for the Ruttleys Road ash dam entrance will be addressed in the design process in consultation with the Central Coast Council under a s138 application. This commitment is to be included as an additional mitigation measure for traffic in Table 6.1 of the EIS.

Issue	Mitigation Measures
Transport	The project includes proposed upgrade~~s~~ ~~to both~~ to the existing Ruttleys Road entrance intersection~~s~~ to improve vehicle access safety. Alternative measures are available and would be implemented should the intersection upgrades not be agreed in time for the construction of the project. The works and mitigation measures proposed include: • A construction traffic and access management plan should be developed and implemented for the project and include a driver code of conduct; and • ~~Upgrade access to the site from the Pacific Highway in consultation with Roads and Maritime Services to include a short left turn lane prior to use of this access associated with the project; and~~ • Upgrade site access from Ruttleys Road under s138 application in consultation with Central Coast Council to improve access and egress efficiency in a manner that does not reduce road safety. Intersection design to consider recommendations from the completed Intersection Road Safety Audit.

8.0 Project Evaluation

This report has been prepared by Delta to provide a response to issues raised in submissions made by the community, interest groups and government agencies during the public exhibition of the Environmental Impact Statement for the Vales Point Solar Project, and in doing so, satisfy the requirements of Section 115Z(6) of the *Environmental Planning and Assessment Act 1979.*

Only minor amendments have been made to the original project presented in the EIS in response to the submissions received that have no material impact on the proposal. While there would be some environmental impacts as a consequence of the project such as temporary traffic inconvenience, noise and ecology impacts, they have been avoided or minimized wherever possible through design and mitigation measures. The beneficial effects of renewable generation on land unsuitable for other development is considered to outweigh the mostly temporary adverse impacts and risks associated with the project.

9.0 References

Commonwealth Conservation Advice for Subtropical and Temperate Coastal Saltmarsh (Threatened Species) Scientific Committee, 2013 available at:
http://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf

Electricity Supply Amendment (Protection of Electricity Works) Act (2006) available at:
https://www.legislation.nsw.gov.au/acts/2006-28.pdf

Environmental Planning and Assessment Act (1979) available at:
https://www.legislation.nsw.gov.au/#/view/act/1979/203

NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014) available at:
http://www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf

NSW Department of Planning and Environment (2017) *State Significant Development Assessment - Vales Point Solar Project (SSD 8533)* available at:
http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8533

NSW Department of Trade and Investment (2015) *NSW Renewable Energy Action Plan* available at*:*
http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0010/475318/nsw-renewableenergy-action-plan.pdf

NSW Framework for Biodiversity Assessment (OEH, 2014) available at:
http://www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf

NSW Roads Act (1993) available at:
https://www.legislation.nsw.gov.au/#/view/act/1993/33

Vales Point Power Station Environmental Protection Licence (EPL) 761 available at:
https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=124427&SYSUID=1&LICID=761

10.0 Appendices

Appendix A: Summary of Predicted Ecosystem Credit Species Removed from each Vegetation Zone

Section 5.3.2 of the BAR has addressed each of the ecosystem credit species predicted by the BioBanking credit calculator as potentially occurring in the study area. An assessment of whether each species is likely to occur on site has been undertaken to address Section 6.3 of the FBA and shown in Table 5.5 of the BAR. Section 6.3 of the FBA allows an assessor to remove predicted ecosystem credit species if the assessor has compared the habitat components of the species listed in the Threatened Species Profile Database (TSPD) and determines that none of those habitat components occur in the vegetation zone.

The BAR describes the presence of modified saline and freshwater wetland habitats that have developed in low-lying portions of the relict ash dams. A detailed habitat assessment was also provided to assess the condition of the regrowth open forest habitat present along part of the disused conveyor easement and subject to disturbance for installation of the 33 kV connector to the sub-station.

The assessment of ecosystem species presence in each vegetation zone has been re-applied in the tables below. The assessment provides further detail on the habitat requirements of the species and comparison with the site conditions. While it is acknowledged that the documented vegetation types in the BAR may be associated with these species in the credit calculator, the assessment has taken due consideration for the disturbed and modified condition of these habitats on site in determining whether they would be considered adequate as habitat for the subject species and therefore warranting an ecosystem species offset.

Section 6.3.1.2 of the FBA	Assessment
(a) the distribution of the species includes the IBRA sub region in which the development site is, in the opinion of the assessor, mostly located, and	The development site is wholly located in the Wyong sub-region of the Sydney Basin Bioregion. This sub-region is within the distribution of all the predicted species, hence why they have been included by the calculator. However, it is evident that the reported distribution of a number of species identified is not typical of this coastal sub-region and indeed associated records are very rare, this has been considered when assessing the predicted species. This includes - • Painted Snipe- NSW distribution mostly from the Murray-Darling Basin, Hawkesbury River and Clarence Valley and Lower Hunter • Black-chinned Honeyeater – Rarely recorded east of the Great Dividing Range except from the far north coast, and rarely recorded in the Central Coast • Painted Honeyeater – the greatest concentration of the species and almost all breeding occurs on the inland slopes of the Great Dividing Range
(b) the species is associated with any of the PCTs identified by the assessor under Chapter 5 as occurring within the development site, and	The TSPD associates each species assessed with the PCTs identified within the development site
(c) except if the Major Project is, or is part of, a linear shaped or multiple fragmentation development, the percent native vegetation cover class within the outer assessment circle as determined by the assessor in accordance with Appendices 4–6 (as relevant) is equal to or greater than the minimum class that is required for the species, and	The percent native cover in the outer assessment circle was identified in the BAR as 66.23%. The percent native vegetation cover range for all species identified in the TSPD is less than then this indicating there is adequate habitat availability.

(d) the condition of vegetation within any vegetation zone (as identified by the assessor under Chapter 5) within the development site is equal to or greater than the minimum condition required for that species, and	Refer assessment in table below
(e) the patch size which the vegetation zone is part of is equal to or greater than the minimum specified for that species, and	The area of each vegetation zone is tabled below. The forest habitats (Zone 1 and 2) are both <1 ha, with the exception of Zone 3 (6.65 ha) which scores <17 and therefore an offset is not required. Of the forest / woodland dwelling species assessed 2 require a patch size that is greater than was is available. • Black-chinned Honeyeater • Long-nosed Potoroo
(f) the species is identified as an ecosystem credit species in the Threatened Species Profile Database	Refer assessment in Table below

The list of threatened species predicted by the BioBanking credit calculator is presented below along with a description of the habitat components associated with these species. Information is provided on whether the habitat components for a predicted species are present within the vegetation zones identified in the Biodiversity Assessment Report. Six vegetation zones were identified in the BAR, as tabled below. Note Zone 3 showed a site value score of <17 and so an assessment of threatened species is not required.

Vegetation zone No.	Plant Community Type name	PCT code	Vegetation zone (condition)	Area to be impacted	Site value score
1	Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast	1636	Moderate/Good	0.002 ha	82.29
2	Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast	1636	Moderate/Good_Poor	0.17 ha	62.50
3	*Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast*	*1636*	*Low*	*6.52 ha*	*13.02*
4	Saltmarsh Estuarine Complex	1746	Moderate/Good	8.36 ha	61.11
5	Saltmarsh Estuarine Complex	1746	Moderate/Good_Poor	1.54 ha	37.04
6	Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion	1071	Moderate/Good_Poor	2.60 ha	53.49

In assessing the likelihood of occurrence, OEH has suggested that a number of forest fauna species should be assessed as likely to be present when assessing offsets for this project. While it is evident that the PCT described in Zone 1 and 2 and the plant species composition of the regrowth along the conveyor easement is consistent with the reported potential habitat of the species listed, the assessment of their presence in the BAR was being pragmatic in approach. Based on the poor condition of this habitat and the small scale of actual impacts (i.e. <1 ha). This was also viewed in the context of the impact assessment which describes very minimal actual disturbance along the connector, which would be limited to the placement of telegraph poles only, and trimming of regrowth below the power line. It was further acknowledged that there is scope to minimise the actual disturbance and no mature vegetation, or hollow-bearing trees would be removed. It is evident from the field habitat assessment conducted within these two zones as presented in Section 5.3.1 of the BAR that some species identified by OEH could be reasonably considered unlikely to occur particularly Squirrel Glider, Brown Treecreeper and Spotted-tailed Quoll and that the small loss of habitat would have a negligible impact for the remaining species.

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
Australian Painted Snipe (Rostratula australis)	No minimum vegetation condition specified in the TSPD. Species distribution in NSW mostly from the Murray-Darling Basin, Hawkesbury River and Clarence Valley and Lower Hunter and no coastal Wyong Patch size <5 ha Prefers swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mud flats in shallow water	Does not match habitat description	Saltmarsh habitat in Pond 3 is only periodically and briefly wet following rainfall events, there is a lack of groundcover vegetation in the mudflats and ash dam. Mud flats and periodic shallow water occurs occasionally on Pond 3 after heavy rains. On this basis considered low condition for this species.	The ephemeral wet habitats on Pond 2 and in low condition. Mud flats and period shallow water occur occasionally on Pond 3 after heavy rains	No
Barking Owl (Ninox connivens)	Hollow-bearing trees Patch size 25 -100 ha required for breeding, no size constraint for foraging Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile riparian soils	Small patch size, does not meet minimum for breeding habitat. Very small patches of previously cleared regrowth occur adjacent to relict conveyor with no hollow-bearing trees, no mature trees, poor structure and species diversity. Refer habitat assessment on Section 5.3.1.	Doesn't match description. Forested areas adjacent to the open ash ponds may present potential habitat, however outside the site. Not breeding habitat and prey diversity and abundance would be extremely low.	Doesn't match description. Disturbed Acacia regrowth and low ephemeral soaks. Not breeding habitat and prey diversity and abundance would be extremely low.	Yes, marginal foraging habitat only as part of much larger range
Black-chinned Honeyeater (*Melithreptus*	No habitat constraint specified	Doesn't match description, patch size <1 ha	Doesn't match description, not forest or woodland	Doesn't match description, not forest or woodland	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
gularis subsp. *gularis)*	Patch size 5 – 24 ha, with percent native vegetation cover (between 11 and 30% habitat retained) Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees				
Black-tailed Godwit (*Limosa limosa)*	Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified This is a species and ecosystem species. In coastal areas, found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.	Doesn't match habitat description	Species credit and ecosystem credit species (the habitats were surveyed and the species was not located). Habitat not tidal, does not match description	Species credit and ecosystem credit species (the habitats were surveyed and the species was not located). Habitat not tidal, does not match description	No
Blue-billed Duck (*Oxyura australis)*	Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover.	Doesn't match habitat description	Doesn't match habitat description, mudflats and saltmarsh	Doesn't match habitat description	No
Brown Treecreeper (*Climacteris picumnus* subsp. *victoriae)*	Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. Only if within 100 m of moderate to good condition vegetation of suitable type. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey,	Doesn't match habitat description. Open forest habitat is shrubby, or absent ground cover of gravel and bare ground. Habitat assessment including quantifying logs and fallen timber,	Doesn't match habitat description, mudflats and saltmarsh	Doesn't match habitat description	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
	sometimes with one or more shrub species; also found in mallee and River Red Gum (Eucalyptus camaldulensis) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains	found to be absent (refer Section 5.3.1 of BAR and Figure 5.3)			
Bush Stone-curlew (*Burhinus grallarius)*	Patch size <5 ha, fragmented (between 11 and 30% habitat retained), Fallen/standing dead timber including logs. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber	Open forest habitat is shrubby, or absent ground cover of gravel and bare ground. Habitat assessment including quantifying logs and fallen timber, found to be absent (refer Section 5.3.1 of BAR and Figure 5.3)	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	No
Eastern False Pipistrelle (*Falsistrellus tasmaniensis)*	Patch-size 5-24 ha, cover variegated (between 31-70% habitat retained), no habitat constraint specified Prefers moist habitats, with trees taller than 20 m Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Does not match habitat description, one hollow on edge of this zone that will not be removed	Does not match habitat description, mudflats and saltmarsh, however hunting over the mudlflats may occur, as well as the solar panel arrangements	Does not match habitat description	No
Eastern Freetail-bat (*Mormopterus norfolkensis)*	Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range Roost mainly in tree hollows but will also roost under bark or in man-made structures	Dry sclerophyll forest, one hollow on edge of this zone that will not be removed, so roosting and foraging opportunities will remain	Does not match habitat description, mudflats and saltmarsh, however hunting over the mudlflats may occur, as well as the solar panel arrangements	Does not match habitat description	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
Freckled Duck (*Stictonetta naevosa)*	Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds	Does not match habitat description	Does not match habitat description, no permanent freshwater present	Does not match habitat description, no permanent freshwater present	No
Gang-gang Cockatoo (*Callocephalon fimbriatum)*	Species and ecosystem Patch size <5 ha, fragmented (between 11 and 30% habitat retained), Breeding habitat constraint - Eucalypt tree species with hollows greater than 9cm. In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas Favours old growth forest and woodland attributes for nesting and roosting.	Not suitable as nesting habitat confirmed no large tree hollows present. Dense eucalypt forest with shrubby understorey in surrounding areas. Does not match habitat description	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	No
Glossy Black-cockatoo (*Calyptorhynchus lathami)*	Patch size <5ha, relictual (with 10% or less habitat retained). Breeding habitat constraint., hollow bearing trees required with hollows greater than 15cm and 5 m above ground. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (Allocasuarina littoralis) and Forest Sheoak (A. torulosa) are important foods. Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill	Not suitable as nesting habitat, confirmed no large tree hollows present. The small patches in this zone may form part of larger foraging area. The Allocasuarina littoralis is common in the surrounding forest and only small regrowth individuals within the	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	Yes, very marginal foraging only

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
		easement. Impacts can be avoided.			
Great Knot (*Calidris tenuirostris)*	Species and Ecosystem Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons.	Does not match habitat description	Does not match habitat description, habitat not intertidal	Does not match habitat description, habitat not intertidal	No
Greater Broad-nosed Bat (*Scoteanax rueppellii)*	Patch-size 5-24 ha, variegated (between 31 and 70% habitat retained), no habitat constraint specified. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings	The patch size for zone 1 and 2 are both <1 ha, so does not meet minimum patch size, no hollows within area to be disturbed	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not forest habitat	No
Grey-crowned Babbler (*Pomatostomus temporalis* subsp. *temporalis)*	Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions	Does not match habitat description	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not woodland	No
Little Eagle (*Hieraaetus morphnoides)*	Species and ecosystem. Patch size <5 ha, fragmented (between 11 and 30% habitat retained) Nest trees are live. Occasionally dead large old trees within vegetation Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.	Not suitable as nesting habitat, confirmed no large tree hollows present Survey conducted for this species credit species and was not located.	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not forest or woodland	Yes, marginal foraging only

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
		The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.			
Little Lorikeet (*Glossopsitta pusilla)*	Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not forest or woodland	Yes, marginal foraging habitat
Long-nosed Potoroo (*Potorous tridactylus)*	Patch-size 5-24 ha, cover variegated (between 31-70% habitat retained) Dense shrub layer or alternatively high canopy cover exceeding 70% (i.e. to capture populations inhabiting wet sclerophyll and rainforest) Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature	Refer description of habitat in Section 5.3.1 of report. Does not match habitat description and minimum patch size	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not forest or woodland	No
Magpie Goose (*Anseranas semipalmata)*	Ecosystem, patch size <5ha, fragmented (between 11 and 30 % habitat retained). The species nests in large rush/sedge swamps but forage broadly in wet grassland habitat often a significant distance from nesting locations. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges	Does not match habitat description	Does not match habitat description, no permanent freshwater present	Does not match habitat description, no permanent freshwater present	No
Masked Owl (*Tyto novaehollandiae)*	Species / ecosystem, <5ha fragmented (between 11 and 30 % habitat retained) Habitat constraint – hollow-bearing trees	Not suitable as nesting habitat, confirmed no large tree hollows present	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not forest or woodland	Yes, marginal hunting habitat only

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
	Patch size selected is based on that fact that the species will use areas that are quite small, especially as foraging habitat but also as roosting habitat and occasionally as breeding habitat. In Tas and Vic Masked owls have been recording nesting in paddock trees. Note that the species has been found to nest in caves in Tasmania (and maybe the Nullabor?) but there is no evidence to suggest that this occurs in NSW. Dead stags are especially popular for roosting/breeding habitat and are a limited resource due to natural attrition. Lives in dry eucalypt forests and woodlands from sea level to 1100 m	The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.			
Painted Honeyeater (*Grantiella picta)*	Ecosystem, <5ha fragmented (between 11 and 30 % habitat retained) If mistletoes are present at a density of greater than five mistletoes per hectare Order Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests	Does not match habitat description	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not woodland	No
Powerful Owl (*Ninox strenua)*	Species / ecosystem, <5ha fragmented (between 11 and 30 % habitat retained) Habitat constraint – hollow-bearing trees. Living or dead trees with hollow greater than 20cm diameter The species can breed and forage in very small patches of vegetation, although this is hugely variable across their range. Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest	Not suitable as nesting habitat, confirmed no large tree hollows present The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description, not woodland or forest	Yes, marginal hunting habitat only
Sanderling (*Calidris alba)*	Species / Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. Often found in coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and bare open coastal lagoons; individuals are rarely recorded in near-coastal wetlands	Does not match habitat description	Does not match habitat description, wetland is not tidal or a bare open coastal lagoon. Targeted bird surveys were conducted for breeding and foraging individuals	Does not match habitat description, weeds and small patches of sedges in ephemeral soaks	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
			and did not detect the species		
Scarlet Robin (*Petroica boodang)*	Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps Usually contains abundant logs and fallen timber: these are important components of its habitat.	Understorey is densely shrubby and lacks fallen timber and logs within the area to be disturbed Habitat assessment including quantifying logs and fallen timber, found to be absent (refer Section 5.3.1 of BAR and Figure 5.3)	Does not match habitat description, mud flats and saltmarsh	Does not match habitat description of a 'wetland'. The wetland areas of zone 6 are predominantly dry and the overall ash pond is dominated by weeds and acacia regrowth. Few small patches of sedges have established in wet depressions. Does not constitute a permanent wetland as intended with the description in the TSPD	No
Speckled Warbler (*Chthonicola sagittata)*	Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies Habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy	Does not match habitat description, understorey is densely shrubby	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	No
Spotted Harrier (*Circus assimilis)*	Ecosystem, <5ha fragmented (between 11 and 30 % habitat retained) No habitat constraint specified Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands	Does not match habitat description. Understorey is densely shrubby with areas of bare disturbed ground and gravel.	Does not match habitat description, mudflats and saltmarsh areas	Does not match habitat description, weeds and acacia regrowth, small reed and sedges patches in ephemeral soaks, not native grassland or agricultural land.	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
Spotted-tailed Quoll (*Dasyurus maculatus)*	Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. The species has been shown to use small patches and highly fragmented landscapes. Species regularly uses hollows for denning and is dependent on hollow-dependent prey in many parts of NSW. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites.	Dry sclerophyll habitat, however as demonstrated by the habitat assessment in Section5.3.1, this zone does not contain important habitat features for this species life-cycle (hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites). Therefore does not meet minimum vegetation condition	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description small reed and sedge patches in ephemeral soaks	No
Square-tailed Kite (*Lophoictinia isura)*	Species/Ecosystem, <5ha fragmented (between 11 and 30 % habitat retained). No habitat constraint specified Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses	Not breeding habitat, survey for nest trees conducted, and not present The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	Yes, marginal foraging habitat
Squirrel Glider (*Petaurus norfolcensis)*	Species, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. Relies on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely-connected (i.e. no more than 50 m apart).	Refer habitat assessment in Section 5.3.1. this species is expected to occur in same forest type in surrounding forest, but not within area of zone 1.	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
	mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas	Bloodwood forest with heath understorey in coastal areas is present surrounding the conveyor easement, however as demonstrated by the habitat assessment in Section5.3.1, this zone does not contain important habitat features for this species life-cycle (hollow-bearing trees, and flowering shrubs or small trees). Therefore does not meet minimum vegetation condition.			
Swift Parrot (*Lathamus discolor)*	Species, Ecosystem, Patch size <5ha, relictual (with 10% or less habitat retained), no habitat constraint specified. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens.	No important winter flowering eucalypts within this habtitat	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	No
Turquoise Parrot (*Neophema pulchella)*	Ecosystem, <5ha fragmented (between 11 and 30 % habitat retained). No habitat constraint specified Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland Nests in tree hollows, logs or posts	Does not match habitat description. Understorey is densely shrubby with areas of bare disturbed ground	Does not match habitat description, mudflats and saltmarsh. This species associated with woodlands adjoin	Does not match habitat description, regrowth and small patches of ephemeral sedge habitat. This species	No

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
		and gravel. No hollow-bearing trees present.	grassland and agricultural areas	associated with woodlands adjoin grassland and agricultural areas	
Varied Sittella (*Daphoenositta chrysoptera)*	Ecosystem, <5ha fragmented (between 11 and 30 % habitat retained). No habitat constraint specified Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	Yes, marginal foraging
White-fronted Chat (*Epthianura albifrons)*	Ecosystem, <5ha fragmented (with less than 10% or less habitat retained). No habitat constraint specified Usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.	Does not match habitat description	Saltmarsh occurs on Pond 3 after heavy rains. On this basis considered low condition foraging habitat.	Wetland areas in pond 2 fill after heavy rains and may be considered low condition foraging habitat	Yes, marginal
Yellow-bellied Glider (*Petaurus australis)*	Ecosystem, patch size 25-100 ha variegated (between 31 and 70% retained) Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	Does not match habitat description	Does not match habitat description, mudflats and saltmarsh	Does not match habitat description	No
Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris)*	Ecosystem, <5ha fragmented (between 11 and 30 % habitat retained). No habitat constraint specified Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory	The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	The small patches in this zone may form part of larger foraging area, impacts to habitat can be avoided.	Yes, foraging only

Species	Specified minimum vegetation condition (including cover, patch size and habitat constraint and habitat components)	Zone 1-2	Zone 4-5	Zone 6	Habitat on site / potential presence
	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.				

Appendix B: Revised Credit Calculation

A revised credit calculation has been provided. This reflects the addition of ecosystem credit species assessed as potential to occur in the above assessment.

In determining the ecosystem credits required consideration was given to the Threatened Species (TS) Multipliers assigned by the calculator to each vegetation zone and whether these accurately reflected the loss of habitat for that species. Given that it has been clearly demonstrated that none of the vegetation zones that require offset actually contain hollow-bearing trees, the impact to many of these ecosystem species would be associated with a loss of marginal foraging habitat only, for example Barking Owl, Glossy Black-Cockatoo and hollow-dependent bats. As such the TS score was reduced by around 30 % for these species, to reflect the loss of foraging habitat only. The calculator has assigned the Little Eagle to the Saltmarsh vegetation zones as the species with the highest TS multiplier. The threatened species profile database description of habitat for this species does not identify saltmarsh as potential or preferred habitat, nor are there large or dead trees present in this habitat that may provide potential nesting opportunities. As such the TS multiplier score was reduced from 1.4 to 1.0 for this species to reflect the actual anticipated impact and offset requirements for this species.

The revised number of credits from the BioBanking credit calculator are shown below.

PC type code	Plant Community Type	Mgt zone area (ha)	TS with highest credit req	TS offset multiplier	Ecosystem credits required
HU673	Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion	2.60	Barking Owl	1.5	69
HU850	Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast	0.17	Little Lorikeet	1.8	1
HU960	Saltmarsh Estuarine Complex	9.90	Little Eagle	1.0	173

Appendix C: Biodiversity Offset Strategy

Background

As a State Significant Development (SSD), the potential biodiversity impacts from the Vales Point Solar Project (the Project) were assessed under the NSW Framework for Biodiversity Assessment (FBA, OEH, 2014) as detailed in the Biodiversity Assessment Report (BAR, EIS- Appendix C; Jacobs, 2017). The preliminary Biodiversity Offset Strategy (BOS) has been prepared in accordance with the FBA and the NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014).

It is noted that the project footprint is a highly disturbed and modified landscape that does not resemble surrounding PCTs due to the previous land use as an ash depository. There are no remnant native vegetation stands impacted by the project. The site has been rehabilitated with native species to minimise potential environmental impacts including topsoil runoff from storm water flows and dust generation from loose topsoil and several salt tolerant native groundcover species have established in some areas. The FBA and BioBanking Calculator have proven inflexible by not differentiating between a naturally occurring vegetation community and a regenerated man-made landscape which was problematic for assessing the biodiversity value of this highly modified area.

The project footprint is within the approved operational area of an existing coal-fired power station and an impractical offset requirement will likely create unnecessary environmental and economic burden on a project that represents an opportunity to repurpose low value land.

Preliminary Biodiversity Offset Strategy (BOS Part 1)

The provision of a preliminary BOS (Part 1) for the Project is precautionary as it considers clearing of all PCTs listed in the calculator credit profile as shown in Table C1.

Table C1: BioBanking credit calculator summary.

PC type code	Plant Community Type	Mgt zone area (ha)	Ecosystem credits required
HU673	Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion	2.60	69
HU850	Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast	0.17	1
HU960	Saltmarsh Estuarine Complex	9.90	173

Section 9.4 of the FBA identifies only impacts to EECs and threatened species habitat require offsets, where:

9.4.1.1 The assessor is not required to determine an offset for the impacts of development on PCTs that are:

a. in a vegetation zone with a site value score of <17, and the PCT has not been identified as a CEEC or EEC

b. not associated with threatened species habitat according to Section 6.4, and are not identified as a CEEC or EEC.

The BAR did not classify the PCTs within the project footprint as a CEEC or EEC. The Project will not result in removal of habitat that is considered to be important for any threatened species and populations and it is considered unlikely that threatened species or populations would be impacted as a result of the project.

Survey results reported in the BAR indicate that the development site native vegetation, that may be removed, do not provide habitat important to any threatened or migratory species protected under the EPBC Act and TSC Act. Therefore, offsetting for threatened or migratory species is not required.

The remainder of the development site supports poor condition vegetation zones, non-native vegetation and highly disturbed land. No further consideration of these areas is required.

The Project development site avoids areas considered to be of high habitat value within the local landscape. This avoidance of habitat, in combination with appropriate environmental safeguards during construction of the project is expected to ensure that the development meets the requirements to avoid and minimise impacts on biodiversity values as set out in Chapter 8 of the FBA.

Offsetting the loss of native vegetation is not considered necessary due to the likely minor loss of vegetation and negligible impacts to threatened fauna.

Preliminary Biodiversity Offset Strategy (BOS Part 2)

The impacts presented in the BAR have been calculated as a worst-case scenario and further opportunities to avoid and minimise impacts to biodiversity are likely to result during the detailed design phase for the project. This process will employ the governing principle of impact avoidance by using prevention and mitigation measures which will potentially reduce the quantum of impacts and residual biodiversity offset requirements. At this point any subsequent amendments will be presented in a revised BOS (Part 2) to be developed in consultation with the consent authority. The Proponent commits to ongoing consultation with the consent authority and OEH to achieve an improved biodiversity outcome in response to the impacts of the project.

Appendix D: Traffic Safety Assessment

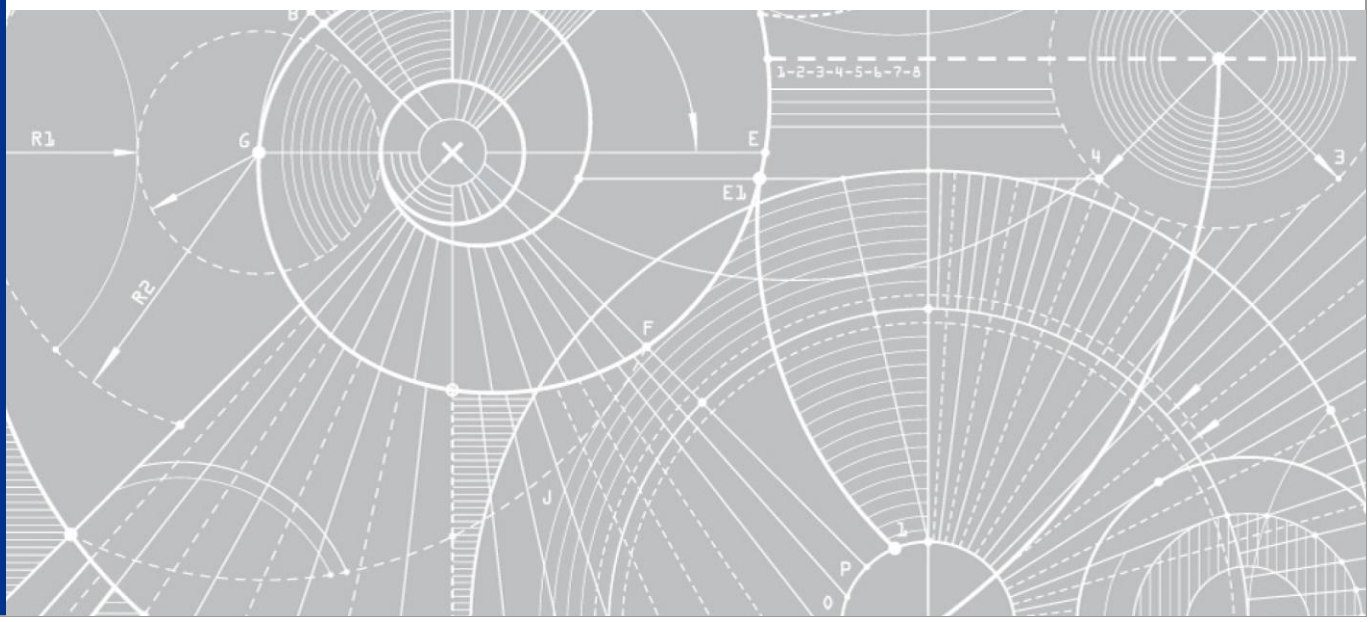
Vales Point Power Station, Ruttley's Road Vales Point

JACOBS

Vehicle Access, Stage 2 (concept design) Road Safety Audit

Revision 03

21 May 2018



JACOBS

Vales point Power Station, Ruttley's Road, Vales Point

Project no:	IA155900
Document title:	Vales Point Power Station, Ruttleys Road, Vales Point - Vehicle Access Stage 2 (concept design) Road Safety Audit
Document no:	
Revision:	03
Date:	26 April 2018
Client name:	Jacobs
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Project manager:	Thomas Muddle
Lead Auditor:	David Lowe
File name:	

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Document history and status

Revision	Date	Description	By	Review	Approved
01	20/04/2018	Vehicle Access Road Safety Audit	A. Hyland	D. Lowe	D. Lowe
02	2/05/2018	Updated design plan	A. Hyland	D. Lowe	D. Lowe
03	21/05/2018	Executive Summary	A. Hyland	D. Lowe	D. Lowe

Contents

Executive Summary

This report details a Stage 2 (concept design) road safety audit of the proposed intersection reconfiguration of Ruttleys Road and the entrance to Vales Point Power Station and the access to the ash dam, Vales Point. We understand that the existing north entrance to the power station is infrequently used but, remains an active gate. The entrance to the ash dam to the south is going to have increased heavy vehicle movements due to construction activity.

The road safety audit was based on the standard practice of identifying safety related issues by undertaking a site visit. The audit was undertaken on Thursday 19th April 2018. The audit was based on supplied aerial photography figures overlaid with the proposed line marking.

The principal concern of the audit team relates to the increased activity of laden trucks entering and exiting the ash dam and the following issues associated with the increased activity:

- No dedicated facilities are proposed which would afford trucks the opportunity to accelerate to the desired speed of the road before merging with the through lanes of Ruttleys Road.
- A dedicated cycle lane is proposed which directs cyclist into the site but then terminates in an unsafe manner with the potential for crashes between cyclist and trucks entering.
- Due to the proposed high volume of heavy vehicle movements into and out of the site, advance warning signs "Trucks Entering' should be placed on both approaches to the site access.

1. Introduction

Jacobs has been commissioned by Delta Energy provide a Road Safety Audit of the proposed reconfiguration of Ruttleys Road and the entrance to Vales Point Power Station and the access to the ash dam, Vales Point.

A road safety audit is *"a formal examination of a traffic project or an existing road in which an independent, qualified examiner reports on the project's accident potential and safety performance,"* (Austroads, 2009).

This road safety audit focused on providing an independent identification of potential safety hazards, regardless of current practices, standards and operations, to allow the asset manager / road owner to identify remedial measures. It is ultimately the responsibility of the asset manager / road owner to determine how to respond to each identified safety deficiency.

1.1 Project and site description

The proposed changes to the intersection are the addition of a deceleration lane on the approach to the site access on the southern side of the road and the associated relocation of an existing cycle lane. All other pavement marking at the intersection is to remain the same including the protected westbound right turn bay for vehicles accessing the site opposite.

The intersection is located along Ruttleys Road at the entrance to Vales Point Power Station, approximately 1.8 kilometres west of the Pacific Highway (A43) Doyalson North **Figure 1-1**.

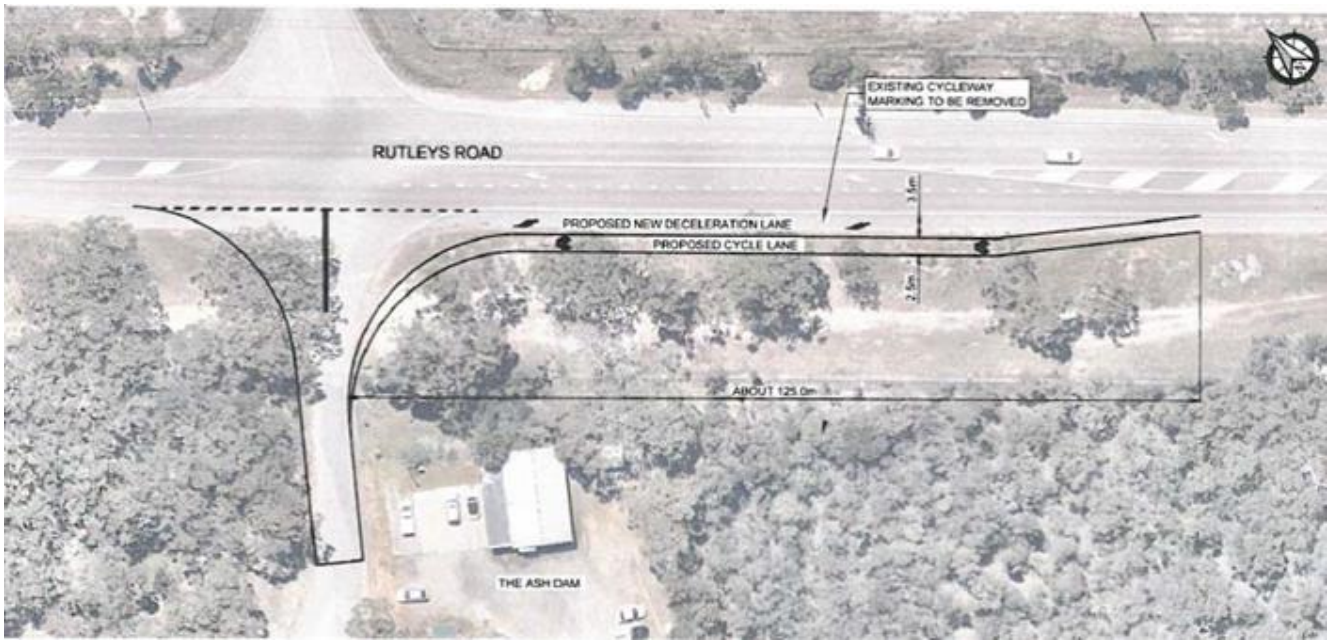

Figure 1-1: Site location Audit details

1.2 Audit methodology

The Stage 2 (concept design) road safety audit of the proposed intersection reconfiguration of Ruttleys Road and the entrance to Vales Point Power Station and the access to the ash dam, Vales Point.

The road safety audit was based on the standard practice of identifying safety related issues by undertaking a site visit. The audit was undertaken on Thursday 19th April 2018. The audit was based on supplied aerial photography figures overlaid with the proposed line marking.

At the time of the audit in the afternoon visibility was good even though light was poor due to an oncoming storm. The road condition was good, with clear pavement markings and retro-reflective devices. No night time audit was undertaken as the site visit was undertaken at dusk on an overcast day. No street lighting is installed in the vicinity of the site. **Figure 1-1, 2-2**

Figure 2-2: Rutleys Road looking West

Figure 2-2: Ruttleys Road looking East

The audit was based on the figure shown at **Figure 1-1** and attached in **Appendix A**. The figure is based on aerial photography with the proposed line marking overlaid:

The audit team consisted of:

- Allen Hyland (Level 2 Road Safety Auditor, TfNSW).
- David Lowe (Level 3 Road Safety Auditor, TfNSW)

The audit team has had no previous involvement in the design of the works.

While every care has been taken to identify safety issues, no guarantee can be made that every safety issue has been identified. Furthermore, even if all the findings of this review were to be addressed, this would not guarantee that the roads would be made "safe". Rather, the safety performance of the roads could be improved.

1.3 References

The following documents were referred to during the audit:

- Austroads *Guide to Road Safety: Part 6 Road Safety Audit* (Third Edition), 2009
- Roads and Maritime *Road Design Guide*, 1996
- Roads and Maritime Supplements to Austroads Guides
- Roads and Maritime *Guidelines for Road Safety Audit Practices*, 2011
- *Australian Standards 1742.1 – Manual of uniform traffic control devices, Part 1 General introduction and index of signs*, 2003
- *Australian Standards 1742.2 – Manual of uniform traffic control devices, Part 2 Traffic control devices for general use*, 2009.

2. Risk assessment criteria

The road safety audit process requires that the safety issues identified during an audit be acknowledged by the audit team and accordingly responded to by the design team. The risk assessment system is the easiest means of identifying the level of risk associated with any given hazard. The risk assessment system is outlined below.

2.1 Risk assessment system

Each hazard has been recorded and assessed in accordance with the Austroads *Guide to Road Safety: Part 6 Road Safety Audit* (Third Edition, 2009). The guide recommends a risk matrix be used to determine the level of risk associated with each hazard. This risk matrix is described below.

2.1.1 Estimated crash frequency (F)

The probable frequency of an incident occurring as a direct result of the hazard was determined using the scale displayed in **Table 2-1**.

Table 2-1 Crash frequency

Crash frequency	Description
Frequent (F)	Once or more per week.
Probable (P)	Once or more per year but less than once per week.
Occasional (O)	Once every five to ten years.
Improbable (I)	Less than once every ten years.

2.1.2 Estimated crash severity (S)

The likely severity of the incident which occurred as a direct result of the hazard was determined using the scale in **Table 2-2**.

Table 2-2 Crash severity

Severity	Description	Examples
Catastrophic (C)	Likely multiple deaths	• High-speed, multi-vehicle crash on a freeway • Car runs into crowded bus stop • Bus and petrol tanker collide • Collapse of a bridge or tunnel
Serious (S)	Likely death or serious injury	• High or medium-speed vehicle / vehicle collision • High or medium-speed collision with a fixed roadside object • Pedestrian struck at high speed • Cyclist is hit by a car
Minor (M)	Likely minor injury	• Some low-speed vehicle collisions • Cyclist falls from bicycle at low speed • Left-turn rear-end crash in a slip lane
Limited (L)	Likely trivial injury or property damage only	• Some low speed collisions • Pedestrian walks into object (no head injury) • Car reverses into post

2.1.3 Deemed level of risk (R)

The risk matrix in **Table 2-3** was used to assess the level of risk for each hazard. The risk matrix uses the frequency and severity determined above to determine the likely level of risk for each hazard.

Table 2-3 Risk matrix

	Frequent (F)	Probable (P)	Occasional (O)	Improbable (I)
Catastrophic (C)	Intolerable (I)	Intolerable (I)	Intolerable (I)	High (H)
Serious (S)	Intolerable (I)	Intolerable (I)	High (H)	Medium (M)
Minor (M)	Intolerable (I)	High (H)	Medium (M)	Low (L)
Limited (L)	High (H)	Medium (M)	Low (L)	Low (L)

2.2 Treatment

Each hazard can be aligned with a suggested treatment, as outlined in **Table 2-4**.

Table 2-4 Treatment

Risk	Suggested treatment approach
Intolerable (I)	Must be corrected.
High (H)	Should be corrected or the risk significantly reduced, even if the treatment cost is high.
Medium (M)	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high.
Low (L)	Should be corrected or the risk reduced, if the treatment cost is low.

3. Audit findings

Identified hazards and the assessed level of risk for each hazard are detailed below in **Table 3-1**.

Table 3-1 Audit findings

No.	Description of road safety deficiency	Crash frequency	Crash severity	Level of risk	Responses to identified road safety deficiencies
1	Laden trucks leaving the ash dam to the west appear not to have enough acceleration length. This may have to the potential for rear-end or side swipe type crashes with approaching vehicles.	Occasional	Serious	High	
2	Laden trucks leaving the ash dam to the east do not to have an acceleration lane. This may lead to rear-end type crashes	Occasional	Serious	High	
3	The proposed cycle lane directs cyclists into the site rather than to continue through the intersection and there is no defined transition for cyclist when they arrive at the access road. There is the potential for cyclists, believing that they are on a dedicated facility, to be struck by trucks entering the site.	Occasional	Minor	Medium	
4	Due to the proposed high volume of heavy vehicle movements into and out of the site, advance warning signs "Trucks Entering' should be placed on both approaches to the site access.		Comment		

4. Conclusion

This report details a Stage 2 (concept design) road safety audit of the proposed intersection reconfiguration of Ruttleys Road and the entrance to Vales Point Power Station and the access to the ash dam, Vales Point. We understand that the existing north entrance to the power station is infrequently used but, remains an active gate. The entrance to the ash dam to the south is going to have increased heavy vehicle movements due to construction activity.

The principal concern of the audit team relates to the increased activity of laden trucks entering and exiting the ash dam and the following issues associated with the increased activity:

- No dedicated facilities are proposed which would afford trucks the opportunity to accelerate to the desired speed of the road before merging with the through lanes of Ruttleys Road.
- A dedicated cycle lane is proposed which directs cyclist into the site but then terminates in an unsafe manner with the potential for crashes between cyclist and trucks entering.
- Due to the proposed high volume of heavy vehicle movements into and out of the site, advance warning signs "Trucks Entering' should be placed on both approaches to the site access.

5. Formal audit statement

This road safety audit has been undertaken by suitably qualified, independent road safety auditors from Jacobs, using the references and documentation detailed previously.

While the road safety audit may provide recommendations about possible remedial measures in response to identified deficiencies, it is ultimately the responsibility of the asset manager / road owner to determine how best to respond to each identified safety deficiency.

The audit has been undertaken for the sole purpose of identifying any safety-deficient features and road safety risks for the audited sections of road. Every effort was made to ensure that all relevant safety issues were considered. The findings are the opinion and judgement of the following team:

David Lowe
Audit team Leader 2 May 2018

Allen Hyland
Audit team member
Cert No 13701735 2 May 2018

Appendix A. Concept Design