

8 March 2010

Mr Scott Jeffries
Director – Infrastructure Projects
GPO Box 39
Sydney NSW 2001

Our ref: A286331

Dear Scott,

Proposed Modification to the Bamarang Gas-Fired Power Station Response to Submissions

I refer to your letter dated 8 February 2010 on clarifications requested on Delta Electricity's application (dated September 2009) to modify the Minister's concept plan approval (MP 06_0029) and the Stage 2 project approval (MP 08_0021) for the Bamarang Gas-Fired Power Station. The modification being proposed is to expand the capacity of the Stage 2 combined cycle facility from approximately 400 MW to approximately 450 MW.

As you are aware, the majority of the queries related to impacts on air quality. Heggies Pty Ltd has undertaken additional modelling specifically to address these queries, and the outcome of this has been reported in *Proposed Gas Turbine Station, Bamarang – Addendum to Air Quality Impact Assessment and Plume Rise Assessment* (March 2010). This report, from hereon referred to as the Heggies report, is attached to this letter.

Delta will also send the updated Plume Rise Assessment to the Civil Aviation Safety Authority and the Department of Defence.

The table below lists the queries raised by the Department of Planning and other Agencies and our responses.

Please do not hesitate to contact Emre Cetin on 9285 2776 should you have any enquiries about this project.

Yours sincerely,



Rodney Ward
General Manager Development



Comment (verbatim)	Response
<p><i>Department of Planning</i></p> <p>(Reference: E-mail to Delta Electricity dated 18 December 2009 and letter reference 9039738-5)</p>	
<p>"Section 5.5 and Appendix A (section 3): the Department requires some additional quantification of each of the pollutants (in addition to NO_x) originally modelled for the Stage 2 Power Station to identify the ground level concentrations (GLCs) predicted at nearest sensitive receptors under the expanded scenario. The Department notes that condition 3.2 of the Stage 2 project approval requires comparison of the operational air quality performance of the Stage 2 power station against predictions made in the original EA. To enable this condition to also apply to the expanded Stage 2 power station, the predicted GLCs under the expanded scenario need to also be clearly identified. Furthermore, the Department notes that the original EAs (concept plan and Stage 2) identified that PM10 would be very close to the DECCW criterion of 50 ug/m³ when considering background + the power station. Consequently, it is important to identify the level of increase of PM10 contributions (and any other pollutant loads) associated with the expanded power station."</p>	<p>An assessment of the level of increase of PM10 and other pollutants' GLCs at the nearest sensitive receivers have been modelled and is documented in the Heggies report. Tables 8-14 of that report list the changes in GLCs associated with the proposed modification for PM10, NO₂, SO₂, CO, and Volatile Organic Compounds (<i>i.e.</i> benzene). The modelling indicates that the increases in GLCs would mostly be negligible and GLCs remain below the relevant air quality criteria.</p>
<p>"Section 5.5 and Appendix A (section 4): the plume rise assessment indicates that the previous assessment undertaken for the Stage 2 project was unrealistically conservative as it overestimated the influence of the air cooled condenser on exit exhaust velocities. The assessment states that any change associated with an expansion from 400 to 450 MW is likely to be accounted by this conservativeness, such that the expanded power station is unlikely to result in any greater plume rise impacts than originally modelled for the Stage 2 plant. The Department requires some quantification of the plume rise impacts of the expanded power station to confirm this assertion or otherwise demonstrate the acceptability of the plume rise impacts of the proposed modification."</p>	<p>A plume rise assessment using the details of the proposed modified plant configuration was undertaken and the results are provided in the Heggies report (particularly Table 3). These results confirm that the Stage 2 EA plume rise assessment was more conservative, and so the proposed modification would not impact on this aspect of the project approval. Heggies report will be sent to Department of Defence as per the Stage 2 project approval (MP 08_0021) Clause 2.23.</p>



<p>"Section 2.1.1 provides an outline for the need for new electricity supply sources in the state. However a justification for the proposed capacity expansion of the power station facility must also be included. For example, it is stated on page 9 that the proposed expansion is based on a consideration of the gas turbines that are commercially available. It should be clarified whether or not the availability of different gas turbine models was considered during the assessment of the approved stage 2 proposal."</p>	<p>Section 2.1.1 provides background to the need for additional base-load capacity in NSW.</p> <p>The Bamarang project is being developed as one option to contribute to satisfying this predicted capacity requirement.</p> <p>At the time of the original project application, system modelling indicated that, with the proposed 132KV system connection, unconstrained plant output would be limited to approximately 400MW. Hence current Project Approval reflects this capacity.</p> <p>Subsequent system modelling has demonstrated that other possible grid connection options exist which would enable unconstrained power station output to approximately 450MW or more. These options include the proposed 330KV connection west of the site to TransGrid's No.6 line. . If regulatory and development approvals are achieved by TransGrid, the planned South Coast Supply Point options also enable unconstrained grid connection for Bamarang to this higher capacity.</p> <p>Commercially available gas turbine generating plants would allow for combined cycle capacities in the order of 400MW-480MW at Bamarang, dependent on manufacturer¹. Without the original grid connection constraint, a Proponent will want to allow for these possible commercially available machines rather than be limited in choice of manufacture. Cost benefits flow from more competitive bidding & the relatively low dollars/MW differential in moving to the larger standard size.</p> <p>From a project need perspective, the demonstrated requirement for more base-load capacity in NSW can be more cost-effectively satisfied by providing for a Bamarang capacity of 'approximately 450MW' rather than the currently approved 'approximately 400MW.'</p>
<p>"The Proponent must identify what the expected greenhouse gas intensity of carbon dioxide (equivalent) per megawatt-hour would be when the project is operated and how it compares to the existing New South Wales average (pool coefficient)."</p>	<p>This has been examined and is detailed in Section 4 of the Heggies report. Emissions of greenhouse gases are anticipated to increase by approximately 13% in accordance with the proposed modification. This would represent an increase of 0.09% on the 2007 Australian electricity sector emissions.</p>

Comment (verbatim)	Response
<p>Department of Environment, Climate Change and Water (Reference: Letter reference FIL07/4424-02)</p>	
<p>"DECCW has no objections to the proposed modifications."</p>	<p>Noted.</p>

¹ To represent the worst case scenario, the assessments carried out in this Modification Application is based on Alstom GT13E2 gas turbines and two GT13E2s are estimated to generate in the order of 480MW in combined cycle configuration at Bamarang.



Comment (verbatim)	Response
<p><i>Shoalhaven City Council</i></p> <p>(Reference: Letter reference 3A08/1003-02)</p>	
<p>"The increase from 400 MW to 450 MW power output at the plant is predicted to result in a 40% increase in NO₂ concentrations at some receptors (see Appendix A page 4 letter from Heggies dated October 2009). The report states that these levels are still below the site "applicable assessment criteria". However mitigation levels should be introduced to reduce NO₂ levels back to that predicted for a 400 kW [sic] output as minimum."</p>	<p>The increase in NO₂ has been remodelled taking into account the proposed modified plant layout and plume rise enhancements (Table 10 of the Heggies report). The increase of ground concentration levels would be in the order of 8%. Chapter 8 of the Environmental Assessment for Stage 2 (April 2008) of the project lists the Statement of Commitments in regard to air quality management. Table 7.4 of that document outlines the air quality goals that are relevant to NSW and to this proposed project. Even allowing for the increase in NO₂ concentrations associated with the increased output capacity, these air quality criteria would not be exceeded.</p>
<p>"Noise generated from the 450 megawatt output should comply with the project noise criteria of L_{Aeq} of 35 dBA, at all receivers (previously set for the 400 kW [sic] output). The EA states that there is likely to be an increase in equipment sound power levels and additional attenuation is required to achieve the project noise criteria.</p> <p>It is strongly recommended that noise measurements be undertaken to confirm that mitigation measures have successfully reduced equipment sound power levels prior to commissioning of the Station. This would be in the form of a Monitoring condition."</p>	<p>As outlined in the modification proposal (September 2009), advice from an original equipment manufacturer is that the required attenuation of the sound power levels so as to meet relevant noise criteria would be achievable. Chapter 8 of the Environmental Assessment for Stage 2 (April 2008) of the project lists the Statement of Commitments in regard to noise and vibration management. There it states that the contractor responsible for the design and management of the facility would be required to meet noise criteria during plant operation. Noise compliance monitoring can be expected to form part of the approach to verifying that the criteria are not being exceeded.</p>
<p>"Greenhouse gas emissions should be off-set by renewal energy generation. This could include wind and solar installations on the site."</p>	<p>Delta would continue to meet its commitments under the Commonwealth Government's Generator Efficiency Standards and Greenhouse Challenge (Plus) Program. Under these agreements, Delta is committed to achieving greenhouse gas emissions abatement through diversification of its generation portfolio, reflecting community and government expectations of a sustainable future for electricity generation. Delta's approach to greenhouse gas abatement includes:</p> <ul style="list-style-type: none"> » Minimising impacts of existing coalfired plants » Investigating transitional, combined technologies » Developing new renewable energy technologies for the future.