



***MODIFICATION REQUEST:
Colongra Gas-Fired Power Station
Doyalson
(MP 05_0195 Mod 3)***

***Request to increase NO_x emissions for natural
gas fuel at the Colongra Gas-Fired Power
Station***



Secretary's
Environmental Assessment Report
Section 75W of the
Environmental Planning and Assessment Act 1979

November 2014

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EXECUTIVE SUMMARY

In July 2014, Delta Electricity (the Proponent) lodged a modification application (MP 05_0195 Mod 3) to enable an increase in the nitrogen oxide (NO_x) emission limit for natural gas at the Colongra Power Station.

The 600 Mega Watt (MW) open cycle gas-fired power station received project approval on 31 July 2006 to provide power during periods of peak demand. The approval was subsequently modified twice, in February 2007 to amend noise limits in acknowledgement of tonality impacts, and November 2008 for a period of outside of hours work.

Condition 2.8 of the project approval sets limits for the concentration of NO_x pollution at 50 milligrams per cubic metre (mg/m³) for natural gas fuel. This is consistent with the limits imposed by Colongra Power Station's Environment Protection Licence (EPL) No. 13036.

The Proponent is seeking to modify condition 2.8 to increase this limit to 70 mg/m³. The power station has operated within current limits, however, recent stack tests found NO_x emission levels had reached a maximum of 48 mg/m³ and 49 mg/m³ on two of its units. The Proponent is concerned that operating so close to the limit risks a breach of its licence and approval.

Under the provisions of section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act) there is no requirement to exhibit the proposed modification, however, the Department placed the modification application on its website and sought input from Wyong Shire Council, and the Environment Protection Authority (EPA) as it is the licencing authority for the power station.

Neither agency raised any objection to an increase in NO_x emission limits. However, the EPA considered that a 60 mg/m³ is likely to comply with the NO₂ ground level criterion and so recommended a 10 mg/m³ increase to Colongra's licence limit.

The Department has concluded that a 20 mg/m³ increase is not warranted but agrees that a 10 mg/m³ increase would allow an appropriate margin of error. Therefore, the Department recommends that the modification application be approved to allow for an increase in natural gas NO_x emissions to 60 mg/m³.

In making this recommendation, the Department notes that data obtained on ground level concentrations at nearby ambient air monitoring stations (AAMS) have been well below emission goals, and that since operation commenced, emission levels have been consistent with plant design and in line with estimated emissions identified in the original air quality impact assessment for the project application.

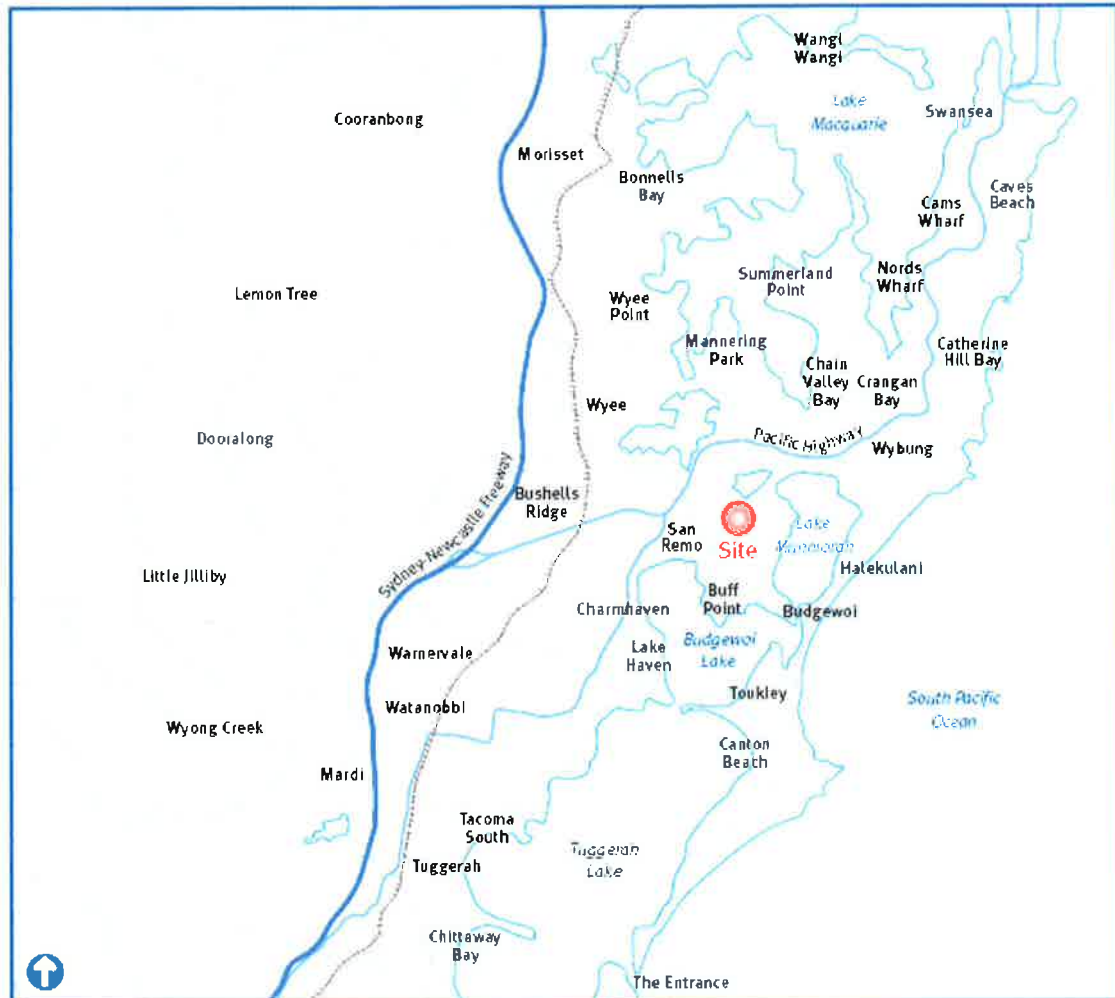
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1. BACKGROUND

On 31 July 2006, the then Minister for Planning approved the construction and operation of a 600 Mega Watt (MW) open cycle gas-fired power station consisting of four gas turbines and an underground pipeline connection to the Sydney to Newcastle Natural Gas Pipeline. The Project is a Part 3A project approved under section 75J of the *Environmental Planning and Assessment Act 1979*. The project is located on Scenic Drive, Doyalson, in the Wyong Local Government Area on the NSW Central Coast. The location is shown in Figure 1.

Figure 1: Approved Project Layout



The gas turbine facility operates as a peak-load power station by providing electricity at short notice during periods of peak demand or as a 'black start' generator in the instance of a state-wide power station shutdown.

On 15 February 2007, a modification application (MP 05_0195 Mod 1) was approved by the then Minister for Planning to adjust noise requirements to allow practical noise limits which acknowledge the technical difficulties associated with mitigating tonal noise from gas turbines.

On 22 November 2008, a further modification application (MP 05_0195 Mod 2) was approved by the then Minister for Planning to extend the construction hours on Saturdays to 7.00 am to 6.00 pm for a period of up to four weeks.

2. PROPOSED MODIFICATION

2.1 Modification Description

On 28 November 2013, the Department received a modification application (MP 05_0195 Mod 3) to increase the nitrogen oxide emissions (NO_x) limits from natural gas.

Condition 2.8 of the project approval specifies the limit for the concentration of each pollutant – nitrogen dioxide (NO₂) or nitric oxide (NO) or as both (NO_x) – at 50 milligrams per cubic metre (mg/m³) for natural gas and 90 mg/m³ for diesel. The condition reflects the requirements of Colongra Power Station's Environment Protection Licence (EPL) No. 13036.

The Proponent has sought to increase the NO_x limit for natural gas only to 70 mg/m³ as the power station currently operates too close to the approval and licence limits to allow for a reasonable margin for error.

3. STATUTORY CONTEXT

3.1 Modification of the Minister's Approval

The Project is a Part 3A project approved under section 75J of the *Environmental Planning and Assessment Act 1979* (EP&A Act). As such, the proposed modification is subject to section 75W of the EP&A Act. Section 75W as in force immediately before its repeal on 1 October 2011, and as modified by Schedule 6A, continues to apply to this project approval in accordance with clause 3 of Schedule 6A of the EP&A Act.

3.2 Delegated Authority

On 10 November 2014, the Minister delegated her powers and functions under section 75W of the EP&A Act to the Director, Infrastructure in cases where there are no public submissions (not including submissions from public authorities) in the nature of objections in respect of the modification request, the relevant local council has not objected, and a political disclosure statement has not been made.

As the local council did not object, no political donations have been made, and no public submission were received, the Director, Infrastructure may determine the modification request under delegated authority.

4. CONSULTATION AND SUBMISSIONS

4.1 Exhibition

Under Section 75X(2)(f) of the EP&A Act and clause 8G of the EP&A Regulation, the Secretary is required to make the modification request publicly available. In accordance with these provisions the modification request was made available on the Department's website.

Due to the minor nature of the proposed modification, the modification request was not exhibited. However, the Department notified Wyong Shire Council and the

Environment Protection Authority (EPA) of the modification application. No public submissions were received in relation to the modification.

A summary of the issues raised in the public authority submissions is provided below.

4.2 Public Authority Submissions

Two submissions were received from public authorities, which advised the following:

Wyong Shire Council:

- raised no objection to the proposal, noting the application is to support a variation to EPL No. 13036 condition L3.4 for Colongra Power Station;
- notes that the increase to the NO_x 10 percentile concentration by 20 mg/m³ in order to provide a reasonable margin for compliance and is in line with the permitted limit for Group 6 gas turbines in Schedule 3 of the *Protection of the Environment (Clean Air) Regulation 2010*; and
- advises that Council does not have any recommended conditions as the licence is regulated by the EPA and the proposed increase in NO_x emissions is in line with estimated emissions, as identified in the original air quality impact assessment provided for the project approval; and
- it is noted that the increase in emissions is not expected to have an additional impact on local air quality.

Environment Protection Authority (EPA)

- raised no objection to the proposal;
- notes that there would be no change to the operation of the gas turbines;
- notes that stack monitoring demonstrates that NO_x concentrations have been consistently below the current limit of 50 mg/m³, except for short periods during start-up when NO_x levels have reached 60 mg/m³;
- notes that measured ambient NO_x levels at the Lake Munmorah Public School and Wyee Ambient Air Monitoring Stations (AAMS) have been well below the EPA 1-hour NO₂ criterion and with the closure of Munmorah Power station, ambient levels of NO_x in the local air shed should also decrease;
- advised that the original air quality assessment by Homes Air Sciences (dated 14 November 2005) for the Colongra Power Station included air dispersion modelling of a distillate-oil as fuel scenario that demonstrated compliance with the NO₂ criterion of 246 mg/m³ at ground level with a NO₂ discharge concentration of 65 mg/m³; and
- considers that a NO_x limit of 60 mg/m³ is likely to comply with the NO₂ ground level criterion and therefore recommends that this limit be applied rather than the 70 mg/m³ limit requested.

The Department has considered the issues raised in submissions in its assessment of the proposed modification.

5. ASSESSMENT

The Department considers air quality to be the single key issue for the proposed modification.

5.1 Air Quality

The Proponent's licence variation application lodged with the EPA states that during the limited peak demand operations, the instantaneous NO_x levels on occasion exceed 50 mg/m³ for a brief period during start-up by up to 5 mg/m³ to 10 mg/m³. This exceedance is allowed for in Condition 2.8 which clarifies that pollution limits apply to operation of the project, and do not apply during start-up or shut-down.

The Proponent has advised that there has been no exceedance of the natural gas NO_x limit during the operation of the gas-fired power station since commissioning, and that stack monitoring has demonstrated that the turbines consistently operate below their current 50 mg/m³ limit. Colongra's emissions have been consistent with plant design and in line with the estimated emissions identified in the original air quality impact assessment provided with the project application.

Recent annual stack compliance testing between February and April 2014, showed that a maximum NO_x emission level of 48 mg/m³ and 49 mg/m³ was recorded on two of the turbine units. The Proponent has raised concern that operating so close to EPL/approval limits leaves no reasonable margin for error, such as for degradation between service intervals and while the plant is being brought up to normal operations following periods of inactivity, and therefore runs the risk of a licence breach being recorded.

Therefore the Proponent has lodged the current modification application to increase NO_x to 70 mg/m³ and would also seek to amend its EPL No. 13036 with the EPA. In support of its application, the Proponent provided monthly data for the 2012 and 2013 years that measured monthly average and maximum 1-hour ambient NO₂ ground level concentrations at two nearby monitoring locations including levels at the Lake Munmorah and Wyee Ambient Air Monitoring Stations. Data showed:

- monthly average 1-hour NO₂ levels ranged between 0.27 parts per hundred million (pphm) and 0.93 pphm; and
- monthly maximum 1-hour NO₂ levels ranged between 1.26 pphm and 4.77 pphm.

The results compared very favourably with the National Environment Protection Measures (NEPM) 1-hour NO₂ goal of 12 pphm, whereby ambient air NO₂ levels have been well below the ambient air NO₂ goal at all times.

There is no proposal to change the operating specifications or actual performance of the gas turbines, with respect to the environmental impacts and performance predicted in the Colongra Gas-Fired Power Station project approval. However, operating close to the licence limit may require corrective action to avoid a breach, which would require powering down the units to reduce NO_x levels at times of peak demand. The Proponent's preference is to maintain operation of the units in order to supply peak demand (typically between one and four hours), which under current licence limits, risks a brief but minor exceedance (less than 1 hour, up to 10 mg/m³).

The Department considered the proponent's justification, the operational data provided in its licence variation, recommendations from the EPA, and Wyong Shire Council's position. The Department is satisfied that the risk of going above 50 mg/m³ is brief and minor.

While the Proponent has demonstrated sufficient justification for an increase to its NO_x limit for natural gas, the Department does not consider a 20 mg/m³ increase to be justified in this instance, particularly as brief start-up exceedance has been in the order of up to 5 mg/m³ to 10 mg/m³. The Department considers that an increase in the NO_x limit to 60 mg/m³ for natural gas would be more acceptable in this instance, in line with EPA recommendations.

6. CONCLUSION AND RECOMMENDATIONS

The Department has considered the modification application to increase natural gas NO_x emissions, stipulated in condition 2.8 of the project approval. It has reviewed submissions made by Wyong Shire Council and EPA and has considered that the key issue is air quality.

The Department has recommended that the NO_x emission limit for natural gas stipulated by condition 2.8 be increased from 50 mg/m³ to 60 mg/m³. This is in line with the EPA's response to the Proponent's licence variation application, as well as the extent to which instantaneous NO_x levels have exceeded 50 mg/m³ for a brief period during start-up.

The increase would not lead to an unreasonable impact on overall air quality in the surrounding area, particularly as there has so far been no breach of the 50 mg/m³ limit during operation and there is no proposal to change the existing operating specifications or the actual performance of the gas turbines. The 10 mg/m³ increase provides only for a compliance safety margin.

Supporting documentation has shown average ground level concentrations in the surrounding area have been well within NEPM goals. Furthermore, as the power station is a peaking plant, it only operates for a limited number of hours per day and limited days per year.

The Department's assessment concludes that a 10 mg/m³ increase is acceptable in this instance to enable the power station to continue to operate within licence limits, whilst not degrading the overall environmental performance requirements for the power station.

It is RECOMMENDED that the Director, Infrastructure of the Department of Planning and Environment:

- notes the information provided in this briefing;
- approves the modification request, subject to conditions; and
- signs the attached modifying instruments (Tag A).


Karen Jones 20.11.14
Director, Infrastructure