

Our Ref: DOC17/218700-13 Your Ref: DA94/165

> Ms Pamela Morales A/Senior Planning Officer Department of Planning and the Environment Via email: planning.matters@environment.nsw.gov.au

Dear Ms Morales

Marubeni Power Development Australia - DA 94/165 MOD 2

I refer to your email of 10 April 2017 requesting the NSW Environment Protection Authority's (EPA) comments on a modification request and Environmental Assessment (EA) from Marubeni Power Development Australia Pty Ltd for the Smithfield Energy Facility located at 33 Herbert Place, Smithfield (DA 94/165 MOD 2).

The EPA understands that the proposed modification involves in changing the operation of the existing facility from a combined cycle (cogeneration) mode to intermittent open cycle mode via alterations to the configuration of the power trains.

The EPA provided preliminary comments to the Department of Planning and Environment (DP&E) on this matter via email on 19 April 2017, and requested that DP&E stop the clock on this application until further information was provided by the proponent. In late April 2017 Marubeni provided a Photochemical Smog Statement and revised EA directly to the EPA in response to the preliminary comments provided by the EPA on 19 April 2017.

The EPA has reviewed the Photochemical Smog Statement and revised EA, and provides comments and recommendations at **Attachment 1**. The EPA has identified some areas where further information is required from the proponent, and would appreciate an opportunity to review the outstanding information prior to finalising its recommended conditions of consent.

Activities undertaken at 33 Herbert Place are regulated by the EPA under Environment Protection Licence 5701. The licensee will need to apply to the EPA separately to vary the licence to permit the proposed works.

PO Box 668 Parramatta NSW 2124 Level 13, 10 Valentine Avenue Parramatta NSW 2150 Tel: (02) 9995 5000 Fax: (02) 9995 6900 TTY Click here to enter text. ABN 43 692 285 758 www.epa.nsw.gov.au If you have any queries regarding this letter please contact James Boyle on 9995 6128 or via email at james.boyle@epa.nsw.gov.au.

Yours sincerely

29/05/2017

MARK HANEMANN A/Unit Head – Sydney Industry NSW Environment Protection Authority

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ATTACHMENT A – EPA detailed comments on modification request and EA from Marubeni Power Development Australia Pty Ltd in respect of the existing Smithfield Energy Facility at <u>33 Herbert Place, Smithfield (DA 94/165 MOD 2).</u>

The EPA has reviewed the modification application, including the documents titled 'Marubeni Power Development Australia, Smithfield Energy Facility, Environmental Assessment (Revised), Modification of DA94/165, dated April 2017', prepared by Marubeni Power Development Australia Pty Ltd in consultation with Visy Industries Pty Ltd, and the letter from Pacific Environment Operations Pty Ltd titled Marubeni Power/ Visy Smithfield Photochemical Smog Statement, dated 11 April 2017. The EPA provides comments on these documents below.

1. Air Emissions

The EPA has reviewed the Air Quality Impact Assessment (AQIA) (Benbow Report dated 24 April 2015, Attachment 5 of the EA) for the proposed modifications.

The EPA notes that Nitrogen Oxide (NOx) emissions will generally not increase during normal operation of the plant, and under the proposed modification emissions will occur over a lower number of hours of the year (however noting there will be spikes during start up). Furthermore, temperature at discharge will increase, which will aid dispersion across the local area. Thus, based on a preliminary review of this assessment, the EPA considers that the local NOx impacts will not increase at the nearest sensitive receptors.

Recommendation

The EPA does not recommend any further action in regards to planning conditions for this modification proposal.

2. Ozone Assessment

The EPA has reviewed the *Photochemical Smog Statement* for the proposed modifications.

The EPA notes that *Photochemical Smog Statement* assumes a NOx emission rate of 4.05 g/s, which is the NOx emission rate of the Visy boiler. The stabilised emission rate, from CEMS data presented in Figure 6-1 of the AQIA, is approximately 2.4 g/s.

The EPA has therefore calculated the increase in NOx emissions over the course of 1 hour due to startup is approximately 130% (not 117% as reported by *Photochemical Smog Statement*).

The EPA has calculated predicted ozone impacts using a Level 1 screening assessment, assuming worst case conditions that the plant operates at the Load Based Licensing (LBL) or Licence limits. In these calculations, the EPA has made the very conservative assumption that start up happens every hour over a 24-hour period (the plant is likely to start up less often than this).

These calculations are listed below.

NOx TPA	NOx TPD	130% increase	1hr inc (ppb)
215* (Annual)	0.589	0.769	0.275
60* (Summer)	0.667	0.871	0.31
	1.524**	1.989	0.69***

TBA = Tons per annum

*** Although the Screening Impact Level is exceeded when all three stacks emit at the licence limit, we note that the maximum allowable increment (1-hr) of 1 ppb is not exceeded.

TPD = Tons per day

LBL limit

^{**}Based on all three stacks emitting at the licence limit of 25 ppm (unlikely since CEMS data shows normal operating conditions are 10 ppm).

Recommendation

Based on this analysis, the EPA considers that the proposal does not require an ozone assessment.

3. Noise

The EPA has reviewed the Noise Impact Assessment (NIA) (Benbow Report dated 15 March 2017, Attachment 6 of the EA). The consultant has not assessed the modelled noise impacts from the change in use of the facility in accordance with current noise policies. The EPA is therefore unable to support the proposal given the current information provided. Further details are provided below.

Project Specific Criteria Not Based Upon Current Environmental Noise Policies

The project specific noise criteria used in the NIA are not based on current NSW environmental noise policies. At the time of the initial development approval (1994), the Marubeni Smithfield Power Plant was assessed against relevant noise policies. However, considering that environmental policies and legislation change over time, the proponent should assess the project and demonstrate compliance with current NSW environmental noise policies. These include, but are not limited to:

- NSW Industrial Noise Policy;
- Interim Construction Noise Guideline; and
- NSW Road Noise Policy.

The NIA states that "*This noise impact assessment has been prepared in accordance with the NSW Environment Protection Authority Industrial Noise Policy*". However, noise impacts from the facility have only been assessed against the noise limits set in the existing environment protection licence. While most contemporary noise conditions in licences are based on the current NSW Industrial Noise Policy, the Smithfield Power Plant licence conditions were based on noise policy which predates this. As a result, an assessment against the licence conditions is not sufficient to demonstrate compliance with current noise policies.

The EPA will reassess the noise limits in the licence after the proponent provides an assessment of the modelled noise impacts against current noise policies.

Construction Noise Not Assessed

The proponent should assess noise from construction works in line with the NSW Interim Construction Noise Guideline. The proposal includes works to bypass the three Heat Recovery Steam Generator (HRSG) units, currently operating between the generators and the stacks. The proponent plans to replace these units with ducting and silencers. They also propose to replace the three current stacks with a more heat resistant design. The NIA has not quantified the noise impacts of any of these construction works.

Noise from construction works is briefly discussed elsewhere in the EA:

"The installation of replacement stacks will require on-site crane attendance and fabrication, welding and related fitting works in the vicinity of the existing power plant. It is anticipated that, in addition to the existing site staff, a total of 20 temporary installation personnel will be present on site for a period of approximately 10 weeks for the modification works.

...It is expected that noise generated from the construction works will be accommodated with the existing site's licenced noise limits. Construction works will be undertaken between normal working hours for this manufacturing precinct, that is from Monday to Saturday between the hours of 7am and 6pm."- Pages 20 & 21

These above stated construction hours are generally appropriate for Monday to Friday only. For Saturdays construction works should be limited from 8am to 1pm, following the recommended

standard hours for construction work, set in the Interim Construction Noise Guideline. There should be no work on Sundays or Public Holidays unless justified appropriately, as outlined in the Guideline.

Little evidence is provided in the NIA to demonstrate that "noise generated from the construction works will be accommodated within the existing site's licenced noise conditions".

Vibration Not Assessed

The NIA does not address vibration from the facility. The proponent should confirm what the likely vibration impacts might be, if any.

Noise Impacts at Receiver Locations

The NIA does not adequately assess current sound pressure levels at receiver locations. The consultant should justify why monitoring has not been undertaken to assess these noise levels. The EPA understands the plant is no longer in operation. It is therefore possible for the proponent to undertake background noise monitoring at receiver locations, assuming that there is currently no contribution from the facility.

The proponent can use this data to calculate the rating background levels (RBL) to inform project specific criteria, from which, together with the predicted levels, the EPA can derive updated licence conditions.

Measurements and Raw Data

The NIA details three methods to measure noise in various locations within the facility over a period of three weeks; noise intensity measurements, spot measurements (to be used as calibration checks) and probe microphone measurements for the calculation of noise associated with the generator ducting and stacks.

It is unclear which operational activities were being undertaken at the power plant during the time of monitoring. For example: whether the steam turbines and water cooling towers were in operation, and how many generators were in use; only one or all three? Were operational activities the same on each of the three days of monitoring? The proponent should provide additional information to enable the EPA to assess the appropriateness of the noise measurements.

Stack measurements

The NIA references Technical Data Sheet 207-1 of the Environmental Noise Control Manual (EPA, 1994). *Duct Directivity Index Applications* by Day, Hansen and Bennett (2009) identifies that the information in Technical Data Sheet 207-1 of the Environmental Noise Control Manual (EPA, 1994) is "wrong in principle and rather inaccurate". The proponent should revise their assessment with reference to this journal article, which was published in Acoustics Australia, 2009; 37(3):93-97.

Noise Characteristics Not Considered

The NIA does not consider noise characteristics such as tonality or intermittency. Is start up and shut down noise significantly different from operational noise?

As the NIA has identified low frequency noise as an issue common to this style of power plant, low frequency noise should be assessed in line with the NSW Industrial Noise Policy. The NIA references criteria set by Broner (2011); however, these criteria are not EPA policy. If there is a predicted difference in A and C weighted sound pressure levels at receiver locations of 15 dB or more, then 5b

penalty should be applied in the project specific criteria. So, for an A-weighted limit of 41 dB, a 5b penalty will be added if the C-weighted level is 56 dB or more.

Noise sources on site not well described

The specific noise sources considered in the noise model are not well described in the NIA, aside from the HRSG and the noise present at the foot and top of the stacks. A description should be provided of exactly what the noise sources are (e.g.: pumps, machinery, vehicles, etc.), their locations, heights, and characteristics.

It also appears that noise sources from the generator area are included in the NIA, but noise sources outside of this area are not. The NIA should justify this and explain the exclusion of sources such as the two cooling towers and circulating water pumps in the noise models.

Sound Power Levels and Model Calibration

The NIA mentions the use of spot measurements to calibrate the computer assisted noise model used; noise intensity measurements were taken for various areas and point sources. Spot measurements were also taken at certain locations around these sources. An iterative model was then run until the sound power level from each identified source resulted in the sound pressure levels at the calibration points (so that levels agreed to within 2B, excluding outliers).

Although the "calibrated" data is provided in an appendix, the raw data for the intensity and spot measurements is not provided. The NIA states that 32 spot measurements were used. However, Figure 6.1 shows 34 spot points. If some of these points were excluded as outliers, then this should be explained in the NIA. The proponent should provide a comparison of these estimated levels with the raw data to demonstrate the validity of their calibrated sound power levels.

Modelled Scenarios

The NIA has modelled three scenarios to predict and compare current noise impacts with proposed noise impacts (with and without additional noise attenuation). However, the NIA does not explain which particular sources are modelled as on/off in each model. For example: does each model assume that one generator is operational, or are all three operating?

Scenario One is designed to model "the existing gas turbines operating without any new exhaust system". This is used in the NIA as a reference point by which to compare current operation with proposed options. However, it is unclear whether this model includes noise contributions from sources outside of the generator unit such as the steam turbine and the four cooling towers. Without these additional sources, the model is incomplete.

It is important to note that project specific criteria that are based on the Industrial Noise Policy will ultimately be $L_{Aeq(15 min)}$ levels rather than $L_{A10 (15 min)}$ levels. It follows that the model outputs should be $L_{Aeq(15 min)}$ level predictions.

The Scenario Two noise model represents a generator operating (or perhaps all three?) with a complete bypass of the HRSG and an upgraded stack design. A silencer has been included in this model to provide 10 dBA of attenuation. It is unclear if the silencers will achieve this level of noise reduction in each unit, or as a combined total. The NIA states that all residential receivers will experience an increase in noise impacts, ranging from 1 to 4 dBA. While a difference of 1 dBA would be indistinguishable to the human ear, an increase of 4 dBA may be noticeable (for example at receiver R6). This creep in operational noise should be mitigated if possible and should be further addressed by the proponent.

Scenario Three models noise impacts from the facility assuming that the generator units are bypassed and the stacks are upgraded. No silencer or further noise mitigation is included. Again, it is unclear how many generator units are running and which other noise sources are "switched on" and

included or excluded from the model. This scenario demonstrates significant increases in noise impacts at receiver locations (up to 10 dBA at R6).

The EA states that the proposed change in operation of the facility will result in lower environmental impacts:

"This environmental assessment demonstrates that, by operating in intermittent OCGT mode there will be lower overall environmental impacts than occurs at present under continuous CCGT mode." – page 22 of the EA. However, based on the information provided in the NIA, this statement may be correct for noise impacts.

Proposed noise mitigation not well detailed

The NIA states that a silencer can be installed along the ducting (which connects each generator to its corresponding exhaust stack) to achieve a 10 dBA reduction in noise. The EPA considers that this level of reduction, as a minimum, should be included as a procurement requirement and a condition to be met in any contract / tender documents associated with the silencer. The EPA recommends that the proponent requires the supplier or contractor to guarantee this level of reduction and suggest that the proponent require a demonstration of achievement for completion of any associated contract (i.e. before final payment is made).

Recommendations

The proponent/consultant should:

- Assess the noise impacts from the change in use of the facility as per current NSW environmental noise policies;
- Undertake noise monitoring at receptor locations or explain to the satisfaction of the EPA why that was not done;
- Assess noise characteristics such as tonality, low frequency and intermittency;
- Elaborate on what equipment or machinery was operational at the time of monitoring and describe the sources of noise on site;
- Adjust the assumptions and clarify the inclusions in the noise models;
- Detail the proposed noise mitigation and provide assurance that the level of noise reduction can be achieved; and
- Address other relevant comments provided above.

Pending the supply of further information, the EPA may choose to update noise limits in the existing licence conditions.