

8 July 2014

Head Regional Operations Unit - Hunter
NSW Environment Protection Authority
PO Box 488G
NEWCASTLE NSW 2300

Attention: Ms Rebecca Scrivener

**RE: LICENCE VARIATION APPLICATION FOR COLONGRA EPL NO. 13036
CHANGE TO NO_x LICENCE LIMIT FOR NATURAL GAS**

Dear Rebecca

Further to our conversation on 19 June 2014, please find attached the new Licence Variation Application (LVA) requesting an increase of the NO_x limit for natural gas fuel in the Colongra power station Environment Protection Licence (EPL) No. 13036, condition L3.4.

The reason for the proposed change to the NO_x licence limit for natural gas fuel is to allow for 'a reasonable margin for compliance' when operating Colongra between service intervals and while the plant is being brought up to normal operations following periods of inactivity, given that the units operate very close to the licence limit, which is explained in more detail in the LVA and Attachment A.

I also refer to the EPA's correspondence dated 5 June 2013 (Variation Notice No. 1510420) in response to Delta's earlier LVA to vary the NO_x limit, where Delta was advised that "*the EPA is unable to consider an application to increase NO_x limits until such time as the licensee can supply an appropriately amended development consent.*"

Delta has subsequently made an application to the Department of Planning and Environment (DPE) on 28 November 2013 and received a response from the DPE on 2 December 2013 (Attachment C in LVA), which advised, amongst other things, that Delta needed to provide evidence of consultation with key agencies, including the EPA, before the application to amend the development consent could be considered.

Therefore, in light of this requirement by the DPE, Delta suggests that, subject to this LVA being considered favourably by the EPA, a draft Licence Variation Notice might be provided conditional on Delta obtaining an appropriately amended development consent from the DPE before the final Licence Variation Notice can be issued.

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Post Office Box 7287
Mannering Park NSW 2259
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Facsimile 02 4399 8207
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Also, as advised in our conversation, Delta has discussed the proposed LVA with Mr Anthony Savage, Manager Air Technical Advisory Services in the EPA air assessment branch in Sydney, who indicated that there may be merit in increasing the NO_x limit given the units operate close to the current licence limit and that a LVA would be given due consideration subject to additional supporting information being provided justifying the proposed change to the NO_x limit.

In making this application to vary the NO_x limit, Delta also wishes to reiterate that:

- it takes its environmental compliance obligations very seriously and seeks to avoid breaches of its EPL 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 original Colongra Project Approval;
- it will continue to operate the Colongra gas turbines to achieve optimum environmental outcomes as required by the EPL and the Project Approval; and
- the NO_x limit increase is requested to allow a 'reasonable margin for compliance' and thus remove future potential operating constraints on Colongra during peak electricity demand operations.

Delta requests that the EPA favourably consider the LVA for an increased NO_x limit at Colongra and looks forward to your response. Should you require any further information or wish to discuss the LVA please do not hesitate to contact me on my mobile 0408 015 185.

Yours sincerely

Bryan Beudeker
Manager Environment

Attachment: Licence Variation Application with Attachments A, B and C

Licence variation application – premises



This is an application to vary a premises-based activity licence issued under the *Protection of the Environment Operations Act 1997* ('POEO Act').

A variation includes the substitution, omission or amendment of an existing condition, or attaching a new condition to a licence. If a licence holder wishes to seek a variation to licence conditions, this is the application form to fill in.

The form provides for the following scenarios:

- undertaking a new scheduled activity or ceasing a scheduled activity
- deleting an activity covered by a water licence or adding a new activity to be covered by the licence
- changing the scale/capacity of an activity
- extending a scheduled development works licence to cover the next stage of the development works or converting it to a scheduled activity licence
- any other variations.

To complete this form you may need the *Guide to licensing* prepared by the Environment Protection Authority (EPA) and available at www.environment.nsw.gov.au/licensing/licenceguide.htm and/or *Waste Classification Guidelines* which are available at www.environment.nsw.gov.au/waste/envguidlns/index.htm.

If you need help filling out the form, please contact your nearest EPA office from the list at the end of this form.

Once completed and signed, the form should be sent to your nearest EPA office (as indicated at the end of this form).

1. Licence to be varied

1.1 Licence to be varied

Licence number	13036 – Colongra Power Station
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1.2 Name of current licence holder(s)

Full name(s) of licence holder(s)	Delta Electricity
ACN /ABN (if applicable)	ACN: ABN: 67 139 819 642

2. Changes to scheduled activities

If you have stopped undertaking a scheduled activity that is covered by your current licence, or propose to commence a new scheduled activity, you should advise the EPA. For more details on changing your activity type, please refer to Section 8.3 of the EPA's *Guide to licensing, part A*.

2.1 Adding a new scheduled activity

Write down the short descriptions of the categories of scheduled activity you would like added to the licence for your premises. These are listed in Schedule 1 of the POEO Act available at www.legislation.nsw.gov.au.

Description of scheduled activities	N/A

Please attach extra page(s) if more space is needed.

2.2 Deleting a scheduled activity

Write down the short descriptions of the categories of scheduled activity no longer conducted at these premises and that you would like deleted from the licence. These are listed in Schedule 1 of the POEO Act available at www.legislation.nsw.gov.au.

Description of scheduled activities	N/A

Please attach extra page(s) if more space is needed.

3. Changes to 'non-scheduled activity' licence

If you hold a 'non-scheduled activity' licence and you want to add or delete activities covered by that licence, you must advise the EPA.

If your activity fits the description of a category of activity listed in Schedule 1 of the POEO Act, it will need a Scheduled Activity Licence, and you will need to answer Question 2 instead of this question. Please refer to Schedule 1 of the POEO Act available at www.legislation.nsw.gov.au to check whether the activity is a scheduled activity.

3.1 Adding a new activity

Write down the short description of the any new non-scheduled activity(ies) proposed to be conducted at these premises and that you would like added to the licence.

Description of activities to be added	N/A

Please attach extra page(s) if more space is needed.

3.2 Deleting an existing activity

Write down the short description of any non-scheduled activity(ies) no longer conducted at these premises, and that you would like deleted from the licence.

Description of activities to be deleted	N/A

Please attach extra page(s) if more space is needed.

4. Fee-based activity

The licence administrative fee varies according to the classification and scale of your activity. Classification descriptions are found in Schedule 1 of the POEO Act while activity scales are found in Appendix 5 of the EPA's *Guide to licensing, part B* or Schedule 1 of the POEO (General) Regulation 2009 available at www.legislation.nsw.gov.au.

A change to the activity classification or activity scale may result in a change to your licence administrative fee. It may also result in a change in, or addition of, a load-based fee if the proposed activity has assessable pollutants as identified by the POEO (General) Regulation 2009.

4.1 Change to applicable fee-based activities

An addition or a deletion of a scheduled activity may result in a change to your fee-based activities.

The classifications used to determine licence fees can be found in Appendix 5 of the EPA's *Guide to licensing, part B* or Schedule 1 of the POEO (General) Regulation 2009.

Please provide details of the applicable fee-based activities and scales of activities that your licence will cover **as a result of the change**.

	Fee-based activity classification after proposed variation	Activity scale after proposed variation
1	N/A	
2		
3		
4		

The EPA will notify you if there is an adjustment to your licence administrative fee.

4.2 Change to applicable fee-based activity scale/capacity

A change to the scale or capacity of your currently licensed activity may result in a change to your fee-based activity scale.

Please write down the fee-based classification of the proposed activity and the new activity scale in the space provided below, as shown in Appendix 5 of the EPA's *Guide to licensing, part B* or Schedule 1 of the POEO (General) Regulation 2009.

Please provide details of any **changes to the scale** of your **currently** licensed activities.

	Fee-based activity classification	Current activity scale	Proposed activity scale
1	N/A		
2			
3			
4			

The EPA will notify you if there is an adjustment to your licence administrative fee.

5. Scheduled development work

5.1 Scheduled development work – progression to next stage

If you hold a 'staged scheduled development work' licence and want to commence the next stage of work, please provide the information required below. You may need to provide extra documentation – refer to the conditions of your licence and Appendix 4 of the EPA's *Guide to licensing, part B*.

Please provide a brief description of the work to be conducted:

Description of activities	N/A

How many stages to the development work are there?	-----
--	-------

Which stage of the development work does this application relate to?	-----
--	-------

When will the next stage commence?	day/month/year
When will the next stage be completed?	day/month/year

You will need to apply to vary the licence if you conduct any further stages.

Please attach to this application any documents about the scheduled development work that are specified in Appendix 4 of the EPA's *Guide to licensing, part B* and list them in the table in **Section 8**.

5.2 Scheduled development work – change to a 'scheduled activity' licence

If you hold a 'scheduled development work' licence and you want to commence the scheduled activity, you will need to vary your licence to a 'scheduled activity' licence. You cannot start the scheduled activity until a 'scheduled activity' licence authorises it.

You may need to provide extra documentation – refer to the conditions of your licence and Appendix 4 of the EPA's *Guide to licensing, part B*.

Please provide the following information:

When will the activity commence?	day/month/year
----------------------------------	----------------

Please tick (✓) 'Yes' or 'No'.

		Yes	No
5.2.1	Will you still be completing some of the development work while carrying on the scheduled activity?	N/A	N/A

Please provide a brief description of the work that still needs to be completed:

Description of activities	N/A

When will the work be completed?	day/month/year
----------------------------------	----------------

Please attach to this application any documents about the scheduled development work that are specified in Appendix 4 of the EPA's *Guide to licensing, part B* and list them in the table in **Section 8**.

6. Details of other variations

Your licence can be varied by deleting or amending a condition, or substituting one condition for another.

Please provide details of any other proposed variations not covered previously in this application.

Licence condition number	Details of proposed change	Reason for proposed change
Condition L3.4	<p>Increase nitrogen oxides (NO_x) 100 percentile concentration limit for natural gas fuel on Licence Discharge Points 1, 2, 3 & 4 from:</p> <p><i>"50 milligrams per cubic metre"</i></p> <p>to</p> <p><i>"70 milligrams per cubic metre"</i></p> <p>(which is the permitted limit for Group 6 gas turbines in Schedule 3 of the POEO (Clean Air) Regulations 2010)</p>	<p>The Colongra power station (CPS) is an open-cycle 'peaking' generation plant, consisting of four 167MW dual-fuel gas turbines primarily powered by natural gas (as the primary fuel) and supplies electricity during peak demand periods.</p> <p>The reason for the proposed change to the gas NO_x licence limit is to allow for a reasonable margin for compliance when operating the CPS during start-up and between service intervals where the units have been idle, which is explained in more detail in Attachment A.</p> <p>It is important to note that with respect to the application to vary the NO_x limit there is <u>no</u> proposal to change the operating specifications or actual performance of the gas turbines with respect to the environmental impacts and performance predicted in CPS Project Approval.</p> <p>In addition, with the closure and decommissioning of the adjacent Munmorah Power Station (MPS) by Delta in 2012, there has been a substantial reduction in the total NO_x load in the local and regional airshed, which has delivered a corresponding improvement in local air quality since the original CPS environmental assessment was undertaken.</p> <p>Therefore, given (i) the operational specifications of the CPS gas turbines with respect to the original Project Approval will not change; and (ii) the closure of the adjacent MPS has delivered an improvement in local air quality, the proposed change to the CPS NO_x licence limit will have <u>no</u> additional impact on local air quality and an additional detailed air quality modelling study is not considered necessary.</p> <p>Increasing the NO_x limit removes potential future operating constraints by providing a reasonable margin for compliance, which is important for the ongoing commercial viability of CPS as a 'peaking' plant, particularly given the substantial decline in the electricity market since the commissioning of CPS in 2009.</p>
Condition M2.2	<p>Change pollutant "nitrogen dioxide" to "nitrogen oxides" and add a note on this Condition (similar to existing note in Condition L3.4); that reads:</p> <p><i>"Note: Nitrogen oxides means: Nitrogen dioxide (NO₂) or Nitric oxide (NO) or both, as NO₂ equivalent, as required by Protection of the Environment (Clean Air) Regulations, Schedule 5."</i></p>	<p>This change is consistent with terminology in licence condition L3.4 and makes it clear that all NO_x emissions (i.e. NO and NO₂) are to be monitored and reported as NO₂ equivalent, as required by POEO (Clean Air) Regulations.</p>

Please attach extra page(s) if more space is needed. – [Refer Attachment A](#)

7. Development consent

Please tick (✓) 'Yes' or 'No'.

	Yes	No
7.1 Have the proposed variation(s) listed above been the subject of environmental assessment and public consultation under the <i>Environmental Planning and Assessment Act 1979</i> ?		✓

If you answered '**Yes**' to this question, please attach a copy of the development consent.

If you answered '**No**' to this question, please tick (✓) the statement below that is correct.

A development application has been made to obtain development consent	
No development consent is necessary for the new activities	✓

If development consent is **not** necessary, please provide details indicating why:

Details	Delta applied to the Department of Planning & Environment (DPE) in November 2013 to vary the NOx
	limit in the original Project Approval (condition 2.8). The DPE indicated in its response to Delta on
	2/12/2014 (refer Attachment C) that before the Project Approval consent condition can be changed
	Delta is required consult with the EPA and seek a variation to the existing Licence condition, which is the
	purpose of this Application.

8. Supporting documentation

Appendix 4 of the EPA's *Guide to licensing, part B* provides details of the supporting documentation that is required when applying for a licence.

Please provide details of documentation included with this application.

	1. Attachment A - Licence Variation Application for Colongra EPL No. 13036
	2. Attachment B – Colongra 2014 Annual Stack Test Report
	3. Attachment C – 2013.12.02 Email from DPE re Application to vary Colongra NOx limit
	4
	5

Please attach extra page(s) if more space is needed.

9. Signature of licence holder

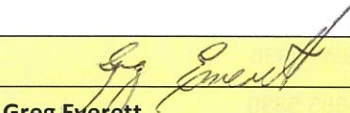
This application may only be signed by a person(s) with the legal authority to sign it. The various ways in which the application may be signed, and the people who may sign the application, are set out in the categories below.

Please tick (✓) the box next to the category that describes how this application is being signed.

If the proposed licence holder is:		The application must be signed and certified by one of the following:
an individual	<input type="checkbox"/>	the individual.
a company	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	the common seal being affixed in accordance with the <i>Corporations Act 2001</i> , or two directors, or a director and a company secretary, or if a proprietary company that has a sole director who is also the sole company secretary – by that director.
a public authority other than a council	<input checked="" type="checkbox"/> <input type="checkbox"/>	the chief executive officer of the public authority, or by a person delegated to sign on the public authority's behalf in accordance with its legislation (Please note: a copy of the relevant instrument of delegation must be attached to this application).
a local council	<input type="checkbox"/> <input type="checkbox"/>	the general manager in accordance with s.377 of the <i>Local Government Act 1993</i> ('LG Act'), or the seal of the council being affixed in a manner authorised under the LG Act.

I/We (the licence holder):

- **apply for the variation of the licence listed in Section 1**
- **declare that the information in this form (including any attachment) is not false or misleading in any material particular.**

Signature		Signature	
Name (printed)	Greg Everett	Name (printed)	
Position	Chief Executive	Position	
Date	8 July 2014	Date	

Seal (if signing under seal):

Additional information

1. It is an offence to supply any information in this form that is false or misleading in a material particular. There is a maximum penalty of \$22,000 for a corporation or \$11,000 for an individual.
2. Details of the licence application and licence will appear on the EPA's Public Register. The EPA can be asked by any person to provide reasons for refusing or granting a licence application.

Send this form to your nearest EPA office:

Metropolitan

Parramatta

Environment Protection Authority NSW
PO Box 668
PARRAMATTA NSW 2124

Phone: 9995 5000
Fax: 9995 6900

Wollongong

Environment Protection Authority NSW
PO Box 513
WOLLONGONG EAST NSW 2520

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Fax: 4224 4110

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ALBURY NSW 2640

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Bathurst

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BATHURST NSW 2795

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GRIFFITH NSW 2795

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Queanbeyan

Environment Protection Authority NSW
PO Box 622
QUEANBEYAN NSW 2620

Phone: 6122 3100
Fax: 6299 3525

Waste Operations

Environment Protection Authority NSW
PO Box A290
SYDNEY SOUTH NSW 1232

Phone: 9995 5000
Fax: 9995 5930

EPA 2012/0243
May 2012

ATTACHMENT A

LICENCE VARIATION APPLICATION FOR COLONGRA EPL NO. 13036 CHANGE TO NO_x LICENCE LIMIT FOR NATURAL GAS

Colongra power station (Colongra), an open-cycle 'peaking' generation plant consisting of four 167 MW dual-fuel gas turbines primarily powered by natural gas (the primary fuel), has been in operation since 2009 and supplies electricity during peak demand periods.

Colongra currently operates under Environment Protection Licence (EPL) No. 13036, with a NO_x limit of 50 milligrams per cubic metre (mg/m³) for each of the four units when operating on natural gas fuel. Being a 'peaking' plant, Colongra operates intermittently during the year and only for a few hours at a time (typically one to four hours), as peak demand dictates.

There has been no exceedence of the NO_x limit for natural gas fuel during the operation of Colongra since commissioning, with the turbines typically operating below the plant design emission limit (49 mg/m³) modelled in the Project Environmental Assessment (EA)¹ for which the Project Approval was granted, an extract of which is provided in Figure 1 below.

Table 10 provides information on the in-stack concentrations for the OCGT. These data can be compared with the amendments to the Protection of the Environment Operations (Clean Air) Regulation (POEO) (DEC, 2004). The OCGT pollutant concentrations were calculated from the mass emission rates and flow characteristics in **Table 9**.

Table 10 : In-stack concentrations for the OCGT

Pollutant	OCGT Normal operations (mg/Nm ³)		POEO limit (mg/Nm ³)	
	Natural gas fired	Distillate fired	Gas	Other
CO	3	21	-	-
NO _x (as NO ₂)	49	65	70	90
SO ₂	3	4	-	-
PM ₁₀	3	5	50	50

Figure 1: Extract from the EA Air Quality Impact Assessment Technical Paper No.4

Colongra stack emissions results are published on the Delta Electricity (Delta) website in accordance with the *Protection of the Operations Environment Regulations* (POEO Regulations), and also provided to the Department of Planning and Environment (DPE) in the Colongra Annual Environment Management Reports (AEMRs), in accordance with Project Approval condition 6.3.

A copy of the most recent annual stack compliance test undertaken between February and April 2014, where a maximum NO_x (as NO₂ corrected) emission level of 48 mg/m³ and 49 mg/m³ was recorded on two of the units, is provided in Attachment B.

¹ Munmorah Gas Turbine Facility Environmental Assessment, Air Quality Impact Assessment Technical Paper No.4:
<http://www.de.com.au/About-Us/Power-Stations/Colongra/default.aspx>

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REVIEW OF COLONGRA NO_x LIMIT

Delta takes its environmental compliance obligations very seriously and seeks to avoid breaches of its Environment Protection Licence (EPL) at all times. However, operating so close to the Colongra EPL limits leaves no margin for error and has caused Delta to review its operating regime at Colongra to ensure there is minimal risk of a licence breach being recorded in the future.

For the construction of Colongra, Delta secured a guarantee from the manufacturer to meet the 50 mg/m³ limit. In reviewing the recent stack NO_x emissions, Delta has confirmed that Colongra NO_x emissions are consistent with plant design and in line with estimated emissions as proposed in the original air quality impact assessment provided during the approvals process. However, having a licence limit of 50 mg/m³ at Colongra leaves no reasonable allowance for degradation between service intervals and peaking operations and therefore imposes potential operating compliance risks on Colongra.

In addition, the current gas NO_x limit imposes potential operating risks on Colongra during the limited peak demand operations because the instantaneous NO_x levels on occasion exceeds 50 mg/m³ for a brief period during start-up (by up to 5 mg/m³ to 10 mg/m³), whereby it is difficult for the operators to determine:

1. if an exceedence of the hourly average NO_x licence limit is imminent “while the plant is being brought up to normal operations following a period of inactivity”², given the units operate very close to the licence limit; and therefore
2. whether corrective action needs to be taken, which would require powering down the unit(s) to reduce the NO_x levels at times of peak electricity demand.

The alternative action is to maintain operation of the units in order to supply the peak demand, which typically only last one to four hours, and thereby risk a brief (i.e. < 1 hour), albeit it minor (< 10 mg/m³) exceedence of the NO_x emission limit, which Delta would be reluctant to do as this is inconsistent with Delta’s operating procedures as it could lead to a technical minor non-compliance of the licence. An example of NO_x emissions variation during a unit start-up is provided in Figure 2 below.

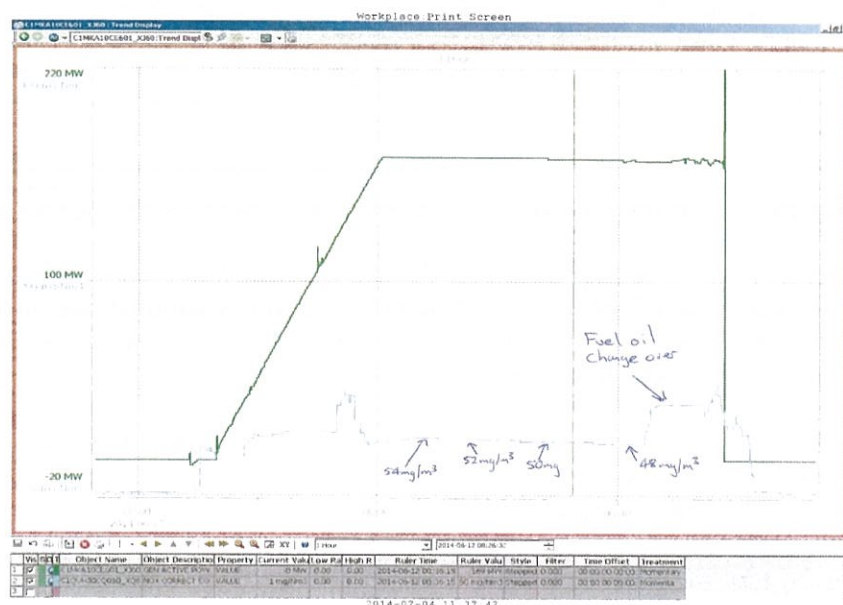


Figure 2: Example of NO_x emissions during Unit start-up

² 'Start-up' as defined in s56(a) of POEO (Clean Air) Regulations



REVIEW OF COLONGRA NO_x LIMIT

To support the request for an increase in the NO_x limit, Delta has also reviewed the ambient air ground level concentrations of NO₂ at the Lake Munmorah Public School and Wyee ambient air monitoring stations (AAMS), which have been operated and maintained by Delta in accordance with Munmorah and Vales Point EPL's) and are the nearest AAMSs to Colongra for which data are available.

Measurements at these sites for the two year period covering 2012 and 2013 are summarised in Table 1 and indicated that:

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

These results compares favourably with the NEPM 1-hour NO₂ goal of 12 pphm, whereby ambient NO₂ levels have been well below the ambient air NO₂ goal at all times.

Table 1: Monthly average and maximum 1-hour ambient NO₂ ground level concentrations

Station	Lake Munmorah Public School AAMS		Wyee AAMS	
Month	1-hour average NO ₂ (pphm)	Maximum 1-hour NO ₂ (pphm)	1-hour average NO ₂ (pphm)	Maximum 1-hour NO ₂ (pphm)
January 2012	0.27	1.65	0.31	2.11
February 2012	0.34	1.26	0.41	1.68
March 2012	0.37	2.46	0.42	1.70
April 2012	0.55	4.77	0.54	2.15
May 2012	0.87	3.35	0.61	2.28
June 2012	0.73	2.72	0.62	2.00
July 2012	0.57	2.60	0.56	1.84
August 2012	0.60	2.85	0.63	2.34
September 2012	0.59	3.08	0.65	2.86
October 2012	0.41	2.99	0.65	3.65
November 2012	0.38	1.40	0.51	3.22
December 2012	0.33	2.13	0.42	2.27
January 2013	0.34	2.74	0.50	3.95
February 2013	0.37	1.49	0.34	1.57
March 2013	0.45	2.01	0.38	1.74
April 2013	0.71	2.00	0.52	2.50
May 2013	0.81	2.30	0.61	2.10
June 2013	0.91	2.30	0.60	2.00
July 2013	0.93	2.50	0.68	2.40
August 2013	0.65	2.40	0.66	2.60
September 2013	0.59	2.19	0.69	3.25
October 2013	0.62	3.30	0.70	2.93
November 2013	0.51	2.08	0.54	2.88
December 2013	0.46	1.79	0.44	3.28



REVIEW OF COLONGRA NO_x LIMIT

In addition, with the permanent closure and decommissioning of the adjacent Munmorah power station by Delta in July 2012, there has been a substantial reduction in the total NO_x load in the local and regional air-shed, as Munmorah operated more frequently and with significantly higher NO_x emissions than Colongra. This permanent reduction in NO_x emissions will have delivered a corresponding improvement in local air quality since the original Colongra power station environmental air quality impact assessment was undertaken in 2005.

In summary, with respect to the environmental impacts and performance predicted in the original documents listed under condition 1.1 of the Colongra Project Approval:

1. Delta modelled NO_x emissions at 49 mg/m³ for the Colongra Project approval process;
2. The equipment manufacturer has guaranteed NO_x emissions for new plant of 50 mg/m³;
3. There is no proposal to change the operating specifications or actual performance of the gas turbines with respect to the original Project Approval;
4. Colongra is a peaking station operating intermittently, typically for no more than a few hours at a time to supply electricity during brief periods of peak demand;
5. The closure of the Munmorah power station in 2012 has subsequently removed a significant source of NO_x emissions in the local and regional air-shed;
6. The local ground NO₂ ambient air quality levels at the Delta ambient air monitoring stations in the vicinity of Colongra are significantly less than the NEPM goal; and
7. Delta will continue to operate the Colongra gas turbines to achieve optimum environmental outcomes as required by the EPL and Project Approval.

Therefore, given the above, it is requested that the EPA favourably consider Delta's request for an increased NO_x limit in Colongra EPL 13036, condition L3.4 to 70 mg/m³ (for natural gas fuel), a limit consistent with the POEO (Clean Air) Regulations for open cycle gas turbines, to allow a reasonable margin for compliance on the NO_x limit and thus remove future potential operating constraints during peak electricity demand operations, which is important for the ongoing commercial viability of Colongra, particularly given the substantial decline in the electricity market since the commissioning of Colongra in 2009.

Subject to approval being provided by the EPA, Delta will then complete the application to the DPE to obtain a modification to the Colongra Project Approval condition 2.8, as per Attachment C.

If you would like to discuss this issue in further detail or require more information, please do not hesitate to contact Bryan Beudeker on 0408 015 185.



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Our reference: **N92324**

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6 May 2014

Delta Electricity
 PO Box 7285
 MANNERING PARK NSW 2259

Attention Mr Paul Sorokin

COLONGRA POWER STATION

Emission Testing Report - FEBRUARY 2014

Tests were performed at the request of Delta Electricity to determine emissions to air as detailed below;

Test Summary		
Location	Test Date	Test Parameters*
Gas Turbine 1	9 April 2014	Nitrogen oxides (NO _x , NO and NO ₂), carbon dioxide, oxygen
Gas Turbine 2	25 February 2014	Nitrogen oxides (NO _x , NO and NO ₂), carbon dioxide, oxygen
Gas Turbine 3	26 February 2014	Nitrogen oxides (NO _x , NO and NO ₂), carbon dioxide, oxygen
Gas Turbine 4	26 February 2014	Nitrogen oxides (NO _x , NO and NO ₂), carbon dioxide, oxygen

* Flow rate, velocity, temperature and moisture were determined unless otherwise stated.

Please refer to the following pages for results, plant operating conditions, test methods, quality assurance / quality control information and definitions.

Heath Thatcher DipAppSc
Client Manager
 ad doc:n92324.doc

Melissa Reddan BAppSc
Compliance Manager



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RESULTS

Date	9/04/2014	Client	Delta Energy - Colongra Power Station
Report	N92510	Stack ID	Gas Turbine 1
Licence No.		Location	Doyalson
EML Staff	HT/MS	State	NSW
Process Conditions	Please refer to client records.		
Reason for testing:	Client requested testing to determine emissions to air		

Sampling Plane Details	
Sampling plane dimensions (mm) & area	6800 35.3 m ²
Sampling port size, number & depth	6" Flange (x4)
Access & height of ports	Fixed ladder 50 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 0.5 D
Upstream disturbance	Change in diameter 1 D
No. traverses & points sampled	3 54
Traverse method & compliance	AS4323.1 Non-compliant

Comments
Non-compliant sampling plane; the testing precision will be reduced
The downstream disturbance is <1D from the sampling plane
The upstream disturbance is <2D from the sampling plane
All results reported on a dry basis at NTP

Stack Parameters	
Moisture content, %v/v	5.5
Gas molecular weight, g/g mole	28.6 (wet) 29.3 (dry)
Gas density at NTP, kg/m ³	1.28 (wet) 1.31 (dry)
% Oxygen correction & Factor	15 % 1.04
Results	
Gas Flow Parameters	
Temperature, K	773
Velocity at sampling plane, m/s	38
Volumetric flow rate, discharge, m ³ /s	1400
Volumetric flow rate (wet NTP), m ³ /s	490
Volumetric flow rate (dry NTP), m ³ /s	470
Mass flow rate (wet basis), kg/hour	2.3 E+06

Gases	Sampling time	Average 1000-1100			Minimum 1000-1100			Maximum 1000-1100			Licence Limit
		Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	
Nitric oxide (as NO)		23	25	11	22	23	10	25	26	11	50
Nitrogen dioxide (as NO ₂)		11	11	5	9.2	9.6	4.3	12	12	5.6	
Nitrogen oxides (as NO ₂)		46	48	22	43	45	20	48	50	22	
		Concentration %			Concentration %			Concentration %			
Carbon dioxide		3.3			3.3			3.3			
Oxygen		15.3			15.2			15.4			

*Licence limit is concentration with 15% O₂ correction

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Date	25/02/2014	Client	Delta Energy - Colongra Power Station
Report	N92324	Stack ID	Gas Turbine 2
Licence No.		Location	Doyalson
EML Staff	DH/MS	State	NSW
Process Conditions	Please refer to client records.		
Reason for testing:	Client requested testing to determine emissions to air		

Sampling Plane Details	
Sampling plane dimensions (mm) & area	6800 36.3 m ²
Sampling port size, number & depth	6" Flange (x4)
Access & height of ports	Fixed ladder 50 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 0.5 D
Upstream disturbance	Change in diameter 1 D
No. traverses & points sampled	3 54
Traverse method & compliance	AS4323.1 Non-compliant

Comments
Base load stable 160MW
Non-compliant sampling plane; the testing precision will be reduced
The downstream disturbance is <1D from the sampling plane
The upstream disturbance is <2D from the sampling plane
All results reported on a dry basis at NTP

Stack Parameters	
Moisture content, %v/v	6
Gas molecular weight, g/g mole	28.6 (wet) 29.3 (dry)
Gas density at NTP, kg/m ³	1.28 (wet) 1.31 (dry)
% Oxygen correction & Factor	15 % 1.05
Gas Flow Parameters	
Temperature, K	780
Velocity at sampling plane, m/s	38
Volumetric flow rate, discharge, m ³ /s	1400
Volumetric flow rate (wet NTP), m ³ /s	480
Volumetric flow rate (dry NTP), m ³ /s	450
Mass flow rate (wet basis), kg/hour	2.2 E+06

Gases	Sampling time	Average 1411-1510			Minimum 1411-1510			Maximum 1411-1510			Licence Limit mg/m ³
		Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	
Nitric oxide (as NO)		27	28	12	25	27	12	28	30	13	
Nitrogen dioxide (as NO ₂)		<4.1	<4.3	<1.9	<4.1	<4.3	<1.9	<4.1	<4.3	<1.9	
Nitrogen oxides (as NO _x)		44	46	20	41	43	19	47	50	21	50
		Concentration %			Concentration %			Concentration %			
Carbon dioxide		3.4			3.1			3.5			
Oxygen		15.3			15.3			15.4			

*Licence limit is concentration with 15% O₂ correction



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Date	26/02/2014	Client	Delta Energy - Colongra Power Station	State	NSW
Report	N92324	Stack ID	Gas Turbine 3		
Licence No.		Location	Doyalson		
EML Staff	DH/MS				
Process Conditions	Please refer to client records.				
Reason for testing:	Client requested testing to determine emissions to air				

Sampling Plane Details			
Sampling plane dimensions (mm) & area	6800	36.3 m²	
Sampling port size, number & depth	6" Flange (x4)		
Access & height of ports	Fixed ladder	50 m	
Duct orientation & shape	Vertical	Circular	
Downstream disturbance	Exit	0.5 D	
Upstream disturbance	Change in diameter	1 D	
No. traverses & points sampled	3	54	
Traverse method & compliance	AS4323.1	Non-compliant	

Comments	
Base load stable at 160MW	
Non-compliant sampling plane; the testing precision will be reduced	
The downstream disturbance is <1D from the sampling plane	
The upstream disturbance is <2D from the sampling plane	
All results reported on a dry basis at NTP	

Stack Parameters	
Moisture content, %v/v	5.9
Gas molecular weight, g/g mole	28.6 (wet)
Gas density at NTP, kg/m³	1.28 (wet)
% Oxygen correction & Factor	15 %
Gas Flow Parameters	
Temperature, K	780
Velocity at sampling plane, m/s	37
Volumetric flow rate, discharge, m³/s	1400
Volumetric flow rate (wet NTP), m³/s	470
Volumetric flow rate (dry NTP), m³/s	450
Mass flow rate (wet basis), kg/hour	2.2 E+06

Gases	Sampling time	Average			Minimum			Maximum			Licence Limit
		1005-1105			1005-1105			1005-1105			
		Concentration mg/m³	O2 corrected mg/m³	Mass Rate g/s	Concentration mg/m³	O2 corrected mg/m³	Mass Rate g/s	Concentration mg/m³	O2 corrected mg/m³	Mass Rate g/s	
Nitric oxide (as NO)		18	18	8	15	15	6.6	20	21	9	
Nitrogen dioxide (as NO ₂)		8.4	8.7	3.7	7.5	7.8	3.3	9.6	10	4.3	
Nitrogen oxides (as NO _x)		36	37	16	31	32	14	40	41	18	50
		Concentration %			Concentration %			Concentration %			
Carbon dioxide		3.2			3.2			3.3			
Oxygen		15.2			15.2			15.2			

*Licence limit is concentration with 15% O₂ correction



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Test report prepared for Delta Electricity

Date	26/02/2014	Client	Delta Energy - Colongra Power Station
Report	N92324	Stack ID	Gas Turbine 4
Licence No.		Location	Doyalson
EML Staff	DH/MS	State	NSW
Process Conditions	Please refer to client records.		
Reason for testing:	Client requested testing to determine emissions to air		

Sampling Plane Details	
Sampling plane dimensions (mm) & area	6800 36.3 m ²
Sampling port size, number & depth	6" Flange (x4)
Access & height of ports	Fixed ladder 50 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 0.5 D
Upstream disturbance	Change in diameter 1 D
No. traverses & points sampled	3 54
Traverse method & compliance	AS4323.1 Non-compliant

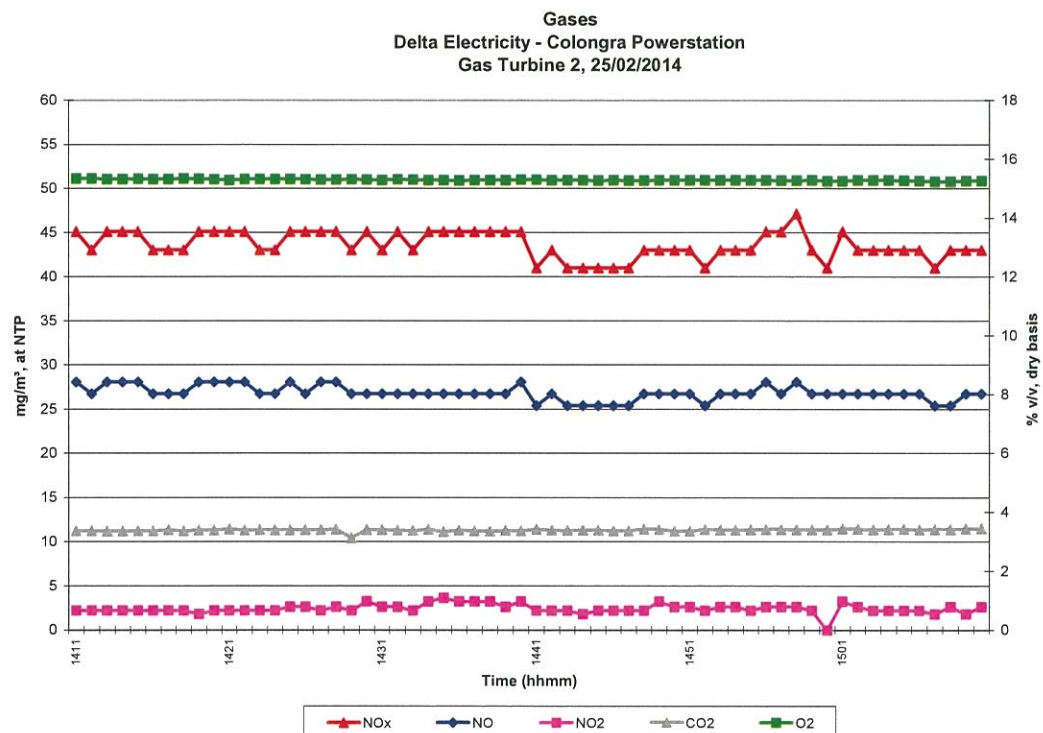
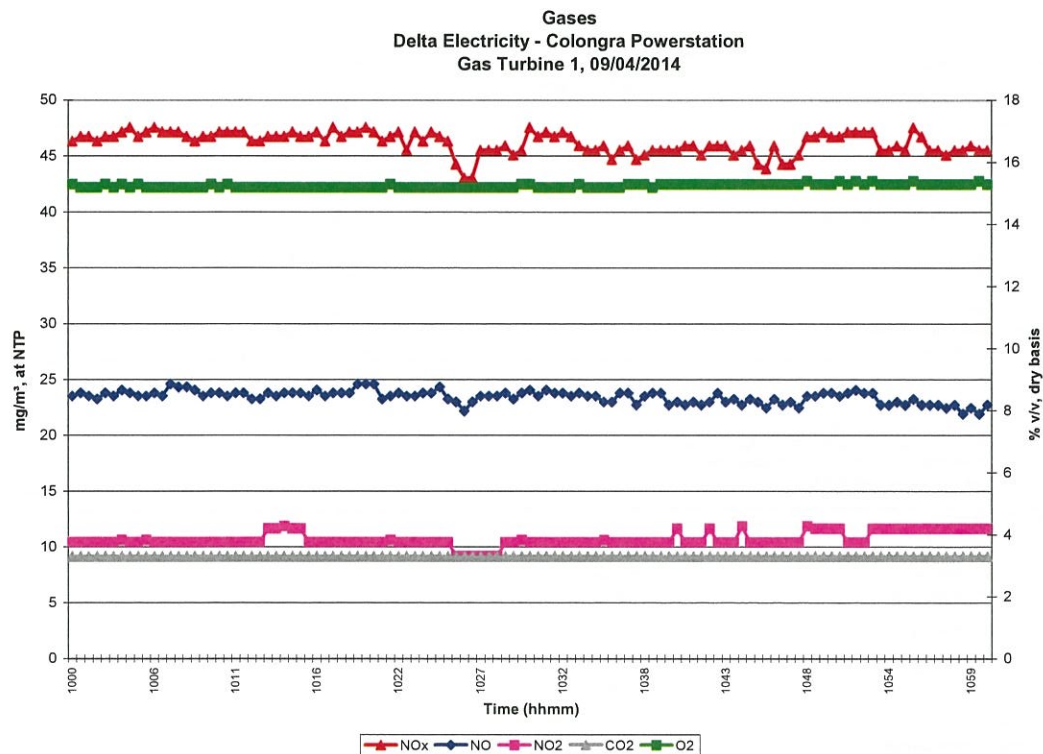
Comments
Base load stable at 160MW
Non-compliant sampling plane; the testing precision will be reduced
The downstream disturbance is <1D from the sampling plane
The upstream disturbance is <2D from the sampling plane
All results reported on a dry basis at NTP

Stack Parameters	
Moisture content, %v/v	5.5
Gas molecular weight, g/g mole	28.6 (wet) 29.2 (dry)
Gas density at NTP, kg/m ³	1.28 (wet) 1.30 (dry)
% Oxygen correction & Factor	15 % 1.06
Gas Flow Parameters	
Temperature, K	770
Velocity at sampling plane, m/s	36
Volumetric flow rate, discharge, m ³ /s	1300
Volumetric flow rate (wet NTP), m ³ /s	480
Volumetric flow rate (dry NTP), m ³ /s	430
Mass flow rate (wet basis), kg/hour	2.1 E+05

Gases	Sampling time	Average 1406-1506			Minimum 1406-1506			Maximum 1406-1506			Licence Limit
		Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	Concentration mg/m ³	O2 corrected mg/m ³	Mass Rate g/s	
Nitric oxide (as NO)		25	26	11	23	25	10	30	32	13	
Nitrogen dioxide (as NO ₂)		7.8	8.2	3.4	<4.1	<4.3	<1.8	12	13	5.2	
Nitrogen oxides (as NO _x)		46	49	20	41	43	18	55	58	24	50
		Concentration %			Concentration %			Concentration %			
Carbon dioxide		3.2			3.2			3.2			
Oxygen		15.3			15.3			15.4			

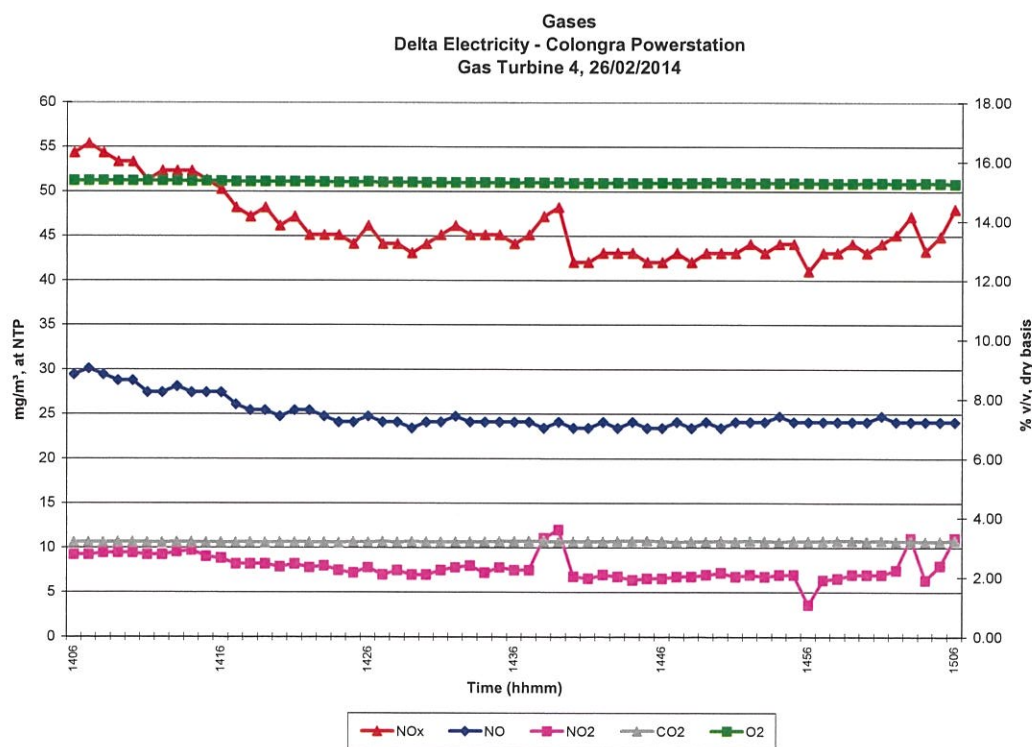
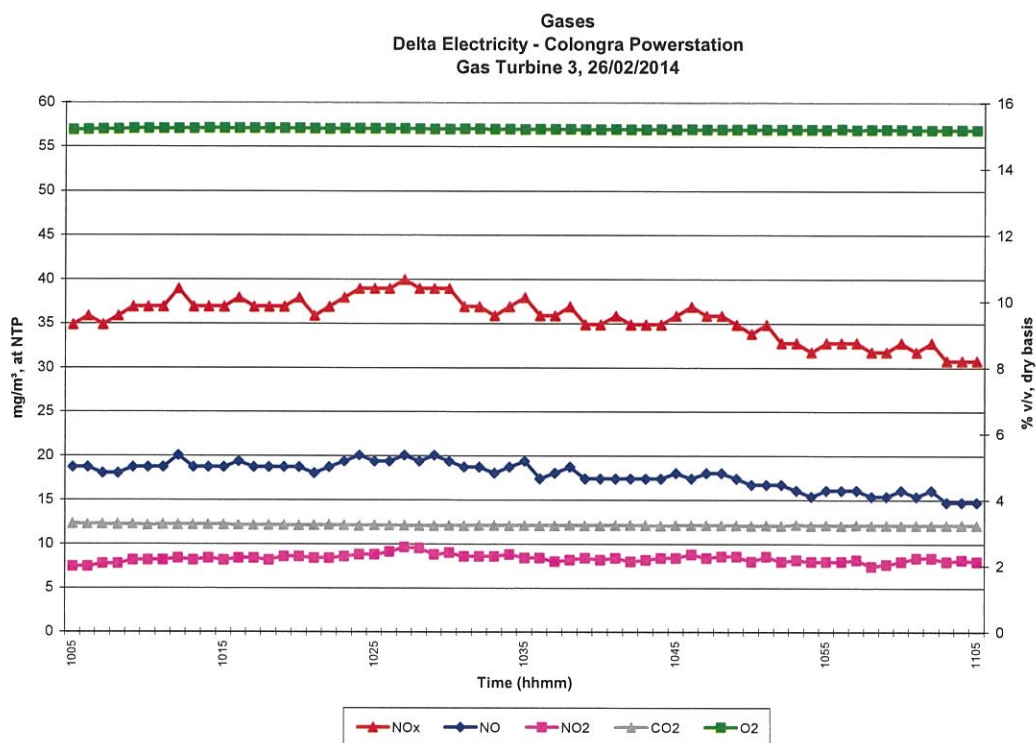
*Licence limit is concentration with 15% O₂ correction

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PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See Delta Electricity's records for complete process conditions.

TEST METHODS

Unless otherwise stated, the following methods meet the requirements of the NSW Office of Environment and Heritage (as specified in the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007). All sampling and analysis was performed by EML Air unless otherwise specified. Specific details of the methods are available upon request.

Parameter	NSW Test Method	Reference Method	Uncertainty*	NATA Accredited	
				Sampling	Analysis
Sample Plane Criteria	TM-1	AS 4323.1	-	✓	NA
Flow rate, temperature and velocity	TM-2	USEPA 2	8%, 2%, 7%	✓	NA
Moisture content	TM-22	USEPA 4	8%	✓	✓
Nitrogen oxides (NO _x)	TM-11	USEPA 7E	12%	✓	✓
Carbon dioxide	TM-24	USEPA 3A	13%	✓	✓
Oxygen	TM-25	USEPA 3A	13%	✓	✓

* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

AS – Australian Standard

USEPA – United States Environmental Protection Agency

QUALITY ASSURANCE / QUALITY CONTROL INFORMATION

EML Air Pty Ltd is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources (Accreditation number 2732). Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for EML Air at NATA's website www.nata.asn.au.

EML Air is accredited by NATA (National Association of Testing Authorities) to Australian Standard 17025 – General Requirements for the Competence of Testing and Calibration Laboratories. Australian Standard 17025 requires that a laboratory have a quality system similar to ISO 9002. More importantly it also requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Assurance Manager.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world-wide.

A formal Quality Control program is in place at EML Air to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.



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DEFINITIONS

The following symbols and abbreviations may be used in this test report:

NTP	Normal temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0°C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa, unless otherwise specified.
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
~	Approximately



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Beudeker, Bryan

Subject: FW: Colongra Gas-Fired Power Station : Part3AMod Application Received

From: Flood, Justin
Sent: Monday, 2 December 2013 4:27 PM
To: Beudeker, Bryan
Cc: Sharrock, Glenn; Morris, David; Hogg, David; Callan, Tony
Subject: FW: Colongra Gas-Fired Power Station : Part3AMod Application Received

From: Anna Timbrell [<mailto:Anna.Timbrell@planning.nsw.gov.au>]
Sent: Monday, 2 December 2013 2:46 PM
To: Flood, Justin
Cc: Neville Osborne
Subject: Colongra Gas-Fired Power Station : Part3AMod Application Received

Dear Justin

I refer to your Part 3A Modification application for the Colongra Gas-Fired Power Station to increase NOx emissions limit for natural gas.

Your application lacks sufficient detail to enable an assessment of your modification request. This includes:

- no details regarding the condition(s) you wish to modify;
- no justification for the proposed modification or discussion of the issues;
- no consideration of the environmental impacts of the proposed modification, and ways to mitigate the impacts;
- no evidence of any consultation with key agencies, including the Environment Protection Authority, nor any response form the EPA or other agencies.

The Department is unable to process your application until you have provided appropriate supporting information for review.

Should you have any queries regarding this, please do not hesitate to contact me.

regards
Anna

Anna Timbrell
Planning Officer - Infrastructure Projects (Energy)
NSW Department of Planning & Infrastructure | GPO Box 39 | SYDNEY NSW 2001
T 02 9228 6345 F 02 9228 6366 E Anna.Timbrell@planning.nsw.gov.au
(Monday, Tuesday, Thursday, Friday)

>>> <no-reply@planning.nsw.gov.au> 28/11/2013 3:03 pm >>>

Site Title:
Munmorah (Colongra) Gas-Fired Power Station
Job Title:
Modification to Project Application
Modification Description:

Amend the NOx emission limit for natural gas to allow for a reasonable margin for compliance due to the intermittent nature and short duration of operation of the gas turbines. Requested is a 100 percentile limit of 70 mgm-3 for NOx. The existing limit for NOx is 100 percentile 50 mgm-3.