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Attention: Mr Jeffrey Peng

ELECTRONIC MAIL
18 February 2022

Dear Mr Peng,

EPA Request for more Information on Environmental Impacts

Thank you for the request for advice from Public Authority Consultation (PAE-32670512), requesting the review by the NSW Environment Protection Authority (EPA) of the Environmental Impact Assessments for the proposed Second Thermal Oxidiser (Application DA246/96 MOD-4) at Terminals P/L, 45 and 51 Friendship Road, Port Botany (the premises).

The EPA has reviewed the *Statement of Environmental Effects Section 4.55(2) to DA 246/96, Second Combustor, Terminals Port Botany*, prepared by Urbis, undated (the Modification Report) which includes the following key appendices:

- Appendix D - HAZOP, prepared by Pinnacle Risk Management Pty Ltd, dated 28 October 2020;
- Appendix E - Preliminary Hazard Analysis, prepared by Pinnacle Risk Management Pty Ltd, dated 14 November 2020.
- Appendix F- Air Quality Assessment (Rev 4), prepared by Peter Ramsay and Associates dated 8 November 2021 (the AQIA)
- Appendix G - Waste Management and Impact Assessment prepared by Icubed dated 3 November 2021 (the WMIA)
- Appendix H - Waste Management and Heat Recovery Report, prepared by Quantem dated 11 August 2021 (the Waste Management and Heat Recovery Report)
- Appendix I - Technical Specification VOC and Liquid Waste, prepared by CEC dated 9 November 2021 (the Technical Specification)
- Appendix K - Response to EPA RFI, prepared by Ricardo dated 9 November 2021 EPA response

The purpose of this letter is to provide comments on the AQIA and on all sections of the WMIA, including the Comparative Assessment contained in section 3.7 and the Greenhouse Gas Comparison contained in section 3.8-3.11 of the WMIA. This letter replaces the EPA's letter dated 24 December 2021 (DOC21/1047479-10) which provided comments on the AQIA and some aspects of the WMIA.

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The EPA understands that the proposal is for:

- Installation and operation of a second thermal oxidiser (TO) and associated infrastructure at the premises, to combust liquid hydrocarbon waste generated at the premises.
- Demolition and removal of an existing liquid waste tank.
- Repurposing of an existing tank for use as a new liquid waste tank.

Activities undertaken at the premises are regulated by the EPA under Environment Protection Licence no. 1048 (the licence), issued under the Protection of the Environment Operations Act 1997 (the Act). Under Section 45 of the Act, in exercising its licensing functions, the EPA is required to take into consideration any pollution caused or likely to be caused by activities under the licence and the likely impact of that pollution on the environment.

The EPA notes that this proposal was previously submitted through 4.55(1A) of the Environmental Planning and Assessment Act 1979 as Modification 3 (Mod-3) and sent to the EPA for comment (PAE-11650633) on 30 November 2020. The EPA reviewed the previous AQIA (Peter J Ramsay & Associates, V1.2, November 2020) and discussed the issues in subsequent meetings with the proponents and the Department. A revised AQIA (Peter J Ramsay & Associates, V1.3, February 2021) (the revised AQIA for Mod-3) was submitted under Mod- 3 prior to its withdrawal. The EPA refers to the revised AQIA for Mod-3 in this advice.

The EPA has reviewed the AQIA and considers that the document does not clearly present the expected and modelled emissions for the proposal.

The AQIA submitted for Mod-4 is not significantly altered from the revised AQIA submitted under Mod-3. Although the predicted impacts do not exceed the impact assessment criteria and the benzene impacts from the proposed thermal oxidiser do not appear to significantly contribute to ground level concentrations, the AQIA lacks clarity and robustness in providing the emission parameters with the result that it hinders evaluation of the proposal. Specifically, the EPA has identified numerous inconsistencies with the flow rates, two sets of manufacturer emission concentrations and stack specifications. The EPA is unable to confidently ascertain that the predicted impacts remain valid considering the uncertainties identified in the AQIA. Further details are outlined in **Attachment A**.

The EPA has reviewed the WMIA and has determined that inadequacies remain within the WMIA. With respect to the comparative assessment and greenhouse gas comparison in the WMIA, the EPA's focus was on the technical aspects of the quantitative greenhouse gas assessment and comparison. Several issues were identified that bring into question to veracity of the greenhouse gas assessment.

The EPA notes the issues identified with respect to the greenhouse gas assessment are not expected to be critical with respect to deciding on the proposal, noting:

- 1) Many assumptions are required to assess greenhouse gas emissions and depending on the assumptions used, the outcome can vary significantly. Further the EPA does not object to developments based on greenhouse gas impacts due to the EPA's limited role in the regulation of greenhouse gas emissions.
- 2) Qualitative comparative assessment of environmental impacts across all environmental aspects is generally not used by the EPA to assess environmental aspects. Rather assessment of individual project specific environmental aspects and impacts against relevant legislative and other requirements is used.
- 3) The EPA's support of the onsite waste management option due to alternative offsite management options outside NSW not being considered sufficiently available or feasible, for this proposal.

Further details regarding the review of the WMIA are outlined in **Attachment B**.

If you have any questions in relation to this matter, please contact Afnan Fazli on (02) 8275 1415 or at Afnan.Fazli@epa.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Erin Barker'.

18 February 2022

Erin Barker
Manager Regulatory Operations
Regulatory Operations Metropolitan

Attachment A – EPA review of the AQIA for Mod-4

Inconsistent and unclear emission concentrations and emissions parameters

The AQIA states that the proposed maximum emission limit for benzene is 1 mg/m³, however provides manufacturer emission calculations at reference conditions in both Appendix E (1.7482 mg/m³) and Appendix G (0.3707 mg/m³) that differ. The methodology section of the AQIA says the worst-case scenario calculation is provided in Attachment G. However, the lack of a clear and consistent emission concentration in the AQIA causes uncertainty regarding the expected performance of the proposed thermal oxidiser.

Further, the flow rates provided are inconsistent throughout the AQIA. The flow rates provided at reference conditions for the proposed thermal oxidiser provided in both Appendices E and G is 19734 Nm³/hr (5.48 m³/s), however, the flow rate provided in Table 5 of the AQIA for inputs into calculated emission rates is 6.71 m³/hr and 5.5 m³/s in Table 8. Flow rates provided in the revised AQIA for Mod3 were 25.16 m³/hr (Table 5) and 25.16 m³/s (Table 8). Similar inconsistencies occur for the existing thermal oxidiser.

Additionally, there have been changes in the AQIA for Mod-4 compared to the revised AQIA provided to the EPA for Mod3. These include the modelling of both thermal oxidisers at the licence limit (existing for TO-1 and proposed for TO-2) of 1 mg/m³ for benzene in the Mod3 AQIA while using the manufacturer calculations in the Mod4 AQIA. The proposed thermal oxidiser stack diameter has also changed while the flow rates remain the same (Appendix E vs Appendix G).

Despite all these inconsistent and unclear emission concentration, parameters and emission rates, the predicted impacts (Tables 9, 10, 11 and 12, Figures F3, F4, F5 and F6) remain exactly the same as presented in the revised AQIA for Mod3. Figure F3 of the predicted impacts remain dated 10/2/2021 which indicates the model has not been updated to reflect changes made as outlined above.

While the predicted impacts are all below the relevant impact assessment criteria and may not materialistically change as a result of the identified emission changes, the AQIA for Mod4 does not provide enough clarity and robustness to evaluate this. Although difficult to ascertain, the information in the AQIA indicates that the impacts of the proposal may need to be remodelled.

In summary this issue could be a result of:

- a) The AQIA providing multiple manufacture emission calculations (Appendix E, Appendix G), without clarity on which calculations are representative of the proposed design; and
- b) Inconsistencies with the emission parameters outlined and adopted within the modelling, particularly given the provision of multiple manufacturer emission calculations (Appendix E, Appendix G).

Recommendation: The EPA recommends the AQIA for Mod-4 include clear and consistent emissions concentrations and parameters and the proponent confirm the emission parameters (concentration, flow rate and emission rates) that were modelled for both of the thermal oxidisers.

The EPA recommends that the proponent either confirm that the predicted impacts remain valid or remodel them using the correct and updated emission parameters. This should include modelling existing sources at licence limits, clearly outlining the expected emissions performance of the proposed thermal oxidiser in the main AQIA and correcting inconsistent or incorrect emission parameters.

Attachment B – EPA review of the WMIA for Mod-4

1) Thermal oxidation has not been demonstrated as a suitable and fit-for-purpose technology for the treatment of all the liquid waste generated onsite proposed to be treated this way

The application (Technical Specification s3.3) states that solid particles are assumed not to be present in the liquid waste stream. Solid particles present an issue to the treatment of liquid waste via thermal oxidation. In addition to the potential for solid particles to foul the TO and its critical components such as the liquid waste injection/spray nozzle, the TO has no flue gas filtering. Without flue gas filtering the TO has no control of particulates generated from the waste streams that it treats, and ash and solids can accumulate within the TO.

The application refers to the Quantem facility as an 'end of line' storage facility and import terminal that does not have the processing equipment to undertake liquid treatment technologies such as filtration (WMIA, s3.4.2/3.4.3). Liquid wastes generated at the site are proposed to be consolidated and collected in a single tank (T261) in order to produce a waste stream that is as homogenous as possible, noting the high variability and lack of chemical and physical homogeneity in Quantem's waste streams.

Wastes to be treated in the TO are categorised in the application (WMIA s3.2) as:

- a. Waste from routine operations, generated primarily from line cleaning and line changeover operations. The waste is stated to be liquid chemical waste and solvents used to flush the lines.
- b. Waste from environmental effects, generated primarily at road tanker gantries and consisting of potentially contaminated stormwater. The waste is stated to be typically contaminated with minor quantities of product that has collected on pavement such as small drips and spills associated with sampling and hose couplings in the gantry bays.
- c. Waste from routine and planned maintenance, generated from the emptying, inspection and cleaning of tanks. The cleaning is stated to involve solvents with steam and water washing, generating a mixed composition waste, that can include flammable base solvents, cleaning solvents and water, de-greasers, scale and general heavy sludge from tank bases.

Waste from environmental effects (road and stormwater runoff) and routine and planned maintenance (including accumulated scale and sludge from tanks) therefore will and do contain solid particles. The thermal oxidation of site liquid waste (consolidated in Tank T261) will also therefore result in the generation and emission of particulate matter – which as noted above may foul and damage the TO, as well as have environmental effects.

The application (WMIA, s3.4.6) also refers to a previous disposal pathway of the site's liquid waste at Cleanaway's Homebush facility, the first step of which involved the removal of solids by gravity settlement, skimming or coarse filtration, with the solids being disposed to landfill. The Cleanaway liquid treatment process is designed to manage the solid component of the liquid waste generated at Terminals, which the current proposal lacks.

Further to the above, the application (WMIA, s 3.2) refers to the site storing and managing chemicals including, corrosives. Although detailed information on the specific corrosives is not provided, corrosives refer to strong acids and bases which are inorganic chemicals, and which also readily dissolve other inorganic chemicals. However the application (*Technical Specification* s3.3) also states dissolved inorganic chemicals "which would form particulates and build up in the base of the thermal oxidiser or be carried out with the stack gases" are not assumed to be in the liquid waste stream. The EPA is concerned that the TO may not be suitable for the liquid waste stream that is proposed to be processed.

Recommendation: The EPA recommends that the proponent review the proposed liquid waste treatment technology to be employed and provide information to demonstrate the proposed liquid waste management strategy is suitable and fit for purpose, including for each waste stream and associated contaminants.

2) The current and proposed waste reduction and management strategies require implementing and further review to ensure waste avoidance is maximised and waste treatment is avoided or minimised.

The WMIA and the Waste Management and Heat Recovery Report provide information on management actions and controls used, implemented over the last 5 years and proposed to minimise liquid flammable waste generated at Quantem's Site A and Site C Terminal's at Friendship Road, Port Botany. The report states that Quantem considers the current generation of waste at these sites as minimised as far as practicable and concludes:

- a) Further separation of product to recycle is not feasible due to various miscible products;
- b) Filtration to recycle is not feasible; and
- c) Reuse is not viable due to the arrange of products handled and infrastructure requirements are not possible with the footprint required.

The report also refers to energy recoverable from the TO stack gases and heat recovery uses contemplated.

However, the EPA notes the waste reduction review in the Waste Management and Heat Recovery Report (s3) does not consider all potential control measures and strategies to avoid or minimise liquid waste generation. In particular, the report does not consider possible opportunities and measures to segregate liquid wastes, alternative disposal options for those liquid wastes and the potential associated benefits of doing this. Segregation of certain liquid wastes generated onsite may eliminate the need for the waste to be thermally oxidised and may enable the management/treatment of the waste via preferred and more environmentally sound liquid waste management techniques.

For example rainwater entering the loading bays is automatically pumped to flammable waste when it may be possible to utilise other methods and systems to manage, segregate and ultimately dispose of, predominantly rainwater runoff waste - which could then be managed via liquid waste treatment technologies, rather than through the TO.

Management of liquid wastes associated with product spills at loading bay gantries is also not considered separately, which could minimise the generation of mixed solvent and VOC waste streams. First flush and other liquid waste control methods and technologies are not referred to and therefore do not appear to have been considered.

The EPA also notes that a trial to separate flammable waste from water was undertaken by Stephenson Applied Services, however the trial was based on separation of consolidated mixed solvent wastes (generated from line cleaning, tank maintenance and related operations) – most being miscible with water and thus difficult to separate. Liquid waste generated at loading bay gantries however may be able to be managed for example on a batch basis thus potentially enabling the segregation of non-miscible solvent wastes and miscible solvent wastes.

Recommendation: The EPA recommends that the proponent review the waste reduction and minimisation strategies employed and proposed for liquid waste generated the site and provide further information to demonstrate all potential options including those relevant to waste segregation and more tailored individual or specific liquid treatment strategies that may be applied to different types/batches of waste have been considered.

A table outlining each liquid waste source, its composition, waste reduction and minimisation strategies, disposal options, preferred approach and the reasoning for this would assist in demonstrating that waste avoidance is maximised and waste treatment is avoided or minimised.

3) The application lacks clarity with respect to the location, quantities, movement and management of wastes to be treated by the thermal oxidiser and stored, and the activities that generate liquid waste streams associated with the proposal.

The application refers to Site A which includes where the new TO will be constructed, and Site C where no works are proposed and will form a part of a complying development certificate (CDC) (section 3.5 Modification Report).

The Modification Report (s7.2.5) refers to a reduction of truck movements between the two sites by one truck a week however does not provide further information on the relationship between the sites or activities undertaken on Site C.

The HAZOP (s2) refers to liquid waste being sourced from Site A and Site C, and the Waste Management and Heat Recovery Report (s2) describes “the operational areas on both Sites A and C that generate flammable waste”. The WMIA (s3.1) refers to Site C being dedicated to ‘ground fuels’ with no water-based line cleaning or flushing.

The EPA notes the waste origins/locations for the non-flammable waste streams is not provided in the WMIA or elsewhere in the proposal application.

The application notes the new TO will have a throughput of approximately 972 tonnes per annum (based on 6.5 L/hr at 10 hrs/day 5 days/week and 50 weeks/year – (Technical Specification s3.3) or maximum 2722 tonnes per annum per annum if operated more frequently and for a longer duration (based on 6.5L/hr at 20hrs/day 7 days/week and 50 weeks/year. This is stated to be “well in excess of the anticipated liquid waste stream volume” (Response to EPA RFI, s3.1). A summary of the annual throughput and waste generation data is provided in the WMIA (s3.1) however quantitative information specific to each waste stream and source is not provided.

Further information on the origin/location of wastes (ie site A or C and the source location for each waste) and their estimated quantities is required to verify the project’s design specifications are consistent with site operating conditions and scenarios, and subsequently to demonstrate the assessment of project impacts is adequate.

Recommendation: The EPA recommends that the proponent provide detailed information on the location, quantities, movement and management of wastes to be treated by the TO and stored onsite, and the activities that generate liquid waste streams associated with the proposal.

4) The use of thermal oxidisation at Quantem’s West Melbourne site and other locations is not demonstrated as consistent with the proposed use and NSW requirements

The WMIA notes (s3.5 and s3.6):

- a) Quantem operates a combustor at their West Melbourne site (since 2002) that undertakes thermal oxidation of VOC vapour streams, and from late 2007 onwards commenced thermal oxidation of the liquid waste stream from their site in addition to the vapour stream.
- b) The liquid waste stream processed at the West Melbourne site is of ‘comparable chemical composition’ to that proposed for thermal oxidation at Port Botany.
- c) The operational data from the West Melbourne site demonstrates no deleterious impacts from the introduction of the liquid waste stream, with the latest February 2020 test results showing a destruction efficiency of 99.99% for VOCs.
- d) With respect to best available techniques to treat the proposed liquid waste stream, thermal oxidisers that treat aqueous phase waste streams have been installed in facilities such as Queensland Alumina, APA Group, Leigh Creek Energy and Northern Oil Refinery.

The EPA notes the WMIA or other assessment documents do not provide any details of the West Melbourne plant (combustor), liquid waste and operational parameters or any direct comparison of the West Melbourne operations to the proposed TO and its operation at Port Botany. Therefore it is unclear if Quantem’s West Melbourne combustor also processes liquid waste from environmental effects (road and stormwater runoff) and routine and planned maintenance (including accumulated scale and sludge from tanks) that for example contain solid particles, are highly variable in physical and chemical composition, and may consist of close to 100 percent water.

The MWIA or other assessment documents do not provide details on the TOs installed at Queensland Alumina, APA Group, Leigh Creek Energy and Northern Oil Refinery and their operations and how they are applicable to the current proposal. The EPA however notes the circumstances and nature of the operation of these TOs are likely to be considerably different to that required at Terminals Port Botany, due to the differing nature of the operations, wastes generated and other factors. Consequently, it is not suitable or appropriate to use these sites to assist to demonstrate a thermal oxidation process is consistent with best practice for the current proposal.

The EPA also notes the required destruction efficiency for the TO operating at Port Botany is 99.9999%, due to the TO being used to treat air impurities originating from material containing principal toxic air pollutants such as benzene. However, the WMIA (s3.5) refers to a destruction efficiency of only 99.99% for VOCs in the latest testing results from the West Melbourne site combustor. Consequently, based on information gained from the West Melbourne site it is unclear if the proposed TO at Port Botany will be able to meet NSW air pollution control requirements.

Recommendation: The EPA recommends that the proponent provide further information on the use of thermal oxidation at Terminal's West Melbourne plant and elsewhere to demonstrate and support the proposed use of thermal oxidation alone to treat the proposed liquid waste streams, including predominantly aqueous wastes generated from environmental effects (gantry and storm water runoff), is consistent with current international best practice for the management of the proposed liquid wastes.

Review of the RtS Comparative and Greenhouse Gas Assessments (Sections 3.7 and 3.8)

1) The qualitative comparative assessment has been amended to identify relevant environmental aspects and impacts. Greenhouse gas emissions have been quantified however several issues have been identified with the assessment of these emissions.

The EPA notes the WMIA has been amended to identify environmental aspects and impacts associated with three scenarios being: the current process, waste treatment at an interstate cement kiln, and the proposed onsite thermal oxidation process. The WMIA (Section 3.7) also includes a brief discussion comparing the waste treatment processes/scenarios, and notes key positive aspects of the proposed onsite processing of liquid waste including:

- a) the proposal being simpler and involves fewer handling and transfer steps, which will result in reduced emissions;
- b) the proposal requiring fewer resources and less physical infrastructure;
- c) the proposal resulting in resource savings in the form of reduced fossil fuel consumed in transport;
- d) the proposal resulting in reduced noise and road transport pollution;
- e) the proposal resulting in a reduction in risk associated with loss of waste containment due to reduced handling and transfer steps;
- f) the proposal being more controllable due to no external parties or operations being involved; and
- g) the proposal having significantly reduced operational risk.

The EPA notes potential negative aspects are not included in the comparative assessment discussion.

Greenhouse gas emissions have been quantified and compared for each scenario and are considered favourable with respect to the proposal; however several technical issues have been identified with the comparative greenhouse gas assessment and are addressed in the points below.

Recommendation: See below points.

2) The greenhouse gas emission estimates should refer to emissions from the existing thermal oxidiser.

The EPA notes:

- a) The assessment of greenhouse gas emissions associated with the thermal treatment of gaseous and liquid waste generated at the site does not refer to emissions generated from the continued operation of the existing thermal oxidiser at the facility.
- b) The existing thermal oxidiser only treats gaseous vapours generated onsite. These emissions will continue to require treatment.
- c) Where the existing thermal oxidiser runs in parallel with the new thermal oxidiser, greenhouse gas emissions from both plant will require consideration.

The assessment (WMIA Section 1) states:

- the new thermal oxidiser will run in parallel with the existing oxidiser and is not intended to replace it; and
- the existing thermal oxidiser will continue to run on the site and is not nearing the end of its operation life.

Consequently, the EPA notes that emissions from the existing thermal oxidiser are relevant to the comparative assessment of existing and proposed project impacts.

Recommendation: The proponent include consideration of emissions from the existing thermal oxidiser in the comparative greenhouse gas emissions assessment.

3) Further information is required to justify and verify the estimations used to quantify greenhouse gas impacts.

The EPA notes the quantity estimates of aqueous and non-aqueous wastes, and in particular the ratio of these, are critical with respect to the comparative assessment between each treatment scenario.

The assessment of greenhouse gas impacts refers to a number of assumptions and values used to quantify waste amounts and emissions some of which lack detail or justification. For example, the WMIA (Section 3.8.1) refers to a total annual quantity of liquid waste of approximately 1000 tonnes, which is estimated to contain 30% aqueous phase and 70% oil/hydrocarbon phase. Of the oily/hydrocarbon phase, 15% is estimated to be water soluble hydrocarbons, and a further 10% would be 'drawn off as part of the gravity separation process'. The use of these values results in an estimated 475 tonnes per year of aqueous waste contaminated with soluble and emulsified hydrocarbons, and 525 tonnes per year of hydrocarbon waste, which are used to estimate greenhouse gas impacts.

The EPA also notes with respect to the applied assumptions:

- 1) it is unclear why the assessment refers to a 30% aqueous phase and 70% hydrocarbon phase when 15% of the hydrocarbon phase is water soluble and ends up being treated in the aqueous waste stream. The EPA notes the assessment refers to Cleanaway's liquid waste treatment process including hydrocarbon separation by gravity settlement, however the WMIA (Section 3.4.6) notes this step does not remove the water soluble components (presumably from the hydrocarbon phase). Thus it is also unclear if/when the removal of 15% of hydrocarbon phase as water soluble hydrocarbons from the hydrocarbon phase occurs.
- 2) the report refers to Cleanaway's process as including solids removal by gravity settlement, skimming or course filtration. However, it is unclear if or how this can result in a reduction of 10% of the hydrocarbon phase.

Recommendation: The proponent provide further information to clarify the basis of all assumptions used to estimate greenhouse gas emissions for comparative assessment purposes and to support the proposal.

4) Additional information is required to verify the estimations used to quantify greenhouse gas impacts.

Transport greenhouse gas emissions have been assessed using assumptions including 80% full load efficiency averages and 50% return trip efficiency averages (WMIA, Section 3.8). However the EPA notes it is unclear if and how these assumptions have been applied to the emissions calculations. Without detailed information on the assumptions and their application in calculations, it is not possible to verify the estimations used to quantify greenhouse gas impacts and assess the comparison between the relevant waste management scenarios.

Minor issue: The EPA notes a more current document *National Greenhouse Account Factors – August 2021* is available to the October 2020 version used in the greenhouse gas assessment. The EPA notes however the formula's, assumptions and default values used for emissions calculations relevant to the assessment have not changed between the two versions, so the use of the October 2020 factors is acceptable.

Recommendation: The proponent provide information to clarify the assumptions used for the comparative greenhouse gas emissions assessment.

5) The greenhouse gas emissions calculation for emissions generated from the treatment of aqueous waste at Cleanaway Homebush facility are not supported.

The EPA notes that the estimate of emissions associated with anaerobic treatment of aqueous liquid waste at Cleanaway Homebush is significant (3,631 tonnes CO₂ equivalent per annum) and based on this figure, the quantitative greenhouse gas assessment is used to demonstrate that the proposal will result in significant reductions in greenhouse gas emissions.

The EPA notes that a value of 10% is used for the level of anaerobic process at Cleanaway's Homebush liquid waste treatment plant for greenhouse gas assessment purposes. The value is the default value of COD in sludge for the treatment of organic chemicals referred to in the *National Greenhouse Accounts Factors – October 2020* (Table 29).

However Cleanaway has advised the EPA that the biological treatment at their Homebush liquid waste treatment facility is normally aerobic and consequently very little to no methane is produced during the biological treatment of aqueous liquid waste at the facility.

The EPA notes that the WMIA (Section 3.11) notes that 'many assumptions have been made to make a quantitative greenhouse gas comparison and a variation in these assumptions could alter the final assessment' and agrees with this statement.

The EPA notes that a revised greenhouse gas calculation based on site specific information of minimal methane emitted from the biological liquid waste treatment process at Cleanaway would not support the current conclusion that the proposal will result in a significant reduction of greenhouse gas emissions.

Recommendation: The proponent review the assessment of greenhouse gas emissions to consider and/or include site specific emissions information from Cleanaway.

6) The greenhouse gas emissions estimation for cement kiln operations is based on sub-bituminous coal use replacing liquid waste from Terminals' operations.

The proposal states (WMIA, Section 11) the environmental impact from onsite thermal destruction of liquid waste will be significantly lower than current practices, in particular associated with the reduction in greenhouse gas emissions.

To calculate and compare changes in emissions between waste management scenarios, the WMIA includes an estimate of greenhouse gas emissions from the cement kiln where the kiln no longer processes liquid waste (as a fuel) from Terminals. For this estimation, sub-bituminous coal was chosen as the alternative fuel as 'a coal grade typically used for electricity generation', and emissions were estimated to be only 56 tonnes per annum of CO₂ equivalent.

The EPA notes the choice of sub-bituminous coal as the alternative fuel appears to have resulted in a significant reduction (1,204 tonnes CO₂ equivalent per annum) in CO₂ equivalent emitted from the kiln compared to current use of liquid waste fuel produced onsite from Terminals' operations (1,260 tonnes per annum of CO₂ equivalent). Based on a like for like fuel replacement at the cement kiln, emissions associated with the operation of the proposed thermal oxidiser would close to double and thus change the findings of the greenhouse gas assessment.

Recommendation: The proponent review the assessment of greenhouse gas emissions to comment on the use of conservative assumptions with respect to fuel replacement for cement kiln operations.

7) The calculation of the emissions for the trucking of waste to Homebush is not included in the WMIA.

The greenhouse gas assessment results summary (WMIA, Table 8) refers to the baseline emissions scenario including trucking of waste to Homebush being 3 tonnes per year of CO₂-equivalents. Despite the greenhouse gas emissions contribution being small for this step, the EPA notes the calculation of this value does not appear to have been included in the Project WMIA.

Recommendation: The proponent ensure all relevant calculations used to quantify greenhouse gas emissions are included in the WMIA.

8) Clarification of controls for fugitive emissions from the storage of liquid waste is required.

The WMIA (Section 3.7) notes that as the proposed process involves fewer handling and transfer steps, this will lead to a reduction in VOC emissions due to reduced potential for fugitive VOC emission release. Nevertheless with respect to the onsite emissions, the EPA notes the additional storage of liquid waste onsite may result in additional localised gaseous emissions, including volatile organic compound vapours, from the filling and diurnal breathing of the proposed single 200 kL capacity tank (T261), if these emissions are not captured and treated.

The EPA also notes that it is unclear what controls will be applied to the proposed liquid waste storage. In particular, it is unclear if vapour generated from the collection and storage of liquid waste in tank T261 will be emitted as fugitive emissions or captured as a vapour waste stream.

Recommendation: The proponent clarify if emissions from the liquid waste storage tank (T261) will be captured and managed as a vapour waste stream.