Industry Assessments
Contact: Emma Barnet
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02 November 2016

Mr Garbis Simonian
Weston Aluminium Pty Ltd
PO Box 295
Kurri Kurri NSW 2327

Our ref: SSD 7396

Dear Mr Simonian

Proposed Thermal Waste Processing Facility
129 Mitchell Avenue, Kurri Kurri (Lot 796 DP 39877) (SSD 7396)
Response to Submissions

The exhibition of the Environmental Impact Statement for the above project ended on 24 October 2016. All submissions received by the Department during the exhibition of the project are available on the Department's website at the following location:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7396

In accordance with clause 85A of the *Environmental Planning and Assessment Regulation 2000* (Regulation), the Secretary requires you to provide a written response to each of the issues raised in a Response to Submissions (RTS) report. In addition, it is also requested you address the issues raised by the Department at **Attachment 1**.

Your RTS should include any revised management and mitigation measures, if considered necessary.

The Department is still awaiting a further submission from the Department of Primary Industries – Biosecurity which will be forwarded to you once received.

Note that under clause 113(7) of the Regulation, the days occurring between the date of this letter and the date on which your RTS is received by the Secretary are not included in the deemed refusal period.

If you have any questions, please contact Emma Barnet, Senior Planning Officer, Industry Assessments, on the details above.

Yours sincerely

C. Ritchie 2/11/16.

Chris Ritchie
Director
Industry Assessments
as delegate for the Secretary

cc: Simon Murphy, AECOM.

ATTACHMENT 1

The Department of Planning and Environment (Department) has reviewed the Environmental Impact Statement titled "Thermal Waste Processing Project" prepared by AECOM and dated 26 August 2016 (EIS) and have the following issues that need to be addressed in a Response to Submissions report:

Waste Handling and Storage

1. Provide a detailed justification that the proposed storage areas are capable of handling the proposed amount of wastes to be processed. In particular provide a visual representation of the amount of waste containers/bins which can be stored in the designated locations and an analysis of the sufficiency of the space based on maximum daily processing rates. Further, provide a list of the wastes which will require refrigeration and a justification as to the adequacy of the refrigerated area to store these wastes.
2. Provide details of the bunding to be provided in the storage areas.
3. The pre-shedding of waste process is unclear. Provide specific details of this process including:
    a. how the waste is transferred to the waste shredder;
    b. how the shredded waste is transferred to the waste loader and tippler;
    c. the specifications / design details of the shredder including if the process is proposed to be carried out under negative pressure; and
    d. detail the human exposure risks of the shredding process and the health and safety measures proposed to protect workers.
4. Provide details of the waste quarantine area for non-conforming wastes which are received which cannot be processed on site.

Biosecurity

5. Detail how biosecurity and quarantine laws will be adhered to during transportation and storage and any requirements under the *Biosecurity Act 2015.*

Wastewater

6. Provide details of any correspondence with Hunter Water regarding Trade Waste. In particular, will the gross pollutant trap (GTP) proposed be adequate to ensure waste water quality is to a suitable level for discharge to sewer through a Trade Waste agreement. Provide an alternative wastewater collection and disposal method should a Trade Waste agreement be unattainable.
7. How will the waste collected in the GTP be further processed?

Contamination

8. The "Phase One Contamination Assessment" (Appendix, H of the EIS) details that the site is potentially contaminated due to the existing and past uses. A stage 2 investigation is required to determine the extent and type of contamination on site (if any) to provide the Department with greater certainty in order to meet its requirements under *State Environmental Planning Policy 55 (Remediation of Land).*

Cumulative Impacts

9. Have the modelled scenarios taken into consideration the proposed expansion of the adjacent battery recycling facility under SSD 7520?

Flooding

10. As previously required, a quantitative assessment of the existing flooding on site and an assessment of the potential impacts of the proposal on flood behaviour in the locality shall be provided.
11. Risks associated with the mobilisation of hazardous goods as well as contamination of waterways in a flood event has not been adequately addressed.
12. Figure 15-1 on pg. 108 of the EIS shows the proposed building footprint in the incorrect location. As previously requested, please provide an updated map indicating the correct location of the building envelope with reference to the flood hazard.

Greenhouse Gases

13. As previously requested, provide a greenhouse gas (GHG) assessment.

Bushfire Protection

14. The proposal will be within the sites existing bushfire hazard reduction area. As previously requested, an image indicating the extent of the bushfire hazard reduction area shall be provided. Also, will the proposal require the clearing of additional vegetation to expand the hazard reduction area?

Traffic

15. An assessment of the parking needs of the existing facility and proposed development referencing RMS guidelines, Council policies and Australian Standards including plans has not been provided.

Community Consultation

16. The EIS, in Section 9.3 states that community and stakeholder engagement was limited to a single community consultation session which occurred in August of this year. The Department has received several public submissions regarding the development. The Department suggests that a further community consultation / information session be advertised to the community and held during the preparation of the RTS.

Hazards and Risks

17. Ensure that key hazard scenarios associated with the proposed processing facility are identified, proposed safeguards are adequate and demonstrate that the process will not impose a level of risk that will impact people and the environment in particular:
    a. Specifically in terms of combustion efficiency and its relation in preventing the formation of dioxins;
    b. t should be noted that the higher the combustion efficiency, the lower the dioxin output in the flue gas emissions;

c. Also the level of products of incomplete combustion in the discharge are less dependent on the emissions control equipment and more on the design and operation efficiency of the facility.

18. Identify safeguards, preventative controls for potential cross contamination of toxic and infectious substances across the stages of incineration; at loader and bin tippler, at waste loader, during shredding, primary combustion, ashing etc.
19. Cytotoxic material should not come into contact with normal living cells. Clinical manifestations of toxicity may not become evident for a period of time. All waste generated as a result of the use of cytotoxic drugs should be handled using special precautions. How is WA going to address these risks at all stages of; storage, handling, treatment and incomplete combustion emissions of Cytotoxic substances?

In order to achieve destruction of cytotoxic waste (Class 6.1) the incineration process must be capable of reaching a temperature of 1100C in the secondary chamber with a retention time of at least two seconds. Additional information should be provided to demonstrate that risks will not significantly increase for the following:

20. In the secondary combustion chamber, duel burners are being proposed utilising natural gas (NG) and waste oil. Waste oil can be high in viscosity and may require preheating and atomisation. Flame failure on a burner can reduce temperatures below 1100C and lead to products of incomplete combustion including carbon monoxide and trace organics including dioxins. The hazards and risks associated with the design, operation and control of the secondary combustion chamber duel fuel burner system efficiency are to be addressed.
21. Flue gas contaminants can include acid gases such as; nitric acid, sulphuric acid, hydrochloric acid and hydrofluoric acid. The main source of acid gases from biomedical waste incinerators is PVC used in disposable equipment. These flue gases from the thermal waste incinerator will depend on the incinerator type, design and combustion conditions and should be addressed.
22. Potential risk associated with exposure to cytotoxic waste released to atmosphere, if the bypass stack is activated in an emergency and cytotoxic waste is released directly from the secondary combustion chamber prior to complete incineration is to be identified, and potential preventative controls included.
23. The proposed thermal processing facility will be integrated with the existing facility emission control system (PHA, 5.1.2 Integration with existing operations). The PHA does not address the integration of the two separate waste processing gas streams and the potential hazards and risks associated with cross contamination and exceeding design utilisation rates, in the event that both streams operate concurrently. Emissions from Class 6.1 and Class 6.2 are different to emissions from processing of aluminium smelter wastes and aluminium scrap. Please provide further detail and information.
24. The risk of fire and explosion from hot exhaust gases (1100C) coming into direct contact with the activated carbon stream in Baghouse 5 has not been identified as a hazard. The secondary combustion chamber gases exit at 1100C, and are directed to Baghouse 5 for treatment with activated carbon prior to release to atmosphere. Further detail is requested on the proposed safeguards to prevent a mixture of hot gas and injected activated carbon causing a fire/explosion in the event of failure of the air treatment and cooling system.

25. The existing Baghouse 5 is to be used for emission capture and treatment of process emissions from the thermal waste processing plant. The existing dry-lime scrubber system is to be upgraded to incorporate an activated carbon dosing system, at the Baghouse entry point. Provide further detail for the proposed process of injecting activated carbon into existing scrubber, assessing hazards and safeguards.
26. Has impact from the proposed development to the nearest residence, located on land zoned rural (270m) to the north, been considered in this assessment and has it been considered as a receptor in the Air Quality Assessment or the HHRA?
27. Shredding of solid waste has been discussed, and the PHA states that liquid wastes will be thermally destroyed in the facility via a customised injection system. Please provide further detail on the interface of the customised liquid injection system with the waste loader, tipper and primary combustion chamber and identify any hazards and risks associated with this injection system.
28. The SEARs for the development required that a preliminary risk screening be undertaken in accordance with SEPP 33 and applying SEPP 33, including consideration of likelihood and consequences of exposure of the facility to flood events and if necessary a PHA.

    Flooding events have not been addressed in the PHA, no consideration has been provided within either the EIS or the PHA to mitigate the risk to the community posed by mobilisation of stored dangerous goods during a flood event.

    The PHA is to address the likelihood and consequences of the exposure of the facility to flood events including probable maximum flood, 1% annual exceedance probability and 0.5% annual exceedance probability. Risks to human health, structural damage to the proposed facility (significant mobilisation of stored dangerous goods) and the downstream waterway must be considered.
29. Only events that have onsite impact can be eliminated from future analysis. Those events that will be carried forward for more detailed analysis should be clearly identified in the Hazard Identification, Table A1 Appendix J EIS. Please review Table A1.
30. Please correct the following errors in the PHA.
    I. Under Section 5.1.2 "Integration with Existing Operations" pg 21 first paragraph,

    '*The proposed thermal processing operations at the WA facility (the Project), includes the construction and operation of purpose built equipment for the safe receipt, storage and processing of aluminium smelter wastes and aluminium scrap'.*

    II. Please check all Codes and Standards referenced in the PHA, and correct the following, *'Australian Standard 3813-2009 Industrial and Gas Fired Appliances'* to:

    Australian Standard 3814-2009 Industrial and Commercial Gas Fired Appliances.

DOC16/445196-19; EF13/3847

Department of Planning & Environment
GPO Box 39
SYDNEY NSW 2001
Attention: Ms Emma Barnet

emma.barnet@planning.nsw.gov.au

Dear Ms Barnet

REQUEST FOR COMMENTS AND RECOMMENDED CONDITIONS
WESTON ALUMINIUM PTY LTD – PROPOSED MEDICAL AND OTHER WASTE THERMAL PROCESSING (SSD 15_7396)

I refer to your email to the Environment Protection Authority (EPA), dated 5 September 2016, seeking the EPA's comments and any recommended conditions in relation to the proposed thermal processing treatment of medical and other waste at the Weston Aluminium Pty Ltd (Weston Aluminium) facility, Kurri Kurri, application reference SSD 15_7396. The project relates to Weston Aluminium premises licensed under Environment Protection Licence 6423, located at 129 Mitchell Ave, Kurri Kurri.

Reference is also made to the documents '*Thermal Waste Processing Project – Environmental Impact Statement – SSD_15_7396*' (EIS) dated 26 August 2016 and prepared by AECOM Australia Pty Ltd.

Based on the EIS the EPA understands the application proposes the construction of a dedicated waste thermal treatment plant including:

- Solid waste loader and bin tippler;
- Primary and secondary combustion chamber;
- Ash discharge system;
- By-pass stack;
- Waste bin washing machine;
- Associated infrastructure and safety management control upgrades at the existing Weston Aluminium Site to support the project; and
- Processing of the following waste products – clinical and related wastes, pathogenic substances, cytotoxic substances, waste from pharmaceutical products, solvents and pants, pitch sludge, quarantine wastes, illicit materials, and miscellaneous scheduled wastes.

Based on the information provided in the EIS the EPA is currently unable to provide any recommended conditions of approval for the project until the matters identified below are addressed.

Air Quality

The EPA has undertaken a detailed review of the EIS in relation to potential air quality emissions and has determined that further information is required before the EPA can adequately provide any

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recommended conditions of approval in relation to air quality matters. The EPA's detailed comments on air quality assessment matters are at **Attachment A**.

The EPA's key issues in relation to air quality are listed below. The Air Quality Impact Assessment (AQIA), provided at Appendix E of the EIS should be revised to include the following:

a) assess emissions based on the maximum potential process rate of the proposed thermal waste treatment plant;
b) provide robust justification of estimated emissions. As a minimum, reference should be made to manufacturers' performance guarantees and reference plant stack test data and reports;
c) include analysis of the composition of the expected feedstock, and emissions adjusted accordingly. Emissions from expected fuels types should also be incorporated into the analysis;
d) assess Aluminium, Barium and polycyclic aromatic hydrocarbon emissions;
e) assess VOCs from all scenarios, and reference the Regulation limit;
f) include an assessment of 10 minute averaged SO_2;
g) include a particle size distribution that is more representative of emissions from a baghouse;
h) consider maximum emissions, consistent with a worst case scenario for all emission sources at the premises;
i) consider 100th percentile model results for toxic air pollutants;
j) assess potential emissions from the burnout hearth and any additional emission sources not currently assessed;
k) demonstrate that all emission concentrations will comply with regulatory requirements prior to dilution with excess air;
l) review of modelling data including:
    i. justify 2014 as a representative year for modelling;
    ii. quantitatively evaluate meteorological model performance, including a statistical evaluation;
    iii. confirm the model setup and account for missing data; and
    iv. justify the adopted background air quality data.
m) provide a thorough and rigorous benchmarking of the proposal with best practice process design and emission control, including comparison with applicable best practice reference facilities. Where the proposed plant is not consistent with best practice, the project should be modified to adopt additional emission control;
n) ensure compliance with Protection of the Environment Operations (Clean Air) Regulation 2010 limits and Approved Methods impact assessment criteria for all pollutants at all times; and
o) provide the input and output files of any revised modelling data to adequately assess the revised model.

In addition to the air quality matters identified above, the EPA also requests the proponent address the following information:

1. <u>Primary Chamber</u>
    - The EIS does not appear to identify the combustion temperature.
    - The EIS does not provide specific information about combustion air (i.e. whether starved (sub-stoichiometric) or excess air (above stoichiometric) condition burning is carried out).
    - There does not appear to be sufficient information provided on monitoring temperature and oxygen levels during the burning process, if proposed.

2. <u>Secondary chamber</u>
    - No explanation has been provided about how the 2 seconds residence time is determined.
    - The EIS has not included the gas flow rate and volume of the chamber.
    - There is no information on monitoring temperature and oxygen levels during secondary burning process provided.

3. <u>Waste types</u>
    - The waste types proposed to burn include waste types that are likely to contain dioxins and furans precursor chemicals such as chlorobenzenes and chlorophenols. Burning of halogenated hydrocarbon containing wastes will greatly increase the potential for

dioxins/furan formation and such waste must not be burned unless very high levels of consistent process and procedural controls are set in place.

Please note that Officers of the EPA are able to meet with Weston Aluminium and its consultants to further discuss the detailed information requirements included in this letter. Should Weston Aluminium wish to arrange such a meeting, or require any further information regarding this matter, please contact Emma Paull on 4908 6828 or by email to hunter.region@epa.nsw.gov.au

Yours sincerely

24/10/16

MICHAEL HOWAT
A/Head Regional Operations Unit - Hunter
Environment Protection Authority

Encl: Attachment A – EPA's Air Quality Impact Assessment Review

ATTACHMENT A

EPA'S AIR QUALITY IMPACT ASSESSMENT REVIEW (SSD 15_7396)

The EPA has reviewed the EIS and specifically the report at Appendix E of the EIS titled '*Weston Aluminium Thermal Waste Processing Project – Air Quality Impact Assessment*' (AQIA), dated 26 August 2016 and prepared by Aecom Australia Pty Ltd. The EPA's detailed comments on the AQIA are provided below.

1. Processing rate may be underestimated causing underestimation of emission rates

According to the EIS, 8,000 tonnes of clinical waste are proposed to be treated per annum. Assuming continuous operations, this requires waste to be treated at a rate of approximately 913 kg/hr. Since the operations will not be continuous (the thermal treatment process will not operate when the reverberatory furnace is in operation), the maximum rate of waste treatment could be higher than 913 kg/hr. However, emission rates used in the AQIA have been calculated assuming that waste is processed at a rate of 800 kg/hr. On this basis, emission rates used in the AQIA may have been underestimated leading to an under prediction of potential impacts.

Recommendation: The AQIA should be revised to assess emission based on the maximum potential process rate of the proposed thermal waste treatment plant.

2. Emission data and assumptions not adequately justified

Emission rates have been estimated using USEPA AP42 emission factors for incineration of biomedical wastes in rotary kilns.

Calculations of the emissions have assumed all feedstock to the primary combustion chamber is biomedical waste. However, the AQIA states that the feedstock to the combustion chamber can comprise approximately 15% of quarantine wastes, and 10% of other wastes. Since the composition of the feedstock is not completely comprised of biomedical wastes, the emissions should be conservatively adjusted to account for the variable composition of the feedstock.

The EIS advises that the proposed design utilises technology that has been proven in installations throughout the world and is similar to incineration sites operating in Brisbane, Melbourne and Perth. *"The Project has utilised the same design and equipment vendor to capitalise on this knowledge to produce a plant that will be appropriate for Australian conditions and is known to both local customers and regulators".*

The Approved Methods Modelling advises that emission factors should only be adopted when there is no other information available or when emissions can reasonably be demonstrated to be negligible. Based on the above, the use of emission factors is not considered appropriate where other more refined emission data is available, e.g. manufacturers performance specifications and test results for reference facilities.

Recommendation: The AQIA should be revised to provide robust justification of estimated emissions. As a minimum, reference should be made to manufacturers' performance guarantees and reference plant stack test data and reports.

3. Dioxin emission have not been adequately justified

Dioxins and furans are assumed to be emitted at a concentration of 10% of the Group 6 emission concentration specified in the Protection of the Environment Operations (Clean Air) Regulation 2010. Justification for this was based on emissions data from Daniels Health Pty Ltd (formerly Sterihealth Pty Ltd), however, no details and nor the emissions data was provided. Additionally, the AQIA notes differences between the Daniels Health plant and the proposed Weston Aluminium plant.

The EPA notes that Table 2.3-16 SD/Carbon Injection/FF of the USEPA AP42 document for incineration of biomedical wastes specifies an emission factor for dioxins in rotary kilns. This emission factor results in a discharge emission rate that is approximately 6 times that of the emission rate used

in scenario 1 (expected emissions scenario) in the AQIA. In order to use the lower emission rate specified in the AQIA, a more robust justification should be provided.

The Approved Methods Modelling requires that dioxin and furan model results be expressed as toxic equivalent. The AQIA does not discuss toxic equivalent calculations, therefore it is assumed that results have not been expressed in this manner.

Scenario 2 (maximum emissions) adopts a 'pollute up to goal' approach to deriving the maximum allowable emission of dioxins. The adopted approach is inconsistent with the requirements of the Approved Methods Modelling, which requires that principal toxic air pollutants (including dioxins) be minimised to the maximum extent achievable through the application of best practice process design and emissions control.

Recommendation: The AQIA should be revised to provide robust justification of estimated emissions and results presented. As a minimum, reference should be made to manufacturers' performance guarantees and reference plant stack test data and reports.

4. Aluminium, Barium and polycyclic aromatic hydrocarbon emissions do not appear to have been assessed

Emissions of Aluminium and Barium do not appear to have been assessed. USEPA AP42 lists Aluminium and Barium as expected pollutants during biomedical waste incineration.

Emissions of polycyclic aromatic hydrocarbon (PAHs) have not been assessed. The EPA advises that based on the proposed process and waste streams, there is potential for PAH emissions to be generated. Further, it is a requirement of the EPA's Energy from Waste Policy Statement (EfW Policy) to assess emissions of PAHs.

Recommendation: The AQIA should be revised to assess Aluminium, Barium and polycyclic aromatic hydrocarbon emissions.

5. VOC emissions not adequately assessed

Emissions of VOCs have not been considered in scenarios 1, 3 and 4. The EPA advises that, where not adequately controlled, emissions of VOCs could be significant from a facility that thermally treats waste.

The assessment assumes VOC emissions as benzene but provides no justification for the assumption. The concentration limit for VOCs is quoted as being 40 mg/m^3. The correct Group 6 concentration limit is $20mg/m^3$, where the emission material being treated contains a principal toxic air pollutant.

Recommendation: The AQIA should be revised to assess VOCs from all scenarios, and reference the correct limit in the POEO (Clean Air) Regulation.

6. 10 minute average SO2 not modelled

The Approved Methods Modelling lists SO_2 criteria for 10 minute, 1 hour, 24 hour and annual averaging periods. The AQIA does not appear to provide model results for the 10 minute averaging period.

Recommendation: The AQIA should be revised to include an assessment of 10 minute averaged SO_2.

7. Particle size distribution not representative

The ratios between PM_{10} and $PM_{2.5}$ emissions does not appear to be consistent with Table 2.3-15 of USEPA AP42, and may not be realistic for emissions from a baghouse. This is also reflected in the ratios in ambient concentrations.

Recommendation: The proponent should ensure the particle size distribution used in the AQIA is representative of emissions from a baghouse system.

8. Existing sources modelled based on average emissions

The AQIA advises that existing emission sources at the premises were modelled using average source emission data. The use of average emission data is not consistent with the EPA's Approved Methods Modelling requirements to model maximum emissions. The use of average emissions may lead to an underestimation of impacts from the premises.

Recommendation: The AQIA should be revised to consider maximum emissions, consistent with a worst case scenario for all emission sources at the premises.

9. Partitioning of metal emission species not adequately justified

In Scenario 2, Type 1 & Type 2 substances have been partitioned assuming that all have the same emissions, which is 1/13th of the total Type I and Type 2 emissions (there are 13 Type 1 and Type 2 substances). This is considered too simplistic. The EPA notes that USEPA AP42 estimates Hg emissions to be approximately 87% of all Type 1 and Type 2 emissions for incineration of biomedical wastes. Thus, the estimation of Hg impacts will have been significantly underestimated using the current approach.

Recommendation: The AQIA should be revised using more realistic partitioning of Type I and Type 2 emissions.

10. Adoption of 99.9th percentile model results for dioxins not adequately justified

The AQIA adopts 99.9th percentile model results for toxic air pollutants. The Approved Methods provides guidance on interpreting dispersion model results. Model results for refined (Level 2) assessments should be compared against 99.9th percentile predictions, whilst Level 1 assessments should be compared against 100th percentile predictions. The Approved Methods describes a Level 2 assessment as a refined dispersion modelling technique using site-specific input data.

The EPA notes that the AQIA adopted not site specific input data including emission factors. Further, site specific meteorological observations do not appear to have been used.

Recommendation: The AQIA should be revised to consider 100th percentile model results for toxic air pollutants.

11. Potential emissions from the 'burnout hearth' not assessed

The EIS (page 28) describes a burnout hearth, where thermally treated waste / ash material is discharged from the kiln and are maintained for a period of up to eight hours to ensure complete burnout of all carbonaceous matter. The AQIA does not appear to consider potential emissions from this part of the process.

Recommendation: The AQIA should be revised to assess potential emissions from the burnout hearth and any additional emission sources not currently assessed.

12. Duel fuel combustion operation not assessed

The EIS (section 6) identifies liquid fuel as a possible fuel type for both the primary and secondary combustor. The AQIA does not discuss or assess any option for liquid fuel. The EPA notes that fuel type can significantly alter the emission performance of combustion plant for some pollutants. Where a range of fuels are proposed for use, assessment of potential emissions and impacts for all the proposed fuels should be undertaken.

Recommendation: The AQIA should be revised to assess all fuel types proposed.

13. Emission concentrations do not appear to have been demonstrated as complying with the Regulation prior to dilution

Page 30 of the EIS advises that *"Air leaving the heat exchanger is reduced in temperature by several hundred degrees and is then injected with ambient air until it reached temperature of approximately 160°C".*

Based on the above, emission concentrating will be diluted by a potentially significant margin prior to discharge at the stack. The POEO (Clean Air) Regulation requires that emission concentrations apply at the point prior to air being added to the air impurities.

Recommendation: The AQIA should be revised to demonstrate that all emission concentrations will comply with regulatory requirements prior to dilution with excess air.

14. Meteorology and background air quality data not adequately evaluated and justified as representative.

The meteorology used in the dispersion modelling was generated by TAPM and Calmet for 2014. The synthetically generated meteorological data was qualitatively compared to meteorological monitoring that was undertaken at the Hydro Aluminium site between January 2014 and September 2014.

The AQIA provides no analysis and discussion which shows that 2014 is a representative year for meteorology and dispersion.

The monitored meteorological data was not assimilated into the generation of the synthetic data. The synthetically generated meteorology data was qualitatively compared to the measured on-site data, and claimed to be acceptable. However, as pointed out in the AQIA, the measured data indicated a significant amount of calms when compared to the synthetic data. An assessment of the measured data to assess the calms, and to determine whether they are real, or whether they are a result of a limitation in the monitoring equipment, was not undertaken. If the calms are considered to be real, the synthetic data should reflect a higher frequency of lower wind speeds than what is currently used. The EPA notes that the site is in a shallow basin, and it is possible that the calms are real.

Additionally, wind roses presented for the modelled meteorology dataset show 8735 hours of data. There are 8760 hours in a standard year. No explanation of the missing hours has been provided in the AQIA. The EPA notes that missing observations are not applicable in this instance, where a synthetic dataset 'no-obs' was used, which indicates a potential error in the model setup.

The background air quality data used in the AQIA for the cumulative assessment was sourced from the Office of Environment and Heritage (OEH) Beresfield monitoring station for the year 2015. No justification for the adopted data is provided. The EPA notes that the selected meteorology year and the background air quality year are not consistent, this is an atypical assessment methodology that has not been defensibly justified in the AQIA.

Recommendation: The AQIA should be revised to:

- justify 2014 as a representative year for modelling;
- quantitatively evaluate meteorological model performance, including a statistical evaluation
- confirm the model setup and account for missing data; and
- justify the adopted background air quality data.

15. Control technology has not been benchmarked against best practice process design and emission control

The control technology proposed includes a baghouse (existing), a dry lime injection system, and injected activated carbon. The secondary combustion chamber is designed to provide a retention time of 2 seconds at a temperature of 1100°C.

While the EPA's Energy from Waste Policy is not absolutely applicable to the proposal, general principals, including requirement for international best practice emissions control are relevant and should be observed. This is consistent with the requirement of the EPA's Approved Methods Modelling, which requires that principal toxic air pollutants be controlled to the maximum extent achievable through the application of best practice process design and emissions control.

A comparison to best practice control technology for similar plant (reference facilities) was not undertaken by the proponent. Further, the AQIA does not discuss emission available control techniques including but not limited to:

- NOx control – SCR and SNCR
- Acid gas scrubbing – dry and wet scrubbing arrangements
- Dioxin control – rapid quench

The project proposes to utilise a continuous emissions monitoring systems (CEMS) for O_2, CO and CO_2 to monitor the efficiency of the combustion chamber. This is in accordance with the Energy from Waste Policy. However, in order to be fully compliant with the policy, the site should also monitor pressure and temperature in the discharge stack, as well as water vapour content, NO_x, CO, particles (total), total organic compounds, HCl, HF and SO_2 of the exhaust gas.

Recommendation: The AQIA should be revised to provide a thorough and rigorous benchmarking of the proposal with best practice process design and emission control, including comparison with applicable best practice reference facilities. Where the proposed plant is not consistent with best practice, the project should be modified to adopt additional emission control.

16. Proposed bypass stack emissions do not comply with regulation limits and assessment criteria are predicted to be exceeded.

A bypass stack is proposed for use during upset/emergency conditions. The EIS does not explain in detail why the bypass stack is necessary. As discussed above, a comparison to best practice, as well as standard industry practice, is required. The EPA discourages the use of a bypass stack if there are other alternatives.

Emissions were determined from the maximum design stack concentration design limits provided by Advanced Combustion Engineering Pty Ltd. The AQIA assesses potential impacts from the bypass stack as assessment scenario 4. Emissions of VOCs, Be, Se and V were not considered in the analysis of dispersion from the bypass stack.

The bypass stack is proposed to have emission concentrations in excess of the Group 6 emissions standards, as specified in Schedule 2 of the POEO (Clean Air) Regulation. The proposed discharge concentrations are listed in the table below. Specifically, emission concentrations exceeded the Group 6 concentration limits for TSP, HCl, Type I & II substances, Hg and dioxins.

Pollutant	Proposed Emissions Concentration (mg/m^3)	POEO (Clean Air) Concentration Limits (mg/m^3)
TSP	73.8	50
SO_2	61.4	-
NO_x	123.1	350
HCl	615.0	100
HF	6.19	-
Type I & II[1]	3.43	1
Cd	0.143	0.2
Hg	0.619	0.2
Cu	0.333	-
Dioxins	$9.29\ 10^{-4}$	$1\ 10^{-7}$

Note: [1] This did not include Be, Se, V

Predicted ground level concentrations of dioxins and furans due to emissions from the bypass stack are specified in units of $\mu g/m^3$. This is likely to be a typographical error, and the correct units are ng/m^3. If the predicted concentrations are in ng/m^3, then the predicted ground level concentrations are 4 orders of magnitude higher than the impact assessment criteria specified in the Approved Methods. If the units are $\mu g/m^3$ then impacts are predicted to be even larger.

Recommendation: The AQIA should be revised and the proposal redesigned to ensure compliance with POEO (Clean Air) Regulation limits and Approved Methods impact assessment criteria for all pollutants at all times.

CESSNOCK
CITY COUNCIL

PCU067726

21 October 2016

NSW Planning & Environment
Attention: Emma Barnet
GPO Box 39
SYDNEY NSW 2001

Contact: Janine McCarthy
Our Ref: AD2016/032521
Your Ref:

Dear Ms Barnet

State Significant Development 15_7396
129 Mitchell Avenue (Lot 796 DP 39877), Kurri Kurri

Thank you for the opportunity to provide comments in respect of the above State Significant Development (15_7396), for the purpose of installing and operating thermal processing equipment for the processing of medical and other wastes in conjunction with an existing facility ('Weston Aluminium') at 129 Mitchell Avenue, Kurri Kurri.

The proposal, including the associated EIS, has been reviewed by Council officers and considered by the Council at it's meeting of 19 October 2016. The following comments and recommendations are endorsed and provided for your consideration:

Comments

Cessnock Council is supportive of development that does not harm the environment or the local community but contributes to the stimulation of the local economy, particularly where development generates employment opportunities.

Notwithstanding the above, Council raises concern regarding the importation of waste from beyond the local government area. In this regard, it is noted that the application is inconsistent with Cessnock City Council's *Sydney Waste Policy W1.3*, which prescribes as follows:

> *Council not accept any Sydney Waste in the Cessnock Local Government Area and that such resolution become a policy of Council.*

It is noted that, on 15 September 2015, the Department approved two applications to modify the relevant approvals on the site; being Development Consent DA-86-04-01 (Mod 9), and NSW Land and Environment Court No. 10397 of 1995 (Mod 7), both of which are contrary to Council's *Sydney Waste Policy W1.3*.

Recommendations

Below is a list of recommendations that arise from aspects of the proposed development. These recommendations are provided for the Department's consideration. It is noted that, in the event the Application is approved, the recommendations could be imposed as conditions of consent.

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e council@cessnock.nsw.gov.au **w** www.cessnock.nsw.gov.au
ABN 60 919 148 928

Air quality

- Monitoring should be imposed to ensure that the pollutant discharge concentrations are below the allowable limits having regard to air dispersion modelling in the Air Quality Impact Assessment, the maximum allowable concentrations set out in the Protection of the Environment (Clean Air) Regulation 2010 and the Weston Aluminium's Environment Protection Licence. The waste that will be processed at the facility is unknown and may vary between waste types.

- In addition, a pollution incident management and response plan should be developed to deal with the potential situation whereby the pollution discharge level may exceed the allowable concentrations.

Human Health

- Within 12 months of the facility commencing operation, a Human Health Risk Assessment Validation Report should be carried out. The validation report should take into consideration any air quality and noise monitoring as well as any soil and water sampling carried out during the first year of operation. A copy of the validation report should be provided to the NSW Department of Planning and Environment, NSW Health and Cessnock City Council.

- An assessment of the surrounding land uses should be carried out every 2 years to ensure that the assumptions that have been made in the report titled Human Health Risk Assessment prepared by AECOM Australia Pty Ltd (Job No.: 60486360 Date: 26 August 2016), are still valid. A report of the assessment and any relevant updates to the Human Health Risk Assessment should be provided to the NSW Department of Planning and Environment, NSW Health and Cessnock City Council.

Contamination

- A stage 2 detailed site investigation should be required to determine the type and extent of contamination present on the site due to the uncertainty with regards to fill materials, elevated metal levels and potential for the migration of contaminants from neighbouring sites.

- Within 6 months of commencing operation of the facility, an acoustic validation report should be prepared and submitted to the NSW Environment Protection Authority and Cessnock City Council. The acoustic validation report is to determine if the operation of the facility complies with the project specific noise criteria set out in the submitted Noise Impact Assessment.

Community Engagement

- A Communication and Engagement plan should be develop to inform and manage any potential concerns from stakeholders (i.e. residents and neighbouring workers). Examples may include information sessions prior to the approval and or construction of the site to ensure that residents can obtain information from the relevant industry professionals.

Flooding

- Having regard to the nature of materials that will be processed on site and the risk to human health/environment, it is recommended that the building and all material

storage/processing activities be restricted to areas of the site that are beyond the Probably Maximum Flood event on the site.

Trade Waste

- As it is proposed to wash all bins in a designated wash bay and the wastewater discharged to sewer, a trade waste agreement will be required to discharge to sewer. If the applicant is unable to obtain a trade waste agreement, they would need to provide details of how the wastewater would be collected and the proposed method for disposal.

Car parking

- In accordance with *Chapter C1 Parking and Access* of the *Cessnock Development Control Plan 2010* (DCP), car parking is required at the rate of:

  1 space per 75 m^2 of gross floor area, or
  1 space per 2 employees (whichever is greater).

  In consideration of the above, the construction of a further 10 car parking spaces should be required to ensure the proposal complies with Council's DCP requirements.

Vehicular Access

- Consideration of access to the site should be made via a swept path analysis. In this respect, plans should be prepared that demonstrate that the internal access within the site is adequate to cater for the design vehicle (8.8m service vehicle).

Stormwater

- Stormwater disposal should be to a legal discharge point and conditions should be included to ensure the existing stormwater system has adequate capacity to cater for the additional stormwater discharge.

Crime Prevention

- The existing chain wire mesh fencing is relatively easy to breach. Consideration should be given to upgrading the site fencing to a type that provides greater security.

Thank you for the opportunity to provide comments in relation to the proposal.

If you require any further information and/or clarification in relation to this matter, please do not hesitate to contact myself directly on 02 4993 4194 or Council's Development Services Manager, Janine McCarthy on 02 4993 4254, during business hours.

Yours faithfully

Gareth Curtis
Director Planning and Environment

NSW GOVERNMENT | Office of Environment & Heritage

DOC16/445913-1
SSD 7396

Ms Kelly McNicol
Team Leader Waste, Industry Assessments
Department of Planning and Environment
Kelly.McNicol@planning.nsw.gov.au

Dear Ms McNicol

Weston Aluminium Medical and Other Waste Thermal Processing Facility, Weston

I refer to your letter dated 5 September 2016 seeking advice from the Office of Environment and Heritage (OEH) on the proposed Medical and Other Waste Thermal Processing Facility proposed at Weston (SSD 7396). OEH understands that the proposed thermal waste processing facility would have the capacity to process up to 8,000 tonnes per annum of medical, cytotoxic, quarantine and other schedule waste and security waste.

OEH has undertaken a review of the Environment Impact Statement (EIS) titled *Thermal Waste Processing Project Environmental Impact Statement – SSD 15 7396* (prepared for Weston Aluminium Pty Ltd by AECOM Australia Pty Ltd, dated 26 August 2016) in relation to threatened biodiversity, Aboriginal cultural heritage and flooding / floodplain issues. The EIS did not contain sufficient information on these matters for OEH to complete the assessment and provide recommended conditions of consent. OEH recommends that further information is obtained from the proponent. These matters are detailed in **Attachment A**.

If you require any further information regarding this matter please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4927 3154.

Yours sincerely

24 OCT 2016

RICHARD BATH
Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations

Enclosure: Attachment A

Locked Bag 1002 Dangar NSW 2309
Level 4/26 Honeysuckle Drive Newcastle NSW 2300
rog.hcc@environment.nsw.gov.au
ABN 30 841 387 271
www.environment.nsw.gov.au

ATTACHMENT A: OEH REVIEW OF PROPOSED THERMAL WASTE PROCESSING PROJECT, WESTON ALUMINIUM, WESTON (SSD 7396)

The proponent prepared an Environmental Impact Statement (EIS) (AECOM Australia Pty Ltd, 2016) following the Department of Planning and Environment issuing the Secretary's Environmental Assessment Requirements (SEARs) on 16 December 2015. OEH has reviewed this report in relation to threatened biodiversity, Aboriginal cultural heritage and flooding / floodplain management against the SEARs, including OEH's recommended input to the SEARs. These elements are discussed below.

THREATENED BIODIVERSITY

A specific requirement of the SEARs issued for this project is that biodiversity / threatened species aspects of the project are to be assessed under the NSW Biodiversity Offsets Policy for Major Projects. This includes the requirement to comply with the Framework for Biodiversity Assessment (FBA) (OEH 2014). As part of this process the EIS must include a Biodiversity Assessment Report (BAR), which assesses the impacts on threatened biodiversity. No such document exists within the EIS.

OEH acknowledges and concurs with the EIS that the site is disturbed and would provide limited habitat to threatened species, however, there is a specific process under the FBA which would halt further assessment. Section 3.3 of the FBA outlines when an assessment (based on a 'vegetation zone') does not require further assessment. However, under this pathway it does not preclude the provision of the BAR, as the inclusion of such a document in the EIS will show that due process has been followed and that an appropriate assessment has been undertaken following the FBA. This process will indicate if the subject site is devoid of biodiversity values. OEH acknowledges that the subject site likely provides minimal habitat to threatened species, however, there is still the potential for certain threatened species to utilise the site, particularly those known to utilise modified landscapes, such as the Green and Golden Bell Frog (which has been recorded nearby) and/or transient bird species. As such the appropriate assessment should have been undertaken in accordance with the FBA.

The FBA does not provide an exemption for removal of the BAR where projects are deemed to have no values due to current disturbance. OEH recommends the proponent conduct an assessment in accordance with the FBA and specifically provides a BAR. This assessment must be undertaken by an accredited person under section 142B(1)(c) of the *Threatened Species Conservation Act 1995*. OEH is unable to complete its assessment or provide any recommended conditions for consent for this project unless and until this additional information is provided.

ABORIGINAL CULTURAL HERITAGE

OEH has reviewed the Aboriginal cultural heritage desktop assessment contained in EIS. Based on this review OEH has identified the following concerns which need to be addressed prior to issuing recommended conditions of consent for Aboriginal cultural heritage management:

- Section 19 of the EIS contains a significant discrepancy on the site's assessed potential to contain potential archaeological deposits (PAD). The EIS notes the requirement for earthworks and states that the Weston Aluminium site is heavily disturbed or modified (AECOM 2016: pg. 141). In contrast, the EIS also states that earthworks are proposed "*... partially within an area not previously subject to significant modifications...*" and "*... therefore some residual potential for the Project to impact on unknown Aboriginal cultural heritage...items in this area...*" (AECOM 2016: pg. viii).

OEH requires an adequate assessment of the area of PAD be undertaken for this project and requests that the cursory due diligence assessment (provided) be escalated to a more robust Aboriginal Cultural Heritage Assessment (ACHA) that will identify the nature and extent of the identified area of PAD, and if relevant, a determination on the significance of any objects contained within it. The ACHA must be undertaken in accordance with the following Codes and Guidelines:

- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). OEH recommends following these requirements wherever there is any uncertainty a proposed activity could potentially harm any Aboriginal objects or places and the proponent is required to undertake a cultural heritage assessment.
  www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (OEH 2010). This document further explains the consultation requirements that are set out in clause 80C of the National Parks and Wildlife Regulation 2009. The process set out in this document must be followed and documented in the EIS.
  www.environment.nsw.gov.au/licences/consultation.htm.
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010). The process described in this Code should be followed and documented where the assessment of Aboriginal cultural heritage requires an archaeological investigation to be undertaken.
  www.environment.nsw.gov.au/licences/archinvestigations.htm

FLOODING AND FLOODPLAIN MANAGEMENT

Based on the information presented in the EIS the proposed development is designed for the purpose of hazardous waste facilities that transfer, store or dispose of solid or liquid waste classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste. These materials are considered too hazardous to dispose of to landfill and the facility would come under the provisions of SEPP 33 – Hazardous and Offensive Industries. The EIS highlights that the facility is needed because the wastes pose a hazard to human health and to the environment.

The project site is located 129 Mitchell Street Kurri Kurri. This site is affected by the 1% AEP (annual exceedance probability) flood event. (Swamp Creek Floodplain Risk Management Study and Plan, Worley Parsons, 2013) The existing building and site for the proposed building extension are below the 0.5% AEP and the whole of the operational area of the site is below the probable maximum flood (PMF). There is approximately five metres difference in level between a 1%AEP flood and a PMF flood in this location (approximately 0.8m difference in level between a 1%AEP and 0.5% AEP). Floods in excess of the 1% AEP flood have occurred in parts of this local government area in the recent past (2007 and 2015). There is no specific flood warning system for Swamp Creek and the peak flood is noted to occur in Abermain as little as six to nine hours after water starts to rise. This gives very limited time for emergency response procedures to be implemented on site.

Flood levels nominated in the Swamp Creek Floodplain Risk Management Study and Plan are as follows: 1% AEP 11.8m AHD, 0.5% AEP 12.6m AHD, PMF 16.8m AHD. Please note the 2000 year recurrence interval flood estimated for the adjacent development of battery recycling plant (SSD 7520) at approximately 13.8m AHD.

The EIS makes limited mention of flooding considerations simply stating that the development is an industrial development and is located above the flood planning level (1% AEP plus 500mm), therefore, will not be likely to suffer damage. Flood planning levels based on the 1% AEP are considered to be the appropriate planning level to apply for residential developments where other issues such as emergency egress can be addressed. Higher flood standards should apply for hazardous or offensive industries. The proposed storage facility comprises a metal shed located on a fill platform to achieve a floor level above the flood planning level of 1% AEP plus 500mm. Floor levels nominated for the facility are 12.55m AHD and 13.0m AHD respectively.

The EIS has not considered the impact on the facility or the environment for floods in excess of the 1% AEP flood. Reference to the Swamp Creek Floodplain Risk Management Study and Plan (Worley Parsons, 2013) indicates that flood waters will enter the proposed storage and processing facility in flood events between the 0.5% and 0.2% event. This means that for a service life of the order of 50 years the facility has approximately a 25% chance of experiencing floods at floor level or deeper. A

flood of 1 in 2000 year recurrence interval is likely to cause significant structural damage to the proposed facility together with significant mobilisation of stored goods. These risk factors are considered to be too high a risk without mitigation and have not been considered in the preliminary hazard assessment.

Fill is also proposed to be placed in the floodplain to enable the construction of the new sections of the facility. Fill in flood storage areas has the potential to increase flood levels in the vicinity of the proposed development. No assessment has been made in the EIS of the impact of this fill.

The facility uses Mitchell Avenue and Government Road as prime access routes to the Hunter Expressway. Bridges in both of these locations are closed by floods in excess of the 5% AEP flood. Alternative access routes would need to be considered during flood events. Access routes towards Government Road will be closed by flooding well before the facility is affected by flooding.

The goods proposed to be stored and processed within the facility are considered to be hazardous to human health and to the environment. No consideration has been provided within the EIS to mitigate the risk to the community posed by mobilisation of stored dangerous goods during a flood event in excess of the 1% AEP event. The large differential between the 1% level and the PMF level means that it is unlikely that adequate storage outside of/above the flood extent can be accommodated on site. Ash formed by the incineration process may also be mobilised by flood events.

The SEARs for the development required the following items to be addressed in the EIS:

1. A quantitative assessment of existing flooding on the site, potential impacts to and as a result of the development and proposed mitigation measures.
2. A preliminary risk screening undertaken in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) and applying SEPP 33, including consideration of likelihood and consequences of exposure of the facility to flood events and if necessary a Preliminary Hazard Analysis (PHA).

OEH considers that the EIS does not adequately address the above requirements. Therefore, OEH cannot recommend conditions of consent. The following flooding matters need to be addressed before OEH can complete its review of this project:

- the impact of any changes to the existing site topography including cut, fill and building construction is to be assessed by flood modelling for events up to and including the PMF. The site currently contains areas of flood storage which if filled may have off site impacts. The development must demonstrate that it will have no impact on flood levels outside of the site boundary
- the EIS must demonstrate how the risk of mobilisation of stored dangerous/hazardous goods will be managed in a flood event, up to and including the PMF event
- the EIS must demonstrate how the risk of contamination of waterways will be managed in the event of inundation of the site during flood events up to and including the PMF. This assessment must include both the dangerous/hazardous goods and the waste ash product
- under SEPP 33 requirements, hazard assessments are required. Hazard assessment should be undertaken in accordance with the Hazardous Industry Planning Advisory Paper guidelines provided by the NSW Department of Planning for Multi-Level Risk Assessment (www.planning.nsw.gov.au/Policy-and-Legislation/Hazards). Likelihood and consequences of exposure of the facility to flood events including the 1% AEP, 0.5% AEP, and PMF events must be considered. Risks to the facility (economic damages), risks to human health, the bio-physical environment and the downstream waterway must be considered.

References:

AECOM Australia Pty Ltd (2016) 'Thermal Waste Processing Project: Environmental Impact Statement – SSD_15_7396. Prepared for Weston Aluminium Pty Ltd. 26 August 2016.' AECOM Australia Pty Ltd, Warrabrook. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7396

DECCW (2010) Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/licences/archinvestigations.htm

OEH (2010) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/licences/consultation.htm.

OEH (2011) Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf

OEH (2014) *Framework for Biodiversity Assessment*. September 2014. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf

Worley Parsons, (2013) *Swamp/Fishery Creek Floodplain Risk Management Study*. Worley Parsons Services Pty Ltd, North Sydney.www.cessnock.nsw.gov.au/resources/file/OnExhibition/2013/Swamp-Fishery%20Creek%20FRM%20Report.pdf

OEH OCTOBER 2016

Hunter New England Local Health District
Hunter New England Population Health
Direct Contact Details
Phone: (02) 49246476 Fax: (02) 49246490
allison.garrett@hnehealth.nsw.gov.au

NSW GOVERNMENT | Health
Hunter New England
Local Health District

20 October 2016

Emma Barnet
Environmental Planning Officer
Department of Planning & Environment
GPO Box 39
Sydney NSW 2001

Dear Ms Barnet

Weston Aluminium Thermal Waste Processing Project (SSD 15_7396)

I refer to the Environmental Impact Statement (EIS) exhibited on the NSW Department of Planning & Infrastructure web site in relation to the Weston Aluminium Thermal Waste Processing Project (SSD 15_7396).

Weston Aluminium proposes to install and operate thermal processing equipment for the processing of medical and other wastes - including clinical, pharmaceutical, pathogenic and cytotoxic-related wastes, as well as solvents, pitch residues, documents and oily rags. The proposed thermal oxidiser and feeding systems will be established within the northern end of the site, utilising some existing plant infrastructure - including common emission control systems. Currently an Aluminium Dross and Spent Pot Lining recycling facility exist on-site. Operations are to occur 24 hours per day, 7 days per week, processing up to 8,000 tonnes per annum.

Hunter New England Population Health (HNEPH) has reviewed the Environmental Impact Statement (EIS) Report and associated documentation, paying particular attention to the management of air quality, noise, soil, water and other issues which may have an impact on human health.

HNEPH notes the emphasis in the Director General's Requirements on effective and genuine community consultation with active involvement of the community in this process. There is some sensitivity in the community associated with this development proposal. Human Health Risk Assessments (HHRA) are best conducted when members of the impacted community are recruited as equal partners in the HHRA team providing input and oversight of research questions, data collection, methods, analysis, interpretation, and communication of results. It will be important to bring community members into this process as soon as possible. HNEPH notes there has only been a single community consultation session thus far.

Hunter New England Local Health District
ABN 63 598 010 203

Hunter New England Population Health
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Wallsend NSW 2287
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Email HNELHD-PHEnquiries@hnehealth.nsw.gov.au
www.hnehealth.nsw.gov.au/hneph

HNEPH requires further information as detailed following in order to fully evaluate potential health impacts.

- HNEPH requires clarification as to whether operation of the Thermal Waste Processing Plant will occur at separate times to the processing of Aluminium Dross and Spent Pot Lining; or, if planned for simultaneous operation, whether cumulative emissions are accounted for in the EIS.

- The EIS states that if plant failure occurred and the by-pass stack was utilised then automated systems would shut down other elements of the plant and therefore, emissions from the bypass stack would largely be limited to those in the system at the time of the shutdown. HNEPH requires information on the period of time the bypass stack may need to operate and therefore the quantity of emissions.

- The waste streams that may be incinerated at this facility vary greatly. The types and volumes of substances to be processed are difficult to discern from the report. Because of this, the quantity and potential health impacts of emissions are difficult to estimate. A sensitivity analysis of best case and worse case waste stream scenarios would assist HNEPH's understanding of the potential health impacts. HNEPH understands that waste streams may vary over time and therefore emissions will vary. HNEPH assumes that EPA licences will set upper bounds for the frequency and quantity of selected waste streams. Clarification of how these variances will be managed from an operational and regulatory perspective would be useful.

- The level of Dioxins emitted appears to be significant, particularly during bypass operations. Whilst VOCs are considered, emissions from thermal destruction of hazardous chemicals, including paint, may result in higher VOC emissions than may be predicted from pharmaceutical wastes. Worst case (quantity/frequency) scenarios for Dioxins and VOCs should be explicitly explored in the EIS.

- HNEPH is of the understanding that incineration trials of illicit drugs and pharmaceutical wastes have occurred at Weston Aluminium over the past year. The results of these trials should be included in the submission to assist with the assessment.

- HNEPH notes that Table 2, Page 5 of the Air Quality and Odour Assessment showing the NEPM Ambient Air Quality Criteria for PM 2.5, is incorrect. The NEPM Ambient Air Standard for annual average PM2.5 is 8 $\mu g/m^3$ and the 24 hour maximum for PM2.5 is 25 $\mu g/m^3$. It is very important for the annual PM2.5 increment to be carefully modelled.

- The likelihood of project ozone impacts should be explicitly addressed.

Finally, all of the above comments need to feed into and be considered within a more community driven approach to the development HHRA as noted above.

Addressing the issues outlined above will result in a substantial amount of information that will require some time to evaluate. HNEPH requests that at least an 8 week period be allowed for review. Consultation between stakeholders during this time could expedite the review process.

If you require any further information please contact Allison Garrett, Environmental Health Officer on (02) 49246476

Yours Sincerely

Dr David Durrheim
Service Director- Health Protection
Hunter New England Population Health

Department of Primary Industries

OUT16/39211

Ms Emma Barnet
Infrastructure and Industry Assessments
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Emma.barnet@planning.nsw.gov.au

Dear Ms Barnet

Weston Aluminium Medical and Other Waste Thermal Processing Facility (SSD 7396)
Comment on the Environmental Impact Statement

I refer to your email of 5 September 2016 to the Department of Primary Industries (DPI) in respect to the above matter. Comment has been sought from relevant divisions of DPI. Views were also sought from NSW Department of Industry - Lands that are now a division of the broader Department and no longer within NSW DPI.
Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au.

DPI has reviewed the application and associated Environmental Impact Statement and advises that should groundwater be intercepted at any time during works, the proponent should contact DPI Water urgently via water.referrals@dpi.nsw.gov.au to discuss licensing requirements.

DPI has no further comments on this project at this time.

Yours sincerely

Mitchell Isaacs
Director, Planning Policy & Assessment Advice
21 October 2016

DPI appreciates your help to improve our advice to you. Please complete this three minute survey about the advice we have provided to you, here:
https://goo.gl/o8TXWz

Transport
Roads & Maritime
Services

24 October 2016

CR2016/004269
SF2015/185355
KAP

Infrastructure and Industry Assessments
NSW Department of Planning & Environment
GPO Box 39
SYDNEY NSW 2001

Attention Emma Barnet,

MITCHELL AVENUE (RR7766): SSD 7396, WESTON ALUMINIUM MEDICAL AND OTHER WASTE THERMAL PROCESSING FACILITY, LOT: 796 DP: 39877, 129 MITCHELL AVENUE, KURRI KURRI

Reference is made to the Department of Planning and Environment's (DPE) letter dated 5 September 2016, regarding the exhibition of the abovementioned application which was referred to Roads and Maritime Services (Roads and Maritime) for comment.

Roads and Maritime understands the development to be for the installation of thermal processing equipment at the existing aluminium recycling and refining facility. The new equipment will process and enable to thermal processing of medical waste and other waste.

Mitchell Avenue (RR7766) in this location is an unclassified (Regional) road. Council is the roads authority for Mitchell Avenue and all other public roads in the area with the exception of the M15 – *Hunter Expressway*.

Roads and Maritime response & requirements

Roads and Maritime has reviewed the information provided and raises no objection to or requirements for the proposed development as it is considered there will be no significant impact on the nearby classified (State) road network.

Advice to Consider

Roads and Maritime recommends that the following matters should be considered by the DPE in determining this development:

- Roads and Maritime has no proposal that requires any part of the property.

- DPE should ensure that appropriate traffic measures are in place during the construction phase of the project to minimise the impacts of construction vehicles on traffic efficiency and road safety within the vicinity.

- Consideration should be given to ensure appropriate sight line distances are available at the entry / exit from the subject site, in accordance with the relevant Australian Standards (i.e. AS2890:1:2004). The consent authority should be satisfied that the location of the proposed driveway promotes safe vehicle movements.

  Further to this, Roads and Maritime notes that there is no existing provision for through vehicles to pass vehicles turning right into the site. Consideration should be given to the provision of suitable intersection upgrade treatment consistent with the warrants in section 4.8 of *Austroads Guide to Road Design – Part 4A Unsignalised and Signalised Intersections.*

On determination of this matter, please forward a copy of the determination to Roads and Maritime for record and / or action purposes. Should you require further information please contact Hunter Land Use on 4924 0688 or by email at development.hunter@rms.nsw.gov.au.

Yours sincerely

David Collaguazo
A/ Manager Land Use Assessment
Hunter Region

Science Division	
For information	

Weston Aluminium Thermal Waste Processing Project (SSD 15_7396): C&R Review of August 2016 Human Health Risk Assessment	**SF16/53337; DOC16/608193**
	1 December 2016

Purpose

Office of Environment and Heritage, Contaminants and Risk Team comments in relation to the August 2016 Human Health Risk Assessment for the proposed Weston Aluminium Thermal Waste Processing Project (SSD 15_7396).

Analysis of issues / sensitivities

The Department of Planning & Environment has requested the Office of Environment and Heritage, Contaminants and Risk Team (C&R) provide comments in relation to the Human Health Risk Assessment (HHRA) for the Weston Aluminium Pty Ltd (WA) proposal to thermally process certain wastes, application reference SSD 15_7396 (the Project).

The Project consists of the construction and continuous operation of a waste processing facility that will thermally treat up to 8,000 tonnes per annum of medical and other generally problematic wastes at WA's existing facility in Kurri Kurri (the Site).

C&R has undertaken a detailed review of the Project HHRA (AECOM, 26 August 2016)[1]. The HHRA considers potential chronic and acute impacts on human health from Project related changes to air quality, noise, vibration, soil and water. The HHRA finds the estimated health risks to off-site residents, recreational users and commercial workers from exposure of air pollutants from all exposure pathways are low and acceptable.

However C&R has identified a number of issues with the HHRA that require amendment or clarification in order to ensure the assessment is robust, and consequently that potential human health risks associated with the operation of the facility are acceptable. Details of the issues identified from C&R's review of the HHRA are provided in **Attachment 1**.

C&R also notes the assessment of risks to human health is dependent on the accuracy of information and data provided in the Project Environmental Impact Statement (EIS), in particular the Project Air Quality and Odour Assessment (AQIA). C&R has not reviewed the AQIA in detail however notes this assessment has been reviewed by the Environment Protection Authority (EPA) – who identified numerous issues with the AQIA that prevented the EPA from recommending Project approval conditions. Consequently any amendment to the AQIA that changes information or data required to conduct the HHRA, based the EPA's review or otherwise, will also require amendment of the HHRA.

Recommendations

Prior to Project approval, Weston Aluminium address the issues identified in **Attachment 1**.

Approvals

CC:	Keith Osborne, Senior Team Leader - Contaminants and Risk	Click here to enter a date.
Contact:	John Klepetko, Senior Scientist	9995 6091

[1] *Human Health Risk Assessment, Weston Aluminium, Thermal Waste Processing Project* (AECOM, 26 August 2015).

Attachments

A.	Attachment A – Weston Aluminium ThermalDetailed review of August 2016 Human Health Risk Assessment

ATTACHMENT A: WESTON ALUMINIUM THERMAL WASTE PROCESSING PROJECT (SSD 15_7396): DETAILED REVIEW OF AUGUST 2016 HUMAN HEALTH RISK ASSESSMENT

1. The HHRA does not clearly consider and assess all potential Project health risks

The HHRA considers impacts to human health from potential impacts associated with the Project, specifically those associated with air quality and odour, noise and vibration, and soil and water.

Other potential impacts to human health are considered in the Project Hazard Analysis (HA) component of the EIS, such as impacts associated with:

- produced waste material (ash product and baghouse dust); and
- the transport, receipt and processing of wastes including infectious and pathogenic substances, quarantine and pharmaceutical wastes, flammable liquids, toxic substances, corrosive substances, pitch sludge residues and other dangerous/hazardous substances.

The HA assesses the above risks qualitatively against the risk criteria for land use safety planning in *Hazardous Industry Planning Advisory Paper No 4* (DP&E, January 2011). The HA notes the greatest potential for far field effects is associated with the evolution of toxic gas, though states this is not considered a credible scenario for the facility. In addition the HA notes that scenarios for potential toxic gas releases have been considered in the Project AQIA and HHRA, and that these studies found that consequences due to toxic releases were not significant.

However C&R notes that the toxic gases assessed in the AQIA and HHRA are associated with stack emissions from the proposed incinerator, rather than (as noted in the HA) the toxic gases in the air resulting from for example:

- vapours from toxic liquids;
- reaction of materials giving off toxic vapours or gases;
- other scenarios listed in Section 7.2 of the HA; or
- the transport, handling and processing of the hazardous materials included in Section 7.1 of the HA.

Recommendation: The HHRA and HA should be revised to clarify and demonstrate that all potential risks associated with the Project have been appropriately considered and assessed.

2. It is unclear if the HHRA is based on the most up to date technical reports

The HHRA states (Section 1.1) that it was written in conjunction with other technical report required as part of the EIS including the Draft Noise Impact Assessment, Draft Air Quality Impact Assessment, and Draft Soil and Water Assessment. C&R notes it is unclear if the draft assessments referred to include the most up to date data for the Project.

C&R notes that the AQIA and other assessments provide information and source data on which the assessment of health risks associated with the facility is based. Therefore the results of the HHRA depend on the data provided in the other assessments being up to date and correct.

Recommendation: The HHRA should be revised to clarify that the data used in the assessment is current and from the most up to date technical reports.

3. Critical parameters and assumptions regarding the facility and its operations are not adequately considered

A large number of assumptions have been incorporated in the HHRA to enable an assessment of potential human health risks. Critical assumptions used in the HHRA include those associated with estimating or defining: waste inputs, waste composition and processing, plant operation and performance, and to characterise emissions. Assumptions to assess maintenance, start-up, shut-down and upset conditions, where often measured data is limited, unreliable or unavailable, also require incorporation into the assessment.

C&R notes the HHRA does not provide details of the proposed facility or facility operations, or the associated factors and assumptions that must be considered to ensure the assessment is thorough and conducted properly.

C&R also notes that ongoing proper operation and maintenance of the facility will be required to ensure the assumptions incorporated into the assessment of facility impacts and health risk remain valid. Generally the assumptions used are based or depend on reliable, consistent and predictable operation and performance of the plant. Consequently all critical parameters and assumptions should be clearly identified, and potential variability and uncertainty associated with these should be comprehensively evaluated.

Recommendation: The HHRA should be revised to provide additional information:

- **on the facility and Project operations relevant to potential emissions and impacts;**
- **on the factors and assumptions used to ensure the assessment adequately addresses identified uncertainties and variability regarding the facility and facility operations; and**
- **to clarify the factors and assumptions used are robust and conservative with respect to the assessment of risk to human health.**

4. <u>It is unclear if all relevant and significant data gaps in the HHRA have been identified and appropriately evaluated</u>

Several data gaps which may impact the HHRA are discussed (Table 4). C&R notes however these do not appear to cover all the potential aspects where data is not available or complete and may significantly impact the HHRA. For example, emission data is not available that covers all likely plant operations / scenarios, and data is not available for use in assessing odour or fugitive emissions. With respect to emissions data, the HHRA notes that the assessment may need to be revised if prescribed limits or emission data become available in the future.

Recommendation: The HHRA should be revised to identify potential data gaps and their significance with respect to their impacts on the HHRA.

5. <u>It is unclear if the operating scenarios considered are appropriate</u>

The HHRA considers four operating scenarios defined as follows:

a. Scenario 1 - Normal Operating Conditions: a chronic health assessment associated with 'normal operating conditions' defined as the proposed plant operating continuously at a maximum capacity, and all existing on-site air emission point sources are modelled using average source data. Scenario 1 is stated to consider potential chronic health impacts associated with representative conservative conditions.

b. Scenario 2 - Stack Emission Limits: an acute health assessment defined as the proposed plant emitting air pollutants at Environment Protection Licence limits, and all existing on-site air emission point sources are modelled using average source data. Scenario 2 is stated to consider potential acute health impacts at infrequent maximum operating conditions at the site.

c. Scenario 3 - Battery Recycling Facility: a chronic health assessment of modelled emissions from the proposed adjacent battery recycling facility using high level design limit emission concentrations and continuous operation, added to the predicted maximum impacts in Scenario 1 to determine the cumulative impacts from both proposals. Scenario 3 is stated to consider potential chronic health impacts at worst case/unlikely operating conditions.

d. Scenario 4 – Emergency Bypass Operations: an acute health assessment that utilises the maximum discharge emission concentrations based on the design limits for the operation of the emergency bypass stack during upset conditions. Scenario 4 is stated to consider acute health impacts associated with upset operating conditions.

C&R notes in all scenarios <u>non</u>-Project site emission sources were modelled using average source emission data. The data from the non-Project related emission sources is not presented or discussed

in the HHRA and therefore it is not possible to evaluate the appropriateness of this data in the chosen scenarios for the assessment of chronic and acute health risks.

Recommendation: The HHRA should be revised to clarify the use of average source emission data for existing site emission sources is reasonable and conservative with respect to the assessment of human health risks.

6. It is unclear if all significant potential emission sources have been considered in the assessment

The HHRA identifies (Table 6) eight emission stacks as sources of potential contamination at the site, and states site operations including emission sources, air emission controls and potential emission concentrations are described in detail in the Project AQIA. However C&R notes that the AQIA does not clearly define or discuss the existing emission sources or emission controls at the site, or the potential new emission sources associated with the Project.

The project will comprise the construction of a new building which will accommodate waste material storage and primary combustion chamber inlet plant and equipment (EIS 6.1). In addition the Project will include installation and operation of a waste treatment system comprised of elements such as: waste shredder, waste handling facilities, solid waste ram loader system, and rotary kiln and associated plant and equipment. Wastes will be appropriately segregated and stored in dedicated locations within the building, with no waste stockpiles or waste stores in the open air. Storage is generally proposed to be in sealed delivery bins. The bin tippler and soil waste loader are located inside the building (EIS 6.4.6), and the loading hopper includes a lid to minimise air exchange between the hopper and open air environment.

C&R notes that the Project HHRA (or AQIA) does not consider odour generation or the potential for odour impacts associated with the materials proposed to be processed at the facility. In addition fugitive air emissions associated with the transport, receipt, handling and processing of waste are also not considered in the HHRA (or AQIA).

The EIS does not provide sufficient information to evaluate the potential for facility activities to result in significant impacts, such as waste preparation and shredding to generate odour or other fugitive emissions, or impacts associated with waste wash water of which up to 250 litres per hour will be generated during peak processing times (EIS 6.4.8 and 6.4.10).

Recommendation: The HHRA / EIS should be revised to clarify the potential significant emission sources associated with Project operations have been identified and assessed where appropriate.

7. It is unclear if the emissions considered in the assessment are appropriate

The EIS notes (Section 6.4.1) the Project is proposed to process a wide variety of wastes generally considered problematic due to their potential to cause harm to human or environmental health. The EIS provides a list of the proposed types of waste to be accepted at the facility (Table 6-3), however does not include a breakdown of the potential associated chemicals of potential concern (COPC) or hazardous substances that may be emitted either prior to or after the waste is incinerated.

The estimated waste volumes derived from known industry generation rates, though subject to demand and market factors, have been broken down to give an indicative estimate of: medical wastes 75%, quarantine wastes 15%, and other 10%. C&R notes however that insufficient information is provided in the EIS to be able to undertake further estimates or evaluations to better characterise the nature and amounts of COPC that will result from the waste received.

The EIS states the operation will have a maximum throughput of 800 kilograms per hour (kg/hr), based on the processing capacity of the plant. C&R notes that the EIS (Table 6-5) includes a maximum yearly waste throughput figure of 8,000,000 kg, which is approximately 14% higher than the value calculated based on the maximum throughput of 800 kg/yr. A total annual throughput value of 8,000 tonnes/year is utilised elsewhere in the EIS, for example in estimating the amount of ash generated each year (800 tonnes, based on a 10% waste to ash conversion ratio). C&R presumes this is a calculation error.

Recommendation: The EIS/HHRA should be:

1) **revised to clarify and include additional information to assist to demonstrate the emissions considered in the HHRA and EIS are representative of those that will result from the Project; and**
2) **reviewed and amended as appropriate, to address the yearly waste throughput value in Table 6-5 and elsewhere in the EIS.**

8. <u>The Project HHRA relies on information and data in other EIS documents being accurate</u>

The assessment of risks to human health is dependent on the accuracy of information and data provided in the Project Environmental Impact Statement (EIS), in particular the Project AQIA. Consequently any change to the EIS that changes information or data required by the HHRA will also require amendment of the HHRA.

For example, the Project AQIA and dispersion model outputs are used in the HHRA for the estimation of exposure point concentrations and to estimate health risks to residents and other receptors. The HHRA is critically dependent on this information being accurate.

C&R has not reviewed the Project AQIA in detail however notes a review of the HHRA will be required if the AQIA is amended, in order to incorporate and update the HHRA of any relevant changes.

Recommendation: The HHRA should be reviewed and revised as appropriate if an amendment is made to Project or EIS that is relevant to the assessment of risks to human health.

9. <u>It is unclear what modelling was undertaken for the considered operating scenarios</u>

C&R notes the HHRA states (Section 4.1.1) that only three of the four scenarios were modelled as a part of the AQIA, however it appears modelling was involved in all four scenarios:

1) modelling of project and other site emissions using average source emission data;
2) modelling of project emissions at EPL limits and other site emissions using average source emission data;
3) modelling of emissions from the proposed adjacent battery recycling facility; and
4) modelling of emissions at the design limits of the emergency bypass stack.

Recommendation: The Proponent clarify if three or four scenarios were modelled for use in the HHRA.

10. <u>It is unclear what ground level concentrations were used to assess chronic and acute impacts</u>

The HHRA adopts 24-hour maximum annual average ground level concentrations in the chronic health assessments (Scenarios 1 and 3). 1-hour maximum annual average ground level concentrations are adopted for acute health assessments (Scenarios 2 and 4) and in the sensitivity analysis of a chronic health assessment (of Scenario 1) to assess worst-case conditions.

C&R notes the HHRA does not clarify what is meant by 1-hour maximum annual average or 24-hour maximum annual average concentrations, however presumes this refers to the maximum value of the 1-hour (or 24-hour) averages that were predicted over a whole year. Overall the chosen exposure point concentrations to assess each scenario and relevant potential health impacts lack clarity.

Recommendation: The HHRA should be revised to clarify and justify the exposure point concentrations used to assess potential chronic and acute health effects.

11. <u>Dust deposition details are not provided</u>

The HHRA uses estimated annual average dust deposition rates for non-volatile COPC to determine what concentrations may deposit onto soil, relevant to the assessment of non-direct inhalation exposure pathways.

Limited details of the deposition modelling or deposition estimates are provided in the HHRA (Section 4.3). The deposition modelling assumed dry deposition only. The HHRA states that wet

deposition was not included as dust emissions from the site are expected to be low and the area does not receive high amounts of rainfall. C&R notes information to support this conclusion is not provided.

C&R also notes the HHRA refers to Appendix C for deposition rates, however Appendix C does not appear to include deposition information.

Recommendation: The HHRA should be revised to provide further information to demonstrate the deposition estimates are robust.

12. <u>The selection and characterisation of COPC is not adequately justified</u>

The COPC considered in the HHRA were sourced from the Site's EPL, US EPA emission factors AP 42 Compilation of Air Pollutant Emission Factors, and those measured from a 'similar' plant at Silverwater in NSW run by Daniel's Health Pty Ltd (formerly SteriHealth Pty Ltd).

C&R notes that details of the selection process for COPC are not provided. Due to variation in waste composition the characteristics of emissions may differ between waste management facilities despite similar plant or operational conditions. In addition due to the variability and uncertainty of waste materials and their composition, a wide range of potential contaminants and classes of contaminants requires consideration. Consequently a detailed and robust analysis of potential wastes and contaminants within these wastes, plant and operational processes, and related information (such as emissions data from other 'reference' plant or the literature – where available), is required to justify the identification and selection of potential chemicals of concern for the Project.

C&R notes the HHRA does not refer to potential COPC such as barium, silver, tin, zinc, molybdenum, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), hexachlorobenzene and individual volatile organic compounds, or other hydrocarbons or chlorinated compounds that may be present within the wastes to be processed, or that may be generated and emitted during the incineration process.

C&R notes a waste screening process is proposed to be implemented to avoid acceptance of waste containing for example radioactive materials, however the EIS does not clarify the effectiveness or demonstrate the adequacy of such screening processes.

Numerous COPC were not assessed for the four scenarios due to the absence of emissions data, or there being no prescribed limits for the relevant plant in the Protection of the Environment Operations (Clean Air) Regulation 2010. C&R notes that this generally does not represent a conservative approach to the assessment of potential health risks associated with human exposure to these COPC.

In addition it is unclear if the air pollution control process will utilise NOx control measures such as selective non-catalytic reduction (SNCR) which is commonly used to meet best practice requirements. If this is the case the generation and potential emission of ammonia should be considered.

Recommendation: The HHRA be revised to:

1) **clarify the potential chemicals and hazardous substances associated with the proposed wastes and those that may be emitted from processing these wastes;**
2) **provide details and further justification how the COPC were identified and selected;**
3) **justify why COPC were excluded from further consideration or assessment;**
4) **include discussion on the implications of uncertainties in COPC and COPC emission concentrations; and**
5) **demonstrate the HHRA has been conducted conservatively with respect to the COPC and emission concentrations used.**

13. <u>Transport pathways excluded from the assessment are not adequately justified</u>

The potential transport pathways for off-site migration of COPC considered in the HHRA are:

- release of vapour to ambient air from the facility stacks; and
- release of particulates to ambient air from the facility stacks.

The HHRA assumes that:

- all COPC are release as a vapour to assess the cumulative risk associated with emissions; and

- particulates released are deposited during dry conditions only.

The HHRA does not assess other transport pathways, such as leaching from soil to surface or groundwater, transport of leached contamination within groundwater, and volatilisation and vapour migration from subsurface media, as these are not considered to be significant.

Recommendation: The HHRA should be revised to include further information or references to support the exclusion of other potential contaminant transport pathways.

14. Unclear if future receptors have been appropriately considered

The potential off-site receptors identified, based on the surrounding land uses were:

- off-site residents;
- off-site commercial workers; and
- off-site recreational users of open space.

The modelled receptor locations are provided (Appendix A, Figure 5) however C&R notes it is unclear if emissions were modelled at and beyond the boundary of the facility where future sensitive receptors may be located.

Recommendation: The HHRA should be revised to clarify it has used input values relevant to:

- **future commercial receptors at relevant locations adjacent to the facility boundary; and**
- **future residential receptors around the facility.**

15. Assumptions used to evaluate and quantify exposure should be clearly presented and robustly justified

a. Assumed fruit and vegetable intakes

Off-site residents, due to the low density area around the site, were assumed to consume less than 10% of their fruit and vegetable intake from produce derived from their properties. However C&R note this value is not justified in the HHRA (Section 4.6).

b. Assumed poultry intakes

Off-site residents were assumed to keep poultry and ingest eggs from the kept poultry. However the consumption of poultry was considered unlikely and therefore this was not assessed.

Recommendation: The HHRA should be revised to include justification for assuming residents consume less than 10% of the fruit and vegetable intake from home grown produce. Other assumptions used to evaluate and quantify exposure should also be clearly presented, discussed and robustly evaluated and justified.

16. All COPC that are persistent and/or bioaccumulative should be considered in the multiple pathway assessment

Bioaccumulative and/or persistent chemicals are listed in Table 8, however not all the chemicals listed have been appropriately considered. For example all metals are persistent, however Table 8 does not include the metals antimony, beryllium, cobalt, copper, manganese, nickel, tin and vanadium as bioaccumulative and/or persistent.

C&R notes that apart from dioxin and furans, the COPC considered do not include other semi- or low-volatile organic compounds that are also persistent and/or bioaccumulative and that may be emitted from incinerator operations, such as PCBs, hexachlorobenzene and PAHs.

In addition, ATSDR notes COPC such as nickel and vanadium can bioaccumulate in some plants, however the HHRA does not provide any comment on whether there is any potential for this to be significant and therefore require further assessment.

Recommendation: The HHRA should be revised to include the correct information in Table 8 and provide additional information on the selection of COPC for the multiple pathway assessment, in particular semi- or low-volatile organic compounds other than dioxins and furans, and metals that bioaccumulate in some plants.

17. It is unclear if all relevant exposure pathways were considered and assessed

The multiple pathway assessment does not include risk from acute exposure such as resulting from upset conditions due to the infrequent and short duration of acute/upset conditions scenarios.

The chemicals present in soil around the facility have been considered for the following pathways:

- uptake by edible plants within roots and stems;
- uptake by backyard chickens who lay eggs that are consumed by residents;
- direct contact of surficial soils (and dust deposited on capped surface for commercial workers) – including both ingestion and dermal exposure; and
- uptake via all pathways detailed above by breastfeeding mothers and exposure to infants.

C&R notes the HHRA states that the assessment of potential exposure pathways has been undertaken in accordance with approaches and guidance provided in:

- Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (USEPA, 1989);
- Human Health Risk Assessment Protocol (HHRAP) for Hazardous Waste Combustion Facilities (USEPA, 2005); and
- Health Effects of Municipal Waste Incineration (Stevens, 1991).

With respect to accumulation of COPC in edible plants, root uptake and deposition onto outer plant surfaces have been considered, however the HHRA does not refer to or discuss air-to-leaf transfer which is noted in Stevens (1991) as potentially as, or more, important than root update as a source of plant contamination.

Recommendation: The HHRA should be revised to clarify and demonstrate appropriate exposure pathways were considered and assessed, including why air-to-leaf transfer was not considered as a means of accumulation in edible plants.

18. Clarification and justification of site conceptual site model (CSM) is required

The HHRA discusses the conceptual site model used for the site (Section 4.10) and states it has been prepared in accordance with Schedule B2 of the Assessment of Site Contamination (ASC) NEPM (2013). The ASC NEPM states that CSM can be useful to inform discussions with stakeholders regarding the investigation and management of potential and known contamination impacts, and that the complexity of the CSM should correspond to the scale and complexity of the contamination impacts. In addition, elements of a CSM include: known and potential sources of contaminants of concern, potentially effected media, relevant receptors, and potential and complete exposure pathways.

Other potential exposure pathways to those considered in the HHRA may include those relevant to farming and ingestion of drinking water.

The ASC NEPM also states that data gaps and uncertainties in the CSM should be assessed and for the CSM to address how representative the available data is, what the potential sources of variability and uncertainty are, and how important the identified gaps are to the assessment.

C&R note that Section 8 of the HHRA consists of an uncertainty and sensitivity analysis of the assumptions used in the air dispersion modelling, ingestion models, toxicity assessment, background exposure and human exposure parameters. However C&R note that although this analysis of uncertainty is relevant to the evaluation of the CSM, it is not directed specifically at the evaluation of the CSM.

Recommendation: the HHRA should be revised to provide further details of the CSM for the project, including potential pathways considered that may not be complete, or justification for pathways considered too insignificant for further assessment.

19. The screening criteria used to assess chronic exposure are not adequately justified

Table T1 in Appendix B shows the screening criteria selection process for chronic exposure. C&R notes that the selected chronic criteria is not always the criteria with the longest averaging period, as would be expected. For example the chronic criteria (for both residents and commercial workers)

selected for sulphur dioxide is the1-hour average value of 520 µg/m3, rather than the NEPM 1-year average value of 50 µg/m3. C&R notes it is unclear why this approach for screening has been taken as it does not appear to be consistent with the most conservative approach generally applied for Tier 1 screening assessment.

Recommendation: The HHRA should be revised to justify the screening criteria used for assessment of chronic exposure via the inhalation pathway.

20. Justification for the use of the selected screening criteria for lead is required

The chosen screening criteria for lead is the rather dated (1998) Ambient Air NEPM goal of 0.5 µg/m^3 as a yearly average. The HHRA (Table T1) also states the more recent (2015) US EPA RSL for residential air which is a significantly lower concentration of 0.15 µg/m^3. C&R note however the HHRA does not appear to justify the use of the higher (less stringent) value.

Recommendation: the HHRA should be revised to justify the use of the chosen criteria for lead.

21. Clarification is required regarding several specific air toxics

C&R notes hydrogen chloride (HCl), hydrogen fluoride (HF) and sulfuric acid (H_2SO_4) are not defined as criteria pollutants under the Ambient Air NEPM, however have been incorrectly included as criteria pollutants in Tables T1- T4. C&R also notes that HF is not included in Tables T3 and T4.

Recommendation: The HHRA should be revised to clarify the criteria and specific toxic pollutants listed in Tables T1 to T4.

22. Acute screening does not include consideration of appropriate criteria

The screening criteria selection process for acute exposure (Scenario 2 and Scenario 4) in Table T3 does not include the most relevant values for assessing upset condition relevant to the Project facility. For example temporary emergency exposure limits (TEELs) based on threshold concentrations below which most people experience no appreciable risk of health effects (TEEL 0) and/or other more relevant short average period criteria where available, should be considered and adopted where appropriate.

Recommendation: The HHRA should be revised to include relevant criteria for assessing upset conditions. In addition the HHRA should be revised to ensure all criteria chosen has been robustly evaluated and justified.

23. Stack concentrations used for emergency bypass operation modelling require justification

The HHRA states (Appendix B) that emission rates used for the emergency bypass stack operation scenario (Scenario 4) are based on maximum stack concentration design limits provided by Advance Combustion Engineering Pty. Ltd.

C&R notes that no performance specifications or other data are provided with the HHRA (or AQIA) to justify these design limits, and it is unclear how these concentration limits have been determined. The nature of bypass emissions will be determined by various factors including the waste types being processed and the nature of the plant upset. Due to the variability of these factors it is important to demonstrate the maximum stack concentrations are representative of worst case upset condition scenarios.

Recommendation: The HHRA should be revised to include information to justify the maximum stack concentration design limits are robust and representative of worst case emissions from the bypass stack.

24. The HHRA should include assessment of emissions at in-stack concentrations

C&R notes the HHRA does not appear to assess potential chronic human health impacts using the more conservative proposed in-stack concentration limits to support approval of the plant. Consequently if approval is given for the Project, the emission limits in the facility's licence would need to reflect the more stringent values assessed and demonstrated to not result in any adverse impacts to human health.

C&R recommends the Proponent revise the HHRA to include an assessment of risk to human health that demonstrates an acceptable risk where the facility emissions are at the proposed maximum permissible concentrations.

25. It is unclear if the exposure point concentrations used reflect worst case current and future receptor locations

C&R notes it is unclear if the input exposure point concentration values to the HHRA reflect worst case values with respect to current and future receptor locations. Use of the modelled grid maximum value would provide a more comprehensive and conservative assessment that would also address future receptors at non-modelled locations.

C&R recommends the Proponent revise the HHRA to clarify that the exposure point concentration used in the HHRA have considered all future potential receptor locations.

26. Representative exposure point concentrations appear to be based on Scenario 1 emissions estimates (normal operating conditions) rather than Scenario 2 (operating continuously at stack emission limits)

C&R notes that the representative exposure point concentrations (Section 6.1, Table 13) appear to be based on Scenario 1 emissions estimates which is for normal operating conditions, rather than the intended (as per text in Section 6.1) Scenario 2 emission estimates which includes continuous operation at stack emission limits.

Consequently the exposure point concentrations used to assess chronic health impacts appear to be incorrect and significantly lower than the correct values. C&R notes that some selected calculated 24-hour average values under Scenario 2 appear to be above the selected chronic tier 1 screening criteria.

Recommendation: The HHRA should be revised so the exposure point concentrations used are those derived from Scenario 2 which includes continuous operation of Stack 5 with emissions at the stack limits.

27. Chemical intakes for offsite residents use incorrect values for soil ingestion

The daily soil ingestion rates used in the HHRA (Table 15) to the assess impacts for offsite residents were those that apply to high density residential sub-populations with minimal opportunities for soil access (12.5 and 25 mg/day). However the correct ingestion rates are the significantly greater values that apply to low density residential sub-populations with garden / accessible soil (50 and 100 mg/day).

Recommendation: The HHRA should be revised so the correct daily soil ingestion rates are adopted for offsite residents.

28. Some toxicological profiles require amendment

There is not a toxicological profile for dioxins and furans, or information on the dioxin toxicity reference value chosen, despite several reports on dioxins provided in the HHRA.

Recommendation: The HHRA should be revised to include appropriate toxicological information applied to the assessment.

29. It is unclear how exposure point concentrations for chromium(VI) were estimated

The HHRA does not include information on chromium speciation or what form of chromium [total Cr, Cr(VI) or Cr(III)], exposure point calculations were estimated and based.

Recommendation: The HHRA should be revised to clarify the treatment of chromium.

30. It is unclear if the Project applies best available techniques and best environmental practices

In accordance with NSW EPA and Stockholm Convention requirements, the Project must apply best practice process design and emissions controls, best available techniques, and best environmental

practices. C&R notes that this does not appear to be demonstrated for the relevant and main elements and aspects of the Project.

C&R also queries whether proposed emergency bypass operations (EIS 6.4.6) that make provision for the bypassing of hot combustion gases directly from the plant to atmosphere during incidents such as a power failure or other emergency situations constitute best practice process design.

Recommendation: The HHRA/EIS should be revised to clarify and demonstrate the Project will apply best available techniques and best environmental practices, including for and associated with: the management and incineration of waste, combustion engineering, flue gas cleaning and residue management techniques.

31. Lack of information presented to demonstrate the Project uses demonstrated technology

The EIS states (Section 6.3.3) that the technology to be applied for the Project has been proven in many installations throughout the world and is similar to that used in Brisbane, Melbourne and Perth. In addition the EIS states the Project has utilised the same design and equipment vendor as presumably those operating elsewhere in Australia.

C&R notes however that information to demonstrate the technology is proven has not been provided in the EIS. In particular, detailed information to demonstrate the proposed technology used in these other facilities, and to be applied at the Project, is proven (in addition to being consistent with best practice) for the processing of equivalent waste streams, types and amounts as those proposed for the Project.

Recommendation: The HHRA/EIS should be revised to clarify and demonstrate the proposed technology for the Project is proven for the expected types, sources and volumes of waste the Project expects to receive.