NSW EPA

The Next Generation (NSW) Energy from Waste Facility, Eastern Creek EIS

Merit Review

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Job number 239880-00

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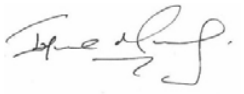
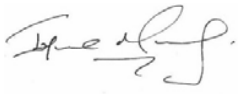
		Signature			
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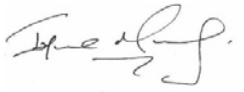
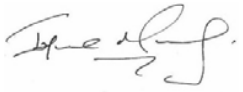
		Signature			
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Appendices

This report has been prepared by Arup for the NSW EPA and the Department of Planning and Environment, NSW in connection with The Next Generation (NSW) Pty Ltd application for an Energy from Waste Facility, at Eastern Creek, and takes into account their particular instructions and requirements. It is not intended for and should not be relied on by any third party and no responsibility is undertaken to any third party.

1 Scope of Work

Arup was appointed in November 2014 to undertake an adequacy review of the technical components of The Next Generation (NSW) Energy from Waste Facility, Eastern Creek EIS. This was undertaken by Arup in December 2014, and this information was used to inform the NSW EPA response on the adequacy of the EIS documentation.

In June 2015, Arup was appointed by the NSW EPA to:

- Conduct a merit assessment of the Concept Design Report (dated 11 March 2015 and prepared by Fichtner Consulting Engineers Limited) ("The Report") and relevant sections of the Environmental Impact Statement (dated April 2015 and prepared by Urbis Pty Ltd) ("the EIS").
  The merit assessment should focus on the technical content of the Report and EIS. Specifically determine whether the Report and EIS demonstrate that (including but not limited to):
  - The proposed facility will use current international best practice techniques with respect to process design and control; emission control equipment design and control; emission monitoring with real-time feedback; arrangements for the receipt of waste; management of residues from the energy recovery process;
  - The proposed technologies are proven, well understood and capable of handling the variability and type of waste feedstock; and
  - Whether the proposed facility delivers on all aspects of the NSW Energy from Waste Policy Statement (2015) (including meeting emission limits).
- Provide written comments to the EPA in relation to the above points; provide expert opinion as to whether the facility will perform as proposed; and provide expert advice for development of conditions of approval should the development be approved.

This report documents the findings of the merit assessment and provides advice for the development of conditions of approval should the development be approved.

A review of the Applicants responses to the comments made during the Adequacy review has been carried out and is included in Appendix B.

2 Summary of findings

2.1 Introduction

The Next Generation NSW Pty have made an application for the construction and operation of an Electricity Generation Plant which will be fuelled using waste materials sourced from commercial and industrial (C&I) stream, construction and demolition (C&D) stream and residual wastes from municipal solid waste (MSW) treatment facilities. The facility proposed will be developed in two phases, both with a design electricity generation of approximately 70MW. The proposed Facility will have the capacity to process up to 1.35 million tonnes of Residual Waste Fuel based on a calorific value of 10MJ/kg. The design capacity of the Facility is estimated at 552,000 tonnes per stage or 1,105,000 tonnes per year based on a calorific value of 12.34MJ/kg.

The facility will be located within the Eastern Creek Industrial Estate, Eastern Creek, NSW 2766.

The overall EIS and supporting documentation appear to lack a 'source of truth' and there is a large number of inconsistencies between the Main EIS and the appendices which have been authored by different specialists and within the EIS itself. There are a number of inaccuracies and inconsistence between the main EIS document, the Environ Waste Management Report and the Concept Design Report produced by Fichtner, that has resulted in uncertainty in the information being provided, as the authors are unsure on which report is the 'source of truth'. Where inconsistencies relate to technology, feedstock, ash residues or other aspects of the proposal which relate to its operation and functionality, Arup has sought to identify them within our commentary.

The Fichtner report is titled the Concept Design Report and could be expected to provide the basis of design for the EIS. However, the preferred technology provider Hitachi Zosen Inova (HZI) have provided reference data for the Environ Waste Management Report which at times is inconsistent with the Fichtner report. It would be reasonable to expect that a concept design would have been developed for the proposal that comprehensively and accurately defined the Facility and provided a consistent basis of design for the EIS.

The proposed technology provider is Hitachi Zosen Inova (HZI). Arup recognise that HZI is a leading company in grate incineration technology, with reference facilities around the world treating MSW and C&I waste. However, the EIS and supporting documentation only outlines a possible concept for a facility and does not define the facility in sufficient detail to allow for a full adjudication to be made on whether the proposal is compliant with International best practice.

A detailed assessment based on the information provided has been undertaken against the NSW Energy from Waste Policy Statement (2015) based on the information provided in the Main EIS, Environ Waste Management Report and the Fichtner Concept Design Report. It is considered that insufficient data has been provided within the EIS and supporting documentation to a sufficient level of detail to allow a full technical assessment of the technology to be undertaken

and determine whether the application and supporting documentation complies or meets the requirements of the NSW Energy from Waste Policy Statement (2015). Refer Appendix A.

2.2 Feedstocks and reference facilities.

It is proposed the facility will be fuelled on a number of residual waste fuel types. These are:

- Chute Residual Waste (CRW) from the Genesis MPC;
- Commercial and Industrial (C&I);
- Construction and Demolition(C&D);
- Flock waste from car and metal shredding;
- Paper pulp;
- Glass Recovery;
- Garden Organics (GO);
- Alternative Waste Treatment (AWT); and
- Material Recovery Facility waste (MRF waste) residual.

The breakdown of the waste feedstock can be visualised as following:

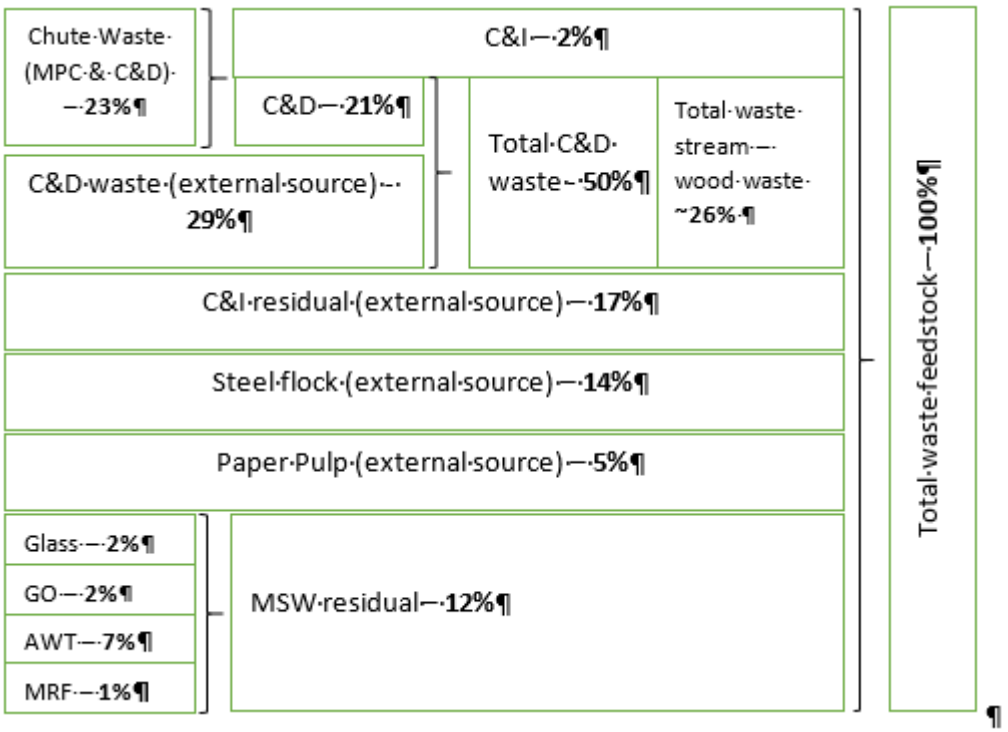

Figure 3.1: Breakdown of waste feedstock.

Arup consider that insufficient details have been provided in the EIS to allow a full comparison and assessment of the TNG proposed feedstock in the ratios suggested to the facilities listed in Table 4 – Section 3.5 of the EIS.

Facility Name	Location	Capacity	Fuel Contents
TREDI	Salaise, France	146,000 t/a	Grate furnace within a plant for treatment of industrial and hazardous waste
KEBAG	Zuchwil, Switzerland –	200,000 t/a	– – 50% C&I waste (no pre-treatment)
VFA	Buchs, Switzerland	180,000 t/a	65% C&I waste (no pre-treatment)
STADTWERKE ERFURT	Erfurt, Germany □	80,000 t/a □	100% pre-treated MSW and C&I waste (fraction not known)
EEW	Knapsack, Germany	300,000 t/a	100% pre-treated C&I waste

Table 1: Reference facilities provided in Section 3.5 of EIS.

For the five reference facilities provided in the EIS:

- There is no correlation in feedstock of the reference facilities to that of what the project is proposing
- None of the identified reference facilities demonstrate the treatment of C&D waste
- None of the reference facilities refer to the treatment of floc waste – however it is noted that this maybe include as part of C&I waste stream

It is important to consider the actual composition of Australian feedstock and consider whether it is comparable to the feedstock of that being treated by the reference facilities.

When considering whether a reference facility is comparable, consideration needs to be given not only to the types of waste that are accepted at a reference facility but also to the upstream processes a waste is subjected to before presentation at the facility and whether those upstream process facilities are comparable to upstream process facilities that will be used to source waste for TNG facility. For instance, C&I and C&D recycling facilities in Sydney, Australia are potentially different to that in the European Union (EU) which would result in a different residual waste being generated.

2.3 Wood waste

Based on the data provided in Table 7 of the Waste Management Report, approximately 26% of the total waste stream will be wood waste. Given the very high proportion of wood waste, more details need to be provided on the specific composition of the wood waste within the different waste types and how much of the wood waste could be treated with paints, solvents or other possible contaminants. Also consideration needs to be given the physical size of wood waste and how it will be handled to reduce its size to allow for full combustion on the grate.

2.4 Floc waste

It should be noted that floc waste is referred to as 'Flock waste' throughout the EIS and supporting documentation. The NSW EPA refer to this waste as floc waste and thus in this section the authors will refer to it as floc waste.

Floc waste composition in Table 1 of the Concept Design Report is inconsistent with floc waste composition in Table 7 of the Environ Waste Management Report. Therefore, there is uncertainty to the actual design composition of this waste input.

With regard to the generation of floc waste, consideration needs to be given as to whether the resource recovery facilities in Australia handling motor vehicles and white goods and generating floc waste are using the same processes and technology as those facilities operating in Europe. It is the authors understanding that Australian metal recyclers currently shred whole cars and white goods without prior breakdown or removal or many materials. This results in the contamination of floc waste with oils, lubricants, wire castings, soils and other materials. A detailed compositional comparison and analysis of floc waste generated from an Australian motor vehicle and white goods recovery facility to floc waste generated from an European facility should be undertaken to ensure it is comparable and producing a waste of a similar composition..

With regard to floc waste the EIS states in Section 3.9.4 that the percentage of floc waste in the feedstock could be increased to improve the Net Calorific Value (NCV) of the Facility feedstock as required. The Fichtner Report on Table 1 Page 8 states that the NCV of the floc waste is 8.46 MJ/kg which is the second lowest of all the proposed fuel feedstock. Therefore, the statement that more floc waste will be used to improve the NCV does not equate.

2.5 Ash

There is a number of inconsistencies between the Main EIS, the Fichtner Concept Design Report and the Environ Waste Management Report on the quantities of ash that will be generated. Therefore it is unclear what is the 'source of truth' for the ash production rates. This EIS and Waste Management Report state:

EIS/Waste Management Report			
Fuel Input	1,105,000.00 tonnes per annum (tpa)		
	Wet tpa	Dry tpa	Per cent of fuel input (%)
Bottom Ash	270000	225000	20.36
Boiler Ash	5,000	5,000	0.45
APC	55,000	55,000	4.98
	330,000	285,000	25.79

Table 2: Ash generation rates reported in EIS and Environ Waste Management Report.

The EIS states circa 30% total ash generation (20% moisture content in wet bottom ash) or 25.8% total ash generation (dry weight). The ash generation rates quoted in the EIS are very high and it is our understanding that typically total ash generation would be not greater than 20% with best practice seeking bottom ash generation rates of 10-12% of the total fuel input and APC residue of 3-4%.

The Fichtner report in Section 4.7 details ash generation. The Fichtner report states that:

Fichtner Concept Design Report			
Fuel Input	1,350,000.00 tonnes per annum (tpa)		
Ash Generation	20%		
	Wet tpa	Dry tpa	Per cent of fuel input (%)
Bottom Ash	320,625	256,500	19.00
Boiler Ash	13,500	13,500	1.00
APC	51,700	51,700	3.83
Total	377,325.00	321,700.00	23.83

Table 3: Ash generation rates reported in Fichtner Concept Design Report for 1,350,000 tpa fuel input.

For fuel input of 1,350,000 tpa (8,000hours @10MJ/Kg) there will be a total of 20% bottom and boiler ash of which 95% will be bottom ash. This equates to 321,000 tpa wet bottom ash (assumes 25% increase due to water). For this fuel input the APC residues are estimated at 51,700 tpa.

Fichtner Concept Design Report			
Fuel Input	1,105,000.00 tonnes per annum (tpa)		
Ash Generation	11.53%		
	Wet tpa	Dry tpa	Per cent of fuel input (%)%
Bottom Ash	151,295	121,036	10.95
Boiler Ash	5,000.	6,370	0.47
APC	43,800	43,800	3.24
Total	200,095	171,206	14.67

Table 3: Ash generation rates reported in Fichtner Concept Design Report for 1,105,000 tpa fuel input.

The Fichtner report states for a fuel input 1,105,000 tpa (8,000 hrs at 12.34MJ/kg) the ash content would be 11.53%. It then states that the amount of bottom ash generated would be 184,000 tpa. Based on the figures provided in the report, the authors are unable to substantiate these estimates as 1,105,000 x 11.53% x 1.25 = 151,295 tpa. The APC residues for a 1,105,000 tpa fuel input are estimated at 43,800 tpa.

Table 11 in the Fichtner report summarises the ash production but does not quantify the percentage of boiler ash separately and includes it in the bottom ash calculation. This is inconsistent with the rest of the report. It is therefore also unclear whether boiler ash is quoted in dry weight or wet weight. It is assumed to be wet weight as it is included in the bottom ash quantities.

5.7 Ash and Residue

The residue production from the Facility has been estimated and presented within Table 11:

Table 11: Ash Production			
		Design fuel	Worst case fuel
Fuel NCV	MJ/kg	12.34	10
Ash content	%	11.53	20
Fuel Flow	tpa	1,105,000	1,350,000
Bottom ash (dry)	tpa	127,400	257,000
Bottom ash (wet)	tpa	159,300	321,000
FGT/APC residue	tpa	43,800	51,700
Combined ash and residue	tpa	203,100	372,000

Figure 2: Extract from Fichtner Concept Design Report – Table 11: Ash Production.

2.6 Thermal Efficiency

The EIS assumes a net electrical production of 30% but does not demonstrate its assumptions through calculations. Given the seasonal ambient air conditions in Sydney the Applicant needs to demonstrate that the net electrical efficiency can be achieved through the whole year.

The Fichtner report refers to the R1 energy efficiency requirement from the EU Waste Framework Directive. This requirement has been removed from the NSW EPA Energy from Waste Policy therefore it is not appropriate to rely on this as proof of meeting the thermal efficiency requirements. Again no allowance was made in the calculations provided in the Fichtner report for the seasonal ambient air conditions in Sydney.

2.7 Chlorine

The EIS highlights the difference in the wording between the NSW policy and EU Industrial Emissions Directive (IED) and identifies that the NSW EPA policy applies to all waste not just Hazardous waste as in the IED.

Hazardous waste incinerators are designed for 1100°C, due to the nature and composition of the difficult waste generally processed through them thus ensuring their complete destruction. This practice is based on considerable practical experience.

Similar practical experience shows that 850°C is sufficiently high for the destruction of MSW and C&I wastes, where the chlorine concentration of the waste feed to the grate is normal up to 1%. Limiting the chlorine concentration in the feedstock to 1% prevents excessive corrosion of the boiler and shock loading of chlorine into the flue gas treatment plant. It is possible and acceptable for small quantities of waste with higher concentrations of chlorine to be accepted into the pit but they would need to be mixed and/or blended with other waste before feeding onto the grate.

The EIS states in Table 9 that:

In the European EfW experience it has been found that EfW typically has to cope with concentrations of PVC of around 1% (MSW) with around 0.4% as background chlorine (not PVC related). Residual fractions from recycling, C&D and C&I can reach up to nearly 10% in the European experience. If TNG would find similar chlorine level of around 1% in MSW as per European experience, the current NSW EfW Policy would require burning at 1,100°C/2s instead of 850°C/2s. Current technology (from all EfW providers) doesn't allow efficient energy recovery at the higher temperature. In consequence, the energy efficiency requirement of R1>0.65 cannot be achieved. Hence, the NSW EfW Policy will contradict itself unless the wording is changed (back to the European IED).TNG believes that the text of the NSW EfW Policy needs to be amended to reflect the EU regulation and the European experience of safe EfW at chlorine concentrations of typically around 1% with some waste fractions up to 8%.

MSW and C&I incinerators are not designed to receive 8 or 10% chlorine and can only deal with higher levels of chlorine when the waste is mixed or blended with other feedstocks to ensure that the overall chlorine concentration is not greater than 1%. Therefore, if it is proposed by TNG to receive feedstocks with typically higher concentrations of chlorine it is important they are they accurately identify and quantify this waste and robust operational procedures are put in place to ensure that the overall concentration of input fuel into the incinerator is not greater than 1%.

The EIS suggests that in Table 9 the requirement to bring wastes with a higher concentration of chlorine to 1,100ºC will impact the energy efficiency of the facility. The energy efficiency of an energy from waste plant is more complex than implied in the EIS and the need to restrict the temperature is not just due to energy efficiency but due to possible high temperature chlorine corrosion of the boiler which limits the input temperature to the boiler.

Therefore, the design chlorine input level of the incinerator should be provided based on the specific waste streams and types that will be inputted into the TNG facility.

2.8 Current Genesis Xero Waste Facility Materials Processing Centre– Best Practice.

The EIS states that 23% of the phase 1 composition will be derived from chute residual waste from the current Genesis Xero Waste Facility Materials Processing Centre (MPC).

The EIS states that the Genesis MPC environmental management procedures have been developed in accordance with best practice to maximise resource recovery and minimise biodegradable material from being landfilled in accordance with relevant legislative requirements. Copies of the Environmental Management Procedures should be provided to demonstrate how best practice is being benchmarked against current international best practice and how this is being achieved.

2.9 Design Basis.

The Fichtner report states that sections of the plant will be designed to meet the UK's interpretation of the EU's Industrial Emissions Directive, however there is no clear design statement that the whole facility with be designed to meet the all the requirements of Best Available Techniques (BAT), as specified in the relevant BREF or 'BAT reference document[1]'. Instead reference is made to the design being based on the UK's interpretation of the EU's Industrial Emissions Directive.

Before the development commences the Applicant should submit for approval the fully defined standard to which the whole facility will be designed and operated to and an assessment should be made to ensure that this meets Australian design and operational standards. A comparison of the design to the EU BREF for energy from waste facilities should also be undertaken and any variances to the BREF should be described and validated. Given that the EU BAT and BREF are currently under review the Applicant should be made aware that the facility's design will be compared to the standard in force at the time the facility is approved to proceed.

2.10 Traffic

Chapter 16 Traffic and Transport and Appendix R detail the Traffic Impact Assessment (TIA) undertaken.

The proposed operational traffic generation on the external road network did not consider or assess the traffic volumes associated with the removal of ash residues from the facility. The EIS states that residual bottom, boiler and APC residues will be removed from site for recovery or disposal. The Fichtner report states in Section 5.8 that the average payload for bottom ash will be 18 tonnes and for APC residues will be 22 tonnes. Although the ash generation rates are unclear (refer Section 3.5) based on the figures quoted in the EIS and Waste Management Report there will be c15,000 one way vehicle movements a year associated with bottom ash removal, and 3,333 on way vehicle movements a year associated with boiler ash and APC residue removal.

[1] The BAT (Best Available Techniques) Reference Document (BREF) entitled Waste Incineration (WI) reflects an information exchange carried out under Article 16(2) of Council Directive 96/61/EC (IPPC Directive), dated August 2006.

TABLE 31 - OPERATIONAL TRAFFIC GENERATION ON EXTERNAL ROAD NETWORK

TYPE	MOVEMENTS	
	DAILY (VEH/DAY)	HOURLY (VEH/DAY)
Staff (Cars)	110	37
Input Waste / Fuel Deliveries	336	14
Miscellaneous Deliveries	8	2
Total	**454**	**53**

Figure 3: Extract from Chapter 16 of the EIS – Table 31 Operational traffic generation on external road network.

It is therefore recommended that the TIA is revised to consider the impact of vehicle movements carrying ash residues and the possible different scenarios for final ash treatment is considered in this assessment (on site recovery, off site recovery, onsite disposal, offsite disposal).

3 Summary

The overall EIS and supporting documentation appear to lack a 'source of truth' and there is a large number of inconsistencies between the Main EIS and the appendices which have been authored by different specialists and within the EIS itself. There are a number of inaccuracies and inconsistences between the main EIS document, the Environ Waste Management Report and the Concept Design Report produced by Fichtner, that has resulted in uncertainty in the information being provided and the authors of this review being unsure on which report is the 'source of truth'. The Fichtner report is titled the Concept Design Report and could be expected to provide the basis of design for the EIS. However, the preferred technology provider Hitachi Zosen Inova (HZI) have provided reference data for the Environ Waste Management Report which at times is inconsistent with the Fichtner report. It would be reasonable to expect that a concept design would have been developed for the proposal that comprehensively and accurately defined the Facility and provided a consistent basis of design for the EIS.

The proposed technology provider is Hitachi Zosen Inova (HZI). Arup recognise that HZI is a leading company in grate incineration technology, with reference facilities around the world treating MSW and C&I waste. However, the EIS and supporting documentation only outlines a possible concept for a facility and does not define the facility in sufficient detail to allow for a full adjudication to be made on whether the proposal is compliant with international best practice.

It is considered that insufficient data has been provided within the EIS and supporting documentation to a sufficient level of detail to allow a full technical assessment of the technology to be undertaken. A full as possible assessment has been made of the Proposal against the requirements of the NSW EPA Energy from Waste Policy Statement based on the information provided in the EIS, Environ Waste Management Report and the Fichtner Concept Design Report. Possible suggested conditions for approval have been included where appropriate. Refer to Appendix A.

Comments have also been made on the responses provided by the Applicant to the Terms of Reference Adequacy comments. Refer Appendix B.

Based on the merit assessment undertaken by Arup of the technical aspects of the EIS referring to the proposed technology and its compliance with the NSW Energy from Waste Policy Statement (2015), Arup would propose that the NSW EPA recommend that this application is not approved in its current form.

Appendix A

NSW EPA Energy from Waste Policy Statement Review

NSW Energy from Waste Policy Statement Review

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
1. Introduction	1	Facilities proposing to recover energy from waste will need to **meet current international best practice techniques**, particularly with respect to: • **process design and control** • **emission control equipment** design and control • **emission monitoring with real-time feedback** to the controls of the process	*The report defines a concept not the actual proposed development. It is very possible that the concept described may well lead to meeting this criteria, however based on the information provided within the EIS, it cannot be confirmed at present.* *For example the report states:* *4.3 A moving grate is likely to offer the most flexible technology. –However, it does not define the type of moving grate that will be utilised.* *4.4.1 Lists nine options to improve thermal efficiency, however the report does not define the selected option.* *4.5.1 States that Selective Non Catalytic Reduction (SNCR) is likely to be required however it is not definitive on this requirement.* *4.5.5 Does not specify the actual reaction to neutralise acid gases, it lists 2 options.*	*Section 3.10 through 3.17 provides a technical summary of a plant to be supplied by HZI.* *HZI are one of the leading international WtE technology providers. They have a proven track record in providing WtE that meet international best practice.* *In section 7.4.4 the report says this requirement is "according to ISO".* *The developer should explain why this has been added as it is not in the policy.*	*The Waste management report includes in Appendix F – the HZI Plant Operation Outline. This document clearly states that this document does not reflect the actual proposed plant configuration and is provided for demonstration purposes only.* *An operational facility will require a bespoke operational plan written specifically to meet the configuration of the actual facility designed and constructed.*	*The Proponent should submit for approval a concept design that comprehensively and accurately defines the facility. This should then flow down accurately through all documents and drawings*
2. Energy recovery framework and scope	4	As proposals progress from the concept to detailed development assessment stage, proponents should engage in a genuine dialogue with the community and ensure that planning consent and other approval authorities are provided with accurate and reliable information.	*Sections 3.4 and 4.5.7b refer to two stacks one for each phase but the layout diagram shows only one for the whole facility this is inconsistent.* *Section 4.3.5 States that Gasification is unproven at the scale required.* *Gasification is proven up to a scale of up to 90,000 tpa per line e.g Nippon in Japan operate 42 gasification plants. This may be costly but it is not unproven.*	*The EIS lacks in parts sufficient detail to allow a full and comprehensive examination of the proposal.* *There is no correlation in feedstock of the reference facilities listed in the EIS to what is being proposed.* *None of the reference identified reference facilities demonstrate the treatment of C&D waste which is proposed to be 50% of the total feedstock.* *None of the reference facilities refer to the treatment of floc waste – however it is noted this could be included in other jurisdictions as part of the C&I waste stream.* *The EIS provides inconsistent information with regard to the estimated development timeframe/schedule of the development. This therefore does not allow the public to*	*Comment as EIS*	*The Proponent should submit for approval the ongoing community engagement programme through the design, construction and commissioning stage.* *Information used to inform this engagement program should be consistent with the actual 'basis of design' of the facility.*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
				fully consider the potential impact associated with the construction program. *The traffic impact assessment does not assess the actual proposed full traffic movements associated with the proposed development as it does not consider the movements associated with ash residue removal (min 15,000 one way vehicle movements per year).* *As evidenced in Appendix X Community Communication and Consultation Report, the majority of the community consultation took place during the latter part of 2013 and the early part of 2014. Given that the EIS has been extensively revised since its original submission in 2014 and the proposal is now staged, it would have been reasonable to expect a further round of community consultation to update them of changes made to the proposal.* *There is a lack of a future plan to actively engage and communicate with the community through all stages of the proposal including operation.*		
		The operators of an energy from waste facility will need to be 'good neighbours' – particularly if near a residential setting but also where there are workers in other facilities. This would apply to waste deliveries and operating hours, but most importantly with respect to readily available information about emissions and resource recovery outcomes.	*Ongoing community engagement is not adequately described in the report.*	*Appendix X Community Communication and Consultation Report provides details of the community engagement to date.* *There is a lack of a future plan to actively engage and communicate with the community through all stages of the proposal including operation.*	*Ongoing community engagement is not adequately described in the report.*	*The Proponent should submit for approval a detailed community engagement plan for the life of the facility*
3. Eligible waste fuels	5	The following wastes are categorised by the EPA as *eligible waste fuels*: 1. biomass from agriculture 2. forestry and sawmilling residues 3. uncontaminated wood waste 4. recovered waste oil 5. organic residues from virgin paper pulp activities 6. landfill gas and biogas 7. source-separated green waste (used only in processes to produce char) 8. tyres (used only in approved cement kilns).	*Next Generation NSW Pty Ltd (TNG) proposed feedstock mix does not meet the 'eligible waste fuel' requirements.* *TNG therefore needs to meet the Policy requirements for an* ***energy recovery facility*** *– as detailed in Section 4 of the Policy.*	*Section 7.4 states that the proposed facility has been designed to recover energy from waste and waste-derived materials that are not listed as eligible waste fuels. It is stated that the Genesis MPC generates uncontaminated wood waste and source separated green waste but given their saleable value, and are not intended to be used as a fuel for the Facility.*	*Section 5.2 suggests that the Proponent may seek permission to process eligible wastes in the facility* *This is therefore contrary to the statement made in Section 7.4 of the EIS, which does not state that any changes will be made to treat eligible waste fuels through the Facility.*	*Permission should be obtained from the NSW EPA before processing Eligible Waste Fuels in the facility*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
					Descriptions of waste throughout the Report are unclear, inconsistent and do not align with the Energy from Waste Policy. e.g. *1. green waste from the back end of the materials processing facility is described as an eligible waste fuel (only source-separated green waste is a listed eligible waste fuel in the Energy from Waste Policy);* *2.biosolids are listed within the Commercial and Industrial waste stream*	
4. Energy recovery facilities	6	Any facility proposing to thermally treat a waste or waste-derived material that is **not a listed eligible waste fuel** (Section 3) must **meet the requirements to be an energy recovery facility**. Energy recovery facilities refer to facilities that **thermally treat waste-derived materials that fall outside of the low-risk '*eligible waste fuels*'**				
		These facilities must therefore **demonstrate** that they will be **using current international best practice techniques**, particularly with respect to: • **process design** and control • **emission control equipment** design and control • **emission monitoring with real-time feedback** to the controls of the process • **arrangements for the receipt of waste** • **management of residues** from the energy recovery process.	*In various sections, the report states that sections of the plant will be designed to meet the UK's interpretation of the EU's Industrial Emissions Directive.* *There is no clear design statement that the whole facility with be designed to meet the all the requirements of Best Available Techniques (BAT), as specified in the relevant BREF or 'BAT reference document'. Instead reference is made to the design being based on the UK's interpretation of the EU's Industrial Emissions Directive.* *It should also be noted that the EU BAT and BREF are currently being reviewed. This is expected to be completed in 2017.* *Consideration of how the design meets or compares to the EU BREF should be undertaken by the proponent.* *The report states in 4.5.10 that the flue gas treatment plant will be located outside. The*	*Refer to comments made under Fichtner Concept Study* *Table 3 indicates a flue gas treatment building size. The Proponent should*	*Refer to comments made under Fichtner Concept Study*	*Before the development commences the Proponent should submit for approval the fully defined standard to which the whole facility will be designed and operated. For example the EU IED as adopted in the UK.* *The Proponent should provide a comparison of the design to the EU BREF for energy from waste facilities.* *The Proponent should note that the facility's design will be compared to the standard in force at the time the facility is approved to proceed.* *Before the development commences the Proponent*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
			report often quotes UK standards. In the UK flue gas treatment plants are normally enclosed by buildings.	*confirm the extend the FGT plant is enclosed*		*should submit for approval the building enclosing FGT plant.*
			Arrangements for the management for the receipt of incoming waste is provided in Section 5.	*Arrangements for the management for the receipt of incoming waste is provided in Section 3.8 Weighing, Checking and Reception.*	*Arrangements for the management for the receipt of incoming waste is provided in Section 3.5.2*	*Before receipt of any waste at the facility the proponent should submit for approval a comprehensive suite of operational procedures for the weighing, checking and handling of incoming waste fuels.*
			There are a number of inconsistencies throughout the whole EIS on ash generation. *This report states for fuel input at 10MJ/kg that 20% ash will be generated.* *For design fuel input of 12.34MJ/kg that 11.53% ash will be generated. Figures provided though to not equate to these percentages.* *Table 5.7 Ash and residue – figures in this table are inconsistent with those quoted in Section 4.7.* *Section 2.10 states bottom ash of 23.8% and design of 11.8%. This range should be explained by the Proponent as it is not normal for this type of facility. Section 4.7 states that the maximum ash concentration is 20%, this is inconsistent.*	*Inconsistency with figures in Main EIS Section 3.11 quoted for ash quantities/* *Section 10.5 states a bottom ash of 24.4%*	*Appendix H provides a calculation of ash generation. States that c20% bottom ash (dry) will be generated based on design fuel CV. This appears very high and could be justified by the Proponent with reference to other facilities treating similar waste types.*	*The proponent to provide accurate consistent data on ash generation from the facility drawing reference to similar facilities using a similar feedstock of a similar composition, ratio and CV.*
			The report states in 4.7 that bottom ash will be landfilled or recycled as aggregate, but does not define the treatment process for the bottom ash is recycled, or define end markets. *The report does not define the further treatment of boiler and FGT residues.* *The treatment of residues is not adequately defined in the report.*	*The EIS states the Proponent will engage with the EPA to means of recycling the bottom ash.* *Section 10.6 states the APC residue will be treated offsite and landfilled. Also that the boiler ash will combined with the APC residue unless it can be proven to be reusable.*	*Table 8 lists possible disposal options for all ashes* *3.7.1 highlights that the APC may be classified as hazardous*	*All ashes from the facility will be directed to appropriate landfill until the NSW EPA approves otherwise.* *It should be noted that the EPA considers that:* *If the material is classified as hazardous the material must be immobilised before transport to landfill for disposal. EPA policy is not to issue Resource Recovery Orders or Exemptions for restricted solid or hazardous wastes.*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
			The report specifies the noise sources from a number of sources but does not define the noise expected outside the building or at the site boundary.	*Noise is addressed in the EIS – Ch 14 Noise Assessment*		*The Proponent to provide an assessment of the impact of traffic by traffic movements associated with ash removal from site.*
		Energy recovery facilities must **use technologies that are proven**, **well understood** and **capable of handling the expected variability and type of waste feedstock**. This must be **demonstrated through reference to fully operational plants** using the **same technologies** and **treating like waste streams** in other **similar jurisdictions**.	*In section 2.2 the report states that the range of acceptable fuels needs to be as wide as practical. In section 3.1 the report goes on to say the assumptions should be confirmed with the potential supplier. Section 4.2 also talks of maximum fuel flexibility.* *These comments are true but they does not assist in defining the limits and range of allowable wastes.* *The report does not attempt to demonstrate compliance with this section of the policy.* *Table 4 of this report lists the characteristics of suitable and unsuitable wastes for moving grate technologies. Listed in the criteria as unsuitable is waste with an NCV < 7MJ/kg.* *Table 4 also lists virgin wood and saw dust as being unsuitable.* *Table 1 provides a compositional breakdown of the proposed feedstocks. This includes Green organics (GO) residual. This has a CV listed as 6.31 MJ/kg. Therefore this would be deemed unsuitable as per Table 4.* *The composition of floc waste listed in Table 1 is different to the composition of floc waste listed in Table 7 of the waste management report.*	*Table 18 states that 50% of the design fuel mix is Mixed C&D waste and 14% is floc waste as C&I waste.* *Table 4 details the 5 reference plants. C&D and floc waste are not specified as a fuel in these reference facilities which equate to c64% of the waste input.* *Section 3.5 does not demonstrate that the jurisdictions of the reference facilities are similar to the proposed facility.* *For these reasons the EIS does not demonstrate compliance with the policy.* *The CRW waste passes through a shredder to give a material size of 450mm. Table 18 states that 25% of the whole waste stream is wood. The Proponent should confirm what further shredding of the wood is undertaken.*	*The composition of floc waste listed in Table 1 is different to the composition of floc waste listed in Table 7 of the waste management report.* *The report indicates certain contaminated woods will be removed from the waste streams. Explanation on how contaminated woods, virgin wood and sawdust will be removed from the waste stream given the high percentage of wood waste needs to be provided.* .	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met including referencing fully operational plants using the same technologies and treating like waste streams in other similar jurisdictions.*
Technical criteria	6	The **gas resulting from the process should be raised**, after the last injection of combustion air, in a **controlled and homogenous fashion** and even under the most unfavourable conditions to a **minimum temperature of 850°C for at least 2 seconds** (as measured near the inner wall or at another representative point of the combustion chamber).	*Refer to comments made under Section 4: Energy Recovery Facilities. The report states 850°C for at least 2 seconds*	*Subject to comment in item 6 above.* *The report indicates compliance with this standard*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
		If a waste has a **content of more than 1% of halogenated organic substances**, expressed as chlorine, the **temperature should be raised to 1100°C for at least 2 seconds** after the last injection of air.	*In 4.2.2 the report states a maximum design Cl of 1%. The maximum allowable range of Cl should be confirmed by the Proponent.*	*The report highlights the difference in the wording between the NSW policy and IED. The NSW EPA policy applies to all*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
				waste not just Hazardous waste as in the IED. *Hazardous Waste incinerators are designed for 1100°C, to ensure destruction of the difficult waste processed. This is based on considerable practical experience.* *Similar practical experience shows that 850°C is sufficiently high for the destruction of MSW and C&I wastes, where the chlorine concentration of the waste feed to the grate is normal up to 1%. This is done to prevent excessive corrosion of the boiler and shock loading of chlorine into the FGT plant.* *Small quantities of waste with higher concentrations of Chlorine can be accepted into the pit but they would need to be mixed with other waste before feeding onto the grate.* *MSW and C&I incinerators are not designed to receive 8 or 10% chlorine as suggested in the report.* *The report suggests that higher temperatures do not allow efficient energy recovery. In general coal or gas power stations work at higher temperatures and efficiencies.* *The energy efficiency of an energy from waste plant is more complex than implied in the report, for example, possible high temperature chlorine corrosion of the boiler limits the input temperature to the boiler.* *The Proponent should define the design chlorine input level of the incinerator.*		*demonstrates this clause of the policy has been met.*
		The process and air emissions from the facility must satisfy **at a minimum** the requirements of the **Group 6 emission standards** within the Protection of the Environment Operations (Clean Air) Regulation 2010	*Refer to comments made under Section 4: Energy Recovery Facilities. The IED requires tighter emissions controls and exceeds the Group 6 emissions.*	*Comment as Concept study*	*Comment as Concept study*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
	7	**There must be continuous measurements of NOx, CO, particles (total), total organic compounds, HCl, HF and SO2**. This data must be made available to the EPA in real-time graphical publication and a weekly summary of continuous monitoring data and compliance with emissions limits published on the internet. The continuous measurement of HF may be omitted if treatment stages for HCl are used which ensure that the emission limit value for HCl is not being exceeded.	*Refer to comments made under Section 4: Energy Recovery Facilities Assuming this is complied with, this requirement will be met.*	*Refer to comments made under Section 4: Energy Recovery Facilities* *The report indicates compliance with this standard*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
		There must be **continuous measurements** of the following **operational parameters**: **temperature** at a representative point in the combustion chamber; **concentration of oxygen**; **pressure and temperature in the stack**; and **water vapour content** of the exhaust gas.	*Refer to comments made under Section 4: Energy Recovery Facilities Assuming this is complied with, this requirement will be met.*	*Refer to comments made under Section 4: Energy Recovery Facilities.* *The report indicates compliance with this standard*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
		As part of the environment protection licence conditions of any energy recovery facilities, the EPA will require operators to undertake proof of performance (POP) trials to demonstrate compliance with air emissions standards. Following successful POP trials, there must be at least two measurements per year of heavy metals, polycyclic aromatic hydrocarbons, and chlorinated dioxins and furans. One measurement at least every three months shall be carried out for the first 12 months of operation. If and when appropriate measurement techniques are available, continuous monitoring of these pollutants will be required.	*Refer to comments made under Section 4: Energy Recovery Facilities.* *Assuming this is complied with, this requirement will be met.*	*Pag85 of the EIS states that:* *TNG will fully comply with all EPA requirements, allowing independent personnel to conduct proof of performance trials at any time.* *The EPA consider that the onus of proof is on the Proponent to provide proof of performance and it is the view of the EPA that the information provided does not show that proof of performance trials will be undertaken to demonstrate compliance with air emissions standards.*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
		The **total organic carbon** (TOC) or **loss on ignition** (LOI) content of the **slag and bottom ashes must not be greater than 3% or 5%,** respectively, of the dry weight of the material.	*The report is silent on this requirement.*	*The EIS states that the HZI plant will comply with this requirement (Table 9)*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
		Waste feed interlocks are required to prevent waste from being fed to the facility when the required temperature has not been reached either at start-up or during operation.	*See comment in item 6. Assuming this is complied with, this requirement will be met.*	*The report indicates compliance with this standard*	*Comment as EIS*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
Thermal efficiency criteria	7	The **net energy produced** from thermally treating that waste, **including the energy used in applying best practice techniques**, **must therefore be positive**.	*This requirement should be met by the facility.*	*See comment in Concept study*		*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
		To meet the **thermal efficiency criteria**, facilities must **demonstrate that at least 25%** of the energy generated from the thermal treatment of the material **will be captured as electricity** (or an equivalent level of recovery for facilities generating heat alone).	*In 3.2 the report states a net electrical efficiency of approximately 30%. In section 9 the report states the EPA policy requires R1 to be met, this is incorrect. It then goes on to demonstrate the facility will meet the requirements of R1. This is not reliable and should be confirmed against the seasonal ambient air conditions in Sydney.*	*The EIS assumes a net electrical production of 30% but does not demonstrate through calculations. The Proponent should demonstrate the seasonal electrical efficiency based on Sydney climatic conditions.*	*The thermal efficiency criteria is addressed in Section 5.6*	*Before development commences the Proponent should submit for approval information that demonstrates this clause of the policy has been met.*
		Energy recovery facilities must also **demonstrate that any heat generated** by the thermal processing of waste is **recovered as far as practicable**, including **use of waste heat for steam or electricity generation** or for **process heating of combined heat and power schemes**.	*The reports states that heat will be recovered to make steam for electricity. The report states that the facility will be designed to be capable of being modified to provide CHP should a user of the heat be found.*		*The report states that provision will be made for CHP.*	*Before the development commences a market study of the possible heat and cooling market should be submitted for approval. This market study should be repeated every 3 years till a use for the heat is found. Demonstration of how the design can be modified to allow for heat recovery needs to provided, an assessment of construction impacts associated with this modification needs to be undertaken.*
Resource recovery criteria	7	The policy statement's objectives in setting resource recovery criteria are to: • **promote the source separation of waste** where **technically and economically achievable** • drive the use of **best practice material recovery processes** • ensure **only the residual from bona-fide resource recovery operations are eligible** for use as a feedstock for an energy recovery facility.	*The report does not adequately demonstrate this requirement will be met.*	*To compare the sorting line of the MPC with best practice materials recovery a full description of the sorting line is required. Section 2.2.5 states the waste is sorted automatically but does not describe how.* *Statement made that the Genesis MPC environmental management procedures has been developed in accordance with best practice to maximise resource recovery and minimise biodegradable material from being landfilled in accordance with relevant legislative requirements.*	*Similar to the EIS comment section 3.5.2 does not adequately describe the sorting process.*	*The proponent needs to provide evidence that any residual waste material accepted at the facility is eligible for use as a feedstock.* *Copies of the Environmental Management Procedures should be provided to demonstrate how best practice is being benchmarked and is being achieved.* *Approval must be sought in advance for the acceptance of feedstocks not listed in Schedule XX of the Approval or in quantities exceeding those listed in Schedule XX.*
	8	Energy recovery facilities **may only receive feedstock from "authorised" waste facilities or collection systems** that meet the criteria outlined in **Table 1**.	*The report does not define the sources of CRW waste or demonstrate compliance with this requirement.*	*The EIS states that details of source facilities of feedstock will be provided in confidence to the EPA and the Dept. of Planning and Environment. Arup or the EPA has not sighted this information so therefore cannot comment of the compliance with this requirement and in*	*The EIS states that details of source facilities of feedstock will be provided in confidence to the EPA and the Dept. of Planning and Environment. Arup or the EPA has not sighted this information so*	*The proponent should provide details of source facilities of feedstock prior to receiving them at the facility and approval should be sought for their acceptance.*

Section	Page Ref	NSW EfW Policy Criteria	Arup Comments on Fichtner Concept Study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
				the absence of this information considers this as failure to demonstrate compliance with the resource recovery criteria set out in Table 1 of the Energy from Waste Policy.	*therefore cannot comment of the compliance with this requirement and in the absence of this information considers this as failure to demonstrate compliance with the resource recovery criteria set out in Table 1 of the Energy from Waste Policy.*	

Table 1 - Resource recovery criteria for energy recovery facilities (*adapted from NSW EfW Policy Statement*)

Waste stream	Authorised facility	% of residual waste allowed for energy recovery	Arup Comments on Fichtner Concept study	Arup Comments on EIS	Arup comments on Waste Management report	Suggested conditions
Mixed municipal waste (MSW)	Facility processing **mixed MSW** waste where a **council has separate collection systems** for dry recyclables and food and garden waste	**No limit** by weight of the waste stream received at an authorised facility	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*Provide a condition that Mixed MSW is not an acceptable waste input stream.*
	Facility processing **mixed MSW** waste where a council has **separate collection systems for dry recyclables and garden waste**	**Up to 40%** by weight of the waste stream received at an authorised facility	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*Provide a condition that Mixed MSW is not an acceptable waste input stream.*
	Facility processing **mixed MSW** waste where a council has a **separate collection system for dry recyclables**	**Up to 25%** by weight of the waste stream received at an authorised facility	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*N/A.* *Mixed MSW is not a proposed design fuel for the facility.*	*Provide a condition that Mixed MSW is not an acceptable waste input stream.*
Mixed commercial and industrial waste (C&I)	Facility processing **mixed C&I** waste where that waste is **sourced solely from an entity that has separate collection systems** for all relevant waste streams	**No limit** by weight of the waste stream received at an authorised facility		*The EIS states that details of source facilities of feedstock will be provided in confidence to the EPA and the Dept. of Planning and Environment. EPA/Arup has not sighted this information so therefore cannot comment of the compliance with this requirement.*		*The proponent should provide details of source facilities of feedstock prior to receiving them at the facility and approval should be sought for their acceptance.*
	Facility processing **mixed C&I waste**	**Up to 50%** by weight of the waste stream received at an authorised facility			*Assumption made in Table 13 Potential tonnes for energy from waste processing 2015 that 100% of landfilled C&I waste is mixed C&I waste.*	*The proponent to demonstrate prior to using any C&I waste that a minimum of 50% of the waste stream can be recovered.*
Mixed construction and demolition waste (C&D)	Facility processing **mixed C&D waste**	**Up to 25%** by weight of the waste stream received at an authorised facility			*Assumption made in Table 13 Potential tonnes for energy from waste processing 2015 that 100% of landfilled C&D can be processed through an authorised facility.*	*The proponent to demonstrate prior to using any C&D waste that a minimum of 75% of the waste stream can be recovered*
Source-separated recyclables	Facility processing **source-separated recyclables**	**Up to 10%** by weight of the waste stream received at an authorised facility				*The proponent to demonstrate prior to using any source segregated recyclables that no more than 10% of the input waste stream to the facility is being accepted by TNG.*
Source-separated garden waste	Facility processing **garden waste**	**Up to 5%** by weight of the waste stream received at an authorised facility				*The proponent to demonstrate prior to using any source separated garden waste (GO) that no more than 5% of the input waste stream to the facility is being accepted by TNG. Consideration needs to be made of the CV of GO and whether it is a*

						suitable waste fuel stream for a grate incinerator.
Source-separated food waste (or food and garden waste)	Facility processing **source-separated food or source-separated food and garden waste**	**Up to 10%** by weight of the waste stream received at an authorised facility				*The proponent to demonstrate prior to using any source separated food waste (or food and garden waste) that no more than 10% of the input waste stream to the facility is being accepted by TNG*
Note 1	1. The EPA may give consideration to increases to the maximum allowable percentage of residuals from facilities receiving mixed municipal and commercial and industrial waste where a facility intends to use the biomass component from that process for energy recovery, rather than land application and the facility can demonstrate they are using best available technologies for material recovery of that stream.		*None the report is silent on these requirements*	*None the report is silent on these requirements*	*None the report is silent on these requirements*	
Note 2	2. Waste streams proposed for energy recovery should not contain contaminants such as batteries, light bulbs or other electrical or hazardous wastes.		*None the report is silent on these requirements*	*None the report is silent on these requirements*	*The report requests that this be amended to include a test of economically and technically justifiable.* *The Report infers community drop off schemes for the removal of hazardous wastes – this is not applicable to C&I and C&D streams.* *Additionally, training documents included does not reference hazardous materials as per the policy.*	*The Proponent needs to provide details on how it will identify and manage contaminants listed under Note 2.*

Appendix B

Adequacy Comments Review

General Observation / DG Requirement	excel row no.	Environmental Assessment Requirements / General Requirements	EIS section/appendix Cross-Reference	Adequacy against TOR (Y/N/Partial)	Review Comments	Applicant Response	Applicant Reference	EIS (June 2015) Review Comments	Adequacy against TOR (Y/N/Partial)
	General Requirements								
Arup (gnl)	1	The Proponent must demonstrate that the technology will perform as stated in the EIS, with the composition of feedstock proposed.			While the technology proposed (HZI Moving Grate) is primarily designed and well established for the management of Municipal Solid Waste ("MSW"), it is not well established for the management of a composition of C&I and C&D feedstock. Demonstration of performance can be done by providing real data from named reference facilities that treat the same type and mix of wastes that are proposed for the Next Generation facility (C&I and C&D) for comparison. However, the EIS does not list any named reference facilities or 'real' representative data from those facilities to support the assertion made in the EIS about the performance of the proposed Next Generation facility with the proposed feedstock composition. Therefore, the Proponent must provide named reference facilities treating similar feedstock and ratios as is proposed for the Next Generation Facility. This includes specific data on the composition of waste feedstock received at those named reference facilities and the subsequent performance of those facilities, so it can be compared to the Next Generation's proposed facility.	The following is a list of EfW plants with moving grate technology whose fuel contains only or to an important fraction of C&I waste or pre-treated (often mostly commercial) waste. - 'TREDI' in Salaise, France. 146'000 t/a, Grate furnace within a plant for treatment of industrial and hazardous waste - 'KEBAG' in Zuchwil, Switzerland. 200'000 t/a, 50% C&I waste (no pretreatment) - 'VFA' in Buchs, Switzerland. 180'000 t/a, 65% C&I waste (no pretreatment) - 'STADTWERKE ERFURT' in Erfurt, Germany . 80'000 t/a 100% pretreated MS and C&I waste (RDF) (fraction not known) - 'EEW' in Knapsack, Germany. 300'000 t/a 100% pretreated C&I waste (RDF)	EIS Section 3.	The EIS lacks details on the ratio of feedstock material, only providing percentage of C&I waste, and also the performance of the named reference facilities. Noted that only one reference facility listed as having feedstock that is 100% pre-treated C&I waste - EEW. Recommend that further representative data is provided on the reference facilities; this should address the history of each facility (when constructed and modifications), ratio of feed stock of each facility, and the operating performance and outputs. Proponent to provide details on an existing reference facility that is processing similar (within a +/-5% variable range) feedstock to that is proposed.	N/A
Arup (gnl)	2				The EIS is not a stand-alone document and relies heavily on information contained within the appendices and even at that the information is spread across a number of the appendices. This makes the EIS difficult to read and review.	A peer review has been carried out by Ramboll and ENVIRON Australia. The quality and independence of the EIS is considered to have substantially improved since the previous submission. Ramboll and ENVIRON Australia consider the EIS addresses the comments from the agencies' reviews and is adequate for exhibition.		The EIS contains summary supporting information with reference to relevant appendices that information has been drawn from. However, in some cases where data has been sourced, the referenced document(s) have not been identified. Sourced data should be referenced, with details of published reports provided.	
Arup (gnl)	3				The EIS does not provide all the supporting information required and makes a large number of general statements without providing justification or supporting data.	See above.			
Arup (gnl)	4				The assessment of the need for the development is weak and does not provide robust analysis of current waste and infrastructure available in catchment area for this proposal. Furthermore, no assessment is made of other potential EfW projects that could be drawing on the same waste feedstock as this proposal. The EIS implies that the total available residual C&I and C&D waste streams in the catchment area are available to the facility. This assumption is not supported by any analysis of financial or demand modelling.	Additional information has been added on need for the development and detail on current waste infrastructure in the catchment area. A section on material input streams has been provided in the Waste Management Report and EIS. Although there is a lot of interest in EfW, particularly spurred on by the release of the EfW Policy Statement, TNG is by far the furthest advanced in terms of planning, licensing and procurement. No other large scale EfW facilities are currently in operation in NSW. As such, there are currently no other EfW facilities that would be drawing on the same waste feedstock as the proposal.	EIS Section 24 EIS Section 10.4, Waste Report Section 2. EIS Section 24.3	The EIS lacks details on the ratio of feedstock material, only providing percentage of C&I waste, and also the performance of the named reference facilities. Noted that only one reference facility listed as having feedstock that is 100% pre-treated C&I. There is a lack of assessment on future identified/planned waste infrastructure projects that may also draw on the identified input material, or that may have an impact on feedstock	
Arup (gnl)	5				The assessment of the potential sources of feedstock is confusing and it is not clear where feedstock will emanate from outside of the c10% residual waste by-product from the Genesis Xero Facility.	Clarification of sources has been provided in the Waste Management Report.	Waste Report Section 3.5	EIS states that proponent will provide in confidence to the EPA and the Dept. of Planning and Environment. Recommend that EPA and the Dept. of Planning and Environment to evaluate identified feedstock sources.	
Arup (gnl)	6	Further details on compositional data required			Very little compositional data is provided on the proposed feedstock. It categorises feedstock as general C&D and C&I and residual waste from Genesis Facility, "Flock waste" and other organic waste. Some compositional data is provided in the Fichtner Concept Design Report (Appendix Y) but it does not clarify if this data is based on Australian compositional analysis.	See above.	Waste Report Section 3.5	Provision of detailed data on sources	
Arup (gnl)	7				The composition of the bottom ash provided is based on the EfW facility burning Municipal Solid Waste. This facility will handle other feedstock and therefore the data provided is not representative of the waste that will be treated at the proposed facility.	This has been updated accordingly.	Waste Report Section 6.6.1	Note comments in Arup merit report on ash generation rates.	

General Observation / DG Requirement	excel row no.	Environmental Assessment Requirements / General Requirements	EIS section/appendix Cross-Reference	Adequacy against TOR (Y/N/Partial)	Review Comments	Applicant Response	Applicant Reference	EIS (June 2015) Review Comments	Adequacy against TOR (Y/N/Partial)
Arup (gnl)	8	The Concept Design Report suggests the facility will be phased but no details are provided on phasing in the Main EIS.			This needs to be clarified as it will impact construction activities etc.	Phasing details have been provided in the EIS	EIS Section 3.3	Staging of the development is detailed in Section 3.4. General overview of two phased development of the facility provided. No details provided on estimated development timeframe/schedule of the facility. Inconsistencies of construction period in EIS - Section 14.4.1 (Construction Noise) states construction period of 36 months. Section 3.16 (Water Demand) states that construction will take place over 43 months. Section 16.4.2 (EIS) and Section 7 (Traffic Impact Assessment), mentions total construction period of three (3) years.	
Arup (gnl)	9	No information is provided on the proposed facility's Distributed Control System (DCS).				Details of the DCS provided in EIS and Appendix E of the Waste Report.	EIS Section 3.13, Waste Report Appendix E.	Section 3.14 of EIS provides details of Distributed Control System (DCS).	
Arup (gnl)	10	There is no separate assessment of cumulative impacts with other existing or proposed projects, except for where a short commentary is provided at the end of individual chapter.				Section added in EIS.	EIS Section 9.2	Details on current and future interactions of the proposed facility with current neighbouring operations outlined in Section 9.2. Cumulative noise, traffic and air impacts detailed in following sections (9.3, 9.4, & 9.5).	
Arup (gnl)	11	The EIS has no referencing. There are numerous spelling, incomplete sentences and inconsistencies on information provided in the main document and appendices throughout				A peer review has been carried out by Ramboll and ENVIRON Australia. The quality and independence of the EIS is considered to have substantially improved since the previous submission. Ramboll and ENVIRON Australia consider the EIS addresses the comments from the agencies' reviews and is adequate for exhibition.		Minor grammar and spelling errors sighted throughout EIS. Lack of referencing through EIS especially relating the waste composition.	
Arup (DGR)		Detailed description of the site, and any existing or approved operations	Section 3.0	Y				Detailed site description and history provided, including history of development and operation approvals for the site.	Y
Arup (DGR)	12	Detailed description of the development, including need for the development; alternatives considered; engineering and/or architectural plans; justification for the development taking into consideration its location, any environmental impacts of the development, suitability of the site and whether the development is in the public interest	Executive Summary, section 3.0, 4.0 and 24.0.	P	The need and justification for the development is addressed in Section 4, 24 and the Executive Summary and the Waste Management Assessment Report. Further information and analysis on the justification for the project would be beneficial, particularly around the demand for waste infrastructure including EfW and the economic viability of the project in relation to a changing renewable energy and carbon market. No information on the staging of the development was located, although suggested in the Concept Design Report.	Additional information has been included around the demand for waste infrastructure and economic viability of the project. A summary on the phasing of construction has been provided.	EIS Section 24 EIS Section 3.2	WMP provides details on current waste infrastructure capacity based on two NSW Government commissioned studies and independent research. A brief summary of development staging is provided in EIS Section 2.4, but no details provided on preliminary development schedule/timeframe. In reviewing the CEMP, there is also no reference to scheduling.	P
Arup (DGR)	13	Likely interactions between the development and existing, approved and proposed operations in the vicinity of the site		N	No information on the interaction with existing, approved and proposed operations in the vicinity of the site could be located, with the exception of the provision of some information on the existing Genesis Xero Waste Facility. No discussion on any potential interactive or cumulative impacts was located in the main body of the EIS, although air, noise and traffic assessments in appendices had considered cumulative impacts. An additional section should be added to the EIS describing existing, approved and proposed operations and the interactive/cumulative impact of these in combination with the proposed project.	Additional section added to EIS addressing cumulative impacts.	EIS Section 9.2	Overview of local current and proposed future operating facilities identified. Lack of detail of current resource recovery operation on site - difficult to evaluate that current resource recovery practices are *employing best practice material recovery processes* (as per NSW EfW criteria).	
Arup (DGR)	14	Consideration of any relevant statutory provisions	Sections 7.0 and 8.0	Y				n/a	Y
Arup (DGR)	15	Risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment	Section 5.0	P	A summary of risk assessment has been provided in Section 5.0. Further information on the risk assessment methodology, criteria and scale/level of impact should be provided.	The Director-General's Environmental Assessment Requirements do not include an Environmental Risk Analysis. Further detail has been provided.	EIS Section 5.	AS/NZ 4360 Risk management methodology applied for risk analysis undertaken, however no details have been provided on the risk evaluation criteria. Details of the scale/level of impacts have still not been provided.	
Arup (DGR)	16	Detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: a description of the existing environment, using sufficient baseline data; an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage significant risks to the environment:	Various	P	A detailed assessment of key issues below is provided, as well as some additional issues (Section 22.0). There is limited assessment of staging options and cumulative impacts; descriptions of operational controls, contingency plans, monitoring and reporting could also be provided in more detail.	Staging details provided. Cumulative impacts detailed. Details of DCS provided.	EIS Section 3.3, 3.13, 9.2, 10-22.	Section 3.14 of EIS provides details of Distributed Control System (DCS). Note comments above re staging and construction timelines.	
Arup (DGR)	17	Consolidated summary of all the proposed environmental management, mitigation and monitoring measures, highlighting all commitments included in the EIS.	Sections 23.0 and 25.0	P	A summary of recommended mitigation measures is provided in Section 23.0. The proponent should confirm that all mitigation measures listed are to be applied (the use of 'if possible', 'should' etc. should be avoided). Section 25.0 provides a summary of residual impacts and commitments. Monitoring measures should also be included in these sections where relevant.	Mitigation/control measures have been confirmed. Monitoring measures included where relevant.	EIS Section 23, 25.		
Arup (DGR)	18	The EIS must also be accompanied by a report from a qualified quantity surveyor providing: a detailed calculation of the capital investment value (CIV) of the development (as defined in clause 3 of the Environmental Planning and Assessment Regulation 2000), including details of all assumptions and components from which the CIV calculation is derived; a close estimate of the jobs that will be created by the development during construction and operation; and verification that the CIV was accurate on the date that it was prepared.	Appendix I, Section 3.0	P	Appendix I contains a report from a quantity surveyor providing calculations of the capital investment value, although information on assumptions is limited. A close estimate of operational jobs that will be created by the development is provided, however detailed information on construction employment is not provided. Information on how jobs figures were developed and relevant assumptions would be beneficial.	These details have been provided.	EIS Section 24.2, Appendix J.		
	Strategic Planning								

General Observation / DG Requirement	excel row no.	Environmental Assessment Requirements / General Requirements	EIS section/appendix Cross-Reference	Adequacy against TOR (Y/N/Partial)	Review Comments	Applicant Response	Applicant Reference	EIS (June 2015) Review Comments	Adequacy against TOR (Y/N/Partial)
	Waste Management								
Arup (DGR)	1	Details on Boiler ash			Boiler Ash can often be hazardous in composition and is managed either separately or with the APC residues as it may contain elevated heavy metals or dioxins. Therefore, data on this ash should be provided separately.	The quantity, composition and management of boiler ash has been estimated and is provided in Appendix H and Section 3.7.1 of the Waste Management Report. Ramboll and HZI have carried out an assessment of the ash fractions from the plant, based on the expected residual waste fuel composition (Appendix H). This now includes: 1. Bottom Ash 2. Boiler Ash 3. Air Pollution Ash	Waste Management Report Section 3.7.1 & 6.6.1 Appendix H of the Waste Management Report	Estimation of ash generation provided Table 8 of WMR. Composition (including TCLP & SCC values) of ash residues is provided in Appendix H of WMR. Would be beneficial to have overview of ash composition detailed in body of WMR. Inconsistencies in ash generation rates (refer Arup Merit Report Section 2.5).	
Arup (DGR)	2	a description of the classes and quantities of waste that would be thermally treated at the facility;	Section 10.3	P	A general list of waste streams and estimated quantities is included however full compositional breakdown is not provided for each waste stream. Compositional analysis is provided within the Concept Design Report Table 1, however it is not clear whether this compositional breakdown reflects the composition of these waste streams in Australia.	The Waste Management Report now provides the composition of all waste streams specific to Australia (Table 7). The data was sourced from publically available documents and confidential data sourced from operators of authorised waste facilities in NSW. The Company names will be provided in confidence to the Department but for commercial reasons the names will be omitted from the Waste Management Report. Other C&D and C&I residual characterisations have been determined using EPA data as a baseline. Recyclables have then been removed at appropriate recovery rates to determine a residual characterisation.	Waste Management Report Section 3.5 & Table 7 Section 6.1	Composition of waste streams provided in Table 7 of WMR. No reference to Australian reports in which data is sourced form. Useful to identify the publically available documents that data has been sourced from. There is no assurance to whether the compositional data will reflect the actual feedstock for the facility. Inconsistency in flock waste composition. Refer Arup Merit Report Section 2.4.J23	
Arup (DGR)	3	demonstrate that waste used as a feedstock in the waste to energy plant would be the residual from a resource recovery process that maximises the recovery of material in accordance with Environment Protection Authority Guidelines;	Section 10.3	P	The source of each potential waste stream is provided and states that all waste will come from authorised waste facilities. Details of the actual locations of these facilities with the exception of the Genesis Facility has not been provided. Therefore not able to validate if all feedstock be residual from a resource recovery process that maximises the recovery of material in accordance with Environment Protection Authority Guidelines; Furthermore, clarification required on sources of feedstock as Exec Summary states that 850,000 tonnes will be from waste received from Genesis Xero Waste facility and 500,000 from external sources. Section 10.3 Table 16 states that 100,000 tonnes will be from Genesis facility.	A summary of Resource Recovery Facilities is appended to the Waste Management Report and Section 2 summarises waste capacity in NSW. The details and contracts with 'other waste facilities is not possible to be finalised at this stage of the project, however, it is expected to be similar to MPC. The project will take a two phased approach after receiving feedback from the government agencies. Phase 2 will receive waste from external waste facilities. Phase 2 will only commence once the Department of Planning and Environment is satisfied that the required amount of eligible residual waste fuel is	Waste Management Report Appendix C. Waste Management Report Section 1.1 and 3.5	Details of source faculties of feedstock will be provided in confidence to the EPA and the Dept. of Planning and Environment.	
Arup (DGR)	4	procedures that would be implemented to control the inputs to the waste to energy plant, including contingency measures that would be implemented if inappropriate materials are identified;	App J Waste Management Assessment	P	Section 7.6.1 discusses how will minimise lead and nickel from feedstock. More description required on general management practises including SCADA/PLC systems that would be installed to monitor operations at the facility.	These inputs are minimised at the pre-sort stage. The DCS and Plant Operation Outline document appended to the WMR provide this information. Figure 3 presents the methods to be employed for controlling the inputs to the EfW Facility. A Waste Inspection Procedure has been included in Appendix B	Waste Management Report Appendix D, E and F. Waste Management Report Sections 3.3 & 6.3	No commentary provided on how would limit chlorine concentrations in fuel inputs. Refer Arup Merit Report Section 2.7 No commentary provided on detailed composition of wood waste and how this waste stream will be treated. Refer Arup Merit Report Section 2.3	
Arup (DGR)	5	details on the location and size of stockpiles of unprocessed and processed recycled waste at the site;	Section 3.4	Y	All feedstock will be stored in the receiving waste bunker. Ash will be stored in dedicated ash bunkers.	No comment to be made.		N/A	Y

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Arup (DGR)	6	demonstrate any waste material (e.g. biochar) produced from the waste to energy facility for land application is fit-for-purpose and poses minimal risk of harm to the environment in order to meet the requirements for consideration of a resource recovery exemption by the EPA under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005;	Section 3, 10.3, App J	N	Composition of Bottom ash is based on a Municipal Solid Waste Stream feedstock and not on the basis of the actual proposed feedstock. Commentary that bottom ash suitability to be recycled as aggregate or landfilled will be dependent on actual composition but no actual justification of this assumption provided.	An estimation of ash and residue composition has been appended to the Waste Management Report (Appendix H). It is TNG's intention to recycle bottom ash via a crushing and screening process to produce aggregate for road base. This will likely require a resource recovery order and resource recovery exemption to be issued by the EPA under Clause 92 of the PoEO Waste Reg	Waste Management Report Appendix H. Waste Management Report Section 6.5	Composition of bottom ash has been based on (UK) energy from waste data taken from facilities processing MSW. Ash generation rates are inconsistent. Recommend that bottom ash is landfill until provided otherwise suitable for recovery.	
Arup (DGR)	7	procedures for the management of other solid, liquid and gaseous waste streams;	App J Waste Management Assessment Section 7.6	P	Ash residues classified as either Bottom Ash or Air Pollution Control residue are described. Liquid effluent and Gaseous emissions also described. No details or estimate of quantity of boiler ash has been provided. Boiler ash composition is dependent on the feedstock can be classified as either hazardous no non hazardous and is either handled with the bottom ash or the Air Pollution Control residues dependent on its classification. No details provided on how other waste streams such as waste produced by staff or chemical waste will be managed.	Estimated residue ash quantities are now provided in Ramboll 'Estimation of ash and residue composition' assessment. Details on other waste streams are now provided in Section 6.6.	Waste Management Report Section 6.6.3, Waste Management Report Appendix H.	Control inputs detailed in Section 6.3 of WMR. Table 8 in Section 3.7 provides details of estimation of ash residue, based on volume of facility processing 1,105,000 tpa. Manage of bottom ash, APC and boiler ash procedures detailed in Section 6.6 of WMR. Initial identified licenced facilities open to accept APC have not been identified.	
Arup (DGR)	8	describe how waste would be treated, stored, used, disposed and handled on site, and transported to and from the site, and the potential impacts associated with these issues, including current and future offsite waste disposal methods;	App J Waste Management Assessment	P	Some general commentary is provided. No details are provided on a actual the sources of feedstock or possible suitable licenced landfills that could accept the ash residues.	Appendix H and Section 6.7 describe expected ash classification. Only APC reside is a potential the waste that may be classified as Hazardous Waste (although current analysis indicates APC reside will be classified as Restricted Solid Waste). In the event the waste exceeds the criteria for Restricted Solid Waste and is classified as 'hazardous' then the residue will be taken off site for treatment at a Hazardous Waste Treatment facility.	Waste Management Report Section 3.5	Details of information of the identification of authorised facilities for source of feedstock will be will be provided in confidence to the EPA and the Dept. of Planning and Environment. *EPA and the Dept. of Planning and Environment to evaluate identified feedstock sources.* The EIS, or WMR, does not provide any detail of the current resource recovery operation on site - difficult to evaluate that current resource recovery practices are employing best practice material recovery processes (as per NSW EfW criteria). Section 3.7.1 (WMR) details disposal options of APC ash and mentions Kemps Creek Landfill. No details of identified Hazardous Waste Treatment Facilities likely to accept APC ash provided. Section 3.7.1 references Appendix B for detailed procedures for each ash type - general procedures for hazardous waste are addressed, but no	P
Arup (DGR)	9	identify the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2007.	App J Waste Management Assessment	Y		No comment to be made.		N/A	Y
	Air Quality and Human Health								
Arup (DGR)	1	a quantitative assessment of the potential air quality and odour impacts for the development on surrounding landowners and sensitive receptors under the relevant Environment Protection Authority guidelines;	Section 11.0, Appendix K and L		Quantitative assessment of the potential assessment has been undertaken at the site boundary and sensitive receptors taking into account background pollutant levels, in accordance with EPA Guidelines. The assessment should also consider cumulative impacts of potential future developments, if relevant. Odour assessment not viewed.	n/a			
Arup (DGR)	2	a description of construction and operational impacts, including air emissions from the transport of materials	Section 11.0, Appendix K	P	A description of construction and operational air quality limit exceedances is provided. Emissions from the transport of materials is described qualitatively; Further information on the transportation of material to site (particularly for material that is not sourced from the Genesis facility) should be provided. No details provided of potential fugitive emissions.	Qualitative assessment completed.			
Arup (DGR)	3	a human health risk assessment covering the inhalation of criteria pollutants and exposure (from all pathways i.e., inhalation, ingestion and dermal) to specific air toxics	Section 12.0, Appendix N	Y		/		n/a	
Arup (DGR)	4	details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions	Section 11.4, Appendix K	P	The EIS describes in detail pollution control equipment for stack emissions; further information on construction and transportation emission controls are briefly described in Appendix K, but should be presented in the main body of the EIS also. A further description of ongoing management controls (particularly in adverse conditions) and monitoring should be provided.	/		n/a	
Arup (DGR)	5	a demonstration of how the waste to energy facility would be operated in accordance with best practice measures to manage toxic air emissions with consideration of the European Union's Waste Incineration Directive 2000 and the Environment Protection Authority's draft policy statement NSW Energy from Waste	Section 11.3 and 11,4, Appendix K	Y	A description of best practice measures to manage air emissions is provided and emissions modelled against criteria of the two described documents.	/		n/a	
Arup (DGR)	6	an examination of best practice management measures for the mitigation of toxic air emissions	Appendix K	Y	An analysis of best practice management measures applied at a number of similar overseas facilities is provided.	/		n/a	
Arup (DGR)	7	details of the proposed technology and a demonstration that it is technically fit for purpose	Section 11.3 and 11,4, Appendix K	Y	An analysis of best practice management measures applied at a number of similar overseas facilities is provided.	/		n/a	
	Noise								
Arup (DGR)	1	description of all potential noise sources such as construction, operational, on and off-site traffic noise;	Section 14,0 and Appendix O	Y	potential sources of construction, operational and traffic noise are described in detail.	/		n/a	

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Arup (DGR)	2	a quantitative noise impact assessment including a cumulative noise impact assessment in accordance with relevant Environment Protection Authority guidelines	Section 14,0 and Appendix O	Y	a quantitative noise impacts assessment, including cumulative noise has been undertaken.	/		n/a	
Arup (DGR)	3	`	Section 14,0 and Appendix O	Y	detailed noise mitigation, managing and monitoring measures are recommended in Appendix O. The main body of the EIS should confirm which of these measures will be implemented. In particular, it is not clear whether there is a commitment to undertaking noise monitoring.	This has been clarified in the EIS.	Section 14, 23		
	Soils and Water								
Arup (DGR)	1	description of the water demands and a breakdown of water supplies	Section 15.3.6	P	Operational water demand and supply breakdown is provided. Construction requirements should also be detailed.	A construction programme has been prepared by HZI. It is estimated that construction will be completed within 43 months, with civil works being undertaken between months five and thirteen. The plan includes an estimate of town water use by month during the construction period. The average monthly water use is estimated to be 546 m3, with a maximum of 1836 m3 and minimum of 12 m3 . The total water demand for the construction phase is 23,464 m3 or 23.4 ML. There is no estimate in the programme of the quantity of water to be retained for reuse on site during the construction phase. It is likely that the reuse of retained stormwater will be concentrated during the civil works for uses such as dust suppression.		Inconsistent construction program timelines referred to in the EIS.	
Arup (DGR)	2	description of the measures to minimise water use	Appendix P	y	Measures to minimise potable water are proposed (i.e. use of rainwater and reuse of water from bio-retention basin); further information on water efficiency could be provided.	No response required. No reuse of water from bio-retention basin in EfW process currently foreseen by HZI due to water quality requirements.			
Arup (DGR)	3	a detailed water balance	Appendix P	Y	Details on water demand and discharges are provided in Appendix P.	/			
Arup (DGR)	4	description of the construction erosion and sediment controls	Section 15.4.2	Y	A high level description is provided (including provision of a temporary bioretention basin), and a commitment to providing a more detailed ESCP is made.	/			
Arup (DGR)	5	a description of the surface and stormwater management system, including on site detention, and measures to treat or reuse water	Section 15.3.4, Appendix P	Y	A description of the existing and proposed surface and stormwater management system is provided in detail in Appendix P.	/			
Arup (DGR)	6	an assessment of potential surface and groundwater impacts associated with the development including the details of impact mitigation, management and monitoring measures	Section 15.4, 22.0. Appendix P	P	Potential impacts to surface and groundwater are assessed in Appendix P and described briefly in Section 15.4. Although significant impacts are not identified, the ecological implications of potential changes to groundwater should be considered, particularly in relation to the Threatened Ecological Community on site and the riparian corridor. Appendix P indicates that further investigations into groundwater contamination is occurring, although significant problems are not anticipated. If available, this work should be included in the EIS for completeness. Reference is made to a Stormwater Management Plan that has been prepared by AT& L in 2014. This Plan should be appended to the EIS (not available in the copy provided for review - this may be a reference to the Civil Infrastructure Report in Appendix E, but it is not clear). Section 22.0 references a flood report, however it does not appear to appended; this should be included if available. The design measures to control surface water runoff and potential contamination are well described. Further Information on management controls and monitoring should be provided.	Stormwater management has been assessed within the AT&L Civil infrastructure Report and Plan. Monitoring measures are summarised in the EIS Section 15. A water-quality monitoring programme has been detailed within the Soil and Water Report. The Brown Floor Report has been appended to the EIS.	Civil and stormwater Report and Plans EIS Section 15 Soil and Water Report Section 5.2, Table 5.1 EIS Appendix AA		
Arup (DGR)	7	an assessment of any potential existing soil contamination	Section 15.3.3, Appendix P	P	Appendix P provides an overview of historical soil contamination investigations undertaken in relation to minor levels of contamination associated with the nearby Asphalt Plant. These investigations should be attached if available. Further assessment is recommended in Appendix P; the main body of the EIS should describe the extent of this further work and provide a description of treatment measures proposed during construction.	The most recent soil contamination investigation conducted by ADE (2014) concluded “no contamination of the site from potential contaminating practices undertaken both on and off site, had occurred prior to the time the investigation took place”. ADE further concluded that the site is deemed suitable for commercial/industrial land use and the proposed development. This assessment included an evaluation of potential impacts from the adjacent asphalt plant. The Brookfield Multiplex Construction Environmental Management Plan contains an ‘unexpected finds protocol’ that will be implemented as required.	Construction Environmental Management Plan		
	Traffic and Transport								

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Arup (DGR)	1	details of traffic types and volumes likely to be generated during construction and operation	Section 16.3.2	P	Details of traffic types and volumes is provided for operations only. Details of construction is not provided. As details of the sources of feedstock other than from the Genesis facility is not provided, there is no assessment of potential routes	Section 6.2 provides some detail regarding the distribution of traffic onto the surrounding road network, in the absence of detailed information regarding specific feedstock locations. The feedstock locations would be expected to change over time and, given the inimal number of hourly truck movements, is not considered critical to the assessment of the application from a traffic perspective. Indeed, RMS has raised no objection to the application.	Traffic Report Section 6.2	The TIA did not consider any vehicle movements associated with ash residues.	
Arup (DGR)	2	an assessment of the predicted impacts of this traffic on the safety and capacity of the surrounding road network and a description of the measures that would be implemented to upgrade and/or maintain this network over time	Section 16.3 and Appendix Q	P	An assessment of the predicted impacts of traffic on the surrounding road network once the project for operations is provided. Information on construction traffic volumes and management should also be included.	Refer to the amended report (Section 7) which provides information with respect to construction traffic impacts. Notwithstanding, it is expected that preparation of a Construction Traffic Management Plan (CTMP) would be included as a standard condition of consent, as is standard practice	Traffic report Section 7	Construction Mgmt. section provides estimation of truck movements. There is no assessment on the impacts that these increased movements will have on the surrounding road network. Although the management measures construction traffic will be detailed in the CTMP, management measures and commitments could be outlined in the EIS.	
Arup (DGR)	3	details of key transport routes, site access, internal roadways, infrastructure works and parking	Section 16.3 and Appendix Q	Y		/			
Arup (DGR)	4	detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian standards	Appendix Q	Y		/			
	Hazards and Risk								
	1	Preliminary Hazard Analysis (PHA) in accordance with *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* and *Multi-Level Risk Assessment* and details of fire/emergency measures and procedures	Section 17.0 and Appendix V	Y					
	2	detail contingency plans for any potential incidents or equipment failure during the operation of the project	Section 17.0 and Appendix V	N	Design measures are recommended; there is limited information on operational contingency plans in the event of incidents or equipment failure. A full review of drawings has not been undertaken, but it would be useful to provide text on whether the measures recommended in Appendix V have been included in the design.	A Preliminary Hazard Analysis (PHA) assesses the potential impacts (radiant heat, over pressure, toxicity, etc.) of an industrial facility on the surrounding land uses to determine whether the fatality risk of the facility exceeds the acceptable criteria published in the Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 – Risk Criteria for Land Use Planning. The PHA does not take into account emergency response planning or management of equipment failures/systems. These contingency plans are assessed in other risk studies such as a Safety Management System (SMS) or an Emergency Response Plan (ERP). The preparation of these studies is dictated by the Secretary of the Department of Planning and Environment (DPE) following review of the EIS, the Work Health and Safety Regulations or both. In addition, contingency plans in the ERP and SMS are reviewed during a Hazard Audit (this requirement is also dictated by the Secretary) which is generally conducted after the first year of operation and every three years thereafter (although a different frequency maybe requested by the			
	Flora and Fauna								

General Observation / DG Requirement	excel row no.	Environmental Assessment Requirements / General Requirements	EIS section/appendix Cross-Reference	Adequacy against TOR (Y/N/Partial)	Review Comments	Applicant Response	Applicant Reference	EIS (June 2015) Review Comments	Adequacy against TOR (Y/N/Partial)
Arup (DGR)	1	including an assessment of the potential impacts to threatened species, populations and communities, and their habitat(s)	Section 18.0, Appendix G	P	An assessment of the direct impacts of the project on threatened species, populations and communities and their habitat has been made. There has been no assessment of any indirect impacts however, including noise, water quality, changes to hydrology, introduction of weeds or light impacts. In particular, further assessment of indirect impacts on the ecology of the flora and fauna of the Roper Creek tributary corridor and the 9ha of the critically endangered Cumberland Plain Woodland within the study area is warranted. Should indirect impacts be identified, the project may require referral under the Environmental Protection and Biodiversity Conservation Act 1999. It is acknowledged that the 0.2ha patch of Cumberland Plain Woodland to be removed does not meet Conservation Advice published by the Commonwealth Government, however there is no discussion on whether any offsets are still warranted at a state level. Despite this patch not meeting the significance criteria, further discussion on protection and ongoing management of this area in accordance with the conservation advice should be provided. Further information on the long-term monitoring and management of revegetated areas and fauna protection measures e.g. bat boxes, would be beneficial.	Indirect impacts are detailed in Flora and Fauna Report.	Flora and Fauna Report Section 8.3	Long-term monitoring and management of revegetated areas and fauna would be addressed in a VMP, but only if required. Flora and Fauna Report 'anticipates' that there will be no impacts on the 9 ha of Cumberland Plain Woodland, and thus it is 'not necessary' to referee to EPBC Act. No mention of need for referral to TSC Act (NSW).	
Arup (DGR)	2	if required describe how the principles of "avoid, mitigate, offset" have been used to minimise the impacts of the proposal on biodiversity	Section 18.0, Appendix G	P	The EIS does provide measures to mitigate, and to some extent, offset potential impacts where they have been identified. Further discussion on whether these impacts could have been avoided should be included. For example, could removal of the critically endangered ecological community be avoided?	Some areas of remnant indigenous vegetation have been retained and thus clearing has been avoided. Approximately 1.29 ha of River-flat Eucalypt Forest will be retained south of the proposal footprint. However an area of approx. 0.27 ha of Cumberland Plain Woodland and 2.89 ha of River Flat Eucalypt Forest will be cleared for the proposal. Clearing on these areas has not been avoided, but will be offset.	Flora and Fauna Report Section 8.1, 9.3	Avoid, mitigate, offset principles outlined in Section 9.3. Lack of commentary of alternative options to prevent the removal of critically endangered ecological community.	
	Visual								
Arup (DGR)	1	an assessment of the proposed building height, scale, signage and lighting, particularly from nearby public receivers and significant vantage points of the broader public domain	Section 19.0, Appendix H	Y	Provided in Appendix H. Some photo montages within the main body of the EIS would be beneficial.	Montages are provided within EIS.	EIS Section 3, 19	Two photo montages of the proposed facility provided of west and south-west directions.	Y
Arup (DGR)	2	details of design measures to ensure the project has a high design quality and is well presented, particularly in the context of the broader Western Sydney Employment Area	Section 3.6.4, Section 19.0 and Appendix H	N	No mitigation measures detailed in Section 19.0, although options are presented in Appendix H. The main body of the EIS should confirm if these recommended mitigation measures will be implemented. A description of the design is provided in Section 3.6.4; a description of the design objectives, process and quality would be beneficial in this location, particularly in relation to the broader Western Sydney Employment Area.	EIS has been updated.	EIS Section 19.	Details of mitigation measures provided in Section 19.5.	
Arup (DGR)	3	consideration of any impact on flight paths		N	No information on potential impacts to flight paths was located within either the main body of the EIS or Appendix H.	Visual Impact Assessment includes summary of design intents.	Visual Impact Assessment Section 5.	No details of considerations of potential impacts on flight paths in Appendix I Visual Impact Assessment. Section 6.3 (EIS) details consultation with Dept. of Infrastructure & Regional development regarding second airport at Badgerys Creek. Commitment should be made by proponent in EIS that evaluation of potential impacts on flight paths will be undertaken as details on second airport are released.	
Arup (DGR)	4	a detailed photo-montage based analysis of the visual impacts of development and emissions stacks	Appendix H	Y	Detailed photo-montages provided, including emissions stacks.	This matter has been addressed separately. Refer to Consultation section within EIS.	EIS Section 6.		
	Greenhouse Gas								
Arup (gnl)		The abatement equipment proposed is well established and emission modelling indicates emissions will be in line with the European Incineration Directive. No details are provided on fugitive emissions. No assessment is made of emissions during equipment failure or abnormal conditions.				This has been addressed in the Air Quality Report.	Air Quality Report Sections 7.4, 7.5, 7.6		
Arup (DGR)	1	a full greenhouse gas assessment (including an assessment of the potential scope 1, 2 and 3 greenhouse gas emissions of the project, and an assessment of the potential impacts of these emissions on the environment		P	An assessment of Potential Scope 1 and 2 emissions only has been made; an assessment of Scope 3 emissions should be provided.	This has been addressed in the Air Quality Report.	Air Quality Report Section 10.3	Section 10.3 provides GHG emission estimates for Scope 1 but no consideration of Scope 2 emissions have been made or acknowledged. Scope 2 emissions should be identified and quantified for completeness. Report acknowledges that Scope 3 emissions will be 'minor' but no estimations have been provided. Details on how this assumption has been should be provided, considering that Scope 3 emissions from the transportation of >1 million tpa waste feedstock (especially considering that external feedstock supplies have not been identified).	P
Arup (DGR)	2	a detailed description of the measure that would be implemented on site to ensure that the project is energy efficient		N	No specific information on energy efficiency of the project is provided, although some potential measures are described generally in Section 3.0. It is acknowledged that the purpose of the project overall is reduce the energy intensity of energy supply in NSW.	This has been addressed in the Air Quality Report.	Air Quality Report Section 10.3.2	Estimation of net GHG emissions has been made and benchmarking against major NSW generators.	Y

General Observation / DG Requirement	excel row no.	Environmental Assessment Requirements / General Requirements	EIS section/appendix Cross-Reference	Adequacy against TOR (Y/N/Partial)	Review Comments	Applicant Response	Applicant Reference	EIS (June 2015) Review Comments	Adequacy against TOR (Y/N/Partial)
	Aboriginal and non-Aboriginal Cultural Heritage								
		No specific requirements requested.	Section 21.0	Y					