East Rockingham Waste to Energy Revised Proposal

Environmental Review Document

Assessment No. 2116

COMMENTS FROM THE ENVIRONMENTAL PROTECTION AUTHORITY (EPA) SERVICES

This document provides the comments from EPA Services regarding the Public Environmental Review Document for the East Rockingham Waste to Energy Revised Proposal proposed by New Energy Corporation.

EPA Services comment	Proponent response
Proposal	
1. What methods would be undertaken to ensure only genuine residual waste that cannot be feasibly reused or recycled is accepted for processing? 2. The Environmental Review Document (ERD) states that wastes delivered on site will be visually inspected. What other monitoring measures would be undertaken to ensure excluded wastes are not accepted on site? e.g. periodic testing of wastes received. 3. The ERD states that New Energy Corporation (NEC) intend to receive and process waste on site that meet Class III landfill criteria as defined in *Landfill Waste Classification and Waste Definitions 1996* (As amended December 2009). This includes Type 2 Special Wastes, which is defined as *"Waste consisting of certain types of biomedical waste which are regarded as hazardous but which, with the use of specific management techniques, may be disposed of safely within specified classes of landfill"*. Would the proposal be accepting hazardous wastes, including biomedical or clinical waste?	1. The Project consortium has entering into binding long term agreements with Perth Councils that makes the processing of recyclable material expressly prohibited. An example is the agreement with the East Metropolitan Regional Council, which was consummated in March 2018 to process waste from the member councils for a period of 20 years. The Agreement details a "Waste Acceptance Protocol", which forms Schedule 11 to the Agreement. The Schedule defines "Non-Processible Waste", which under the contract cannot be delivered nor processed as the facility. The definition of non-processible waste includes. *Separate Green and Organic Waste: Clean, source separated green waste only or source separated combined green waste and food waste collection or received by or on behalf of one or more Participants*. It also includes *Recyclable materials, either as a single material or comingled materials, separated or collected for recycling.* To ensure compliance with these commitments inspection of waste is undertaken. Details of these inspections are covered in response 2 below. 2. Waste received on site will be visually inspected as stated in the ERD. The plant design allows for non-compliant waste to be identified and picked out of the waste bunker by the grapple operator. A designated quarantine area, adjacent to the pit will store the waste before it is collected and disposed of. In addition to this the project will also: a. Allow only pre-approved trucks to enter the site and exclude the general public. This will ensure that only trucks that are coming from

EPA Services comment	Proponent response
	an approved council or location will be allowed to tip waste. b. Our Agreements allows trucks to be randomly selected and directed to offload waste prior to tipping in the bunker. c. We also expect that periodic waste audits may be required to claim Renewable Energy Certificates. The frequency of the audits is being discussed with the federal Clean Energy Regulator. 3. No we would not be accepting hazardous wastes, including biomedical or clinical waste.
Air quality	
1. In Table 13, Recommendations 9 and 10 (in relation to pollution control and emissions monitoring) as described in the EPA and Waste Authority's section 16(e) advice on waste to energy have not been addressed. A completed table should be provided, which addresses all the recommendations.	A complete table is now provided as an Attachment 1 to this response to submissions.

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Assessment No. 2116

CMS 16316

Summary of Public Submissions

This document forms a summary of public submissions and advice received regarding the Public Environmental Review document for the East Rockingham Waste to Energy Revised Proposal proposed by New Energy Corporation.

The public review period for the proposal commenced on 22 January 2018 for a period of four weeks, ending on 19 February 2018. A total of 19 submissions were received.

The principle issues raised in the submissions and advice received included environmental and social issues as well as issues focussed on questions of fact and technical aspects of the proposal. Although not all of the issues raised in the submissions are environmental, the proponent is asked to address all issues, comments and questions, as they are relevant to the proposal.

The key issues raised in the submissions include:

- appropriateness of the proposal location;
- consistency with the Government's waste management policy;
- potential contamination risk to groundwater;
- impacts to human health from air emissions;
- potential noise and odour impacts on sensitive receptors; and
- consultation process is inadequate.

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The proposal – General comments

No.	Submitter	Submission and/or issue	Response to comment
1	Public submitter 1	There are already existing waste facilities that can be modernised to take residential waste, and hospitals are already dealing with the noxious waste produced. This facility should be located closer to the heavy industry that is producing this waste.	*Residential waste generated in Perth is currently handled in one of three ways:* *1. Disposal to Landfill* *2. Composting in Mechanical Biological Treatment (MBT) Systems (These handle less than 10 % of Perth's waste)* *3. Recovery through Recycling* *A range of State Government Policies are directed at reducing waste to landfill which is seen as the option of last resort.* *The two MBTs which have been constructed have not generally performed in accordance with design specification and there is little appetite in local government industry to enhance or expand these facilities. Thus if Waste to Energy Facilities are not constructed then it is probable that waste will continue to be directed to landfill.* *Although the proposed NEC Waste to Energy Facility is primarily designed to accept residential waste that is currently being directed to landfill, it is located immediately adjacent to the State's main heavy industrial area and in an area highlighted as the next major heavy industrial area. It is therefore difficult to provide a meaningful response to this submission.*
2	Public submitter 2	The submitter is concerned that Rockingham would be dealing with waste from the North East and Mindarie area shires. There is also concern that there is no information about the expression of costs to Rockingham, including financial impact, life expectancy (health effects), and destruction of the environment while their suburbs remain pristine. The City of Rockingham residents live in proximity to pristine bush land.	*NEC decided to locate the facility on the proposed site after extensive consultation with State Government Agencies who indicated that the proposed site is well located on land identified for heavy industry and serviced by a suitable road network.* *The project is appropriately located within the Kwinana Industrial Area and the site is zoned for Heavy Industrial land use. The project will be co-located with other heavy industry such as the East Rockingham Wastewater Treatment Plant. The project is therefore,*

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			consistent with other current and future land uses. This position is supported by the submission from LandCorp. *It is an observable reality that as a result of the very high design and operational standards including the need for buffer distances to residential areas required for all waste management infrastructure, the capital costs for developing and operating such facilities are very high. As a result, for many years there has been a trend for the development of a lesser number of larger facilities to service major cities like Perth rather than each municipality having its own landfill. This means that Perth, despite having more than 40 municipalities, has its waste disposal serviced by 7 Class 2/3 landfills in the metropolitan area and 2 other landfills located south of the City outside the metropolitan area. These landfills are supplemented by 2 Mechanical Biological Treatment Facilities (Nowergup and Canning Vale). Waste from all over Perth is directed to these facilities. It is likely that in the near future (say 5 years) 3 of the existing landfills will reach end of life and will close. So waste disposal will necessarily be concentrated in a lesser number of facilities.* *Modern, well designed facilities operate to a very high standard and do not cause adverse health or environmental impacts for host communities and will generally provide economic benefits in terms jobs and investment.* *The submitter should also be aware that Rockingham is already home to the largest landfill in the metropolitan area. The Millar Rd facility routinely accepts waste from all over the Perth metro area and from other local governments. The waste to energy facility being implemented represents best practice waste management and will divert waste from the existing landfill facility.* *Indeed, there will be a very positive financial impact for Rockingham*

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			with $400m infrastructure investment with over $100m sourced in WA and locally, 300 direct full time jobs created during construction, 40 direct ongoing skilled jobs. A further 600 indirect full time jobs during construction and 100 indirect full time ongoing jobs. *Finally, neither the City of Rockingham nor its ratepayers will be required to contribute financially to the operation of the proposed Waste to Energy Facility.*
3	Public submitter 2	The submitter is concerned that potentially dangerous and hazardous waste would remain on site.	*The project description contained the ERD makes it clear that all wastes are delivered to site in enclosed vehicles, processed in enclosed buildings and the residuals (bottom ash and the resides from the flue gas cleaning system are all directed off-site for reuse or disposal.* *The site will not accept hazardous waste materials and no hazardous waste material will be stored on site.*
4	Kwinana Industries Council	Kwinana Industries Council (KIC) is supportive of the proposal. The KIC considers it would be beneficial to include an additional map setting out the boundaries of the Western Australian Planning Commission's 2010 resolved line of the buffer zone. The Buffer Zone is an important consideration in the placement of industrial installations in the Western Trade Coast.	*Noted – Marked up Plans showing the Buffers referred to is attached (see Attachment 2). These buffers will be referenced in future mapping associated with the project.*
5	LandCorp	LandCorp has provided the following comments: • LandCorp is supportive of the proposal location within the East Rockingham Industrial Zone (RIZ). The proposed location makes use of the existing heavy haulage and power transmission infrastructure within the RIZ, and the operation is consistent with the heavy	*Noted*

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		industrial zoning of RIZ. • The project is consistent with the EPA's strategic advice on waste to energy which recognises that this technology is a relevant method for processing waste, and is preferred to landfilling. • Processing of biosludge would reduce waste which would otherwise be disposed to the environment. • The location will enable waste from operations in Rockingham and Kwinana to readily be disposed of to this processing facility where relevant. • LandCorp is finalising the land tenure for NEC.	
6	Private submitter 1, 2, 3, 5, 6, 7, 9	The submitter is opposed to the proposal. Particular concerns include the following: 1. The economic benefits to the proposal do not outweigh the disadvantages, including medical services to the impacted population. 2. This proposal is not required in Rockingham as there is currently an existing landfill. Also, bottom ash cannot be accepted by NEC and would still be required to be disposed of in landfill. 3. This proposal would impact on rate payers in Rockingham. 4. Consideration should be given to sending city waste north of Southern Cross, where impacts to the environment would be minimal. 5. Consideration should be given to waste recycling and reuse, rather than destruction.	*The following responses are offered to the numbered points raised.* *1. The proposal is essentially an industrial operation like all of the other operations located on industrial zoned land in Rockingham and Kwinana. The facility will be required to meet planning, environmental and health standards before it can be approved to operate and therefore should have no adverse impacts on the region. In contrast the facility will provide the following benefits:* • *Jobs and increased opportunities for local contractors;* • *Rate revenue to the City of Rockingham;* • *Extension of the life of Millar Road landfill by diverting waste that is currently accepted at the site from other local authorities;* • *Improved stability of power the local electricity grid by the addition of up 30 MW of power.*

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		6. To obtain enough waste to produce power, waste would need to be accepted from all surrounding Councils, and significantly increase the quantity of waste in the Council before the plant is working.	*2. As described previously it is no longer feasible for each municipality to operate its own waste disposal facility. The Millar Road Landfill currently receives waste from all areas of Perth and the implementation of the East Rockingham Waste to Energy Facility will accept some waste currently directed to Millar Road Landfill thus extending its life.* *The facility will not accept bottom ash and the proposal is based on treating bottom ash that is produced and directing it for re-use as aggregate.* *3. As described previously, the facility will not impact adversely on the health or amenity of ratepayers in Rockingham and will provide economic benefits.*
		7. The waste is not sorted before incineration; organic waste, plastics building materials would all be burnt together to produce toxic fumes, particles, sludge, steam and ash. This would be carried by the wind and impact on gardens and human health, and the toxic sludge and ash would be sent to a hazardous landfill area, and potentially contaminate land and groundwater. 8. There is a global movement to stop waste incinerators as it is toxic to the health and environment. 9. Concern about the regulation of the proposal. 10. It is not safe.	*4. Southern Cross is over 4 hours by truck or rail and would be an unsustainable and uneconomic solution for the City's waste. There would be a significant increase in the amount of greenhouse gas emission from transporting the waste as well as an increase of risk to the public from traffic incidents from long hauling of the waste. The long transport routes would significantly increase waste disposal costs. This proposal is unfeasible and is not warranted since the East Rockingham Proposal demonstrably meets modern environmental standards.* *5. The East Rockingham facility will only be handling waste which is currently directed to landfill and for which no commercially feasible recycling option exists.* *6. The proposal is based on accepting up to 300,000 tpa of residual waste which will be accepted from a range of sources. The source of the waste is largely irrelevant to the environmental performance of the facility.*

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			7. *Residual waste delivered to the site is in fact sorted before acceptance. This occurs as the local authorities are currently adopting the three bin system for kerbside pickups and therefore the waste stream is divided into 3 categories Recyclables, Food and Organic (FOGO) and residual waste which is placed in the red top bin. The proposed facility will accept the mixed redtop bin waste while the other separated streams will be re-used or recycled elsewhere. Beyond this, the other main feedstocks accepted at the plant will be unrecyclable residual waste streams from Material Recycling Facilities and other waste processing plants. These wastes are currently directed to landfill. The facility design is consistent with world best practice and as result it will not emit toxic fumes.* 8. *There is a small and vocal opposition to incinerators. Notwithstanding this small group, there is worldwide trend to install more waste to energy facilities with a recently released report by the World Energy Council (World Energy Resources Waste to Energy 2016) indicating a 5.5% annual growth in the number of new Waste to Energy facilities coming on line over the period 2016-2023.* 9. *If approved, the facility will be regulated under Part IV and V of the Environmental Protection Act 1986 as well as under relevant planning provisions. Western Australia has very well developed regulatory controls in the area of environmental protection.* 10. *The facility will be designed, constructed, operated and regulated to world's best practice and there is no evidence to suggest the facility will cause adverse health or environmental outcomes*

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7	Public submitter 4	The submitter is supportive of the proposal for the following reasons: • There are associated environmental impacts from landfill. Some local governments have provision for the collection and use of methane gas but the majority do not, and is detrimental to the environment. Leachate generated may also impact on groundwater. • There is an increase to landfill levies to local councils, which will be passed onto ratepayers. • Western Australia does not have the capacity to recycle materials economically. • Incinerators that burn municipal waste substantially reduce the amount of waste going to landfill, generate electricity and allow for metal recovery. • Modern incinerators use high temperature combustion to remove hazardous toxin organic substances and emission control systems minimise hazardous emissions.	*Noted*
8	Waste Authority	In 2013 the Waste Authority released a position statement on waste to energy which confirms its support for: • The waste hierarchy which places material recovery above waste to energy and landfill. • Source separation as the preferred means of maximising material recovery. • Waste to energy to only be used for genuine residual waste which cannot be feasibly recovered through separation at source and/or other processing.	*NEC considers that its approach is entirely consistent with the current State Government Policies in relation to the circular economy. In particular:* • *The site will only accept waste streams that cannot be commercially recycled or re-used and are therefore directed to landfill. It is noted that the Waste Authority has a public position(Waste Authority Position Paper on Waste to Energy (2013) adopts the following position on residual wastes* *"Residual wastes are those that could not without reasonable efforts be reused, reprocessed or recycled and would*

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		The Waste Authority considers that, to be consistent with the waste hierarchy as set out in the *Waste Avoidance and Resource Recovery Act 2007*, the waste strategy and the circular economy (which aims to keep materials circulating in the productive economy for as long as possible), the proposed facility should only accept genuine residual waste. Any licences granted should stipulate conditions in relation to feedstock, including residual waste requirements such as limits for organics and recyclables. Front-end auditing of the mass burner feed and provision of processed material data and mass balance are required to enable the Waste Authority to report on the state's waste management performance.	*<u>otherwise go to landfill"</u>* *The Department of Water and Environmental Regulation (DWER) has indicated that this has been extended to include the "waste that cannot be feasibly recovered through separation at source". This appears to be aimed is aimed at waste segregated in the three bin system being progressively adopted by local governments in Perth* *New Energy's definition of residual Municipal Solid Waste (MSW) waste is:* • *Municipal waste that can feasibly be recovered through separation at sources.* • *Municipal waste that has undergone a recovery process such as aerobic digestion and/or anaerobic digestion (example residual waste from SMRC RRF or MRC RRF).* • *Municipal waste that has been processed at an MSW materials recovery facility.* *Individual councils should be responsible for determining if a third bin is feasible for their jurisdiction. NEC support waste management options and outcomes that are consistent with the waste hierarchy. As such NEC will seek to process genuine residual waste streams.* *NEC however strongly rejects any policy position that allows residual waste from a 2 bin system to be disposed of at landfill but not preferentially disposed of at a waste to energy facility. This position is not consistent with the waste hierarchy nor aligned with the State Waste Strategy.*

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			• *The accepted waste streams are used beneficially to directly generate electricity.* • *Up to 68,880 tpa of bottom ash generated will be recycled meaning that the proposal will divert almost 97% of received wastes from landfill. With treatment, mature bottom ash is turned into a sustainable light-weight and carbon-negative aggregate. The sized aggregate fractions will be suitable for bona-fide re-use for uses such as road base, backfill, pipe bedding and drainage media, fill, lightweight aggregate for masonry and as a component of bituminous mixes. Although the bottom ash recycling is not yet approved in Western Australia, it is a well-established practice in the Britain and NEC has committed to working with DWER and other regulators to gain endorsement for the proposed approach to recycling bottom ash.* • *Other ferrous and non-ferrous metals will be recovered and recycled.* • *As alternative treatment or re-use options are developed, NEC has agreed that waste received under local government contracts can be directed away from the facility at no cost penalty to the waste supplier.* *This approach means that the commissioning of the East Rockingham project will be the biggest single step ever made in Western Australia towards achieving a circular waste economy.* *The comments in relation to imposing limits on organics and recyclables are noted, but in NEC's view are not feasible to implement as waste streams such as residual wastes from Materials Recycling Facilities may contain levels of recyclables, but these are not currently recyclable because they are too heavily contaminated*

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			with organics. NEC contends that the better approach is to look more broadly at the sources of waste streams being accepted rather than imposing regulatory limits. What is clear is that except in extreme circumstances (such as the current ban imposed by China on acceptance of recyclables) separated recyclables should not be accepted as feedstock. Clearly it would be preferable to receive energy from separated recyclables rather than have them directed to landfill as a last resort.
9	Alliance for a Clean Environment (ACE)	The proposal subverts sustainable zero waste management policy and is inconsistent with the government's new direction on waste management in Western Australia. The government is pursuing improved waste management outcomes through a zero waste policy and circular economy models as stated in the current *WA Waste Strategy Review – Waste Avoidance and Resource Recovery*. This project is inconsistent with the state government's investment in the recycling and composting sectors, and other local economic benefits created through increased recovery and source separation. The technology proposed subverts the waste hierarchy by creating a serious economic incentive for regional councils to commit to long-term contracts requiring consistent waste supply volumes at a time when the state government is investing in higher value chains for our waste resources. This project is a financial risk to local governments who are currently being misled by regional councils into submitting to long term contracts that they will increasingly be unable to meet. Western Australian ratepayers will have to carry the financial burden of this outdated and unfavourable dirty energy technology when it ultimately fails, and the state	*The State Government has a clear stated policy of maximising diversion of waste from landfill. The NEC East Rockingham Facility will divert almost 300,000 tpa of waste currently going to landfill for re-use to generate energy.* *In addition, NEC's contracts with local government clients explicitly allow local governments to divert contracted waste away from the NEC Facility with no penalty if new options become available which result in higher or better use than Waste to Energy.* *The goal of a completely circular economy is one supported by all in the community, but the reality is that this is not commercially achievable at this time and the use of modern waste to energy facilities will form an essential part of the State's waste management infrastructure for the foreseeable future.* *In terms of financial risk, Waste to Energy is a proven technology worldwide with a very large installed base of facilities that have operated successfully for many years. The adoption of Waste to Energy as a preferred disposal option for local governments will reduce the financial exposure of ratepayers as the cost of waste disposal to landfill is now equivalent or greater than waste to energy. Waste to energy also results in greatly reduced environmental impact as the waste is dealt with locally in the metropolitan region rather than transported large distances and is*

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		government must protect Western Australian citizens from the inevitable financial burden that this industry will bring. Given that the proponent and the EPA refer to the European Union (EU) often as justification for this technology, particularly in relation to operational standards (but not from an economic policy perspective) it would be appropriate to reconsider the EPA Report 1468 to take a broader, more credible and analytical perspective that protects the long-term interests of the Western Australian economy and its citizens. Europe has recognised the role that waste incineration has had in undermining the recycling sector and has legislated to address this: *"Public funding should also avoid creating overcapacity for non-recyclable waste treatment such as incinerators. In this respect it should be borne in mind that mixed waste as a feedstock for waste-to-energy processes is expected to fall as a result of separate collection obligations and more ambitious EU recycling targets. For these reasons, Member States are advised to gradually phase-out public support for the recovery of energy from mixed waste."* Safer, more effective, sustainable zero waste management and circular economy policies that will deliver more jobs and better environmental outcomes through local economies, is at risk if this project proceeds.	*not left to decompose gradually in the ground for decades leaving legacy environmental issues for future generations.* *The policy matters raised in relation to the acceptability of waste to Energy and the EPA's s16 Advice are matters for the EPA to respond to.*
10	ACE	Successive WA State Governments' have failed to address the issue of hazardous waste management. However, the public will not tolerate the establishment of hazardous waste incinerators by stealth or our regulators ignoring our international obligations under the Stockholm and Basel	*The proposal is based on using the following main feedstocks:* • *Up to 300,000 tpa of MSW that is currently directed to landfill* • *Residual wastes from other waste treatment processes that are currently directed to landfill*

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		conventions to address these issues.	• *Up to 30,000 tpa of sewage sludge for which no commercially viable re-use option exists.* *The proposal as described specifically excludes the acceptance of hazardous waste material with the following wastes listed as not being accepted:* • *Scheduled wastes such as Polychlorinated Biphenyls (PCBs) and Organochlorine Wastes* • *Asbestos* • *Highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine* • *Explosive materials* • *Radioactive wastes* • *Wastes which mechanically cannot be handled by the facility.*
11	Department of Water and Environmental Regulation (DWER)	The ERD document states that *'the main waste streams to be accepted will be MSW waste, residuals from MRFs handling Recyclables and C&I wastes, residuals from Mechanical Biological Waste Plants.'* In 2013, the EPA and the Waste Authority provided joint advice to the then Minister for Environment on the health and environmental impacts of waste to energy technologies using thermal treatment. One of the key findings was "the waste sourced as input must target genuine residual waste that cannot feasibly be reused or recycled". In its 2013 position statement which complemented the joint advice, the Waste Authority noted that waste to energy should only target genuine residual waste. Residual waste is waste that has been left over after waste processing and/or	*The proposal will accept the following waste streams:* • *Residual municipal or commercial and industrial waste that cannot be feasibly separated at source or cannot feasibly be recycled or otherwise re-used.* • *Residual waste streams from Material Recycling Facilities Mechanical Biological Waste Treatment facilities that cannot be commercially recovered and are directed to landfill.* • *Sewage sludge which cannot be commercially re-used or recycled.* *NEC is committed to the waste hierarchy and councils who contract with NEC have flexibility to divert higher order materials from the waste stream. This includes the implementation of a 3rd bin for organic waste. This flexibility has been built into the contracts with local governments ensuring that penalties are not imposed for*

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		source separation activities have been undertaken. Noting the joint EPA and Waste Authority advice in relation to residual waste, it is important to clarify the types of waste being proposed for acceptance. Further detail regarding waste acceptance controls the proponent will use to ensure that no unauthorised wastes (including radioactive wastes) are received is required. In the review of the waste strategy, the paper released for public consultation proposes amendments to the current strategy that would introduce the concept of the circular economy, which builds on the waste hierarchy established in the *Waste Avoidance and Resource Recovery Act 2007.*	*wastes diverted to a higher use.* *NEC considers that is approach is entirely consistent with the current State Government Policies in relation to the circular economy. In particular:* • *The site will only accept waste streams that cannot be feasibly recycled or re-used and are therefore directed to landfill.* • *The accepted waste streams are used beneficially to directly generate electricity.* • *Up to 68,880 tpa of bottom ash will be generated by the process. NEC seeks to recycle this material and if the approach is endorsed by DWER, the proposal will divert almost 97% of received wastes from landfill.* • *Other Ferrous and non-ferrous metals will be recovered and recycled.* • *As alternative treatment or re-use options are developed, NEC has agreed that waste received under local government contracts can be directed away from the facility at no cost penalty to the waste supplier.* *This approach means that the commissioning of the East Rockingham project will be the biggest single step ever made in Western Australia towards achieving a circular waste economy.* *In relation to controls to exclude unauthorised wastes, including radioactive wastes, The following additional information is provided for clarity:* *NEC adopts a three part approach to ensuring that only suitable residual wastes are used as feedstocks and that unauthorised wastes are excluded. The three forms of control are:*

No.	Submitter	Submission and/or issue	Response to comment
			1 Control over sources of waste *NEC will only permit waste deliveries from pre-authorised vehicles and known sources of waste. The primary sources of waste will be:* • *Residual Municipal Solid Waste directed from local authority transfer stations that will have been subject to review and inspection during the transfer process* • *Residual Municipal Solid Waste delivered directly to the site that has been collected at the kerbside.* • *Residual waste from Material Recycling facilities that is the reside remaining after manually and mechanical screening and sorting processes to remove recyclable and unsuitable materials;* • *Residual waste from Mechanical Biological Treatment Systems that has also be subjected to sorting and screening process to recover organic wastes and recyclables and screen out hazardous materials* • *Occasional special C&I wastes including organic sludges that will only be accepted after examination and review of chemical analysis from NATA registered laboratories to ensure that no unauthorised materials are present* *In each case the waste streams are of known origin and will represent a low risk of containing unacceptable or unauthorised materials.* ***2 Monitoring on Entry for Radioactive Waste*** *NEC has committed to installing radioactivity detectors in key locations to detect any wastes exhibiting elevated level of radioactivity* ***3 Inspection on Tipping***

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			All loads will be inspected as they are tipped into the bunker using installed Closed Circuit Television (CCTV) and direct observation by the crane operator. Regular mixing of waste also allows for additional inspection via CCTV and crane operator. In addition, individual delivery trucks will be subject to random inspection prior to delivery. Where unsuitable materials are identified, they will be removed from the pit and placed in a designated area for further evaluation. In addition, staff operating in and around the tip also assess loads as they are tipped and identify unsuitable materials using visual and olfactory cues (e.g. unusual textures/colours or evidence of smoke or fumes, evidence of chemical drums, unusual or acrid odours). *Collectively these approaches provide a much higher degree of confidence in the quality of materials that occurs for example at a landfill when any commercial trucking operator can turn up at a gate and tip wastes of an unknown provenance.*
12	DWER	The proponent intends to use the ash to develop waste derived products such as road aggregates and construction materials. The regulatory framework for the use of waste ash as aggregate as proposed is not currently well developed in Western Australia. Although the reuse of these materials is supported in principal and is routinely carried out in some countries in the European Union, insufficient information has been provided to indicate whether the ash from this site will have a suitably consistent chemical composition and a leaching behaviour that is comparable with similar materials from other incinerator sites where risk assessments have indicated that reuse can take place without causing environmental harm. In order to achieve these objectives, the proponents would	*Noted and acknowledged. NEC has met with representatives of DWER to commence the process of achieving agreement on the assessment protocols for the treated bottom ash. NEC proposed that the United Kingdom Bottom Ash Standard be used as guidance in developing a protocol for bottom ash recycling that is applicable to the Western Australian statutory framework. NEC has committed to work with DWER to develop a Western Australian framework for bottom ash recycling so that it can be in place by the time the East Rockingham facility is commissioned. This allows almost 3 years for this work to be completed.* *NEC further acknowledges the need to establish the quality of bottom ash produced at the facility through an agreed testing regime with the DWER to be implemented through the commissioning stage of the project. We understand that beneficial*

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		have to demonstrate: that the ash from the incinerator at the site is produced from a consistent waste stream; that the ash is aged in a consistent manner with frequent field checks of properties such as the alkalinity of the material; and that periodic chemical and leaching testing is carried out to confirm that the properties of the material are maintained within well-defined tolerance limits. Information on these issues would have to be documented before the reuse of ash from the incinerator site could be considered by DWER. The references to the use of the UK Standard Rules is noted, however the proponent is encouraged to continue liaising with the Department regarding regulatory aspects and alternative reuse / disposal routes.	*reuse of the bottom ash cannot proceed until this requirement has been met.*

Flora and Vegetation

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1	Department of Biodiversity, Conservation and Attractions (DBCA)	There is no change to the footprint nor the impact of the proposal on *Conservation and Land Management Act 1984* and *Wildlife Conservation Act 1950* related matters. The DBCA have no further comment.	***Noted***
2	City of Rockingham	The vegetation surveys for the site were undertaken in 2002, 2004 and 2005 which is considered to be outdated. It is unclear if the surveys were consistent with the requirements of the previous EPA guidance statement No. 51. The ERD only includes extracts from the flora and vegetation surveys rather than including the full flora and vegetation assessments. A revised flora and vegetation survey should be undertaken consistent with the EPA's latest guidance. The revised survey should assess if any Threatened Ecological Communities of Threatened/Priority flora exist within the site or are likely to occur within the site. If conservation significant flora or ecological communities are identified, appropriate management measures should be included in the ERD. All of the database searches should be revised to determine if additional conservation significant flora species may be present within the site. A 5 km buffer should be used for the Protected	*Flora and vegetation were not considered by the EPA to be key environmental factors for the proposed waste to energy facility. The listing of flora and vegetation as 'Other Environmental Factors' reflects that this is a minor issue for the development of the project.* *The PER for the original gasification proposal demonstrated that the site's vegetation and flora values have been substantially compromised. This is reflected in the vegetation condition which was assessed as being Degraded or Good to Degraded based on the high weed density and relative low species diversity as discussed in Section 2.7.5.4 of the ERD.* *As outlined in Sections 2.7.5.5 and 2.7.5.7 of the ERD, no threatened or priority ecological communities or threatened or priority flora have been identified on the site. Given the degraded nature of the site, the likelihood of addition conservation significant species being present is considered to be very low.* *The above points have been assessed by the EPA in its review of the PER for the previous gasification proposal and the impacts associated with the proposed clearing of vegetation was not considered a significant environmental issue.* *The information contained in the surveys relied upon was deemed*

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		Matters Search Tool database search.	*suitable enough for the EPA's assessment of the previous gasification proposal as well as the Rockingham Industry Zone Strategic Environmental Assessment. It is therefore also considered adequate for the purposes of this ERD.* *Given that there have been no changes in land use on the site, or any efforts to rehabilitate the native vegetation present, the proponent does not consider that additional surveys are warranted.*

Terrestrial Environmental Quality

No.	Submitter	Submission and/or issue	Response to comment
1	Public submitter 7	The proposal would result in toxic sludge being left after the combustion process, making soil and land around the plant unusable for centuries.	*All waste is delivered to the site in covered vehicles and processed under cover inside buildings with concrete floors.* *Similarly, the incinerator bottom ash is handled and stored in a roofed and bunded structure with the treated bottom ash being either directed off-site for disposal or recycled.* *As a result, there does not appear to be any basis for this assertion*

Terrestrial Fauna

No.	Submitter	Submission and/or issue	Response to comment
1	City of Rockingham	The fauna surveys for the site were undertaken in 2005 and 2008 and is considered to be outdated. The ERD includes a State conservation significant fauna database search from 2012. The fauna survey should be updated with revised database searches and targeted surveys for conservation significant species that have the potential to occur within the site which were not considered in the previous surveys. A 5 km buffer should be used for the Protected Matters Search Tool database. This revised fauna survey will inform any fauna relocation and management required during clearing. Due to the amount of clearing required, a Fauna	*Fauna was not considered by the EPA to be key environmental factors for the proposed waste to energy facility. The listing of fauna as 'Other Environmental Factors' reflects that this is a minor issue for the development of the project.* *The PER for the original gasification proposal demonstrated that the value of the site from a fauna perspective was severely compromised due to the highly degraded nature of the habitat present as described in Section 2.7.6.1 of the ERD. Highly degraded habitat is unlikely to support a diverse fauna assemblage and unlikely to be considered significant enough that its removal would impact conservation significant species.* *The EPA has previously assessed (for the gasification proposal) the potential impacts to fauna as being acceptable. The same level of*

No.	Submitter	Submission and/or issue	Response to comment
		Relocation Management Plan should be prepared for the site.	*impact is proposed for the revised waste to energy proposal.* *The information contained in the fauna surveys was deemed suitable enough for the EPA's assessment of the previous gasification proposal as well as the Rockingham Industry Zone Strategic Environmental Assessment. It is therefore also considered adequate for the purposes of this ERD.* *Given that there have been no changes in land use on the site, or any efforts to rehabilitate the native vegetation present, the proponent does not consider that additional surveys are warranted.* *As outlined in Section 5.2.5 of the ERD, the proponent has committed to the preparation of a Construction Environmental Management Plan which is to include the development and implementation of fauna protocols outlining specific fauna management measures.*

Inland Waters Environmental Quality

No.	Submitter	Submission and/or issue	Response to comment
1	Public submitter 2	The submitter is concerned about the amount the sewage and waste water volumes. In particular, the submitter is concerned about the following: • it is unclear about the source of the water that would be used on site for cleaning • there is uncertainty about how the wastewater would be treated or disposed of • there is uncertainty about the costs to ratepayers to dispose of the wastewater produced on site.	*The ERD (section 5.5.4.2) states the following:* *It is estimated that 60,000 kL of water will be required per annum (approximately 180 kL/day) for the operation of the plant. The project feasibility has been developed based on use of scheme water. Water will be used for the following purposes:* • *Water steam cycle (approximately 70 kL/day)* • *Bottom ash extractor (approximately 60 kL/day)* • *Bottom ash maturation and auxiliary uses (approximately 30 kL/day)* • *Other uses for e.g. staff, sanitary, maintenance, cleaning and washing, landscape maintenance, etc. (approximately 20 kL/day).* *The energy from waste plant itself is basically neutral in its water balance, i.e. no wastewater to be discharged as a result of the process. If during operation minor water quantities require disposal, the first priority is to reuse it elsewhere within the plant, e.g. for the fire-fighting tank, landscaping purposes or the bottom ash treatment area. There will be no on-site irrigation or infiltration of process effluent.* *In terms of liquid waste disposal the following statements are included in Section 2.6.4.16* *Sewage and grey water will be disposed of by an on-site Aerobic Treatment Unit (ATU) due to the lack of a deep sewer in the area*

No.	Submitter	Submission and/or issue	Response to comment
			Wash water and process water such as blowdown form the boiler water circuit will be managed via one of the following methods: • *Within the bottom ash treatment circuit for dust control and to promote maturation* • *Thermal evaporation using waste heat from the combustion process* • *Off-site disposal to an appropriately licensed facility if it cannot be accommodated on-site.* *The project will be fully funded by NEC using capital raised to construct the facility and revenues collected for processing wastes and selling power. The ratepayers of the City of Rockingham will not incur any costs whatsoever as a result of the proposal being implemented and in fact will receive the benefit of increased rate payments and the general economic benefit arising from more jobs and greater economic development in the region.*
2	Public submitter 2	The proposal is located on Pinjarra white sand, which allows surface water to leach down. There is concern about the impacts on water quality impacting on Cockburn Sound.	*The site is actually underlain by Safety Bay Sands (See section 2.7.3).* *As stated previously, all waste is delivered to the site in covered vehicles and processed under cover inside buildings with concrete floors.* *Similarly, the incinerator bottom ash is handled and stored in a roofed and bunded structure with the treated bottom ash being either directed off-site for disposal or recycled.* *As a result, there does not appear to be any basis for this assertion*

No.	Submitter	Submission and/or issue	Response to comment
3	Public submitter 3, 7	There is concern about the potential impacts on groundwater, including contamination from ash residue at the foot of the furnaces.	*See previous response.*
4	ACE	Waste water from incinerator wet scrubbers is highly contaminated with persistent organic pollutants (POPs) and heavy metals. This contamination also contributes to Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/DF) memory effect in the emissions profile. Failing to address the hazardous composition, management and fate of wastewater in this assessment is a fatal flaw in the project.	*The proposal utilises a dry flue gas cleaning system with the residues being initially stored on-site so that they can be characterised and then directed to an appropriate licensed landfill. As a result, this comment is not relevant to the proposed facility.*
5	DWER	The ash that is produced from the incineration of waste materials has the potential to cause soil and groundwater contamination without careful management. The proponent indicated that it is likely that the ash materials will be of suitable quality for disposal in a Class III landfill site, but this would have to be assessed by undertaking appropriate leaching tests for each batch of these materials that is removed from the facility for disposal.	*Noted and agreed. Experience with overseas facilities indicates that the flue gas residue will be suitable for disposal to Class III landfill.* *NEC will analyse samples of the residue to confirm that contaminant levels are consistent with the assessment criteria contained in the DWER Guideline titled Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009).* *If necessary wastes will be directed to higher class of landfill (Class IV or V) or treated to immobilise contaminants so the flue gas residue meets the criteria for Class III landfills.*

Air Quality

No.	Submitter	Submission and/or issue	Response to comment
1	ACE, Public submitter 1, 2, 7	The proposal would be increasing air toxins to the Kwinana air shed, and potentially Rockingham from burning noxious chemicals such as heavy metals, dioxins, furans, bromines and other toxic compounds. Emissions would also impact on residents in neighbouring suburbs, and represents a major long term air quality risk to the region. The prevailing winds in the area blow west-south westerly in the afternoon over the suburbs Kwinana, Medina, Orelia and Cockburn. The facility is more suited to being located in the desert, east of Kalgoorlie, if it would be taking domestic and industrial waste.	*The emissions from the stack are consistent with the European guidelines recognised by the EPA as the appropriate benchmark in its Section 16 advice on Waste to Energy Facilities.* *Air modelling demonstrates that concentrations of all contaminants are well with adopted criteria.* *There is no evidence to suggest adverse impacts on either industrial or residential zoned land.* *Modern waste to energy facilities are sited in urban settings throughout the world and there is no evidence to suggest that the proposed facility cannot safely operate at the proposed location.* *In relation to prevailing winds, the air dispersion modelling process uses representative meteorological data from a nearby monitoring station and so the predicted ground level concentrations produced by the model account for the prevailing breezes. The entire approach to modelling is conservative in nature and given the relatively low contribution to existing ground level concentrations predicted by the modelling, a very high degree of confidence exists that no unacceptable air quality impacts will occur.* *The level of confidence that there will be no unacceptable impacts on air quality is only reinforced by the commitment to complying with the very strict EU IED emission criteria and emission and monitoring requirements.*

No.	Submitter	Submission and/or issue	Response to comment
2	Public submitter 2, 7	The submitter is concerned about acid rain, which has potential to liberate a range of airborne contaminants in the exhaust gas stream, including heavy metals, dioxins and other toxic compounds and acid gases including sulfur oxides, nitrogen oxides, hydrochloric acids and hydrofluoric acids. The submitter is also concerned about the ongoing pollution of vermin in the dust mounds after the burns, and the generation of fumes from trucks.	*The flue gas cleaning system incorporates the use of alkali scrubbing media to neutralise any residual acid gases in the flue gas stream. The treatment system also incorporates a high efficiency bag filter to capture fine particulate matter. As stated previously, the flue gas treatment is designed to best practice standards and will meet the European IED criteria.* *Australia does not have a high potential for acid deposition due to its geographic isolation, predominantly low sulfur fuels and small scale industrial emissions. There is no evidence of an acid rain issue in Western Australia given that the prevailing winds are from the west over thousands of kilometres of open sea from the Indian and Southern Oceans where there are no industrial emissions to contribute to atmospheric acidity. As result, even if emission levels were significant from the proposal, it highly unlikely that contaminants will be leached due the action of acid rain.* *With regard to vermin, all waste is handled and stored inside an enclosed building and then incinerated. There are no mounds of dust, with the only material being stored onsite being the Incinerator Bottom Ash which it is being treated and conditioned before it is directed off-site for reuse as aggregate.* *NEC will maintain the site in clean and vermin free state.*
3	City of Kwinana	The City of Kwinana is concerned about the location of the facility and the potential air quality impacts from the release of fugitive gas and odour emissions for residents within the Calista, Leda and Medina localities. The predominant winds in the region are typical of	*The location for the project was selected after consultation with several Government agencies. The agencies concerned indicated that a location within the Rockingham Industrial Zone (RIZ) had been assessed by the EPA though a strategic assessment process as highly suitable for medium to heavy industry.* *LandCorp and the Kwinana Industry Council in submissions to the EPA*

No.	Submitter	Submission and/or issue	Response to comment
		coastal environments in the Perth metropolitan region and are characterised by strong offshore breezes during the early morning to midday periods followed by strong onshore breezes in the afternoon to evening periods. The strong south-west to south-south-west breezes are of particular concern, especially during shut down periods for the plant (both scheduled and unscheduled).	*have endorsed the suitability of the site for this project.* *The facility as described meets the European Waste Incineration Directive (WID) and Industrial Emissions Directive (IED) standards of performance which are recommended by the EPA as the benchmark for assessing the suitability of Waste to Energy Projects and modelling of air emissions confirm that this ambient concentrations of the key emitted pollutants are all well below adopted assessment criteria even when existing background concentrations are accounted for.*
4	City of Kwinana	There are two residential premises located on Wellard Road approximately one kilometre east of the facility, but potential impacts from the proposal on these residences are not adequately addressed.	*The residential premises on Wellard Road have been noted by NEC and Aurora Environmental and their presence noted (See figure 12 from the ERD which shows the noise contours and specifically list the location of the residential premises. There is a specific discussion of these premises on page 3 of the noise modelling report appended to the ERD which demonstrates that the predicted noise levels experienced at these premises are likely to comply with Environmental Protection (Noise) Regulations 1997.* *With respect to air emissions, Figure 13 of the ERD illustrates that odour levels in excess of the acceptable residential standard under both normal and upset conditions are confined to industrial zoned land to the west of Old Mandurah Road.* *Finally with respect to other air pollutants, the results in Table 24 of the ERD predict that emissions from the proposed facility are unlikely to result in an exceedance of any of the adopted criteria at any location in the modelling grid. As a consequence it is unlikely that the residential premises on Wellard Road to be adversely impacted.* *In summary, the impacts on these premises were assessed and are*

No.	Submitter	Submission and/or issue	Response to comment
			predicted to be acceptable.
5	City of Kwinana	The assessment assumes that the modelled emission rates will not be exceeded at any time, including during combustor start-ups and shutdowns. However, the assessment does not appear to have modelled any potential fugitive emissions during emergency shutdown scenarios, in particular for scenarios 1, 3, 6 and 8 in Appendix 19 - Emergency Shutdown Scenarios. Appendix 19 states remaining waste still smouldering on the grate may release some pollutants including carbon monoxide and volatile organic compounds, which are not treatable in the air pollution control system. Any potential fugitive emissions released during emergency shutdown periods should be modelled and adequately addressed and considered as part of the ERD process.	*A careful reading of each of these scenarios indicates that the key control measures are:* • *To halt combustion blowers and close primary air flaps which essentially isolates the combustion chamber and the waste bed;* • *Any operational burner halts;* • *Waste feed halts; and* • *The Induced Draft (ID) fan operates at minimal speed.* *The Air Pollution Control (APC) system is still operational and will be treating much smaller gas volumes with the final stage being filtration through the bag filter which will have a layer of finely divided lime and carbon trap on the bag surfaces which continues to absorb metals and volatiles as well as trapping fine particulates much of the unburnt organics and VOCs and treating acid gases.* *A very small mass of CO and gaseous VOCs may pass through the system as under normal operating conditions these are combusted in excess air in the secondary combustion zone. The masses of pollutants involved are very small when compared with normal operation as gaseous VOCs will still be absorbed on the activated carbon deposited on the surface of the filter bags. Modern and properly operated plants have experienced no releases to atmosphere or a breach of environmental regulations as a consequence of the scenarios listed above. This is true in particular of all Energy from Waste plants built by HZI in the UK such as Riverside, Ferrybridge, Newhaven, Tees Valley, Buckinghamshire, Hereford &*

No.	Submitter	Submission and/or issue	Response to comment
			Worcestershire and Severnside.
6	City of Rockingham	An independent peer review commissioned by the City identified the following issues in relation to air quality: a) The ERD considered emissions to air from normal operations but did not consider upset conditions. Emissions to air from process upsets can be significant and should be considered in the air quality assessment. b) The ERD states that the project is expected to have planned maintenance or unplanned shutdown for 9% (788 hours) of the year. The ERD has not quantified emissions during these periods nor has it assessed potential impacts on air quality that may be associated with these incidents. The ERD should provide more detailed quantification of emissions and potential impacts associated with unplanned shutdowns. c) The project includes a backup diesel generator. Diesel generators are potentially a significant source of air pollutants. It is important that they are designed, maintained and operated so as not to adversely impact air quality. The ERD should include a quantitative assessment of the potential impact of the diesel generators on air quality.	*a) The issue of emissions is discussed in section 4.3.5.3 of the ERD document and above. The information presented shows that unplanned shutdowns of the facility will be rare and of short duration. In most circumstances the shutdown is completely controlled and the plant is shut down by halting waste feeds while the flue gas cleaning system operates normally with progressively reducing loads. In the event of an isolated incidence, such as an exploding gas bottle, causing an over pressure alarm in the combustion chamber, a series of rapid automatic actions halt waste feed, auxiliary air and any operation burners and control flaps isolate the combustion chamber. If necessary the ID fan may continue to function to draw any minor exhaust gas leakage through the flue gas cleaning system which remains operational. Exhaust gas volumes are either zero or minimal and as result it is not possible to meaningfully model such events.* *The combustion system incorporates redundant back up equipment, including a hot backup Continuous Emissions Monitoring System (CEMS) system and very sophisticated automatic control and monitoring systems which detect excursion from operating set points and intervene at an early stage in order to prevent alarm conditions or exceedances of emission limits. In the event that these automatic measures cannot achieve sufficient control to prevent excursions in air quality, then the control system will automatically either reduce or cease feed to the incinerator. On this basis, it is difficult to identify any situations where non- standard emissions would occur.*

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		d) The ERD did not characterise the environmental values in relation to air quality. The ERD summarised background concentrations in relation to criteria pollutants using ambient air data from the DWER monitoring stations. However, the ERD did not identify existing industries in the area that have potential for cumulative impacts. It is possible that the background data does not adequately represent the potential effect of activities in the near field. The ERD should include a cumulative assessment of the project operating in conjunction with existing and approved industries. e) Ground-level concentrations from to the Project were not predicted at residential locations or the public open spaces and park and recreational areas identified in the Rockingham Industry Design Framework (Landcorp, 2016) in the ERD. The ERD should include predicted ground-level concentrations at these locations. f) Dispersion modelling was undertaken for the Project that used a combination of TAPM and CALMET/CALPUFF meteorological and dispersion models. Whilst these models are appropriate, the ERD provided insufficient information to determine the suitability and competence of the modelling for the Project.	*b) Under planned maintenance, the facility is non-operational and so other than residual odour emissions from any small amounts of waste in the waste bunker there are no emissions. Odour emission from the waste bunker under shutdown conditions has been addressed in the odour modelling study and in section 4.3.5.2 of the ERD. In relation to emissions during unplanned shutdown events, Sections 4.2.5.3 and 4.2.6.4 of the ERD address emissions during emergency shutdown events. In summary, the design of the facility incorporates multiple redundant power systems to mitigate risks of abrupt power loss. This will ensure that there is sufficient power available to maintain control of the primary combustion and control systems as well as the air pollution control system. Similarly the air pollution control system includes backups for key systems to ensure that there are no interruptions to reagent feeds. In the event of a leakage or failure in a filter bag within the fabric filter, an alarm is triggered in the dust sensor downstream. The control unit identifies the affected chamber and bag row allowing the operator to immediately isolate the affected chamber. Once the chamber is isolated, plant maintenance staff change broken bag. ; A filter bag failure results in only minor impact for limited time (typically, no half-hourly control value is exceeded). Plant operation with 1 isolated chamber is possible for up to 24 h (Refer ERD document Appendix 19 -Emergency-Shutdown-Scenarios).* *The conservative design approach means that unplanned events can be managed in a safe manner whereby controlled shutdown takes place. This involves ceasing waste feed followed by a shutdown of the burners and then closure of the*

No.	Submitter	Submission and/or issue	Response to comment
		The ERD should include detailed information on model configuration. g) The ERD did not appropriately identify meteorological conditions for the Project site. Meteorological conditions are critical to the dispersion of air pollutants. The air quality assessment should include a summary and analysis of the meteorological data that is used in the assessment. The ERD should include a detailed characterisation of dispersion meteorology at the project site.	*air flaps to restrict air flow through the combustion chamber to reduce gas volumes and emissions. The main induced draught fan is shut down and the standby system powers a low power auxiliary fan that directs minor volumes of exhaust gases through the air pollution control system. The built in redundancies within the facility's design means that under an emergency shutdown scenario that controlled combustion and treatment of air emissions continues albeit reduced emissions. As a result, the emissions released under emergency conditions are expected to be less than the modelled levels under normal operation.* *c) The Emergency Diesel Generator for Safe Shutdown produces around 1.5 MVA or 1.4 MW capacity.* *The generator will operate for less than 20 hours per year and given its location within a major industrial area, small capacity and infrequent operation, no further assessment of emission is warranted. In view of comments made by DWER, NEC propose that the emissions from this source are modelled as part of the Works Approval application assessment process.* *d) The ERD describes the surrounding industrial area and receptors and discusses the available monitoring data. Where data is available on background pollutant levels it has been quoted and used in the air dispersion modelling assessment. The cumulative impact of other industries is inherently incorporated in the air modelling assessment.* *The modelling results presented in Table 24 indicate that the maximum ground level concentrations contributed by the project (exclusive of background concentrations) are 21.9 % of the assessment criterial for NO_2 and 32.9% of the assessment*

No.	Submitter	Submission and/or issue	Response to comment
			criteria for cadmium. For most other analytes it is significantly less than 10% of the assessment criteria. *On the basis of this screening assessment it is clear that the proposed facility will not significantly impact on air quality in the Kwinana and Rockingham regions and a more detailed assessment of cumulative impacts is not warranted.* *e) The modelling study completed was essentially a screening study which demonstrated that the facility will not cause or contribute to exceedances of residential assessment criteria at any point in the modelling grid. The modelling assessment indicates that if the project is implement, air quality will not be adversely affected anywhere in the region including all parks and gardens.* *f) The suitability of the models and competence of the modeller was assessed by DWER prior to the ERD being released for public approval. This assessment included a request for further sensitivity studies and the inclusion of additional assessment in relation to sulfur dioxide emissions and assessment of sulfur dioxide impacts. Model configuration files have been provided to allow independent assessment of the model by DWER.* *g) Section 6.2 of Appendix 7 (Air Emission Modelling) presents a discussion on the meteorological data set that has been utilised and its suitability. This dataset was utilised for previous air modelling studies.*

No.	Submitter	Submission and/or issue	Response to comment
7	City of Rockingham	The independent peer review commissioned by the City considered that the methodologies applied to predict Greenhouse Gas Emissions (GHG) are partially consistent with accepted methodologies. The estimated GHG are comparable to those estimated using preferred methodologies. However, the avoided emissions components should be reconsidered and revised to more accurately reflect the impact of the project. The ERD should provide a detailed explanation of the methodology and cross-referencing of assumptions including consistency in annual quantities of waste.	*NEC considers that the information presented in the ERD is adequate for the purposes of the assessment. The analysis shows that implementing the project will clearly result in a nett reduction in greenhouse gases when compared to the status quo which would be directing feedstock wastes to landfill.* *When the project is implemented, NEC will be required to report its emissions under the National Greenhouse Emissions Reporting Scheme (NGERS) as the projected emission of CO_2 are in excess of the facility threshold of 25kt/r. More detailed and accurate calculations will be presented at this time, based on the final facility design and a better knowledge of contracted waste.* *To attempt to perform a detailed analysis of the avoided CO_2 over the 25 year life of the project requires the proponent to make a number of assumptions (such as the travel distance to landfills, the design of the landfills, the efficiencies of landfill gas recovery systems that may be implemented and the origin of the waste being accepted at the facility) which mean such calculations provide limited value.*
8	Private submitter 3, 5	One of the submitters are not opposed to the concept of waste to energy but is opposed to the location of the proposal, particularly due to the wind directions. The proposal should be located in the desert, away from people. A submitter is particularly concerned about the air quality impacts on nearby residents from the burning of refuse year round. The community would be denied the right to breathe the fresh and unpolluted air other Western Australians enjoy.	*The site is located on land zoned for heavy industrial use after completion of a range of strategic studies which were assessed by the EPA and confirmed that the land is well suited for heavy industry with air emissions. As described in other responses, NEC sought advice from LandCorp and other government agencies about where to site the proposal and the site on Office Road was recommended. LandCorp has reaffirmed this advice in a submission to the EPA on the project.* *The facility meets modern best practice and including meeting recommended emission guidelines and air emission modelling*

No.	Submitter	Submission and/or issue	Response to comment
			confirms that adopted assessment criteria will not be exceeded at any location in the modelling grid. *On this basis, whilst the concerns are acknowledged and understood there does not appear to be a basis to support them.*
9	ACE, Private submitter 6, 8	The submitters are concerned about cumulative impacts from other industries. In particular, there is already a significant amount of industry in the area without further impacts on air quality from the proposal. The proponent has predicted air emissions under a scenario that does not include another mass combustion incinerator operating within 2kms, as will be the reality when the Phoenix Energy mass combustion incinerator begins operation. The true levels of air emissions have been underestimated.	*The air emissions modelling has been conducted accounting for background levels from existing industry and the results demonstrate that all relevant criteria are met at all locations.* *The modelled results show that the maximum contribution by this facility above background concentrations occurs for NO_2 (21.9%) and Cadmium (32.9%). Modelled results for most other analytes are well below 10% of the adopted criterion.* *In terms of the need to account for the emissions from the Phoenix Energy proposal. The proposed Phoenix Energy proposal is located more than 5 km north of the 26 Office Road. The modelling grid adopted for the Phoenix Energy air emissions assessment does not extend to 26 Office Road for parameters other than Sulfur Dioxide so exact results are not available for much of the area modelled in the ERD. Notwithstanding the lack of exact data it is clear from the data presented in Tables 27, 28 and 29 of the Phoenix Energy PER and Figures 41-59 that the contribution from Phoenix Energy ground level concentrations in the vicinity of the proposed East Rockingham facility are negligible and in addition, given the spatial separation of the two facilities it would be very rare that there is ever any significant overlap of the emission plume from the two facilities so the emission are most unlikely to be additive in any case.* *It is also noted that the cumulative impact of emissions from the two facilities was addressed in a memorandum dated 2014 and authored by Brian Bell of Environ (The emissions modelling consultant for the Kwinana Waste to Energy Project). This information presented in this*

No.	Submitter	Submission and/or issue	Response to comment
			memorandum confirms that the low emission produced by modern waste to energy facilities and the substantial separation distance between the two facilities means that there is no significant cumulative impact from the two facilities.
10	ACE	The proponent will be burning sewage sludge, which is well known to contain polychlorinated biphenyl (PCBs) and other Persistent Organic Pollutants (POPs). The proponent has either been deliberately misleading about their operations and resulting air quality, wastewater and residue assessments or does not have the necessary expertise to quantify and qualify their claims. The emission of POPs through burning of sewage sludge has not been considered in the air quality assessment, and the ERD is fatally flawed. The proponent should either reassess their proposal to include this information or remove the inclusion of sewage sludge from the proposal. Given that the proponent has not considered the emission contribution of POPs via sewage sludge nor provided any details for the treatment or disposal of wastewater generated at the facility, it is unacceptable for the proponent to suggest that the disposal of the incinerator's wastewater should be left to a Works Approval process under Part V of the *Environmental Protection Act 1986* (EP Act).	*The Water Corporation current approaches to managing sewage sludge produced at its sewage treatment plants are summarised in an article published on its website (Water Corporation of WA - Biosolids - https://www.watercorporation.com.au/water-supply/wastewater-services/how-wastewater-is-treated/biosolids). The article indicates that it manages disposal of sewage sludge by:* • *Dewatering to remove excess liquids which are directed to ocean outfalls or to land disposal;* • *The residual solids are then stabilised by anaerobic digestion or lime treatment;* • *The stabilised solids are then either directed for re-use as a soil amendment material or directed to land as a soil amendment.* *The fact that Water Corporation utilises disposal by land application, which is subject to regulation by DWER pursuant and needs to comply with the guideline titled "Western Australian Guidelines for Biosolids Management (December 2012)" suggest that sewage sludge/bio solids do not contain significant concentrations of PCBS or other POPs as asserted by ACE.* *Notwithstanding the adequacies of current practices adopted by the Water Corporation, it is clear that the incineration of sewage sludge would result the total destruction of any POPs given the efficient design of the combustion chamber and the sophisticated flue gas treatment system that is a key element of the facility. If POPS were present at low concentrations, the incineration of sewage sludge*

No.	Submitter	Submission and/or issue	Response to comment
			would result in a far better environmental outcome than any of the practices currently adopted by Water Corporation. *In terms of the adequacy of the system to deal with low levels of POPs, the EU WID and IED specifications indicate that up to 1% of halogenated hydrocarbons can be handled in a non-hazardous waste incinerator provided the final combustion temperature remains in excess of 850^{o} C which is the case for the HZI grate incinerator or design.* *A further consideration is that the NEC has committed to excluding hazardous wastes including scheduled waste such PCBs. The definition of scheduled waste is any waste containing PCBs or organochlorine pesticide at concentrations in excess of threshold concentration (mg/kg) or quantity (g). In the case of PCBs the threshold concentration is 50 mg/kg and the threshold mass in 50 g. Various threshold concentrations and masses are set for other POPs in the National Scheduled Waste Management Plan 2003.* *NEC will ensure that the quality and quantity of sewage sludge accepted at the facility is managed to ensure that at no time are thresholds quoted in the National Scheduled Waste Management Plan exceeded by this waste stream and the overall quantity of halogenated hydrocarbons accepted does not exceed the 1% limit quoted in the WID Guidelines. This will be achieved by an ongoing program of sampling and analysis of biosolids to provide a statistically valid assessment of the concentration of key contaminants in biosolids. If concentrations approach the 50 mg/kg limit then biosolids would not be accepted and if any mass emission limits appear likely to exceeded, then the quantity of biosolids added to the waste feed will be reduced.*

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11	ACE	The waste to energy incineration industry is the second largest global emitter of POPs. Western Australia is obliged to eliminate all forms of unintentional POPs generation, therefore the WA government should pursue non-combustion technologies for all wastes (including hazardous waste) that contain POPs or their precursors instead of thermal technologies like waste to energy incineration. WA has already utilised such technologies successfully in the past through the use of a Gas Phase Chemical Reduction technology to dispose of WA's PCB stockpiles (Eli Ecologic, Kwinana 1995-2000). Investment in these technologies would provide far greater financial and ecological outcomes in the long-term and could even dispose of contaminated plastic wastes until the manufacturers redesign these flawed products in the future.	*This is a comment on policies allowing the use of Waste to Energy incineration processes generally.* *This matter was considered by the EPA in its Section 16 advice to the Minister and the EPA concluded that subject to meeting suitable benchmarks, Waste to Energy was an acceptable and useful waste treatment technique.*
12	ACE	Furnishings, electronic waste, plastics and polystyrene for example are known to contain POPs or precursors to the generation of Unintentional POPs. The proponent has failed to address engineered nanomaterials and the generation of POPs and other toxics in our waste streams - particularly in the commercial and industrial sectors.	*See previous response and note that the alternative to Waste to Energy is a continued reliance on such materials being disposed to landfill where they will progressively breakdown and potentially leak into ground and surface water systems.*

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13	ACE	The proponent claims the facility will run at optimum levels 100% of the time but this is not a credible or proven claim. Air Pollution Control Units (APC) must be serviced and filters cleaned as their efficiency decreases from installation as they become fouled with filter cake or absorb their maximum capacity. In addition bypass events, such as where APC are bypassed due to system failures leads to massive pollution spikes with complete release of flue gas without any treatment or toxicity reduction. Criteria emissions will be reached at 748m (on average) during these times and for $PM_{2.5}$ under normal operations the annual average is at 92.9% of the criterion. This means that during bypass events $PM_{2.5}$ will exceed air quality protection standards. Given that during bypass events 100% of air pollutants will be released it is predictable and likely that air toxics will exceed the NEPM ambient air quality standards and are known to cause public health and environmental impacts. With less than 300m to the nearest sensitive receptor there is little room for error or dilution to safe standards. With high public use places and sensitive receptors such as Rockingham beach, Point Peron and Shoalwater bay so close, impacts on the community and the environment, particularly the marine environment have clearly been underestimated. Industrial licences in WA allow for many bypass events which are not	*NEC has not claimed the system will run at 100% efficiency all of the time. The design of the combustion system and the flue gas cleaning system has been refined and improved by HZI over decades of operating experience.* *Both the combustion system and the flue gas cleaning system are designed with several layers of redundancy and wit excess capacity so that when the continuous monitoring system identifies that conditions are deviating from optimal set points, system conditions are adjusted by actions such as:* • *Increasing or decreasing fuel loads;* • *Increasing or reducing combustion air levels;* • *Turning auxiliary burners on or off or increasing fuels supplies to ensure combustion temperatures are maintained at appropriate levels;* • *Increasing or decreasing the quantity of treatment reagents (lime and carbon, ammonia etc.) in the flue gas system to account for increasing pollution loads.* *The system is set up to maintain flue gas quality at levels substantially below regulatory criteria so that if an upward extrusion occurs, there is time for the control system and shift supervisors to react and adjust the necessary parameters to ensure compliance is maintained. If it appears possible that regulatory limits may be exceeded then a controlled shutdown of the plant can be implemented by reducing the waste feed to zero and letting the waste in the combustion chamber burn out before shutting down.* *In the rare occurrence of an event that requires a rapid shutdown for the incineration system (See Appendix 19 and Section 4.2.5.3) the*

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		required to be measured, monitored or reported to regulators, representing a gross regulatory failure and public health risk. Regardless of whether the proponent utilises CEMs or not, there appears to be no legal requirement for this data to be available to regulators and nor does the DWER have any system to monitor CEMS data in real time or ensure compliance.	*system response by rapidly moving to a state where waste feed ceases and the combustion chamber is isolated with minimal emissions.* *This approach has been proven in numerous installations around the world and is accepted under the EU Incineration Directives that have been adopted by the EPA as the benchmark for performance.* *In regard to the CEMS data, NEC will comply with requirements agreed with DWER during the Works Approval process and will make the data available to the public as soon as practicable after quality assurance checking.*
14	ACE	There appears to be no legal requirements for Continuous Emissions Monitoring Systems (CEMS) data to be made available to regulators, nor do they have any system to monitor CEMS data in real time to ensure compliance.	*See previous response*
15	ACE	The European Union (EU) Waste Incineration Directive (WID) Best Available Techniques reference documents (BREF) is currently under review and has not been finalised. It is premature to claim that this project can meet these standards when they are currently not defined and will likely be stricter and become legally enforceable unlike the previous 2006 standards. The WID BREF is not due for finalisation until late 2018. This project and EPA Report 1468) is based on outdated EU standards.	*The EU WID standards remain current. It is clearly not possible to design a proposed plant in accordance with non-final draft standard and unreasonable to suggest that either NEC defer implementing its proposal or that the EPA defer consideration of the ERD.* *Regulations and policies are constantly under review and proponents can only deal with the extant law, guidelines and policies.*

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16	DWER	The proposal will use selective non-catalytic reduction (SNCR) to control NOx emissions. SNCR uses ammonia as a reagent; if the SNCR process is not properly controlled, ammonia can pass through the SNCR un-reacted (ammonia slip). The ERD (page 64) references the use of a wet scrubber to control ammonia emissions. DWER recommends that detail or specifications of the wet scrubber be provided.	*The issue of the potential for ammonia slip is recognised as risk by HZI and NEC. To address the risk HZI has committed to installing its Dynor™ SNCR system which minimises ammonia slip by injecting the precisely require amount of ammonia at multiple points in the combustion system with a sophisticated control; system. A product brochure on the Dynor™ system is provided as Attachment 3 and further information can be provided though the Works Approval Application process.* *The reference to a wet scrubber in Table 12 (page 64) of the ERD is simply a statement drawn from the EU Best Available Techniques Document 35 for Waste Incineration and is not a commitment to the installation of a wet scrubber which is in fact not required with the Dynor™ system in order to meet regulatory standards for ammonia slip*
17	DWER	It is noted that there is no statement of compliance against EPA recommendations 9 and 10. Recommendation 11 of the EPA's section 16 advice states that background monitoring of ambient air quality should continue periodically after the commencement of operation. The ERD states (page 66) that the proposal is fully compliant with the recommendation, but it does not specify that ambient air quality monitoring will continue. The proponent response to Recommendation 19 states that any new waste inputs outside the current scope will be discussed and assessed by	*The lack of responses to recommendations 9 and 10 is an oversight and statements responding to these recommendations are included in an updated version of Table 13 which is provided as Attachment 1 with this table of responses.* *In relation to Recommendation 11, NEC commits to conducting a review every 5 years of published data on background pollutant concentrations in the Kwinana air shed such as the output of the Kwinana Industry Council Air Quality Monitoring system and any additional monitoring programs completed by Government. This review will be provided to DWER together with recommendations for any supplementary ambient monitoring that would be beneficial in closing out data gaps that are agreed by NEC and DWER as being of significance.*

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		DWER. Should the proposal be approved, the waste acceptance criteria will be set through the Ministerial Statement and consequently will not be duplicated through the conditions of a works approval or licence.	*In relation to Recommendation 19. NEC seeks a position where any Part IV approval enacted through a Ministerial Statement provides a broad operating envelope for the waste types that can be accepted by the facility and includes explicit statements on those wastes that are to be excluded.* *The Part V approval process can then provide more nuanced approvals or clarifications that remain consistent with the broader Part IV approval either by licence condition or correspondence to clarify whether a specific waste stream or products that is not explicitly included or excluded by the Part IV approval can accepted.* *It is accepted by NEC that any proposal to accept waste streams that are listed as being excluded in the ERD document and therefore in any consequent Ministerial Statement, could only be accepted by an amendment to the Ministerial Statement. NEC does not envisage such an approval being sought.*
18	DWER	Emissions of sulfur dioxide (SO_2) from industries at Kwinana are regulated by the *Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1992* (EPP). These emission limits are referred to as "maximum permissible quantities" in the EPP, and are defined and enforced through licences granted under Part V of the EP Act. There are currently 10 facilities in the EPP Policy Area that are considered significant sources of SO_2 and whose emissions are regulated in this way. The EPP allows for redetermination of maximum permissible quantities as required to accommodate new industries or variations to	*In relation to the Kwinana EPP redetermination, NEC has been in contact with the consultants undertaking this work and will co-operate and assist by providing any required information to support the redetermination process. Emissions information has been provided to the Consultant with a request for an SO2 allocation to be allocated at a later date.* *The comment in relation to the National Environmental Protection Council (NEPC) criteria being listed as ug/m3 at 0^oC rather than 25^oC as noted in footnote a) of Table 5 and also in footnote a) of Table 23 in the ERD is noted. On checking the values presented in the Table are in fact for reference temperature of 25^oC and 1 atmosphere and therefore are correct but the footnote requires amendment. An updated version of Tables 5 and 23 is provided as Attachment 4 with*

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		existing industry emissions, or to allow for improvements in the method of emissions allocation. A redetermination is made by the Chief Executive Officer of DWER, subject to the approval of the Minister, after consultation with industries which may be affected by the redetermination. The SO_2 screening assessment in Appendix 5 of the Air Quality Impact Assessment Report (Appendix 7) indicates an increase in maximum hourly concentration of between 3 to 6% that was not accounted for in the last Kwinana EPP redetermination. The magnitude of the proponent's SO_2 emissions is likely to require inclusion in the Kwinana EPP. A Kwinana EPP redetermination is currently in progress and this provides the proponent with an opportunity to ensure its requirements are also taken into consideration. A review of the adopted criteria in Table 5 Assessment criteria identified: • The listed criteria for some substances (e.g. NEPC (2016) substances) are for 0°C rather than 25°C as stated in the table description. • The atmospheric pressure for the criteria is listed as 0 Atm rather than 1 Atm. • At least one criterion listed in the quoted references is missing, e.g. Cr III 24-hour standard of 0.5 µg/m^3 of Toxikos (2010).	*correct footnote.* *The Chromium III 24 hour value has been included in the list of criterion but NEC does not consider the modelling need be updated to predict the 24 hour Chromium III concentration given the that 1 hour model result for Chromium III was 0.1 % of the 1 hour criterion.* *The references for the Nickel annual value and the Thallium 1 hour value have also been amended.* *All other parameters have been reviewed to confirm they are correct.*

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		The reference Toxikos (2009) *Health Risk & Toxicological Assessment - Worsley Expansion Emissions* quoted for some criteria is not available and could not be verified. Some references listed are incorrect, e.g. the Tl 1-hour and Ni annual criteria are documented as being from Toxikos (2010) but were not found in this document.	
19	DWER	The proposal provides an estimate of net greenhouse emissions considering only direct emissions from the combustion of waste feedstock. Other sources of direct emissions such as fuel consumed to operate the waste cranes (Section 2.6.4.4) should also be included. The estimated greenhouse emissions from the combustion of waste feedstock are based on an assumed 50% proportion of non-biogenic carbon dioxide (C02) to the total C02 emissions during combustion (Table 25, Section 4.2.5.6). The basis of this assumption is not explained, particularly how it relates to the detailed waste analysis presented in Section 2.6.2.2. Emissions from the disposal of operational wastes, such as flue gas treatment residues, bottom ash and wastewater, should also be accounted for at this point as the acceptability of these wastes for recycling or reuse has not been established as mentioned in the project overview (last sentence	*The estimation of greenhouse gas emissions has been updated to take into account the comments received on the East Rockingham WtE proposal.* *In particular, the following comments are acknowledged and sufficient detail is included so that calculations can be replicated:-* • *The use of most recent references sources, i.e.:* - *NGAF - National Greenhouse Accounts Factors July 2017* - *NGERS - National Greenhouse and Energy Reporting Scheme Mechanism October 2017* • *Emissions from combustion have been calculated on the waste streams expected to be received as per Table 8 – Typical Waste Composition of the ERD* • *Avoided emissions from diversion from landfill have been calculated on the waste streams expected to be received as per Table 8 – Typical Waste Composition of the ERD* • *Emissions from operational machinery that use liquid fuels have been included* • *Emissions during the construction stage have been included* • *Emissions from the transport of the residuals to landfill have been included*

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		on page 7) and Table ES2 (page 8). The estimated emissions from the 300,000 tonnes of waste, if disposed of to landfill, is based on the emission factor for municipal solid waste (as a broad waste stream (Table 44, National Greenhouse Accounts Factors (NGAF)). This method, using the emission factor for a broad waste stream is particularly applicable when the waste composition is not known. A more reliable and preferred estimate can be made based on the specific waste types that are to be accepted at the facility as provided in Section 2.6.2.2 and the appropriate NGAF factors. The estimate should also account for greenhouse emissions generated during the construction of the new facility, including from clearing the ten-hectare construction site, energy consumed by heavy construction equipment/machinery, and disposal of construction waste over a three-year period. Emission estimates should also be calculated using emission factors published in the current NGAF in July 2017, instead of the July 2014 version.	*The following should be noted concerning emissions calculations that have not been included:-* • *Emissions from waste haulage to the site have not been included as this will be similar to the current transport arrangement to landfill. It is expected that over time landfills will be situated further from Perth and haulage distances to landfill will increase.* • *Emissions from operational machinery using electricity are not included as they are encompassed in the parasitic load from the facility and this is already accounted for in the combustion of the waste* • *Emissions from wastewater have not been included as there is a zero net water balance and nil waste water will be disposed to sewer.* *The updated calculations are presented in Attachment 5 and confirm a very substantial saving in greenhouse gas emissions over the life of the project.*
20	DWER	DWER previously recommended that the proponent undertake smoke tests in the Receival Hall. While these tests have been included as recommendations in the ERD, no plan was	*NEC notes the comment in relation to smoke testing and agrees to implement such a testing regime as recommended. It is suggested that this is noted as commitment and the details of the testing regime be agreed with DWER during the Part V Works Approval and*

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		provided to assess the results of the testing. DWER recommends the following to be undertaken: • A plan to be provided that details the configurations that will be tested and how the results will be assessed. • An interlock system should be installed to avoid two large doors being open simultaneously. This has not been discussed in the ERD. • Details should be provided about the handling and management of the potential for dust/particulates to become airborne under strong sea breeze conditions to limit off-site impacts.	*Licence application process.* *NEC does not accept the suggestion for an interlock system to be installed allowing only one door to be open at any time. Such a requirement would be commercially unfeasible and is not warranted for the following reasons:* • *NEC has committed to rapid closing and opening in doors;* • *The receival hall is under constant negative pressure due to the fact combustion air is drawn from the receival hall.* *The odour emission assumption adopted for the modelling is quite conservative (See the discussion at Page 9 of Appendix 7) when compared to the approach adopted for a similar facility (Phoenix Energy) which was approved by the EPA without the need for door interlocks. It is expected that the validity of the approach proposed by NEC will be demonstrated by odour and smoke test during the commissioning. If odour monitoring during commissioning identifies that an problem exists with excessive fugitive emissions from the receival hall additional control measures such as the use of door interlocks to restrict the number of doors open at any time will be implemented.* *NEC considers that there is minimal potential for airborne dust or particulates to be generated from the facility even under strong sea breeze conditions for the following reasons:* • *Waste materials are delivered to the site in enclosed vehicles;* • *The materials generally have a low dust emission potential given their nature (This is not construction and demolition waste);*

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			• *All waste materials are tipped into a waste bunker inside an enclosed building;* • *The waste bunker is located more than 15 metres from the entry doors which on most occasions will be closed when tipping occurs;* • *When tipping into the bunker is occurring or when the grab is accessing waste, there will be a positive airflow away from the doors and towards the incinerator;* • *Operational experience with other similar facilities do not suggest that dust is a significant issue.* *Should DWER require further discussions or negotiation on this matter, NEC would be pleased to provide videos and images of operating facilities to confirm the information presented above during the Works Approval Application process.*
21	DWER	A stack emissions verification program should be undertaken for all point sources including odour. This will enable validation of model inputs, ensure compliance with emissions regulations and provide confirmation of source strengths and locations.	*Noted. NEC anticipates that this would be a requirement and has offered a commitment in this regard in Table 10 and in Section 4.3.5.2.*

Social Surroundings

No.	Submitter	Submission and/or issue	Response to comment
1	Public submitter 1	If the council prefers this area to be for industry, they should relocate everyone out of that area.	*This is a matter for the City of Rockingham. The NEC proposal Is located on appropriately zoned land and will be designed and operated to meet all relevant environmental and planning criteria.*
2	Public submitter 2	The submitter is concerned about noise impacts from the proposal.	*Modelling of noise emissions demonstrates the facility will comply the Environmental Protection (Noise) Regulations 1997.*
3.	Public submitter 2	The submitter is concerned about dust problems (as documented in plants in the United Kingdom) before and after accumulation, burning and the siting of waste and sewage sludge.	*The proposed facility receives all waste in enclosed vehicles and handles all waste in enclosed buildings operating under negative pressure so there is minimal potential for fugitive emissions of dust from the waste receival and combustion areas of the facility. The stack emission passes through a very high efficiency bag filter to limit particulate and dust emission to extremely low levels. The only other potential source of dust emissions is the Incinerator Bottom Ash storage and treatment area which is a three sided and roofed building which will act effectively as wind shield.*
4	Public submitter 2, 7	Submitters are concerned about increased traffic congestion in the industrial area. Rubbish disposal from each shire would be ongoing seven days per week, causing traffic congestion in suburbs and impact on residents in the area. The roads are single lane and not suitable for increased traffic. It would also place users at a greater risk of accidents. There is not enough information about the traffic impacts from the proposal, including the proposed routes for waste transport, increased congestion,	*The ERD indicates there will be no more than 90 truck movement per day to service the facility and subsequent traffic modelling suggest this may in fact be as low as 75 truck movements due to the use of larger B-Double vehicles to replace smaller trucks. The vehicles will access the site on road networks designated as major haulage routes and traffic studies completed by Shawmac Engineers confirm that 75-90 vehicle movement per day represents a small increase over existing numbers and can be readily accommodated on the road network. It should be further noted that the truck movements will not occur through residential areas.* *The issue of traffic movements is a planning matter and is being*

No.	Submitter	Submission and/or issue	Response to comment
		road safety and hazards, road maintenance, and diesel fume production.	*addressed in detail with the City of Rockingham.*
5	Public submitter 2, 7	The plant will handle putrescible waste, and the submitter is concerned about odour from the waste including from sewage sludge. There is potential for odours from the 48 metres stack disposal, which would vary with the strong easterly winds over the residents of Rockingham and the stronger westerly sea winds over the Kwinana residents and new suburbs along the freeway.	*All waste deliveries occur in enclosed vehicles and tipping occurs in an enclosed building operating under negative pressure with fast acting doors to minimise fugitive odour release. Odorous areas are used as feed air for the combustion system and all odours will be destroyed through incineration.* *Odour modelling studies predict that odours will not be detectable outside the site boundary under normal operating conditions and that even during shutdown odour level will meet DWER residential odour criteria at Old Mandurah Road well within the industrial zone.*
6	City of Kwinana	The location of the facility is situated near two major southern access routes to the City of Kwinana. It appears that these access routes will be affected by odour from the normal operation and system down times and would have potential to adversely affect the amenity of persons accessing the City. The proposal location should be reconsidered and an alternative site be sought closer to the core of the Kwinana Industrial Area where the prevailing wind direction will direct any fugitive emissions over the existing industrial areas and not residential zoned land.	*This comment shows a complete misunderstanding of the odour assessment and the adopted odour criteria.* *The adopted odour criteria are those which indicate air quality is suitable for residential zoned land. The odour contours presented for normal operation are shown at 1/10th of the adopted odour criteria. In reality under normal operation, odours will not be detectable outside the site boundary.*

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7	City of Kwinana	Predicted odour levels during facility down time are of concern. Whilst there are no residences within the predicted 2.5 odour unit contour during system down times, odours beyond the boundary of the facility may cause a significant impact on the City of Kwinana. Businesses operating in the City of Kwinana's Office Road and Beach Street areas are zoned General Industry but are permitted to have a number of sensitive uses operating incidentally to the industrial uses. Office workers and food businesses will be negatively impacted by the predicted odour impacts during system down times. In addition, there are two dwellings located on Wellard Road approximately one kilometre to the east of the facility. While these premises are not located within a residential zone they are sensitive premises and should be considered as part of the modelling for the facility. There is an estimated average of five unplanned system shutdown incidents per year, in addition to planned system maintenance closures. During these shutdown periods a large number of neighbouring premises in the surrounding industrial area will be affected by significant odours generated by the proposed facility. The City of Kwinana is aware of a number of cases where odour units of 2 have caused significant impacts on sensitive receptors for up to 2	*Again this submitter does not appear to understand the principals of planning and the applicability of the relevant odour criteria.* *As stated previously, the adopted odour criteria are representative of odour levels suitable for residential areas. The derivation of these criteria is such that areas which are subject to such odour levels will occasionally detect odours (by definition for this to occur odour levels would need to be less than 1 OU) but the frequency and duration of such odours will be sufficiently low that they do not result in unacceptable impacts.* *The work completed for this project shows that under normal operating conditions, there will essentially be no detectable odours outside the boundary of the facility. Under shutdown conditions, there is a small area of industrial zoned land to the north and west of the proposed facility that will fall within the 2.5 OU contour and may experience odour levels greater than would be acceptable for residential areas. Having said that, these premises are surrounded by a range of heavy industrial facilities manufacturing a fertilisers and chemicals and there is a major regional sewage treatment facility located just to the south of Office Road.* *Town Planning Schemes allocate specific land areas as industrial zones and planning authorities then group industrial facilities with similar emission potentials in the appropriate industrial zoning. Sensitive land uses such as residential are then located in land zoned specifically for that purpose and are typically located at significant distance from land zoned for industry. This approach is adopted as it is recognised that premises on industrial zoned land can tolerate a lower standard of amenity and experience occasional excursions in environmental quality during unplanned events. This is an*

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		kilometres (from the odour source) on frequent occasions. An odour contour which exceeds 2.5 odour units beyond the boundary of the facility is unacceptable. It is noted that the facility will continue to receive waste during both unplanned shutdown and scheduled maintenance periods. Odour contours and impacts of the facility could be reduced if waste diversion (i.e. redirecting waste to alternative waste disposal locations) is implemented during these periods.	*established and accepted planning principle and for this reason the residential odour criteria do not apply on industrial zoned land.* *Whilst the plant design and operation during planned shutdowns are intended to ensure that there no unacceptable odours, the City of Kwinana's comment on the acceptance of waste during such periods are noted. In the event that odours are detected during such periods, the following contingency measures can be implemented:* • *Waste deliveries could cease; or* • *The capacity of the auxiliary ventilation fan over the bunker could be increased.* *As modelling suggests there should be no odour impacts, NEC proposes these actions are retained as contingency actions.*
8	City of Kwinana	The ERD document has not sufficiently explained the odour modelling criteria adopted for assessing system down time for odour concentration predictions. Confirmation of the nature of odour assessment methodology and the use of dispersion via the 48 m high auxiliary stack (during periods of system failure or shutdown) needs further explanation and clarification. Assurance is required that using the auxiliary stack during system down times to ventilate the waste receival hall and waste bunkers will confine odour impacts to very low levels and in close proximity to the facility.	*Whilst this comment is noted, the use and purpose of odour criteria is a well-established principle and in NEC's view does not require further explanation.* *With regard to the use of the auxiliary fan this explained in section 2.6.4.3 of the ERD and in greater detail in section 3.2.3 of Appendix 7. It is clear from the information presented that the purpose of the auxiliary fan is to maintain the reception hall under negative pressure during periods of planned shutdown. Odorous exhaust gases that may be present in the reception hall will be discharged to atmosphere and then disperse to acceptable levels. The fan capacity and the stack height have been selected to ensure that unacceptable impacts do not occur and the dispersion modelling confirms that this is the case.* *NEC has also committed to perform odour assessments during commissioning to verify modelling predictions and to implement further control measures if issue are noted.*

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9	City of Kwinana	The odour modelling should be revised to address odour source characterisation issues by inclusion of the proposed 30,000 tonnes of bio solids expected to be processed at the facility.	*Any sewage sludge (not biosolids) will be either piped or tankered to the site in liquid form and direct injected into the combustion chamber. There is no potential for odour release form this material.*
10	City of Kwinana	Modelling of normal facility operations predict that there is a tonal component to flue gas emissions at close proximity to the facility. Tonal components add 5 decibels when assessments are made against the assigned levels of the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations). Therefore the facility is likely to exceed the assigned levels with an adjusted noise impact of 70 dB (A) in the industrial area. Tonality has been considered by the noise model not to be significant at the distance of the nearest residences. In the City of Kwinana, the nearest residences to the facility are in the suburbs of Calista and Leda. Residences in the vicinity of Westbrook Road, Wellard Road, Edmund Place, Coleman Road and Harrison Way in Calista, as well as residents in Sloan Drive and Mercer Court in Leda are modelled as receiving sound level impacts in the range of 25 to 30 decibels. The modelled noise contours in the ERD are based upon no tonal component to sound levels being received at the nearest residences. The residential	*The following general comments have been supplied by Herring Storer Acoustics, the consultancy that prepared the noise modelling study:* • *The approach adopted the noise modelling is conservative, in order to ensure that when the facility is operating the noise received at any sensitive premises will not exceed the assigned noise levels. Underpinning the conservatism is the fact that the sound power levels used in the model are conservative which leads to the model over-predicting the actual level of impact.* *The following specific comments apply to the issues raised in the submission:* • *The SoundPlan noise model takes into account topography, ground type and weather conditions. The weather conditions are worst case weather conditions set out in the document titled Draft Guideline on Environmental Noise for Prescribed Premises (May 2016) published by DWER. The ground type used is also conservative.* • *The model assumes that no barriers or screening of sources is present which would occur in real operation as building walls and structures wood screen sources that are located behind them.* • *As a result of the conservative approach adopted, if any error is present between the modelled prediction and the real world*

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		streets listed above are located on elevated land which is less sheltered from noise originating in the Kwinana Industrial Area due to topographical undulations along the axis of Wellard Road. Noise modelling systems have design criteria that can attribute up to a 5 decibel "error margin" in predictions. However, in the case of the Calista and Leda residential streets, an error of 5 dB (A) in combination with a 5 dB (A) tonal component discounted in the noise modelling would result in exceedances of the Noise Regulations assigned night time levels. It is recommended that further design consideration and mitigation be given to treat the flu gas stack to ensure tonal characteristics are eliminated or minimised to avoid the risk of noise impacting on residences in Calista and Leda	*outcome, the modelled result is likely to be up to 3dB (A) higher rather than 5 dB (A) too low as asserted by the submitter.* • *With regards to tonality, even if not taking into account contributions that other industries and the surrounding roads would have on the noise received at the residences the lowest L_{A10} assigned noise level is 35 dB (A). The assigned noise levels are representative of the background noise or the L_{A90} noise level. Thus, the modelled noise level at the residence (30 dB (A)) would be below the background noise level. Hence, noise received at the surrounding residences would not be tonal and a penalty for a tonal characteristic would not apply.* • *The noise modelling study predicts noise levels of up to 65 dB (A) at adjacent industrial properties. Application of a 5 dB (A) tonal penalty brings the predicted noise level to 70 dB (A) which is below the assigned noise level for industries in the Kwinana Industrial Area of 75 dB (A) at all times. As result the concern expressed in relation to noise on adjacent industrial land does not seem to be supported by the facts.* • *Given the conservative nature of the modelling and the fact that predicted levels comply with the assigned noise levels specified in the Environmental Protection (Noise) Regulations 1997, there is no justification for consideration of further mitigation measures as suggested by Town of Kwinana.*
11	City of Rockingham	An independent peer review commissioned by the City identified the following issues: • The ground-level concentrations of odour from maintenance and unplanned shutdown	*The 1-hour average, 99.9th percentile odour criterion that has been adopted is the criterion used by EPA and DWER in Western Australia to indicate odour levels that are compatible with residential and similarly sensitive land uses. This criterion has been adopted because*

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		were predicted to exceed the 1-hour average, 99.9th percentile odour criterion that has been accepted by the EPA for other proposed Waste to Energy Projects (e.g. Phoenix Energy Kwinana Waste to Energy project – Air Dispersion modelling Assessment (ENVIRON, 2014)) and the 1-hour average, 99.5th percentile odour criterion is that currently applied in Queensland (The Department of Environment and Heritage Protection, 2013). • The concentrations of odour were predicted to exceed odour guideline levels approximately 750 m west, north and northeast of the project site where existing industry is located. This area of exceedance of the odour guidelines also occurs to the west in an area of proposed special industry. It is possible that maintenance and unplanned shutdown operations that are expected to occur for up to 788 hours of the year will cause odour nuisance. The ERD should address this risk of odour nuisance through a revised design, refined odour assessment or enhanced management practices for unplanned shutdowns.	*no acceptable odour criteria have been set for other land uses. As the surrounding land is zoned as industrial and occupied by a mixture of commercial and industrial premises, it would not be expected that odour levels meet residential criteria.* *The 8 OU contour for planned shutdowns and maintenance period is largely confined to the facility boundary. The 2.5 OU extends onto industrial land approximately 700 metres to the west. As indicated, the 2.5 OU criterion is applicable to residential zoned land not industrial land.* *Notwithstanding, Section 4.5.3.2 of the ERD indicates that odour levels will be assessed during commissioning and if they are found to be unacceptable, a number of measures are offered which would be implemented in order to ensure odour levels are reduced to acceptable levels. NEC will formalise the approach to odour monitoring and management in Odour Management Plan which will also include a complaints management system. NEC will develop the Odour Management Plan to the satisfaction of DWER during the Works Approval Application process.*

No.	Submitter	Submission and/or issue	Response to comment
12	City of Rockingham	The independent peer review commissioned by the City noted that the methodologies used to assess the noise emissions from the project are generally consistent with standard practice. However the peer review considered the following matters should be addressed: • The assumptions regarding the number and design of the buildings should be reviewed. • Further information should be provided with respect to the number and accuracy of the source sound power level data. Additionally, the likely tolerances should be provided for (i) each quoted sound power level and, (ii) the overall level of noise emission to the community so that the level of confidence in the prediction of the noise impacts and the success of proposed mitigation can be clearly discerned. • The noise assessment in the ERD should be updated to take account of the changes made to any assumptions and/or noise level limits. A clear statement of the level of confidence in the prediction of the environmental noise impacts should also be included.	*See the response to submission 10 which addresses these matters.*

No.	Submitter	Submission and/or issue	Response to comment
13	DWER	Fugitive odour modelling has large uncertainties, especially regarding emissions estimation. Consequently, a larger emphasis was placed on comparing the odour modelling between various operational scenarios. Figures 8 and 9 of Appendix 7 for normal operations and unplanned shutdown emissions scenarios respectively appear to be identical. Discussion in the text suggests that the plot for unplanned shutdown emissions has been incorrectly provided in place of the plot for normal operations (Figure 8). Although the submitted odour modelling is described by the proponent as conservative, owing to the large uncertainty in the odour modelling it is unknown what potential for odour impacts at neighbouring industrial receptors exists. The sensitivity of these receptors has also not been investigated in this review. DWER recommends that procedures for managing odour complaints be established and that complaints act as a trigger for an odour emissions investigation and implementation of mitigation actions such as those included in the Summary and Recommendations of the report.	*The comment regarding the level of uncertainty about emission assumptions is noted and acknowledged. It was for this reason that the emission scenario for fugitive emission adopted in the odour study presented in Appendix 7 adopts a conservative approach. The estimated fugitive emission was some 5 times the level adopted for the Phoenix Energy assessment for a facility of similar configuration. NEC consider that the approach modelling is sufficiently conservative that even accounting for the uncertainties inherent in modelling, the predictions from the model are sound and protective of the amenity in both the surrounding industrial land and the more distant residential areas.* *Figure 8 and 9 in Appendix 7 (Figure 13 in the ERD) are not identical and are correct as presented. It should be noted that the odour contours presented under normal operational conditions are a factor of 10 lower than for the unplanned shutdown condition. This occurs because it is assumed that all odours other than fugitive releases through the receival hall doors are destroyed within the combustion process.* *In relation to the comments made regarding the potential for impacts on surrounding industrial land, the modelled predictions indicate that under normal operating conditions, the predicted odour levels outside the site boundaries are lower than the relevant residential odour criteria. The modelling for unplanned shutdown conditions (Figure 9 - Appendix 7) indicates that odour levels in a small area of industrial zoned land may very occasionally exceed the criteria adopted for residential land. It is an accepted principal of environmental planning that the social amenity (noise, odour, general air quality) of industrial zoned land will be lower than that*

No.	Submitter	Submission and/or issue	Response to comment
			which applies in land for more sensitively zoned land (residential, retail, Central Business District (CBD) etc.). *The small area of industrial land where modelling predicts residential criteria may be exceeded, suggests that odour levels within the 2.5 OU contour in Figure 9 of Appendix 7 will not significantly exceed 2.5 OU and on this basis it is very unlikely that any significant impact will be experienced by those working on surrounding premises. It should also be noted that NEC has committed to monitor odour levels during the commissioning period and has outlined contingency actions that can be adopted in the event that measured odour levels are not consistent with modelled odour levels.* *NEC agrees that complaint logging and handling procedures are required in relation to all potential off-site impacts. References are made to such procedures in several section of the ERD and NEC will ensure that any complaint register and complaint resolution procedure also addresses odour complaints.*
14	DWER	DWER previously recommended that the risk of odour emissions from cold damp bottom ash be assessed. This has not been undertaken. The proponent references the use of a UK guidance document (UK Standard Rules SR2012 No. 13 of the Environmental Permitting (England & Wales) Regulations 2010) which may be relevant to this proposal. It is not clear whether the proponent intends to implement the whole or sections of the UK Standard Rules at the East Rockingham Facility. Sections 3.1.1, 3.2.1 and 3.2.2 of the UK Standard Rules are not clear or	*Operating experience by HZI and research suggests that whilst Incinerator Bottom Ash (IBA) has a distinctive calcareous odour with traces of ammonia, there is no evidence or published literature to suggest that these odours would extend any significant distance from the ash storage and treatment area.* *The operation and handling of IBA has been personally observed by NEC personnel at HZI's Buckinghamshire facility and there were no detectable odours at a distance of approximately 20 metres downwind from the point where fresh IBA was discharging onto the open concrete IBA storage pad that is utilised at that facility. The day in question was a damp overcast day with light winds which would have been conducive to detection of odours.*

No.	Submitter	Submission and/or issue	Response to comment
		prescriptive enough to provide confidence that bottom ash will be managed in a way that will limit odour emissions.	*It should be noted that ash handling is generally performed on open concrete pads (no enclosure) in the UK and there has been no evidence of an off-site odour issue.* *NEC will provide further information on the odour potential from bottom ash in its Works Approval application.*
15	DWER	Most equipment items proposed for this plant using grate combustion technology are relatively quieter than those of the previously proposed gasification technology. New Energy's acoustic consultant Herring Storer Acoustics has predicted that noise emission levels from the new proposal will comply with the *Environmental Protection (Noise) Regulations 1997* at all neighbouring receiving locations, and will also be lower than what was predicted for the previously approved proposal with gasification technology. These assessment conclusions seem reasonable and reliable.	*Noted*
16	DWER	There is insufficient detail regarding the control of fugitive dust from the ash storage facilities. It is understood that the ash treatment building is only enclosed on three sides with gaps between the walls and roof.	*HZI's experience with ash handling systems at other facilities is that there is a relatively low level of risk of dust emissions during the maturation and treatment process. As a result the original design was for the ash storage and processing facility to consist of an open concrete pad. NEC required the standard design to be enhanced in view of the prevailing climate (hot dry summers with strong easterly winds and sea breezes.)* *The current design is considered fit for purpose to control dust as the facility is effectively shielded from the wind due to the three sided and roofed structure. The current storage area has full height side*

No.	Submitter	Submission and/or issue	Response to comment
			walls with louvres in selected locations to enhance ventilation. *It should be noted that in the storage area, the ash is received in a wet state and as part of the maturation process, water is routinely added to speed the stabilisation process. If dust becomes an issue in windy conditions, additional water can be applied to stockpiled ash to control dust.* *Ash will be transported in trucks fitted with tarpaulin covers.* *NEC would be pleased to explore this issue in greater detail with DWER during the Works Approval process.*

Human health

No.	Submitter	Submission and/or issue	Response to comment
1	Department of Health	Considering the nearest residential property is located 1 km east and that there are other residential areas located within 3 km from the Special Industry Zone, it may be prudent to establish a resident-based complaint system and include this as an operation condition.	*Noted, NEC will maintain a complaints register and develop a complaints procedure prior to commissioning. This is also a contractual requirement contained in agreements with Regional Councils who will supply waste to the Project.*
2	ACE, Public submitter 1, 3, 5, 6, 7, 8, 9	Submitters are concerned about the impacts on health from the proposal. Particular concerns include the following: • The air pollution would make residents and workers living in neighbouring suburbs ill. Studies have shown the health risks and cancer clusters around where waste incinerators are located. • Concern about the health impacts from burning questionable products in the feedstock. • The proposal is downwind from a huge growing young population which stand to be poisoned and sickened by the fumes. Many young families are locating to the Medina and Kwinana area as it is affordable, and there is concern about the health impacts. • What studies have been undertaken to ensure the government is not liable for a	*The issue of the acceptability of emissions from waste to energy facilities was considered by EPA in its s16 Advice to the Minister and it was determined that provided waste to energy facilities are compliant with best practice and facilities are sited appropriately then such facilities can be operated with acceptable impacts to surrounding communities.* *NEC considers it has demonstrated compliance with WID in the ERD document and shown that modelled emissions will not cause unacceptable impacts.*

No.	Submitter	Submission and/or issue	Response to comment
		class action? • We should learn from past mistakes, such as from the impacts in the Wattelup/ Hope Valley area from the Kwinana winds. • One submitter advised it will be moving should the proposal be approved. • Two plants in the Rockingham and Kwinana areas is an absolute disregard for the health and safety of all residents in the area.	
3	Private submitter 1	Councils are better positioned to address waste from their local area, as private companies are well known to cut corners at the expense of people's health.	*As stated in the response to item 2 of the submissions under the heading "Proposal - General Comments", the requirement for ever increasing environmental standards has resulted in significant increases in the complexity, size and cost of waste management facilities and as a result, increasingly local governments are choosing to opt out of operating waste disposal facilities and waste collection services and instead utilise the services of large multinational companies with specialist expertise in the range of technical disciplines required to design and operate such facilities. It is simply not the case that Councils are in a position to raise the capital and revenue to operate these major facilities. This is worldwide trend which frees up Councils to deliver other services that can be delivered efficiently at a local scale.*
4	City of Rockingham	The independent peer review undertaken by the City noted that a health risk assessment was not conducted as part of the ERD. Whilst there is no WA or national legislation that requires a health risk assessment to be conducted, it is standard	*The issue of the acceptability of emissions from waste to energy facilities was considered by EPA in its s16 Advice to the Minister and it was determined that provided waste to energy facilities are compliant with best practice and facilities are sited appropriately then such facilities can be operated with acceptable impacts to*

No.	Submitter	Submission and/or issue	Response to comment
		practice to conduct a health risk assessment for this type of activity. A conventional air quality assessment alone will not address the potential additive effects of the pollutants likely to be emitted. A health risk assessment should be undertaken.	*surrounding communities.* *NEC has demonstrated compliance with WID/IED in the ERD document and shown that modelled emissions will not cause unacceptable impacts.* *On this basis a Health Risk Assessment is not considered warranted.*

Consultation

No.	Submitter	Submission and/or issue	Response to comment
1	Private submitter 2, Alliance for a Clean Environment	The consultation process is inadequate. An open forum meeting in the Rockingham and Kwinana districts were not made available to residents. This was previously undertaken for the Hazelmere Wood Waste to Energy Plant.	*This is the second iteration of consultation for a Waste to Energy Facility in this location.* *Any member of the public who contacted NEC as a result of not attending the consultation day was offered a personal briefing. This offer was also made to representatives of ACE.* *In addition to the 4 week public review period set by the EPA, NEC voluntarily conducted a one day consultation workshop in Rockingham, which was attended by 26 persons. The local workshop was advertised in in a large forma advertisement in the local newspaper. Of the 26 persons who attended the workshop, 20 persons expressed neutral or positive views towards the project.*

Peer review

No.	Submitter	Submission and/or issue	Response to comment
1	City of Rockingham	The City has engaged a consultant to undertake an independent peer review of the ERD. Numerous insufficiencies were identified and the City requests that the recommendations in the peer review be addressed by the proponent. The recommendations are described under sections for Air Quality and Social Surroundings.	*Noted, NEC has responded to the specific matters raised and takes issue with the suggestion that numerous insufficiencies were identified as in most cases, the issues raised reflected a lack of knowledge of local policy and practice in WA.*

Other

No.	Submitter	Submission and/or issue	Response to comment
1	Economic Regulation Authority	No comment.	*Noted*
2	Public submitter 2	The proposal would decrease the housing value in the Rockingham area. NEC has not considered potential compensation for the City of Rockingham.	*There is no evidence to support this assertion. The proposed facility is a modern well designed facility located on appropriately zoned land. Modelling indicates that the facility will have no adverse environmental impacts.*
3	Public submitter 2	The submitter is concerned about the associated costs for air quality monitoring, particularly if the company is sold. The submitter also notes that in the UK a “Free Forever Contract” is negotiated for the waste in that area. The submitter considers that the City of	*Any costs for air monitoring will be borne by NEC or any subsequent owner or licensee.* *The contractual aspects of the facilities operation are not matters for consideration in an environmental assessment.*

No.	Submitter	Submission and/or issue	Response to comment
		Rockingham should be offered this.	
4	City of Rockingham	The page numbers stated in the Scoping Checklist are inconsistent with the page numbers on the Contents page of the ERD.	*Minor discrepancies are acknowledged.*
5	Public submitter 3	The submitter is concerned about the proposal impacting on home grown produce.	*Air emissions modelling demonstrates that all adopted emissions criteria will be met and on this basis there is no likelihood of adverse impacts.*
6	ACE	WA does not have a regulatory framework capable of ensuring that public health and the environment are protected from industrial pollution sources, especially such high-risk facilities as these.	*This is a matter for DWER and EPA to consider.* *NEC is of the view that WA has an extensive and strict regulatory framework in the area of environmental protection and planning.*
7	ACE	ACE believes it is untenable for the WA government to continue to apply a risk assessment framework to the environmental impact assessment (EIA) process so as to establish high risk industrial projects in WA. The failure to account for hazard and the realities of environmental pollution from multiple and increasing sources of air pollution is undermining the long-term health of the WA community and our environment. The precautionary approach should be applied to all EIA processes and decision-making in relation to high risk stack industries proposed for WA.	*This is a matter for the EPA and DWER to respond to.* *NEC, however does not support the proposition put by ACE.*

ATTACHMENT 1

Updated Table 13 – Summary of Compliance with Best Practice

Table 1: Summary of New Energy Compliance with EPA section 16 advice

EPA Section 16 conclusion / recommendation	Statement of compliance by New Energy
Conclusion 1 Waste to energy plants have the potential to offer an alternative to landfill for the disposal of non-recyclable wastes, with the additional benefit of the immediate capture of stored energy.	**Acknowledged and supported.**
Conclusion 2 It has been demonstrated internationally that modern waste to energy plants can operate within strict emissions standards with acceptable environmental and health impacts to the community when a plant is well designed and operated using best practice technologies and processes.	**Acknowledged and supported.**
Recommendation 1 Given the likely community perception and concern about waste to energy plants, a highly precautionary approach to the introduction of waste to energy plants is recommended.	**Fully Compliant.** New Energy has adopted a cautious approach in developing the proposal and has ensured that it adheres to Best Practice and Best Available Technology in every aspect of the proposal.
Recommendation 2 As part of the environmental assessment and approval, proposals must address the full waste to energy cycle - from accepting and handling waste to disposing of by-products, not just the processing of waste into energy.	**Fully Compliant.** New Energy targets wastes that are currently being landfilled. All waste will come from collection systems which include separation at the source or have a prior recycling step. Ferrous and non-ferrous materials will be recovered from the process and recycled. The bottom ash from combustion will be treated and used as aggregate as undertaken throughout Europe. Only burnt-out flue gas treatment residues will go to landfill.

EPA Section 16 conclusion / recommendation	Statement of compliance by New Energy
Recommendation 3 Waste to energy proposals must demonstrate that the waste to energy and pollution control technologies chosen are capable of handling and processing the expected waste feedstock and its variability on the scale being proposed. This should be demonstrated through reference to other plants using the same technologies and treating the same waste streams on a similar scale, which have been operating for more than twelve months.	**Fully Compliant.** New Energy's chosen HZI combustion technology is well suited to handling a heterogeneous feedstock. The HZI technology has been used in over 500 plants with many plants operating on the same waste streams at a similar scale. These plants have been shown to meet IED standards. Examples of reference projects are provided in Appendix 5.
Recommendation 4 Waste to energy proposals must characterise the expected waste feedstock and consideration made to its likely variability over the life of the proposal.	**Fully Compliant.** The ERD and appendices present a very detailed assessment of the proposed feedstocks. As stated previously, the HZI combustion technology is capable of handling a wide range of feedstocks, waste compositions, calorific values so that the plant can adapt to short-term changes and different waste streams over time.
Recommendation 5 The waste hierarchy should be applied and only waste that does not have a viable recycling or reuse alternative should be used as feedstock. Conditions should be set to require monitoring and reporting of the waste material accepted over the life of a plant.	**Fully Compliant.** The New Energy proposal will only process residual waste streams which have been source separated or have gone through a separation process. This is consistent with the Waste Management Hierarchy.
Recommendation 6 Waste to Energy operators should not rely on a single residual waste stream over the longer term because it may undermine future recovery options.	**Fully Compliant.** The New Energy proposal is based primarily residual waste from MSW but will also accept residual wastes from C&I, C&D, MRFs, MBTs, composting and biosolids.
Recommendation 7 Regulatory controls should be set on the profile of waste that can be treated at a waste to energy plant. Plants must not process hazardous waste.	**Acknowledged.** Hazardous waste streams are excluded from processing as outlined in Section 2.6.3. Only wastes that have already gone through source separation or recycling operations will be accepted. Quality controls at the weighbridge will exclude radioactive waste and further controls will happen regularly through the crane operator of the waste delivered into the waste bunker.

EPA Section 16 conclusion / recommendation	Statement of compliance by New Energy
Recommendation 8 In order to minimise the discharge of pollutants, and risks to human health and the environment, waste to energy plants should be required to use best practice technologies and processes. Best practice technologies should, as a minimum and under both steady state and non-steady state operating conditions, meet the equivalent of the emissions standards set in the European Union's Waste Incineration Directive (2000/76/EC).	**Fully Compliant.** The New Energy facility is compliant with Best Practice. HZI's technology is proven as Best Available Technology. Refer to Section 2.6.5 for further information.
Recommendation 9 Pollution control equipment must be capable of meeting emissions standards during non-standard operations. (2000/76/EC).	**Fully Compliant.** The Facility incorporates design features which include a CEMS, sophisticated computer control systems, provision of multiple redundant power systems and other redundant control systems to minimise the frequency and duration of non-standard operations. In the event of non-standard operations, the system either comes to a controlled shutdown or automatically shuts off waste feed and isolates the combustion chamber so that the volume and mass of emissions is rapidly reduced to zero while the flue gas control system remains on line. This approach ensures that emission standards are met even in non-standard operations
Recommendation 10 Continuous Emissions Monitoring must be applied where the technology is feasible to do so (e.g. particulates, TOC, HCl, HF, SO2, NOx, CO). Non-continuous air emission monitoring shall occur for other pollutants (e.g. heavy metals, dioxins and furans) and should be more frequent during the initial operation of the plant (minimum of two years after receipt of Certificate of Practical Completion). This monitoring should capture seasonal variability in waste feedstock and characteristics. Monitoring frequency of non-continuously monitored parameters may be reduced once there is evidence that emissions standards are being consistently met.	**Fully Compliant** The facility includes and on-line CEMS (with redundant system on hot standby) continuously monitoring a range of parameters including particulates, TOC, HCl, HF, SO2, NOx, CO and NEC has committed to developing a non-continuous monitoring program for a range of parameters including heavy metals, dioxins and furans to supplement data from the CEMS system. This program will be developed in conjunction with DWER.

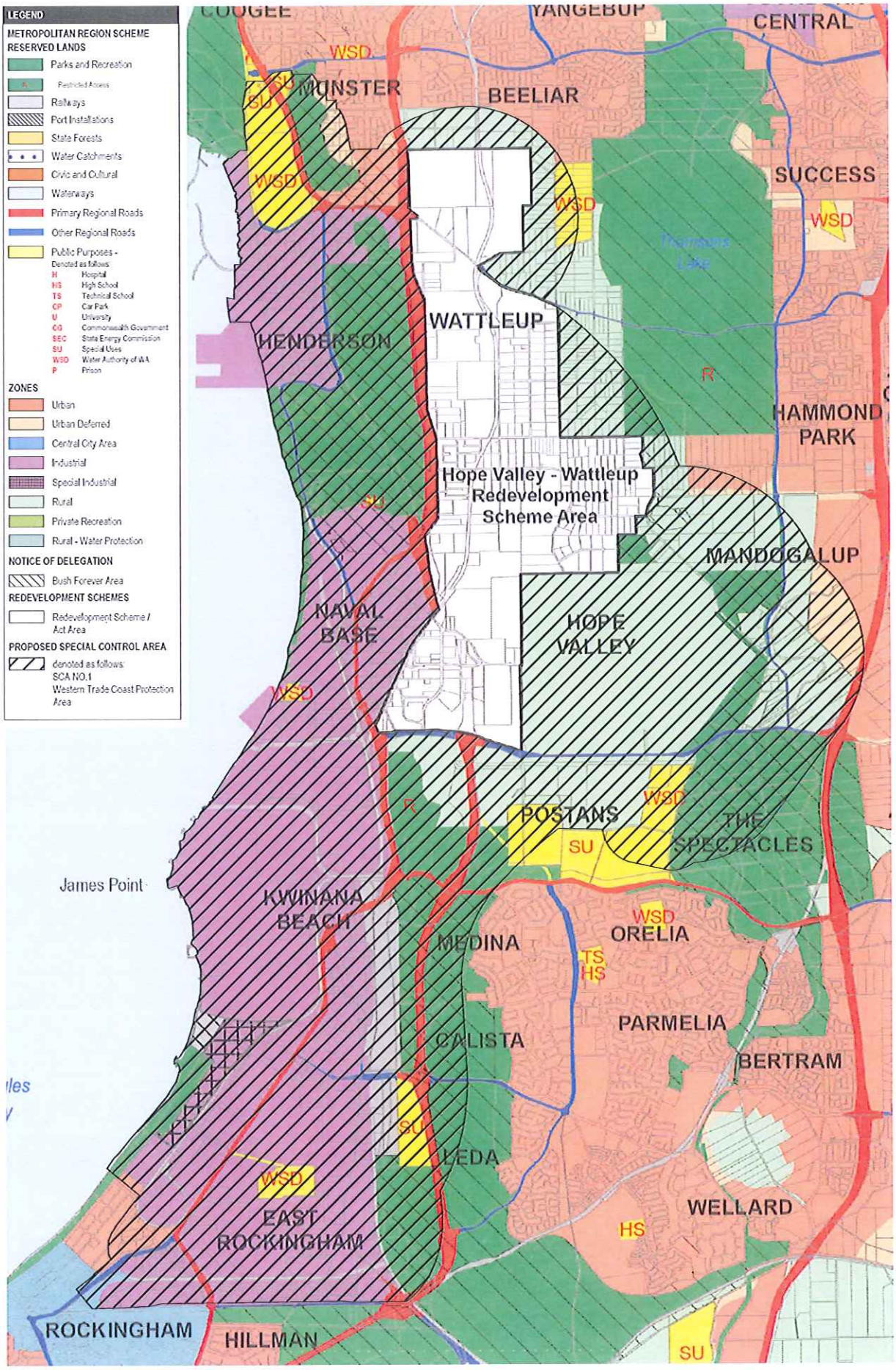
EPA Section 16 conclusion / recommendation	Statement of compliance by New Energy
Recommendation 11 Background levels of pollutants at sensitive receptors should be determined for the Environmental Impact Assessment process and used in air dispersion modelling. This modelling should include an assessment of the worst, best and most likely case air emissions using appropriate air dispersion modelling techniques to enable comparison of the predicted air quality against the appropriate air quality standards. Background monitoring should continue periodically after commencement of operation.	**Fully Compliant.** The air quality assessment contained in Appendix 7 includes the best available information on background air pollutant levels. Ambient and source monitoring will be negotiated with DWER through the Part V assessment process. An indicative monitoring program is outlined in Sections 2.6.4.10 and 2.6.4.18.
Recommendation 12 To address community concerns, proponents should document in detail how dioxin and furan emissions will be minimised through process controls, air pollution control equipment and during non-standard operating conditions.	**Fully Compliant.** The HZI combustion system design and operating characteristics result in low production levels of dioxins and furans. When coupled with a flue gas cleaning system meeting Best Practice and BAT this means the New Energy facility complies with this recommendation. Refer to Section 2.6.5 for further information.
Recommendation 13 Proposals must demonstrate that odour emissions can be effectively managed during both operation and shut-down of the plant.	**Fully Compliant.** An odour assessment has been completed which demonstrates full compliance with odour assessment criteria. Refer to Appendix 7 for further information.
Recommendation 14 All air pollution control residues must be characterised and disposed of to an appropriate waste facility according to that characterisation.	**Fully Compliant.** New Energy has committed to a thorough assessment of the solid residues from the air pollution control system. Based on experience from similar reference plants, the residues collected will likely be disposed to a Class III facility.
Recommendation 15 Bottom ash must be disposed of at an appropriate landfill unless approval has been granted to reuse this product.	**Fully Compliant.** New Energy has committed to a thorough assessment of the bottom ash from the combustion system in order to use the treated material as an aggregate. This approach is used in the United Kingdom in compliance with the well-proven UK Standard Rules SR2012 No. 13 of the Environmental Permitting (England & Wales) Regulations 2010 (Appendix 4).

EPA Section 16 conclusion / recommendation	Statement of compliance by New Energy
Recommendation 16 Any proposed use of process bottom ash must demonstrate the health and environmental safety and integrity of a proposed use, through characterisation of the ash and leachate testing of the by-product. This should include consideration of manufactured nanoparticles.	**Fully Compliant.** The proposal is based on the safe reuse of bottom ash in accordance with UK Standard Rules SR2012 No. 13 of the Environmental Permitting (England & Wales) Regulations 2010. New Energy has committed to a thorough assessment of all solid residues from the combustion system to demonstrate the suitability of the ash for use as aggregate.
Recommendation 17 Long term use and disposal of any by-product must be considered in determining the acceptability of the proposed use.	**Fully Compliant**. New Energy has committed to a thorough assessment of all solid residues from the combustion system and the Air Pollution Control System. The proposal is based on the safe use of bottom ash and disposal of flue gas treatment residues at an appropriate class of landfill.
Recommendation 18 Standards should be set which specify the permitted composition of ash for further use.	**Noted.** New Energy is proposing to use UK Standard Rules SR2012 No. 13 of the Environmental Permitting (England & Wales) Regulations 2010 as the basis of determining suitability for use of the ash. New Energy has committed to working with the DWER to adapt this Standard for the Western Australian context.
Recommendation 19 Regular composition testing of the by-products must occur to ensure that the waste is treated appropriately. Waste by-products must be tested whenever a new waste input is introduced.	**Fully Compliant.** New Energy has committed to a thorough assessment of the flue gas and all solid residues from the process. The proposal is based on a robust flue gas treatment system, the safe use of the treated bottom ash and disposal of the flue gas treatment residues at an appropriate class of landfill. If New Energy introduce new waste inputs outside the discussed feedstock, then an appropriate assessment will be carried out and discussed with DWER and approval obtained before acceptance of the waste stream commences.
Recommendation 20 Waste to energy plants must be sited in appropriate current or future industrial zoned areas with adequate buffer distances to sensitive receptors. Buffer integrity should be maintained over the life of the plant.	**Fully Compliant**. The issue of future zoning is a matter to be addressed by the WAPC and the City of Rockingham. Given the location of the site within the greater Kwinana Industrial Area and within a strategic industry zone, it is unlikely that the land hosting the facility will be rezoned during its commercial life.

EPA Section 16 conclusion / recommendation	Statement of compliance by New Energy
Recommendation 21 For a waste to energy plant to be considered an energy recovery facility, a proposal must demonstrate that it can meet the R1 Efficiency Indicator as defined in WID.	**Fully Compliant**. The R1 efficiency for the facility is 0.778 which exceeds the WID requirement of 0.65 (refer to Appendix 8 for approximate energy efficiency calculation and energy balance).

ATTACHMENT 2

Kwinana Industry Buffer Plan



PROPOSED AMENDMENT TO METROPOLITAN REGION SCHEME: WESTERN TRADE COAST AND BUFFER SPECIAL CONTROL AREA

WESTERN TRADE COAST
KWINANA
WESTERN AUSTRALIA

SCALE 1:50,000 @ A3
DATE 03 May 2017
FILE 170503 2721 Plan.dwg
REVISION 6/DR/Update title block/03.05.17
5/EF/rev/22.02.13
4/GM/Update legend/22.02.13

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ATTACHMENT 3

Dynor™ Brochure

Hitachi Zosen INOVA

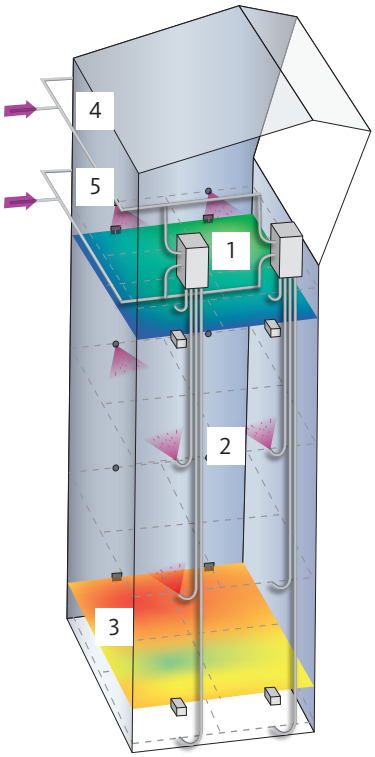
DyNOR™

The SNCR Process that Fulfils Europe's Strict Nitrogen Oxide Standards

DyNOR™ – the SNCR Process that Fulfils Europe's Strict Nitrogen Oxide Standards.

DyNOR™ is the answer to Europe's tightened nitrogen oxide limits. Simple in design and easy to install, the non-catalytic DyNOR™ process closes the gap between the costly SCR process and the conventional SNCR process. It is an investment that pays off.

The DyNOR™ process offers decisive advantages. Harmful nitrogen oxides (NOx) are produced in every combustion process; however, they can be converted into their basic elements – nitrogen and water – through a so-called deNOx process. Developed by Hitachi Zosen Inova engineers, DyNOR™ (dynamic NOx reduction) is an improved SNCR process that succeeds in doing what previously was only possible with a SCR process: It reduces nitrogen oxides to very low levels with minimised ammonia slip. With DyNOR™, operators can leverage a moderate investment to benefit from the monetary incentives offered by various European countries.



Virtual segregation of combustion zones into vertical segments. Independent temperature measurement and selection of injection level.

DyNOR™ Functional Diagram

1 DyNOR™ distributor
2 Nozzles
3 IR pyrometers
4 Air / steam injection
5 Feed of ammonia water / urea solution

Your Benefits

Low Nitrogen Ooxide Levels with Minimal Ammonia Slip

Successful deployment in several energy-from-waste plants has confirmed the functionality of DyNOR™ in full-scale, long-term trials.

Cost Reduction

The precise and dynamic DyNOR™ process delivers the desired performance with significantly lower investment costs and energy consumption than the SCR process.

Energy Efficiency

Minimal atomising media consumption and the elimination of additional dilution water guarantee the highest possible steam production and make DyNOR™ the leading SNCR process with respect to energy efficiency.

Minimised Maintenance

The use of undiluted reagents allows high nozzle exit velocities and thus prevents fouling at the nozzles.

Simple Design

The proven Hitachi Zosen Inova nozzles and the simple design of the DyNOR™ distributor account for the system's dependability, cost-effectiveness, and low maintenance requirements.

Simple Installation

The simple modular design makes the process ideal for integration in new plants as well as for retrofits in existing ones.

Efficiency Thanks to Precisely Interacting Systems

In the SNCR process, the reactant must be injected into the secondary combustion chamber within the optimised temperature range of 850 °C to 950 °C. Although modern combustion systems react to different waste qualities, it not possible to totally prevent short-term temperature fluctuations and asymmetries. The key advantage of DyNOR™ is that reagents are always injected at the precise right location.

Modular Technology

WWith DyNOR™, the first pass of the boiler is virtually divided into vertical segments. Each segment is equipped with a DyNOR™ module, which consists of a DyNOR™ distributor, four injection points (one per level), and an infrared pyrometer. As a rule, four modules are sufficient for medium-sized plants rated at about 40 MW/th .

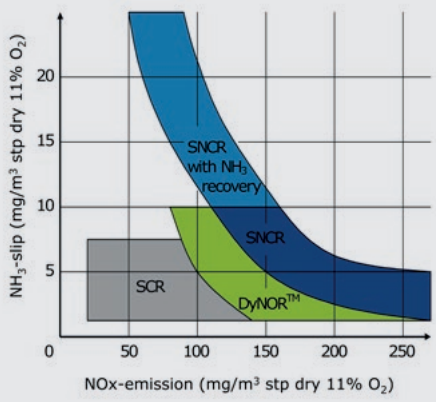
Precise Functionality

An accurately metered amount of reagent, based on NOx emission measurements, is injected via the DyNOR™ distributors. The distributors are independently controlled in response to temperature measurements in the respective segments. They ensure the split-second, continuous, spike-free switching across four levels in each segment and the sufficient cooling of the idle nozzles. In this way, the reagent is injected at the right location even in the event of temperature asymmetries.

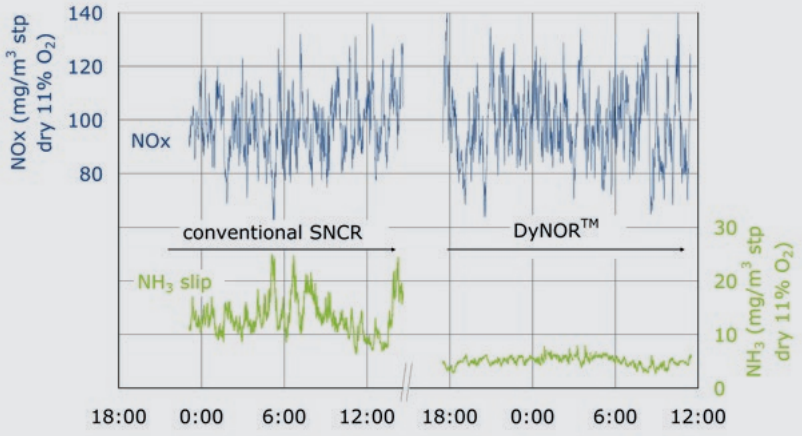
The Answer to Europe's Tightened Nitrogen Oxide Limits

Due to the independent segments and continuous level selection, the full potential of the SNCR process is tapped and very low nitrogen oxide limits are attained with minimal ammonia slip. The patent-pending DyNOR™ process thus fulfils the world's strictest nitrogen oxide standards in a reliable and cost-effective manner. Thanks to the simple installation concept, the process is ideal for both retrofits and for integration in new plants.

DyNOR™ distributor



The DyNOR™ process closes the gap between the conventional SNCR and the costly SCR process.



Minimised ammonia slip with DyNOR™

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ATTACHMENT 4

Updated Table 5 Air Quality Assessment Criteria

Table 2 Assessment criteria

Substance	Averaging time	Concentration (µg/m^3)[(a)]	Reference[(c)]
CO	8-hour	10000	NEPC (2016)
NO_2	1-hour	246	NEPC (2016)
NO_2	1-year	62	NEPC (2016)
PM10	24-hour	50	NEPC (2016)
PM10	1-year	25	NEPC (2016)
PM2.5	24-hour	25	NEPC (2016)
PM2.5	1-year	8	NEPC (2016)
SO_2	1-hour	570	NEPC (2016)
SO_2	24-hour	228	NEPC (2016)
SO_2	1-year	60	NEPC (2016)
HCl	1-hour	100	WA DoH (2007)
HF	1-hour	100	WA DoH (2007)
TOC(AsBenzene)	1-hour	29	DEC NSW (2005)
DioxinsAndFurans	1-hour	0.000001	Toxikos (2010)
As	1-hour	0.09	DEC NSW (2005)
As	1-year	0.003	Toxikos (2010)
Cd	1-hour	0.018[(b)]	DEC NSW (2005)
Cd	24-hour	0.016[(b)]	Toxikos (2010)
Co	1-year	0.1	Toxikos (2009)
Cr(VI)	1-year	0.0002	Toxikos (2010)
Cr(III)	1-hour	0.5	Toxikos (2010)
Cr(III)	24-hour	10	Toxikos (2010)
Cu	1-hour	1	Toxikos (2010)
Hg	1-hour	1.8	DEC NSW (2005)
Hg	1-year	1	Toxikos (2010)
Mn	1-hour	18	DEC NSW (2005)
Mn	1-year	0.15	Toxikos (2010)
Ni	1-hour	0.18	DEC NSW (2005)
Ni	1-year	0.003	DoH (Esperance)
Pb	1-year	0.5	NEPC (2016)
Sb	1-hour	9	DEC NSW (2005)
Tl	1-hour	1	TCEQ (2011)
Tl	1-year	0.1	TCEQ (2011)
V	24-hour	1	Toxikos (2010)

[a] For criteria originally specified on a volumetric basis, conversions to ug/m^3 are at 1 atm, 25^oC.

[b] With respect to the 1-hour criterion for Cd, Toxikos (2010) did not have a recommended 1-hour criterion but instead recommended a 24-hour average criterion of 0.02 µg/m^3 with footnote that this was a rounded up recommendation from 0.016 µg/m^3. Assuming that 0.016 ug/m^3 was the more precise recommendation, this would be approximately equivalent to a 1-hour average of 0.030 µg/m^3, which is 67% higher than the final DoH 1-hour criterion of 0.018 ug/m^3 used in this assessment.

[c] DEC NSW criteria apply to 99.9 percentile of predicted concentration if using local meteorological data for modelling, however, for conservatism, this reports uses the maximum (100 percentile) predictions.

ATTACHMENT 5

Updated Greenhouse Gas Calculations

GHG Calculations – East Rockingham RRF

Greenhouse Gas Emissions Summary Position

GHG emissions generated by the ERRRF	**1 year t CO2-e**	**30 years t CO2-e**	**Comments**
Combustion of waste	70,069	2,102,079	See above table
Supplementary fuels	386	11,570	Start-up / shut down
Operation of mobile diesel equipment	109	3,266	1 x loader
Construction of the ERRRF	705	1500	2 year build (PER)
Transport of residuals	70	2107	80504 tpa residuals
Total generated CO2-e (tonnes)		2,120,522	

GHG emissions avoided by ERRRF	**1 year t CO2-e**	**30 years t CO2-e**	**Comments**
Waste to landfill	356,939	10,708,156	
Equivalent gas power generation	41,688	1,250,645	
Total avoided CO2-e (tonnes)		11,958,801	

Greenhouse Gas Emissions – Basis of Calculations

1. Estimating GHG from waste to landfill –

NGAF Scope 3

GHG emissions (t CO2-e) = Qj x Efj

Qj = Quantity

Efj = Emission factor

TOTAL WASTE STREAM	**fraction mass %**	**component tpa (wet)**	**Landfill emissions factors NGAF Table 42**	**GHG CO2-E tpa)**
Food	19	63,836	1.9	121,289
Green	18	58,093	1.4	81,330
Paper/card	9	30,539	2.9	88,564
Mixed plastics	14	45,738	0	-
PVC	0	439	0	-
Textiles	6	19,301	1.8	34,742
Ferrous and Aluminium	4	11,583	0	-
Glass (large)	4	14,626	0	-
Other inerts	4	13,523	0	-
Water	9	28,891	0	-
Sand, glass & ceramic fines	3	10,240	0	-
Oily waste	0	-	0	-
Wood	6	18,445	0.6	11,067
Rubber	0	249	2.9	722
Bio-Solids	0	1,110	0.4	444
Nappies	3	10,434	1.8	18,781
Concrete/rubble (large)	0	1,478	0	-
Bricks	0	1,478	0	-
	100	330,002		356,939

2. Estimate GHG from combustion of waste

NGERS method 1

Ei = Qi x CCi x FCCi x OFi

Qi = quantity of waste

CC = carbon content of waste

FCC = fossil fraction

OF = oxidation factor

Carbon content factors = Schedule 3

Fuels derived from recycled materials	**carbon content factor**	**fraction of waste (%)**	**Quantity of waste (tpa)**
Industrial materials and tyres that are derived from fossil fuels, if recycled and combusted to produce heat or electricity	0.25	0.1	249
Non-biomass municipal materials, if recycled and combusted to produce heat or electricity	0.585	23.0	75,912
Biomass municipal and industrial materials, if recycled and combusted to produce heat or electricity	0	52	172,023
Inert materials	0	25	81,818

Waste Composition tonnage **Component**	E = **tpa** 330,002 **mass%**	Q x **mass** **tpa**	CC x **carbon content CC**	FCC x **fossil fraction FCC**	OF x **oxidation factor OF**	3.664 **E (CO2eq) tpa**
Food	19.3	63,836	0.000	0.0	1.00	-
Green	17.6	58,093	0.000	0.0	1.00	-
Paper/card	9.3	30,539	0.000	0.0	1.00	-
Mixed plastics	13.9	45,738	0.250	1.0	1.00	41,896
PVC	0.1	439	0.250	1.0	1.00	402
Textiles	5.8	19,301	0.250	1.0	1.00	17,680
Ferrous and Aluminium	3.5	11,583	0.000	0.0	1.00	-
Glass (large)	4.4	14,626	0.000	0.0	1.00	-
Other inerts	4.1	13,523	0.000	0.0	1.00	-
Water	8.8	28,891	0.000	0.0	1.00	-
Sand, glass & ceramic fines	3.1	10,240	0.000	0.0	1.00	-
Oily waste	0.0	0	0.585	1.0	1.00	-
Wood	5.6	18,445	0.000	0.0	1.00	-
Rubber	0.1	249	0.585	1.0	1.00	534
Bio-Solids	0.3	1,110	0.000	0.0	1.00	-
Nappies	3.2	10,434	0.250	1.0	1.00	9,558
Concrete/rubble (large)	0.4	1,478	0.000	0.0	1.00	-
Bricks	0.4	1,478	0.000	0.0	1.00	-
	100.00	**330,002**				**70,069**

GHG from consumption of liquid fuels

NGERS 2017 - refer example pg 160-161	Diesel - stationary			
E = Q x EC x EF / 1000	EC	EF – CO2	EC – CH4	EF – N2O
Q = quantity or fuel in KL	38.60	69.9	0.2	0.5
EC = energy content of fuel	Diesel – transport			
EF = emission factor of gas (CO2, CH4 & N20)	EC	EF – CO2	EC – CH4	EF – N2O
Emissions	38.60	69.90	0.01	0.60

	Qty (KL)	E for CO2	E for CH4	E for N2O	Total CO2-e t
Supplementary fuels for start-up and shut down	141.0	380.4	0.3	4.9	386
Operation of mobile equipment on site	40.0	107.9	0.0	0.9	109
Transport of residuals	25.8	69.6	0.0	0.6	70

Summary of Total GHG emissions - generated & avoided

GHG emissions generated by the ERRRF	1 year t CO2-e	30 years t CO2-e	Comments
Combustion of waste	70,069	2,102,079	See above table
Supplementary fuels	386	11,570	Start-up/ shut down
Operation of mobile diesel equipment	109	3,266	1 x loader
Construction of the ERRRF	750	1500	2 year build (PER)
Transport of residuals	70	2107	80504 tpa residuals
Total generated CO2-e (tonnes)		**2,120,522**	

GHG emissions avoided by ERRRF	1 year t CO2-e	30 years t CO2-e	Comments
Waste to landfill	356,939	10,708,156	
Equivalent gas power generation	41,688	1,250,645	
Total avoided CO2-e (tonnes)		**11,958,801**	

GHG emissions reduction **9,838,280**

Notes

GHG from waste haulage will be same whether going to landfill or ERRRF

GHG from operation of site equipment is nil as uses parasitic load from the ERRRF

GHG from disposal of wastewater is nil as there will be no wastewater disposal

28.2 MW electricity to grid x 8,000 h/y = 225,600 MWh/year or 812,160 GJ/year (multiply with 3.6 GJ/y / MWh/y)

Avoided CO2 from power generation (natural gas): 0.05133 t CO2-e/GJ electricity [2].

[2] Factor for Avoided CO2 from Power Production (Natural Gas) has been taken from the NGAF Table 2 - NGAF July 2017