



Report and recommendations of the Environmental Protection Authority



East Rockingham Waste to Energy and Materials Recovery Facility

New Energy Corporation Pty Ltd

Report 1513

June 2014

Public Environmental Review Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
10/10/11	Level of assessment set	
30/03/12	Final ESD approved	24 weeks
11/11/13	Environmental Review Document (ERD) released for public review	84 weeks
23/12/13	Public review period for ERD closed	6 weeks
24/04/14	Final Proponent response to ERD issues raised	17 weeks
15/05/14	EPA Meeting	3 weeks
11/06/14	Provision of EPA Report to the Minister for Environment	4 weeks
16/06/14	Publication of EPA Report (three days after report to the Minister)	3 days
30/06/14	Close of appeals period	2 weeks

Timelines for an assessment may vary according to the complexity of the project and are usually agreed with the proponent soon after the level of assessment is determined.

In this case, the Environmental Protection Authority met its timeline objective in the completion of the assessment and provision of a report to the Minister.



Dr Paul Vogel
Chairman

11 June 2014

ISSN 1836-0483 (Print)
ISSN 1836-0491 (Online)
Assessment No. 1910

Contents

	Page
1. Introduction and background	1
2. The proposal	2
3. Key environmental factors and principles	8
3.1 Air Quality	8
3.2 Environmental principles	14
4. Conditions	14
4.1 Recommended conditions.....	14
4.2 Consultation	14
5. Other advice	14
6. Recommendations	16

Tables

Table 1: Summary of key proposal characteristics.....	3
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Figures

Figure 1: Regional Location	5
Figure 2: Development Envelope.....	6
Figure 3: Process for Gasification	7

Appendices

1. List of submitters
2. References
3. Summary of identification of key environmental factors
4. Recommended Environmental Conditions and nominated Decision-Making Authorities
5. Department of Environment Regulation process for Works Approval and Licensing of Waste to Energy proposals
6. Summary of submissions and proponent's response to submissions (CD)

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the key environmental factor and principles for the proposal by New Energy Corporation Pty Ltd (New Energy) to build and operate a Waste-to-Energy (WtE) and Materials Recovery Facility (MRF) on Lot 1 Office Road, three kilometres (km) north-east of Rockingham in the Rockingham Industrial Zone (RIZ) (Figure 1).

The proposed facility will accept various wastes, recover materials which can be recycled via the MRF, and convert suitable remaining waste to electrical power in the WtE plant.

The proposal is being formally assessed as there are no operational plants using the Entech technology in Australia.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the key environmental factors and principles for the proposal. The conditions to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides other advice by the EPA and Section 6 presents the EPA's recommendations.

Appendix 6 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

Strategic advice on WtE technologies

The EPA and the Waste Authority released their strategic review on 'Environment and Health Performance of Waste to Energy Technologies' (EPA Report 1468, EPA 2013a) under section 16(e) of the *Environmental Protection Act 1986* (EP Act) in April 2013.

This review concluded that it has been demonstrated internationally that modern WtE plants can operate within strict emission standards with acceptable environmental and health impacts to the community when a plant is well designed and operated using best practice technologies and processes. The EPA supports the establishment of WtE plants in Western Australia subject to proposals demonstrating that they meet a number of principles which are outlined in the EPA's section 16(e) advice.

2. The proposal

The proposal is situated on Lot 1, Office Road, 3 km north-east of Rockingham in the RIZ. Lot 1 represents the development envelope on which the WtE and MRF will be constructed. The proposal requires the direct disturbance of 10 hectares (ha) of native vegetation. The regional location of the proposal and the location of Lot 1 are shown in Figure 1 and Figure 2 respectively. The vegetation to be cleared can also be seen on Figure 2.

The proposal incorporates a MRF and a WtE plant. Waste delivered to the facility would be sorted in the MRF and recyclables and incompatible materials would be removed from the waste stream and sent off-site to be recycled or disposed of at a licensed facility. The remaining waste is baled and used to generate electrical power in the WtE plant.

The WtE plant would consist of gasification chambers, a gas accumulations vessel/burner, Energy Utilisation Heat Exchanger (EUHX)/steam boiler, steam turbine/power generation system and an Air Quality Control System (AQCS). A Continuous Emissions Monitoring System (CEMS) would monitor various air emissions (Figure 3). Other facilities include a weighbridge, biofilter, lined sedimentation pond, administration building, store rooms and a maintenance workshop.

New Energy is proposing to use Entech WtGas-Res gasification technology 'meaning waste-to-gas renewable energy solutions'. Entech is an Australian company that was established in 1990. Entech gasification systems have been installed in a large number of plants around the world but generally at smaller capacities and with varying waste feeds. These plants are located mainly in Asia although the latest plant is in Poland and was commissioned in 2012. The EPA has previously assessed and reported on the Port Hedland WtE and MRF proposal in April 2013 (EPA 2013b). The Port Hedland WtE and MRF was approved in May 2013 (Ministerial Statement 935) and is the first Entech gasification system to be approved in Australia. The Port Hedland plant is yet to be commissioned.

It should be noted that the Entech technology relates to the gasification chambers, gas accumulations vessel/burner and CEMS. Other components such as the EUHX/steam boiler, steam turbine and power generation system and AQCS are robust well-proven technologies, and would be provided by other vendors.

The WtE facility consists of five gasification chambers, of which four will be in operation and one will be set aside for maintenance purposes. Each gasification chamber would be sized at 18 megawatts (MW) thermal capacity, giving a total of 72 MW thermal capacity for the plant. This would produce 18.5 MW of electricity, of which 2.5 MW would be used to power the plant and 16 MW would be fed into the South West Interconnected System (SWIS).

Water required for the operation of the facility would be sourced from scheme water. A reverse osmosis plant or similar technology would be required to reduce the salinity of the water to 30-50 milligrams per litre for use in the boiler circuit.

The amount of waste to feed the gasification chambers depends on the calorific value of the waste, but would be a maximum of 205,000 tonnes per annum (tpa) at a lower calorific value. The maximum amount of waste to be received at the plant would be 225,000 tpa, however a proportion of this would be recovered for recycling and waste unsuitable for combustion would be disposed of off-site.

Waste types that would be accepted at the facility would be Construction and Demolition (C&D) waste; Commercial and Industrial (C&I) waste; Municipal Solid Waste (MSW), Green Waste and non-recyclable residues from material recycling facilities, waste transfer stations/depots and biological waste treatment facilities. The waste entering the facility would be low hazardous material from known sources with a moderate to high calorific value and a low contamination level.

The facility would not accept hazardous waste such as:

- scheduled wastes, as defined by ANZECC for the National Strategy for the Management of Scheduled Waste (1992);
- medical waste;
- radioactive waste;
- asbestos;
- liquid and oily wastes;
- contaminated soils;
- tyres;
- animal carcasses;
- waste with a halogen content greater than 1%;
- highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine; and
- explosive materials..

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 5 of the Public Environmental Review (PER) (New Energy 2013).

Table 1: Summary of the Proposal

Proposal Title	East Rockingham Waste to Energy and Materials Recovery Facility.
Short Description	<p>A waste management facility comprising:</p> <ul style="list-style-type: none"> • a material recovery facility; • five gasification modules, each with a capacity of 18 MW (thermal input); • gas accumulation vessel/burner, heat exchanger/ boiler, steam turbine/power generation system, air quality control system, continuous emissions monitoring system; • sediment ponds; and • associated infrastructure.

Table 2: Physical and Operational Elements

Column 1	Column 2	Column 3
Physical Element	Location	Description
Waste to Energy and Materials Recovery Facility	Figure 2 and geographic coordinates of the Development Envelope in Schedule 3.	Clearing of no more than 10 ha of native vegetation within the Development Envelope.
Operational Element		
Gasification Chamber Thermal Capacity		No more than 72 MW thermal.
Waste receival volume		Up to 225,000 tpa.
Emissions outputs		Shall not exceed the emissions limits specified in Annex V of the European Union Waste Incineration Directive 2000/76 or its updates.
Waste types permitted to be processed.		<ul style="list-style-type: none"> • construction and demolition waste; • commercial and industrial waste; • municipal solid waste; • green waste; and • non-recyclable residues from material recycling facilities, waste transfer stations/depots and biological waste treatment facilities.
Waste types not permitted to be processed.		<ul style="list-style-type: none"> • scheduled wastes, as defined by ANZECC for the <i>National Strategy for the Management of Scheduled Waste (1992)</i>; • medical waste; • radioactive waste; • asbestos; • liquid and oily wastes; • contaminated soils; • tyres; • animal carcasses; • waste with a halogen content greater than 1%; • highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine; and • explosive materials.

The potential impacts of the proposal initially predicted by the proponent in the PER document (New Energy 2013) and their proposed management are summarised in Table 2 (Executive Summary) of the proponent's document.

An additional residence was identified on Wellard Road during the public review period. This has led to updated noise and air quality modelling resulting in revised noise attenuation measures. These are discussed in the response to submissions document in Appendix 6.

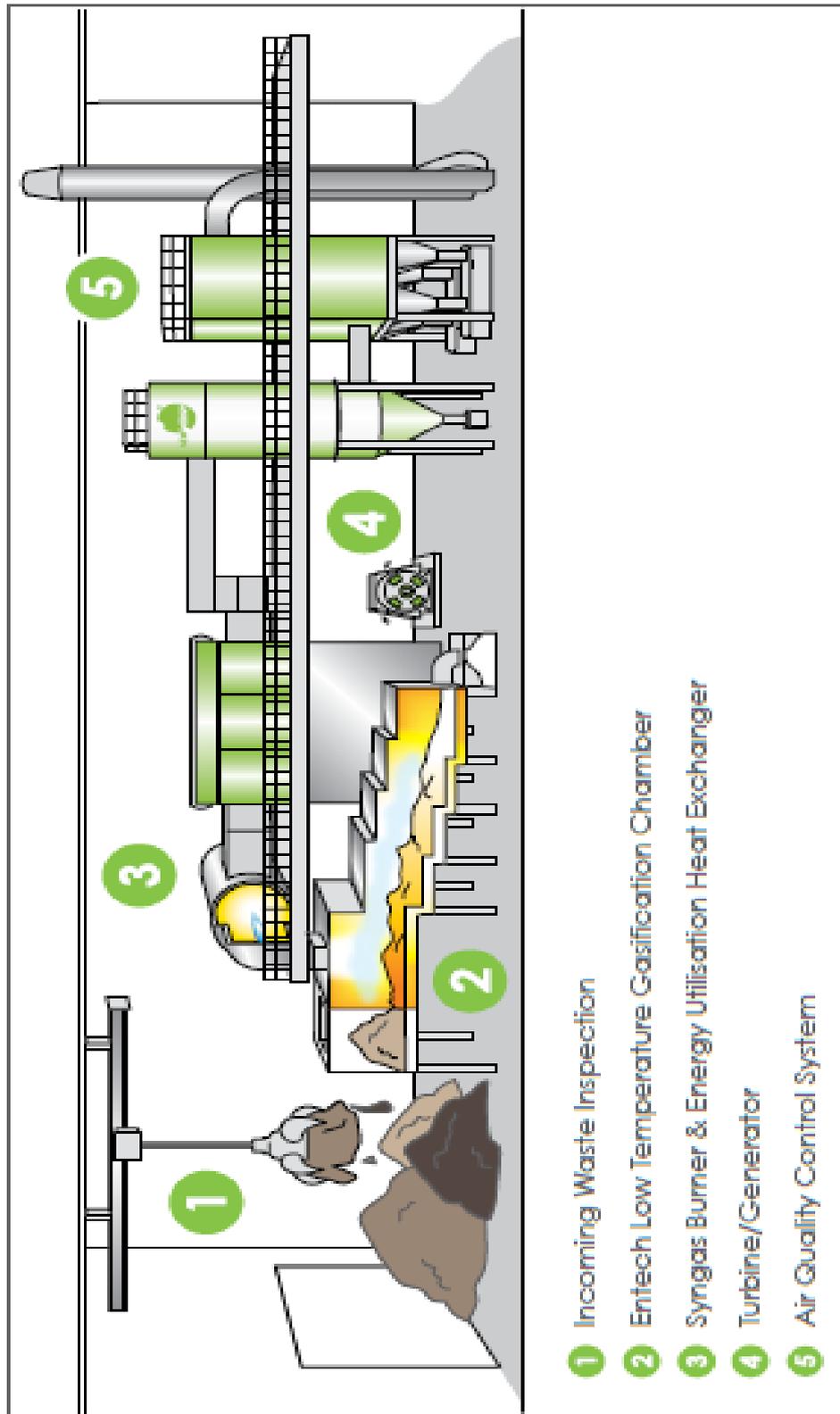


Figure 3: Process for Gasification

3. Key environmental factors and principles

Section 44 of the EP Act requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the key factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as Flora and vegetation, Terrestrial fauna, Inland waters environmental quality and Amenity, are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

It is the EPA's opinion that Air Quality is the key environmental factor for the proposal requiring detailed evaluation in this report:

The above key factor was identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics set out in Table 1.

Details on the key environmental factor and its assessment are contained in Section 3.1. The description of the factor shows why it is relevant to the proposal and how it will be affected by the proposal, taking into consideration environmental impact management by the proponent. The assessment of the factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergenerational equality;
- (c) The principle of the conservation of biological diversity and ecological integrity;
- (d) Principles related to improved valuation, pricing and incentive mechanisms; and
- (e) The principle of waste minimisation.

3.1 Air Quality

The EPA's environmental objective for this factor is to *maintain air quality for the protection of the environment and human health and amenity.*

The proposal is located within the RIZ in East Rockingham, with the nearest residence being approximately 1 km to the east. Other sensitive receptors are Kwinana Beach, which is 1.6 km to the west, and Leda Primary School, which is 2.9 km to the south-east.

During the gasification process, and the burning of the resultant syngas, a number of air pollutants would be produced. These include oxides of nitrogen and sulphur (NO_x and SO_x), carbon monoxide, acid gases, metals and air toxicants (for example polyaromatic hydrocarbons and chlorinated hydrocarbons). These air pollutants are dependent on the waste feed and/or may be formed during the combustion process.

Entech state that its stepped hearth gasification process is unique and is a very clean process as it provides for high surface exposure of waste, long residence times of between 16 and 24 hours and maximum agitation of the bed. Gasification also occurs at low temperatures of 750°C with limited air feed volumes. This ensures that very little flyash is generated. The syngas is considered to be a relatively clean gas as it contains very little solid particulate matter, absorbed heavy metals and dioxins.

The Syngas Burner is a high efficiency, low NO_x burner that ensures very high destruction efficiencies for all organic compounds including toxics such as dioxins.

In order to minimise the discharge of pollutants the exhaust gas would pass through the AQCS prior to discharge to the atmosphere.

The AQCS would inject sodium carbonate/bicarbonate, to remove acid gases, and activated carbon, to trap volatile metals and any trace organics. A high efficiency fabric filter bag house would capture the reagents, carbon and any other particulates. The AQCS consists of three separate compartments of which two will be operational at full capacity and the third will be used for planned and unplanned maintenance while maintaining normal operations.

The cleansed exhaust gases exiting the AQCS would be monitored by the CEMS. The CEMS system is designed to predict imminent breaches of emission set points. It is interlocked with the control system to override normal temperature and pressure control and to adjust various process feed rates to avoid such breaches of emission set points occurring. Alarm interlocks would be provided to terminate feed in the event of an emission set point breach. The CEMS would be provided with software to allow remote on-line posting of all emission parameters.

New Energy propose to adjust control parameters when 60% of critical levels that may lead to a non-compliance of emission set points are reached. Visual and audible alarms will be triggered if parameters exceed 80%. Control parameters can be adjusted by manually adjusting feed in amounts, shutdown of the gasifiers, adding fuel or air to the syngas burner and activating standby pumps or blowers to increase reagents. New Energy state that they can achieve a fast response time should they need to change or reduce the bales into the gasifiers as 80% of volatile materials in the bales are released within five minutes.

New Energy also state that stack emissions would comply with emissions limits in the European Union Waste Incineration Directive 2000/76 (WID), (EU 2000), and Entech guarantees that air emission concentrations would meet the WID criteria.

As part of the assessment, Entech has supplied stack emission monitoring results carried out by independent parties for a number of Entech plants. The results provided (not all substances were measured in all results) showed that the reference facilities are capable of complying with WID emission concentration limits.

Air emissions have been calculated for the East Rockingham WtE and MRF on a mass balance basis using the predicted composition of the waste (Entech 2012). The calculations are based on factors influencing the emissions such as the energy content of the waste, which elements will partition to ash, which elements will be combusted, any air toxics that will be created through the combustion process, removal of elements in the AQCS, and quality of off-gas exiting the main stack during normal conditions and bypass stack in an emergency event.

Air quality modelling has been undertaken to determine the ground level air quality impacts for normal operation and for an emergency shutdown event (Synergetics 2013 and 2014). Background pollutant concentrations have been collected and cumulative impacts have been modelled. Results show that NO_x and particulate matter were the highest compared to criteria, due mainly to existing background levels.

The assessment demonstrates that air quality impacts in the region surrounding the facility will comply with the National Environment Protection Measure (NEPM) standard, World Health Organisation (WHO) standard and criteria from other relevant guidelines for standard operation and emergency shut-down scenarios.

Submissions

Key matters raised in submissions focused on:

- the potential impact and measurement of dioxins and nanoparticles;
- the cumulative emissions from another WtE facility proposed in the area;
- background and continuous monitoring for all emissions;
- the ability to upgrade the AQCS should emissions not be as expected; and
- the upgrading of boilers design/maintenance to reduce the risk of failure.

Waste acceptance criteria

The EPA notes that the waste to be fed into the gasifier is C&D, C&I, MSW, Green Waste and non-recyclable residues from material recycling facilities, waste transfer stations/depots and biological waste treatment facilities. These are all non-recyclable and would otherwise be disposed of to landfill. The waste will be supplied primarily by known suppliers and will be sorted in the MRF and recorded prior to being fed into the gasifier. Any non standard waste received at the facility will be accompanied by a detailed chemical analysis of representative samples of material.

The EPA notes that the emissions expected from this plant could be affected by processing of inappropriate waste into the gasifiers. The EPA recommends condition 6 'Waste Acceptance Criteria' to ensure that only acceptable waste is fed into the gasifiers.

The EPA has also specified in Table 2 of Appendix 4 waste types that shall not be accepted for processing.

Technology

The EPA notes that the Entech technology relates to the gasification chambers, gas accumulations vessel/burner and CEMS aspect of the proposal. Components such as the heat exchangers, boilers, electrical generation plant and the air pollution control system are robust and well proven technologies for WtE plants.

The EPA also notes that the East Rockingham WtE and MRF is the same technology, size and design as the approved Port Hedland WtE and MRF in the Boodarie Industrial Estate (EPA 2013b). The EPA recommended that the Port Hedland facility could meet the EPA's objectives provided that a staged commissioning approach was adopted.

The MRF provides for improved control and sorting of the materials processed. However as noted above there are a number of materials that are not proposed to be accepted or gasified at the facility. The EPA has included this requirement in the key characteristics of the proposal specifying waste types not accepted for processing. Examples of these are medical waste, asbestos, radioactive waste, explosives and scheduled waste (Attachment 3 Table 2).

New Energy has adopted the EPA's advice from the Port Hedland WtE and MRF assessment and has incorporated a staged commissioning approach in this proposal. Each gasifier would be commissioned individually, then two in parallel, then three, then four. Emissions performance would be demonstrated at each stage prior to moving onto the next.

As with the Port Hedland facility, the EPA considers that the staged commissioning approach proposed should be regulated by the Department of Environment Regulation (DER) through the Works Approval process required under Part V of the EP Act. This will be critical to demonstrating that the plant can achieve the design performance stated, and that all emissions to air comply with the WID.

The DER has provided information on the process that it will undertake during the Works Approval and Licensing of WtE facilities which is included in Appendix 5. The EPA notes the DER's ability to require a comprehensive commissioning plan as part of the Works Approval and that, more specifically, the commissioning period will need to measure air emissions for the specified air pollutants with continuous and extractive monitoring. This information would be used to check that the emission limit values specified in WID would be met during the operational phase. The subsequent operational phase would require a Licence from the DER to be issued in accordance with the requirements of Part V of the EP Act.

The EPA therefore considers that the detailed design, engineering phase and commissioning are most appropriately regulated by the DER under the Works Approval requirements of Part V of the EP Act.

Emissions

The EPA and the Waste Authority's strategic review of the Environmental and Health Performance of WtE Technology's (EPA 2013a) identifies the WID as the appropriate standard for WtE facilities in Western Australia. The WID includes stringent operational and technical requirements including emissions limits.

Air quality in WA is regulated by the DER with advice from the Department of Health (DoH). The OEPA notes that the air quality criteria used in this assessment are the NEPM, WHO and regulations from other jurisdictions or regulatory bodies, that have been agreed with the DoH. These guidelines define the concentrations of pollutants not to be exceeded to protect human health, amenity and the environment.

The DER has provided advice that the background data used for the modelling is appropriate. Considering the cumulative context, it should be noted that the EPA is also separately assessing Phoenix Energy Australia Pty Ltd's Kwinana WtE plant as a PER. However, the Kwinana WtE plant proposal is not as advanced as the East Rockingham WtE and MRF and emissions data is not publicly available. Therefore the Kwinana WtE plant assessment will need to address the cumulative context including considering the proposed emissions from the East Rockingham WtE and MRF.

The modelling for the East Rockingham WtE and MRF predicts that ground level concentrations of emissions will meet the above relevant air quality criteria for operational and emergency shutdown events.

The EPA also notes that gasification technology (as opposed to combustion) produces much lower concentrations of emissions than the limits in the WID and considers that it is appropriate to set targets lower than the WID.

The EPA notes that New Energy will continuously monitor stack emissions through the use of the CEMS. The EPA considers that, to build in design redundancy and ensure greater reliability from the CEMS, it would be desirable to install duplicate sampling ports/lines during construction. This would ensure greater availability and certainty in emissions monitoring.

For emissions that will not be continuously monitored (such as heavy metals, dioxins and furans) New Energy propose to monitor every three months for the first 12 months, then twice per year for the second year and then every two years if previous samples consistently show performance in line with expected outputs. This is compliant with the WID.

In relation to nanoparticles, the EPA has received advice from the DoH that monitoring of nanoparticles is not required, however the DoH is observing developments of potential risks to health from leaching of particles from inappropriate handling of bottom ash. This position is supported in the EPA's s16

advice which recommends that nanoparticles be considered in the testing of bottom ash.

As the WID is the appropriate standard adopted by the EPA for emissions for WtE plants, it is specified in the key characteristics of the proposal that emissions outputs shall not exceed the emissions limits specified in Annex V of the WID 2000/76 or its updates (Attachment 3 Table 2).

As noted above the DER can specify in the Works Approval that the plant be constructed and commissioned to meet the requirements of the WID. The DER can also specify stack emission limits as it deems appropriate in the subsequent Licence required for ongoing operations (Appendix 5).

In order to provide transparency, the EPA recommends that the proponent makes near to real time data on emissions publicly available. This could be achieved by displaying the emissions on the proponent's website or at the site entrance.

The EPA notes that Ultra Low NO_x burners can achieve lower NO_x concentrations than the burner currently proposed. New Energy has advised that the burner proposed has most of the component features of an Ultra Low NO_x burner. However, in this case there is a NO_x component in the fuel which passes through regardless of burner design. The EPA expects the proponent to review burner design in order to determine if further reductions of NO_x can be achieved, however, given the relative small-scale contribution of this proposal to the Kwinana airshed, the EPA considers that a condition requiring further reductions is not warranted.

Efficiency

The East Rockingham WtE and MRF would have an R1 efficiency of 0.68, which is considered appropriate to satisfy the European Union Best Available Technology – Energy Efficiency Regulation (EU 2005).

Summary

Having particular regard to the:

- front end MRF to remove incompatibles and sort waste streams;
- ability to inspect and blend waste streams;
- redundancy in the design (four gasifiers plus one backup);
- claimed plant performance meeting the emissions limits in the WID;
- modelling undertaken which predicts that ground level concentrations of emissions will meet the appropriate criteria at sensitive receptors;
- continuous emissions monitoring system;
- ability for the Works Approval required under Part V of the EP Act to ensure a rigorous and staged commissioning process; and
- enforcement provisions available under Part V of the EP Act,

it is the EPA's opinion that the EPA's objective for air quality can be met provided that the facility meets, or performs better than the WID or its updates at commissioning and throughout its operational life. It is recommended that the proposal can be implemented and that the statement specifies the waste types that shall not be accepted and authorises that emissions outputs shall not exceed the emissions limits specified in Annex V of the WID 2000/76 or its updates (Appendix 4 Table 2).

3.2 Environmental principles

In preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the *Environmental Protection Act 1986*. Appendix 3 contains a summary of the EPA's consideration of the principles.

4. Conditions

Section 44 of the EP Act requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

4.1 Recommended conditions

Having considered the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by New Energy to build and operate a WtE and MRF is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include waste acceptance criteria.

It should be noted that the other regulatory mechanism relevant to the proposal is Part V of the EP Act.

4.2 Consultation

In developing these conditions, the EPA consulted with the proponent and the DER in respect of matters of fact and matters of technical or implementation significance.

5. Other advice

Cumulative Impacts in the Kwinana Industrial Area

The EPA expects proponents to detail and predict, through modelling, the impacts of their proposals. When the proposed site is in an industrial area, cumulative impacts also need to be considered.

Undertaking robust cumulative assessment is facilitated when proponents have access to all relevant data. This is particularly important for emissions to air where

data, including source locations, emissions discharge parameters and emission variability for the full suite of pollutants emitted from the estate, is desirable.

As such, in order to facilitate future assessments in the KIA, the EPA recommends that the Kwinana Industries Council (KIC), in consultation with the DER, give consideration to establishing a comprehensive database detailing all relevant air emission information so that it is readily available to future proponents.

In relation to cumulative impacts from noise, the EPA notes that even when each individual industrial premise complies with the *Environmental Protection (Noise) Regulations 1997*, there is still potential for the assigned noise levels to be exceeded at noise-sensitive premises when four or more industries are contributing.

The EPA notes that the DER has strategies in place to reduce noise levels in areas where exceedences occur around the KIA and the EPA support these strategies.

In relation to this proposal, the DER has advised that the contribution to cumulative noise levels is likely to be minimal. Noise is discussed in Appendix 3.

Advice to the Department of Environment Regulation

Since the assessment has been based on the preliminary design, the EPA considers that the DER's Works Approval and Licensing process under Part V of the EP Act will be critical to ensuring acceptable performance of the plant. To assist in this process, the EPA provides the following advice and recommendations to the DER:

- The WID (and future updates) is the appropriate standard for the East Rockingham WtE and MRF.
- The stack emission limits should be set consistent with the WID, or lower for those emissions where gasification can achieve significantly better performance.
- A staged commissioning approach should be adopted in the Works Approval whereby each gasifier is commissioned individually, then two in parallel, then three in parallel and then four. Emissions performance should be demonstrated at each stage prior to proceeding to the next stage.
- The Licence should specify those parameters which should be continuously monitored.
- During the initial operation of the plant (minimum of two years following receipt of practical completion), more frequent testing should be required for those emissions that are not continuously monitored (e.g. heavy metals, dioxins and furans).
- There may be cumulative air quality impact issues from unusually high background levels of emissions in the airshed. The EPA supports the continued implementation by the DER and industry of the program to address ongoing issues of cumulative impacts of emissions.

- As process control is critical to emissions management, the EPA expects the DER to apply the CEMS code to plant operations. The EPA notes the importance of the CEMS in ensuring reliable monitoring and meeting air emissions standards. The EPA recommends that the plant incorporates multiple sampling ports and lines during construction.
- Although the proposal's contribution to the cumulative noise impact is low, the EPA acknowledges that noise will be managed through the Part V regulatory process.
- Note the inputs and waste acceptance criteria to be applied.

6. Recommendations

The EPA submits the following recommendations to the Minister for Environment:

1. That the Minister notes that the proposal being assessed is to build and operate a WtE and MRF located three kilometres north-east of Rockingham in the Rockingham Industrial Zone;
2. That the Minister considers the report on the key environmental factors and principles as set out in Section 3;
3. That the Minister notes that the EPA considers that air emissions are most appropriately managed via the Works Approval and Licence under Part V of the EP Act;
4. That the Minister notes that the EPA has concluded that it is likely that the EPA's objectives for air quality would be achieved provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4 and summarised in Section 4;
5. That the Minister notes the EPA's advice to the DER; and
6. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Organisations:

City of Rockingham
Department of Aboriginal Affairs
Department of Environment Regulation
Department of Health
Department of Parks and Wildlife
Department of Water
Medina Residents Group
Waste Authority

Individuals:

Bart Verwilligen
James Mumme
Kevin Desmond
Robin Chapple MLC
Roger Cook MLA
Sam Low
Sunny Miller

Appendix 2

References

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HSA (2014) *Waste to Energy Power Station East Rockingham Environmental Acoustic Assessment*, Prepared by Herring Storer Acoustics for New Energy Corporation Pty Ltd, March 2014.

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Synergetics (2013) *Final Report: Air quality impact assessment of the proposed waste gasification power station in East Rockingham, Western Australia*. Prepared by Synergetics for New Energy Corporation Pty Ltd, October 2013.

Synergetics (2014) *Wellard Road Receptor GLC Data: Air quality impact assessment of the proposed waste gasification power station in East Rockingham, Western Australia*. Prepared by Synergetics for New Energy Corporation Pty Ltd, March 2014.

Appendix 3

Summary of identification of key environmental factors and principles

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
LAND			
Flora and vegetation	<p>The proposal would require the clearing of 10 hectares (ha) of native vegetation.</p> <p>The Development Envelope is located in the Swan Coastal Plain bioregion, in the Perth sub-region.</p> <p>A vegetation mapping and flora survey was carried out for the Rockingham Industrial Zone (RIZ) Strategic Environmental Assessment (SEA), which covers this area in January 2002, September 2004 and November 2005.</p> <p>The vegetation is part of the Rockingham System: Shrublands – Scrub–heath on the Swan Coastal Plain (Beards Vegetation association 3048).</p> <p>Pre European extent was 12,100 ha with 3,329 ha remaining (27.5%). A total of 841 ha of remaining vegetation (25%) is protected in IUCN reserved 1-4, and a further 2.3 ha (in IUCN reserves 5-6. IUCN reserves do not include Bush Forever, Regional Parks and Bushland reserves.</p> <p>Vegetation types in the development envelope are:</p> <p><i>Xanthorrhoea preissii</i>/ <i>Avena fatua</i> shrubland ((XpAf) 9.1 ha) – Degraded condition; <i>Melaleuca huegelii</i> Low woodland (Mh) (0.1 ha) – Degraded Condition; and <i>Acacia rostellifera</i> Tall Shrubland (Ar) (0.8 ha) – Good to Degraded Condition.</p>	<p><u>DPaW Submission</u></p> <p>The P3 PEC 'Acacia shrublands on taller dunes' is known from 13 locations over a range of 175 kilometres (km) between Seabird and Preston Beach, therefore this community is considered to be reasonably extensive and is known to occur in vegetation that is in excellent condition.</p> <p>The maximum extent likely to be cleared in good-degraded condition is 0.5 ha. This is unlikely to represent a significant impact to the PEC.</p>	<p>The maximum extent of impact to the PEC is expected to be 0.5 ha. This is unlikely to represent a significant impact to the PEC.</p> <p>Not considered to be a key environmental factor.</p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	<p>There is a high weed density on the site.</p> <p>XpAf and Ar have affinities to Floristic Community Type (FCT) 29b, which is listed as a Priority 3 Priority Ecological Community (PEC) by the Department of Parks and Wildlife (DPaW).</p> <p>A total of 166 plant species were recorded in the RIZ, of which 98 were native and 68 introduced. No Threatened or Priority flora were recorded on the site.</p> <p>A total of 92 ha of the best habitat in the RIZ is protected.</p>		
Terrestrial fauna	<p>The proposal would require the clearing of 10 ha of native vegetation.</p> <p>A vertebrate and invertebrate fauna survey was carried out in the RIZ in 2005 and updated in 2008, including an 8 day vertebrate fauna survey, a survey for trees with hollows, invertebrate trapping over 3 months and a targeted survey for the Graceful Sun Moth.</p> <p>The Southern Brown Bandicoot (P5) and the Rainbow Bee-eater (<i>Migratory Environment Protection Biodiversity Conservation Act 1999</i>) were recorded in the RIZ.</p> <p>No Graceful Sun Moths were recorded.</p>	No comments.	<p>Due to the degraded quality of the habitat to be impacted and 92 ha of the best quality habitat protected in the RIZ it is expected that there will not be a significant impact to Terrestrial fauna.</p> <p>Not considered to be a key environmental factor.</p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
WATER			
Inland waters environmental quality	<p>Potential impacts are leakage of chemicals from liquid waste storage tanks.</p> <p>There are no natural surface water features within 1 km of the development envelope.</p> <p>The site is within the Wellard subarea of the Cockburn Proclaimed Groundwater area.</p> <p>All waste will be delivered in sealed containers or covered vehicles and sorted within enclosed buildings.</p> <p>Clean stormwater will be directed to vegetated swales/basins for infiltration.</p> <p>The facility requires 100,000 kilolitres (kl) per annum, which will be provided from scheme water.</p> <p>Waste water will be: 2.5 kl/day of wash down water; and 5 kl/day of water from the water treatment plant. (The reject water would be 2000-5000 mg/L TDS).</p> <p>Liquid waste from the plant would be injected into the gasifier, collected for offsite disposal or disposed via a sewer.</p> <p>A Site Drainage and Groundwater Management Plan will be prepared.</p>	<p><u>Department of Water (DoW) Submission</u> A reticulated sewer is not available at present. The future East Rockingham Waste Water Treatment Plant is due for completion in 2015.</p> <p>The proponent should adhere to the advice in DoW's Water Quality Protection note 52 (WQPN) during the design phase of the drainage management system prior to preparing the Site Drainage and Groundwater Management Plan.</p> <p><u>Department of Environment Regulation (DER)</u> The design of the facility should be altered to better contain fire and fire-fighting water and consideration should be given to the management of fire-fighting water.</p> <p><u>Public submitters</u> Queries regarding polluted water entering the sewage system.</p>	<p>All waste received at the MRF will be delivered in sealed containers or covered vehicles and sorted within enclosed buildings.</p> <p>Liquid waste from the plant would be injected into the gasifier, collected for offsite disposal or disposed via a sewer.</p> <p>Not considered to be a key environmental factor.</p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	<p>Groundwater monitoring wells will be installed at the perimeter of the site (up and down gradient of the facility) with monitoring to commence prior to construction and continue quarterly for the first 2 years and then twice yearly during construction and operation.</p>		
AIR			
Air quality	<p>The nearest sensitive receptor is approximately 1 km east of the site (Wellard Road), followed by Kwinana Beach (1.6 km west) and Leda Primary School (2.9 km south east).</p> <p>Air quality in Western Australia (WA) is regulated by the DER and the Department of Health (DoH). Air quality criteria has been agreed with DoH and are from:</p> <ul style="list-style-type: none"> • Ambient Air Quality National Environment Protection Measure (Ambient Air Quality NEPM); • Air Toxic NEPM; • World Health Organisation (WHO) Guidelines; and; 	<p><u>DoH Submission</u> The DoH considers that the air emission parameters are acceptable.</p> <p>DoH does not require monitoring for nanoparticles, however, DoH is monitoring the development of potential risks to health from leaching of nanoparticles from inappropriate handling of bottom ash.</p> <p><u>DER</u> Should emissions not consistently meet</p>	<p>Air quality is a key environmental factor for this assessment and discussed in the EPA Report.</p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	<ul style="list-style-type: none"> Regulation from other jurisdictions or regulatory bodies. <p>The EPA and the Waste Authority's strategic review of the Environmental and Health Performance of Waste to Energy (WtE) Technologies identified the Waste Incineration Directive 2000/76/EC (WID) as the appropriate standard for WtE facilities in WA.</p> <p>Air quality modelling was undertaken in August 2013 and March 2014 by Synergetics.</p> <p>Background concentrations are taken from the DER monitoring records (DEC 2011 – study from 2005 to 2010).</p> <p>Plant performance meets the emissions limits in the WID.</p>	<p>the required limits, then the AQCS should be upgraded.</p> <p>A query was raised regarding the technology of the gas burner.</p> <p>The design of the boiler and/or maintenance schedule should be improved to reduce the risk of boiler failure.</p> <p><u>Public submitters</u> Concerns that nanoparticles are not proposed to be monitored.</p> <p>Concern that the Hazardous Air Pollutants (HAPS) to be monitored have not been listed individually and that background concentrations are not available. There is also concern that the cumulative impact of all HAPS is unknown.</p> <p>Concerns regarding dioxins and furans.</p> <p>Concerns regarding cumulative impacts from another WtE plant proposed in the area.</p> <p><u>City of Rockingham</u> It is unclear which HAPS will be monitored as part of the CEMS.</p>	

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	<p><u>Greenhouse Gas</u> It is estimated that the WtE plant would produce 255,479 carbon dioxide equivalent (CO₂-e) tonnes per annum (tpa).</p> <p>Of this 34,417 tpa CO₂-e is reportable under the National Greenhouse and Energy Reporting System (NGERS).</p> <p>The amount of waste to feed the plant would otherwise have been put in a landfill which would have generated 144,481 CO₂-e (tpa). In order to produce 17.24 Megawatts (MW) of electricity using coal would have produced 121,319 CO₂-e (tpa) (or using natural gas would be 70,421 CO₂-e (tpa). Note that coal from Collie is mainly used in the south-west. Therefore the net savings of greenhouse gas because of the WtE facility is +10,321 CO₂-e (tpa). (255,479-121,319 -144,481 = +10,321)</p> <p>The estimated greenhouse gas emissions for the East Rockingham facility per annum of 34,417 tpa CO₂-e exceeds the NGERS threshold of 25,000 tpa CO₂-e and so New Energy will develop an NGERS reporting program.</p>	<p><u>DER and public submitters - Greenhouse gas</u></p> <p>Concerns that Greenhouse gas emissions are compared to fossil fuels not renewable sources and should be recalculated. Transport has not been included in the calculations.</p>	

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
PEOPLE			
Amenity	<p><u>Noise</u> The nearest residence is located approximately 1 km to the east (Wellard Road), followed by 2.5 km east (Medina) and SW (East Rockingham) of the development envelope, and 2.7 km south (Hillman).</p> <p>Herring Storer Acoustics (HSA) carried out an acoustic assessment in August 2013 and March 2014.</p> <p>Noise emission at: Nearest receptor (Wellard Road) – Needs to be 40 dB or less to be compliant and not significantly contributing as it is within Area B of the Kwinana Policy Area. The L_{A10} Noise Level at Wellard Road is 39 dB(A)</p> <p>Other receptors – Needs to be 30 dB or less to be compliant and not significantly contributing).</p> <p>Hillman L_{A10} Noise Level is 29 dB(A) Leda L_{A10} Noise Level is 30 dB(A) Calista L_{A10} Noise Level is 30 dB(A) Medina L_{A10} Noise Level is 28 dB(A)</p> <p>Neighbouring industrial premises –Needs to be less than 75 dB(A) to be compliant. Neighbouring industrial premises LA₁₀ Noise Level is 69 dB(A).</p> <p>Due to the close proximity of neighbouring industrial</p>	<p><u>DER</u> Further information should be provided on sound power levels and noise controls for major equipment items.</p> <p>Vehicle noise at the site should also be included in noise modelling predictions.</p> <p><u>City of Rockingham submission</u> The noise report should include impacts of asymmetrical building design on noise levels, surrounding sensitive land uses, direction of wind, surrounding landforms and temperature inversions impacting on actual noise levels.</p>	<p>New Energy has provided further information regarding sound power levels and noise amelioration measures.</p> <p>The DER has confirmed that the facility can meet the noise regulations provided the noise amelioration measures proposed by the proponent are included.</p> <p>New Energy has provided clarification regarding the odour report.</p> <p>Worst case scenario odour contours will not extend over the northern boundary of the development envelope.</p> <p>Comments relating to odour have been addressed in detail in the Response to Submissions document in Appendix 6.</p> <p>Not considered to be a key environmental factor.</p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	<p>premises to this facility compared to other industries, noise received at the boundary of the neighbouring industries would be dominated by noise received from this plant, and the 'significantly contributing' requirement is not applicable to neighbouring industrial premises.</p> <p><u>Odour</u> An odour assessment was undertaken. This identified that the robust design of the facility means that the only odour impacts would be from the biofilter. Best practice building design includes:</p> <ul style="list-style-type: none"> • double skin walls for the waste receiveal and sorting area; • the space between the walls will be under negative pressure; • point source odour extraction in areas where odour is expected to be high; • airlock design (double doors for the waste receiveal building; and • ventilation air fed into the gasifier or biofilter. <p>The amount of Municipal Solid Waste (MSW) expected to be received at the facility is 40,000 tpa, however this is expected to increase and so the building has been designed to be able to accept 120,000 tpa of MSW.</p>	<p><u>Odour</u> <u>DER</u> Odour modelling requires significant assumptions on emissions rates, particularly relating to the efficiency of biofilters. Mitigation contingencies must be considered to ensure timely resolution in the event of a biofilter failure.</p> <p><u>City of Rockingham</u> Odour report has a lack of clarity. Odour from trucks has not been addressed.</p>	
Heritage	A review of the Register of Aboriginal Sites shows that the development envelope does not contain any archaeological or ethnographic sites.		The development envelope does not contain any archaeological or

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
			ethnographic sites. Not considered to be a key environmental factor.
Human health			Potential impacts from emissions on human health are considered under the factor air quality. Not considered to be a key environmental factor.

PRINCIPLES		
Principle	Relevant Yes/No	If yes, Consideration
1. The precautionary principle <i>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</i> <i>In application of this precautionary principle, decisions should be guided by –</i> <i>(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i> <i>(b) an assessment of the risk-weighted consequences of various options.</i>		
	Yes	Specialist studies and site investigations have been sourced or undertaken and modelling carried out to inform the risk assessment process.

<p>2. The principle of intergenerational equity <i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>		
	Yes	The project would contribute positively to current and future waste management outcomes and provide benefits for future generations without having a negative impact on health, diversity or productivity.
<p>3. The principle of the conservation of biological diversity and ecological integrity <i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>		
	Yes	Site specific studies have been sourced or undertaken to determine the presence of Threatened and priority flora, fauna and ecological communities.
<p>4. Principles relating to improved valuation, pricing and incentive mechanisms (1) <i>Environmental factors should be included in the valuation of assets and services.</i> (2) <i>The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.</i> (3) <i>The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</i> (4) <i>Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximize benefits and/or minimize costs to develop their own solution and responses to environmental problems.</i></p>		
	Yes	New Energy recognises and accepts the costs of managing and monitoring the outcomes of the project, which have been factored into the feasibility of the facility.
<p>5. The principle of waste minimisation <i>All reasonable and practicable measures should be taken to minimize the generation of waste and its discharge into the environment.</i></p>		
	Yes	Best practice emission controls would be used to minimise air emissions. The proposal would reduce the amount of waste to landfill and increase recovery of resources.

Appendix 4

Identified Decision-making Authorities and Recommended Environmental Conditions

Identified Decision-making Authorities

Section 44(2) of the *Environmental Protection Act 1986* (EP Act) specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This Appendix contains the EPA's recommended conditions and procedures.

Section 45(1) requires the Minister for Environment to consult with decision-making authorities, and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following decision-making authorities have been identified for this consultation:

Decision-making Authority	Approval
1. Department of Environment Regulation	<ul style="list-style-type: none">• Works Approval and Licence
2. City of Rockingham	<ul style="list-style-type: none">• Planning approval
3. Economic Regulation Authority	<i>Electricity Industry Act 2004</i> <ul style="list-style-type: none">• Licence for electricity generation works

RECOMMENDED ENVIRONMENTAL CONDITIONS
STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(*Environmental Protection Act 1986*)

EAST ROCKINGHAM WASTE TO ENERGY AND MATERIALS RECOVERY
FACILITY

Proposal: To build and operate a Waste to Energy and Materials Recovery Facility on Lot 1 Office Road, 3 kilometres north-east of Rockingham in the Rockingham Industrial Zone.

Proponent: NEW ENERGY CORPORATION PTY LTD
Australian Company Number 16139310053

Proponent Address: Suite 1
12 Parliament Place
WEST PERTH WA 6005

Assessment Number: 1910

Report of the Environmental Protection Authority: 1513

Pursuant to section 45 of the *Environmental Protection Act 1986* it has been agreed that the proposal described and documented in Table 1 and 2 of Schedule 1 may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

Note: Words and expressions used in this Statement shall have the same respective meanings as in the Act or as provided for in Schedule 2 of this Statement.

1 Proposal Implementation

1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 in Schedule 1, unless amendments to the proposal and the authorised extent of the proposal has been approved under the EP Act.

2 Contact Details

2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence

within twenty eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

3 Time Limit for Proposal Implementation

3-1 The proponent shall not commence implementation of the proposal after the expiration of five (5) years from the date of this Statement, and any commencement, within this five (5) year period, must be substantial.

3-2 Any commencement of implementation of the proposal, within five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

4 Compliance Reporting

4-1 The proponent shall prepare and maintain a Compliance Assessment Plan to the satisfaction of the CEO.

4-2 The proponent shall submit to the CEO the Compliance Assessment Plan required by condition 4-1 at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation, whichever is sooner. The Compliance Assessment Plan shall indicate:

- (1) the frequency of compliance reporting;
- (2) the approach and timing of compliance assessments;
- (3) the retention of compliance assessments;
- (4) the method of reporting of potential non-compliances and corrective actions taken;
- (5) the table of contents of Compliance Assessment Reports; and
- (6) public availability of Compliance Assessment Reports.

4-3 The proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.

4-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 4-1 and shall make those reports available when requested by the CEO.

4-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.

- 4-6 The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report.

The Compliance Assessment Report shall:

- (1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;
- (2) include a statement as to whether the proponent has complied with the conditions;
- (3) identify all potential non-compliances and describe corrective and preventative actions taken;
- (4) be made publicly available in accordance with the approved Compliance Assessment Plan; and
- (5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.

5 Public Availability of Data

- 5-1 Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)) relevant to the assessment of this proposal and implementation of this Statement.

- 5-2 If any data referred to in condition 5-1 contains particulars of:

- (1) a secret formula or process; or
- (2) confidential commercially sensitive information;

the proponent may submit a request for approval from the CEO to not make this data publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.

6 Waste Acceptance Criteria

- 6-1 The proponent shall demonstrate that waste types not permitted for processing, detailed in Table 2 of Schedule 1 are not processed at this facility by implementing condition 6-2 to 6-8.

- 6-2 Prior to the commencement of operations the proponent shall prepare and submit a Waste Acceptance Monitoring Plan to the requirements of the CEO. The Waste Acceptance Monitoring Plan shall:
- (1) when implemented, substantiate whether condition 6-1 is being met;
 - (2) detail the proposed monitoring methodology to:
 - (a) identify the supplier of each waste load;
 - (b) record all waste loads received on site;
 - (c) describe waste types accepted on site and categorise as Construction and Demolition Waste, Commercial and Industrial Waste, Municipal Solid Waste, Green Waste or non-recyclable residues from material recycling facilities, waste transfer stations/depots and biological waste treatment facilities;
 - (d) record the amount of waste accepted on site;
 - (e) record waste type fed into the gasifier;
 - (f) record waste type disposed off site; and
 - (3) detail a procedure to summarise the results of monitoring outlined in condition 6-2(2).
- 6-3 After receiving notice in writing from the CEO that the Waste Acceptance Monitoring Plan satisfies the requirements of condition 6-2 the proponent shall:
- (1) monitor and prepare a summary of the results in accordance with the requirements of the Waste Acceptance Monitoring Plan; and
 - (2) continue to monitor and prepare a summary of the results in accordance with the requirements of the Waste Acceptance Monitoring Plan until the CEO has confirmed by notice in writing that monitoring is no longer required.
- 6-4 The proponent shall retain the results of monitoring required by condition 6-3 and shall make those results available when requested by the CEO.
- 6-5 The proponent shall provide the summary of the results of monitoring required by condition 6-3 to the CEO every six months from the date of commencement until the CEO has confirmed by notice in writing that provision of the summary is no longer required.
- 6-6 The proponent may review and revise the Waste Acceptance Monitoring Plan.
- 6-7 The proponent shall review and revise the Waste Acceptance Monitoring Plan as and when directed by the CEO.

6-8 The proponent shall implement the latest revision of the Waste Acceptance Monitoring Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 6-2.

Table 1: Summary of the Proposal

Proposal Title	East Rockingham Waste to Energy and Materials Recovery Facility.
Short Description	<p>A waste management facility comprising:</p> <ul style="list-style-type: none"> • a materials recovery facility; • five gasification modules, each with a capacity of 18MW (thermal input); • gas accumulation vessel/burner, heat exchanger/boiler, steam turbine/power generation system, air quality control system, continuous emissions monitoring system; • sediment ponds; and • associated infrastructure.

Table 2: Physical and Operational Elements

Column 1	Column 2	Column 3
Physical Element	Location	Description
Waste to Energy and Materials Recovery Facility	Figure 2 and geographic coordinates of the Development Envelope in Schedule 3.	Clearing of no more than 10ha of native vegetation within the Development Envelope.
Operational Element		
Gasification Chamber Thermal Capacity		No more than 72MW thermal.
Waste receival volume		Up to 225,000tpa.
Emissions outputs		Shall not exceed the emissions limits specified in Annex V of the European Union Waste Incineration Directive 2000/76 or its updates.
Waste types permitted to be processed:		<ul style="list-style-type: none"> • construction and demolition waste; • commercial and industrial waste; • municipal solid waste; • green waste; and • non-recyclable residues from material recycling facilities, waste transfer stations/depots and biological waste treatment facilities.
Waste types not permitted to be processed:		<ul style="list-style-type: none"> • scheduled wastes, as defined by ANZECC for the <i>National Strategy for the Management of Scheduled Waste (1992)</i>; • medical waste;

		<ul style="list-style-type: none"> • radioactive waste; • asbestos; • liquid and oily wastes; • contaminated soils; • tyres; • animal carcasses; • waste with a halogen content greater than 1%; • highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine; and • explosive materials.
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Table 3: Abbreviations

Abbreviation	Term
ANZECC	Australian and New Zealand Environment and Conservation Council
ha	Hectare
MW	Megawatt
tpa	Tonnes per annum

Figure 1 Regional Location

Figure 2 Development Envelope



Figure 2 Development Envelope

Schedule 2

Table 4: Definitions

Term or Phrase	Definition
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or his delegate
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986</i>
OEPA	Office of the Environmental Protection Authority

Table 5: Development Envelope Co-ordinates.

Coordinate No	Easting (MGA Zone 50)	Northing (MGA Zone 50)
1	384525.47	6430820.91
2	384507.38	6430820.49
3	384489.33	6430819.27
4	384471.34	6430817.25
5	384467.09	6431166.00
6	384467.02	6431172.00
7	384466.96	6431176.76
8	384738.12	6431180.07
9	384742.94	6431175.37
10	384748.24	6431170.20
11	384748.25	6431169.44
12	384749.07	6431103.96
13	384748.43	6430821.21
14	384525.47	6430820.91

Appendix 5

**The Department of Environment and Regulation process for Works
Approval and Licensing of Waste to Energy proposals**

Department of Environment Regulation (DER) - General overview of the likely works approval and licensing process under Part V of the *Environmental Protection Act 1986* for waste to energy plants in Western Australia (WA).

Given the socio-political aspects associated with the Waste to Energy (WtE) sector and its infancy in WA, the DER considers new WtE facilities should comply with Best Practice criteria in relation to the environmental performance and management of the facility.

As there is only a limited amount of state and Australian technical guidance for some industrial processes, including waste to energy, it is reasonable to expect proponents and regulators to refer to alternative technical guidance where necessary to assess Best Practice.

The Best Practice criteria is similar to that in European Union Pollution Prevention and Control legislation which requires permitted installations to use Best Available Techniques (BAT) to prevent and minimise pollution.

The EU Commission issues a 'BAT reference document' (BREF) for each prescribed industrial sector, including waste incineration. The BREFs are the result of an exchange of information between regulators, industry and other interested parties in member states. The BREFs are used by member states to compile their own guidance.

The Waste Incineration BREF note sets out the accepted/proven methodologies for pollution control in accordance with the principals of Best Available Techniques (BAT), as defined by:

- 'best' - means the most effective techniques for achieving a high level of protection of the environment as a whole;
- 'available' - means techniques developed on a scale which allows them to be used in the relevant industrial sector, under economically and technically viable conditions, taking into account the costs and advantages; and
- 'techniques' - includes both the technology and the way the installation is designed, built, maintained, operated and decommissioned.

The EU Waste Incineration Directive (Directive 2000/761EC) (WID) also sets legislative criteria for the design, operation, emissions and monitoring of waste incineration processes. The WID has recently been incorporated into the EU Industrial Emissions Directive.

The DER's position is that works approval and licence applications for WtE schemes should address the key requirements of the WID, having regard to the Waste Incineration BREF note.

The key requirements in the DER's view include, but are not limited to:

- waste acceptance and feedstock control;
- combustion process controls;
- controlling emissions to air to meet emission limit values (ELVs);
- monitoring of air emissions and combustion process controls;
- abnormal operations; and
- process waste disposal or recovery.

Any proposed deviations from the Best Practice standards for these key criteria will require a reliable and an appropriate level of justification.

The works approval stage

The Part V works approval process allows the DER to assess the environmental acceptability of a proposal.

For works approval applications for WtE facilities, the DER will compare the technical information and data for the proposed facility with the strict process design, operational controls and emission limits set out in the WID. This includes key pollutants such as nitrogen dioxide, sulfur dioxide, dioxins and total particulates (including PM₁₀), the limits for which have been set to protect both the environment and human health.

From the start of the application process, through the commissioning phase and throughout operation the operator will need to consider the most appropriate Best Practice process controls for their facility.

For point source emissions to air, proponents are required to submit evidence of impacts from the emissions, in the form of air quality assessments and models to demonstrate that the proposed operation will not have a negative impact on sensitive locations surrounding the site.

Additionally, the Air Quality Assessment will be required to demonstrate that the proposed facility can meet the required ELVs as defined by WID for emissions to air from stacks. These ELVs are likely to be included within the works approval as conditions of operation.

The DER will also require a commissioning plan to be submitted in the works approval application, detailing the key stages and anticipated completion timescales. If the commissioning plan is not available at this stage a condition can be set in the works approval to require the commissioning plan to be submitted and approved before commissioning can commence.

The commissioning plan should include, but not be limited to:

- details of the commissioning stages and expected timescales;
- expected emissions to the environment during each stage;
- an environmental emissions management plan detailing the air / water / land / noise / odour sampling and monitoring protocol to be used during commissioning;

- actions to be taken to protect the environment and report to the DER in the event that the actual emissions exceed those expected;
- actions to be taken during start up to minimise and manage emissions; and
- contingency plans in the event of any incident.

More specifically, the commissioning period will need to measure air emissions for the specified air pollutants with continuous and extractive monitoring. This information should be used to check and/or adjust the amount of abatement material required to meet the emission limit values specified in WID during the operational phase.

The works approval will require commissioning to be carried out in accordance with the approved commissioning plan.

If the information in the works approval application does not meet the key WID criteria, having regard to the Waste Incineration BREF note specified criteria, the DER may not issue a works approval. The proponent would be given opportunity to provide additional information or a revised proposal in order to address the areas of concern where the key criteria are not met.

The DER will only issue a works approval once the proponent has satisfactorily demonstrated that the proposal meets the specified criteria (or has justified deviations from that criteria) and has demonstrated that the potential environmental impact is acceptable.

The works approval will contain conditions to ensure the premises can operate in an environmentally acceptable manner and that the works themselves do not cause an unacceptable environmental impact. In particular conditions are set to cover the commissioning phase. This allows the works approval holder to test, trial or operate the plant for a limited time and discharge or emit waste into the environment without a licence.

Commissioning under a works approval requires the works approval holder to control, manage, monitor and report emissions and discharges of waste during the period of the works approval. It does not remove the requirement to apply for a licence or registration prior to the operation of the works.

The commissioning stage brings the plant up to operating condition for the first time so as to measure the various parameters which are monitored during operation. During initial commissioning the works approval holder will need to operate the facility in order to test and verify the process controls and provide updates/reports to the DER on the progress of the commissioning.

The works approval holder must submit a compliance report to the DER upon completion of the works construction and each stage of commissioning to verify that the works have been completed in accordance with the works approval.

The compliance report upon completion of commissioning shall include:

- a summary of the environmental performance of the plant as installed against the design parameters set out in the works approval application; and
- a review of performance against the works approval conditions with details of procedures developed during commissioning for achieving and demonstrating compliance with the works approval conditions.

Where there have been changes or alterations to the works from those approved under the works approval, this needs to be clearly stated in the compliance document and justification provided for the deviations.

The compliance documents need to be submitted as soon as the works are complete. The DER will review the compliance reports and may undertake a site visit to conduct a compliance audit. Under section 57(3)(b) of the EP Act, the DER must not issue a licence or amend a licence where works have not been completed as per the conditions of a works approval.

The licence stage

Once it is agreed that all conditions of the works approval have been met and the DER is satisfied all works have been completed appropriately, the DER will issue or amend the licence as required to allow the facility to operate.

The licence is likely to specify conditions requiring the facility to be operated in accordance with the requirements of the Best Practice criteria as per the WID, including various validation, monitoring, measurement and recording criteria.

The licence is likely to set controls on the operation of the facility with regards to the throughput, storage and types of wastes that can be accepted.

Varying levels of control apply to WtE plants with regards to the nature of the waste proposed to be utilised as the plant fuel. The major controlling factor on the acceptability of fuel types at a WtE facility is the ability of the fuel to meet the design criteria for the facility and therefore provide the appropriate technical, economic and environmental fuel mix for the plant.

The licence is likely to specify minimum requirements for combustion conditions to ensure complete combustion of all potentially polluting substances. Such technical standards are likely to require verification through on site testing and analysis with reporting to the DER.

It is likely that limits on emissions from the plant will be specified in the licence and these ELVs are likely to be consistent with the continuous/periodic ELVs specified in the WID.

ELVs set are likely to include, but are not limited to the following parameters to air:

- total dust/particulates;
- total organic carbon;
- hydrogen chloride;
- hydrogen fluoride;
- heavy metals;
- dioxins;
- sulphur dioxide; and
- nitrogen dioxide.

The licence is likely to require monitoring to be carried out, including taking and analysing samples, instrument measurement (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data. Records of all monitoring and associated measurements will need to be retained and incorporated into reports as per the licence conditions. In particular the licence will require the licensee to submit an annual compliance report to cover all the licence conditions to demonstrate that they have been complied with.

The licence may set conditions relating to waste products from the facility (e.g. incinerator bottom ash and air pollution control residues). These would need to be monitored and records provided on the type, quantities and composition of such wastes and their destination, to ensure that appropriate facilities are used for the type of waste produced.

All DER licences for prescribed premises contain conditions requiring licensees to report any abnormal operating conditions, deviations, failures of monitoring equipment and exceedances of limits as soon as possible and such incidents need to be investigated and measures taken to mitigate them and prevent reoccurrence.

For WtE plants the licence is likely to require waste to be ceased being charged to the combustion zone if certain defined circumstances occur, such as process control and emission parameters falling outside of the licence limits. These requirements are usually automated via the plant's process control system and such periods have to be recorded.

Ongoing compliance assessment

The DER assesses the reports and monitoring information submitted under works approvals and licences and undertakes site inspections and audits to assess compliance with set conditions.

The EP Act gives powers to the DER to take enforcement action in the event of licence conditions being breached and the DER's enforcement and prosecution policy covers the action that may be taken in such circumstances. This ranges from instigating improvement actions via licence amendments or

notices, to issuing prevention notices whereby measures are required to prevent the discharge of waste, pollution and environmental harm.

Appendix 6

Summary of Submissions and Proponent's Response to Submissions