Mr Jamie Merrick
Director-General
Department of Environment and Science
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11 June 2021

Dear Mr Merrick

Re: Energy from Waste guideline

The Waste Management and Resource Recovery Association of Australia (WMRR) welcomes the opportunity to provide a submission that will inform the development of the Queensland Energy from Waste (EfW) guideline.

WMRR is the national peak body for the $15.5 billion essential waste and resource recovery (WARR) industry. Nationally, we have more than 2,000 members representing over 500 entities that operate in a broad range of government organisations, the three (3) tiers of government, universities, and NGOs.

Our members are involved in in the breadth and depth of WARR, engaging in activities fundamental to the success of the Australian economy, including infrastructure investment, collections, manufacturing of valuable products from resource recovered materials, energy recovery, community engagement and education, and responsible management of residual waste. In Queensland, the WARR sector currently employs more than 11,800 people and contributes $1.5 billion to the state economy.

WMRR commends the Department for releasing a practical and well-considered EfW policy in 2020, which coupled with the Biofutures 10 Year Roadmap and Action Plan, has provided a level of certainty to EfW proponents within Queensland by setting clear policy and regulatory pathways for EfW. Importantly, the policy recognises that EfW has a role to play in an integrated waste and resource recovery system – and that energy recovery from residual waste is clearly to be preferred - while creating greater employment and economic opportunities compared to simply disposing of these residual materials to landfill without high quality biogas capture. This has been supported by recent analysis by the Clean Energy Finance Corporation which demonstrated that strengthening Australia's recycling, organics, bioenergy and thermal energy from waste sectors would result in a number of benefits Australia-wide, including Queensland, such as[1]:

[1] Energising resource recovery: the Australian opportunity, Clean Energy Finance Corporation

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- New and expanded infrastructure requirements for waste, recycling and bioenergy projects in Australia have the potential to generate between $4 billion and $7.8 billion in new investments in the period to 2025.
- The employment benefits include the potential for the creation of up to 9,000 construction jobs, 2,600 indirect jobs and as many as 1,400 direct and ongoing jobs, including in regional and rural areas.
- From an emissions reduction perspective, the benefits are also substantial, with the potential to reduce landfill emissions by as much as 60% based on current forecasts.

WMRR's full submission can be found below. However, WMRR would also request that there be another round of industry consultation when the actual draft guideline is made available in order to provide targeted and constructive feedback on the document itself (as opposed to a PowerPoint presentation on what the guideline is proposed to contain). Please do not hesitate to get in touch with the undersigned if you would like to further discuss WMRR's submission.

Yours sincerely

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Section/topic	WMRR's response
General	*Residual waste* WMRR strongly advocates that there must be a systems-based approach to managing materials in Queensland, which must be underpinned by the waste management hierarchy as we move Australia towards a genuine circular economy that emphasises design, extended producer responsibility and sustainable natural material management. As noted below, WMRR supports DES' adoption of international best practice for material recovery but further recommends that the state government considers how it can develop robust policy and regulatory frameworks across all areas of WARR that work in tandem. For instance, WMRR believes that all state governments should develop specific strategies for significant material streams (e.g., FOGO) and importantly, across each rung of the waste hierarchy. In an integrated system, these strategies would allow the state to appropriately manage its material streams, which would then provide clarity of current and expected material flows. *Incinerator bottom ash* WMRR supports DES' objectives in developing end of waste codes as these set the pathways for materials deemed to be "waste" to return to a resource in a way that in theory, simplifies and streamlines compliance activities while maximising the value and use of materials. In February 2021, WMRR provided a submission to DES proposing that an end of waste code be developed for incinerator bottom ash. WMRR highlights that bottom ash can be recovered for reuse, as proven in the EU and the UK, and doing so would result in greater landfill diversion, which in and of itself will lead to myriad environmental benefits – mitigating carbon emissions being one of them. Further, the process to recover, treat (where necessary), and reuse has the added benefit of creating more jobs in the region (in addition to the jobs and investment that come with EfW), while replacing the use of virgin materials, particularly in civil construction. WMRR recommends the development of an end of waste code for incinerator bottom ash and our submission is attached at Annexure A. *How feedstock is currently being managed*

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	Proponents should consider and describe whether proposed feedstock is currently going to landfill with biogas capture, with or without power generation. The performance of any landfill biogas capture system should be accurately represented to allow the assessment of the proponent's carbon emission outcomes relative to current practices. *Waste levy* The levy rebate that local government receives is a significant disincentive for councils to contract and/or invest in resource recovery, as doing so potentially reduces their financial return. WMRR advocates for the setting of a timetable for the discontinuation of the annual advance payment paid by the Queensland government to councils in the levy zone to ensure actions by local governments within are incentivised to reduce diverting waste to landfill and promote resource recovery as well as EfW. Further, while the levy rate in Queensland remains out of step with other east coast states, interstate transport for disposal will continue and will also see resource recovery investment prioritised in other states over Queensland.
Suitable waste feedstocks – outcome four (4): only residual waste as feedstock Residual waste is waste that is not technically, environmentally or economical practicable (TEEP) to recycle.	While further feedback on feedstock can be found below, WMRR queries how DES will appropriately assess applications as the assessments related to suitable waste feedstock may require highly technical skills and experience. To ensure there is a level playing field and that assessments do not become variable based on experience level and/or perception of officers, WMRR recommends that DES, in consultation with industry, develops a standard assessment scope that is applied across any/all consenting authorities, including local government.
Technically impracticable – outcome four (4): only residual waste as feedstock • Feedstock sorting or recycling technology does not yet exist. • Recycling is prohibited (e.g., biosecurity waste, clinical and related waste). • All reasonable efforts have been taken to	As noted above, WMRR supports a true systems-based approach, which recognises that a variety of treatment options are required as part of resolving the challenges posed by materials discarded, once generated by the community. Thus, WMRR commends DES for adopting international best practice for material recovery, i.e., separation at source, which has also been recognised in South Australia. WMRR proposes that mandatory source separation is also required for the C&D stream.

divert reusable of recyclable material – source separation or pre-processing. • For MSW and C&I waste, diversion of recyclable materials can be achieved through "best practice source segregation of recyclables and/or food and garden organics".	
Environmentally impracticable – outcome four (4) only residual waste as feedstock The possible negative environmental effects outweigh environmental benefits from reusing or recycling the waste: • Additional resource use during processing. • Additional emissions from transport. This should be assessed using a life cycle assessment (LCA), considering at a minimum: • Greenhouse gas emissions • Depletion of non-renewable resources • Water consumption • Particulate matter formation	WMRR notes that the proposed assessment pre-requisites appear to be geared towards larger-scale EfW facilities and highlights that these requirements, including the lifecycle assessment and social impact assessment, may present a higher level of entry for smaller plants. While WMRR supports a consistent policy and guideline, clarity is required on whether there will be metrics and expectations geared towards the aggregation of volumes at smaller plants, given the geographical challenges that do exist in Queensland around aggregating large volumes of material in, for example, Far North Queensland. Clarity is also sought on whether a lifecycle assessment is required if a proposed project will be undertaking pre-processing and there are no transport barriers. For facilities of suitably large scale and mixed waste character, lifecycle assessments should ensure that the likely changing character of waste and grid emissions intensity across the lifetime of the facility is assessed to ensure accurate carbon emissions advice can be presented. In essence, WMRR recommends that in finalising the EfW guideline, DES clearly defines the requirements (and highlight those that are mandatory) for both large- and small-scale plants, including the capacity for each scale.
Long-term feedstock strategy – outcome five (5): adaptability to residual waste changes Proponents should: • Model feedstock variability using baseline	WMRR is seeking confirmation that the general approach to defining residual will be undertaken in today's market and environment, while the feedstock modelling/sensitivity assessment is done over a longer timeframe in order to recognise flexibility in feedstock variability and policy changes.

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composition, future change and sensitivities. • Assess and quantify the impact of feedstock variability on emissions, residues, products and overall environmental impacts and benefits. • Explain contractual, operational and design features that allow the facility to adapt to change.	Further, while industry supports the federal government's 2030 national resource recovery target of 80%, which Queensland has committed to, and Queensland's 90% landfill diversion by 2050 target, it must be noted that evidence from countries with the most established decades-long WARR systems (that Australia does not have) are not able to consistently hit the 70% target. For example, during the period of 2010 to 2016, landfilling in the 28 EU member states decreased from 29% to 25%[2]. Meanwhile, municipal waste recycling rates differ widely between European countries, ranging from 68% in Germany to 0.3 % in Serbia in 2017. In 2017, 28 countries recycled 55% or more of their packaging waste and 15 countries recycled 65 % or more of their packaging waste[3]. Meeting Australia's ambitious targets will take long-term planning and infrastructure development, education and behaviour change programs, a shift in material management including the re-design of products, and nationally consistent systems-based policies and regulations. Until all of these occur (noting that we will still be generating waste in the interim), it will not be possible to achieve an 80% recovery rate without a fully integrated waste management and resource recovery system, which includes EfW.
Best practice operations – outcome seven (7): environmental protection All proposals should consider the EU Best Available Techniques guidance and conclusions where relevant, specifically the EU Best Available Technique Reference Documents (BREF-WI and BREF-WT) and conclusions (BATc).	WMRR strongly supports DES' intent to align its policy requirements to those of BREF as this recognises the need for technology that is utilised to be proven against international best practice, meets all requirements in relation to pollution and energy efficiency, as well as reduces greenhouse gas emissions. Relying on the proven regulatory framework of the EU in developing a robust EfW guideline is supported as it provides project proponents with the necessary reference plants and data. Having proven reference sites is critical from both a procurement and operational perspective and plays a key role in obtaining approvals, including a social license to operate. Should DES decide to divert from the EU model, WMRR would strongly encourage further consultation with industry to ensure a practical policy that meets both industry and government's objectives. WMRR highlights that DES will need to consider the applicability of these standards to the Queensland context (e.g., local

[2] European Environment Agency

[3] European Environment Agency

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	temperature and climate) and recommends that the Department seek expert input on correction factors.
Commercial technologies – outcome two (2): demonstrate operational technologies Should nominate a reference facility: • In commercial operation for at least two (2) years. • At a similar scale to the proposed facility. This scale comparison can be for a single line/module. • Using feedstock which is similar in composition. • In a comparable jurisdiction: Australia, UK and EU.	WMRR supports the EU framework that does not specify the material quantities and tolerances in waste streams but qualifies whether the C&D, C&I and/or MSW that is going to an EfW plant is "residual" (i.e., post source-separation). Industry is able to report on residual materials based on C&I, C&D and MSW split but will struggle to reference similar waste streams with similar inputs. The new emission limit values from the WI-BREF (BAT-AEL) were only published in December 2019. As a result, industry will struggle to nominate reference facilities that have been in "commercial operation for at least two (2) years" and that meet all of the latest WI-BREF (BAT-AEL) limits. It is recommended that the performance of the nominated reference facilities be assessed against the WI-BREF requirements applicable at the time of regulatory approval for such facilities.

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ANNEXURE A

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15 February 2021

Dear Mr Merrick

Re: Submission for proposed end of waste code – incinerator bottom ash (IBA)

The Waste Management and Resource Recovery Association of Australia (WMRR) welcomes the opportunity to provide a submission for an end of waste code for Incinerator Bottom Ash (IBA). WMRR is the peak national body for the $15.5 billion essential waste and resource recovery (WARR) industry. Nationally, we have more than 2,000 members representing over 500 entities that operate in a broad range of government organisations, the three (3) tiers of government, universities, and NGOs.

Our members are involved in in the breadth and depth of WARR, engaging in activities fundamental to the success of the Australian economy including infrastructure investment, collections, manufacturing of valuable products from resource recovered materials, energy recovery, community engagement and education, and responsible management of residual waste. In Queensland, the WARR sector currently employs more than 11,800 people and contributes $1.5 billion to the state economy.

WMRR supports DES' objectives in developing end of waste codes as these set the pathways for materials deemed to be "waste" to return to a resource in a way that in theory, simplifies and streamlines compliance activities, while maximising the value and use of materials. WMRR submits that as part DES' annual call for submissions, the department considers the development of an end of waste code for IBA.

Background
In 2020, the Queensland government released its Energy from Waste (EfW) policy that clarifies how EfW can play a key role within an integrated WARR system. This document, which WMRR believes to be practical and well-considered, provides EfW proponents with much-needed certainty and coupled with the forthcoming EfW operational guidance, is expected to drive the development of EfW facilities in Queensland. As it stands, there is an active EIS for a Remondis EfW facility in Ipswich, Swanbank that when commissioned, has the ability to process up to 500,000 tonnes of residual waste a year. As more of these projects come online across the state, WMRR believes that the department must consider what the pathways of reuse are – whether direct or through secondary beneficial reuse - for Incinerator Bottom Ash (IBA), a residue produced during the EfW production process.

This is particularly important for a number of reasons. For example, proponents of the Australian Paper 650,000tpa thermal EfW plant in Latrobe Valley, Victoria, have estimated that bottom ash would comprise about 20% to 25% of the weight of the input material. In WA, the 300,000tpa East Rockingham plant is expected to produce approximately 70,000tpa of bottom ash. International studies and practice have demonstrated a proportion of bottom ash can be recovered for re-use (more below); however, in the absence of these pathways for its reuse and uptake, these materials will be sent to landfill, incurring the landfill levy and significantly affecting the financial viability of these facilities. Taking the example of the East Rockingham plant, a similar sized project in Queensland would have to pay $80/t in waste levy (plus gate fee) at this present time, amounting to a cost impost (for the year) of upwards of $5.6 million on the EfW operator; Remondis' Swanbank facility, which has estimated that its bottom ash volumes could sit between 16% and 22% of input waste, could incur upwards of $6.4 million in waste levies (plus gate fee).

Given bottom ash can be recovered for reuse, as proven in the EU and the UK, doing so would also result in greater landfill diversion, which in and of itself will result in numerous environmental benefits – mitigating carbon emissions being one of them – and the process to recover, treat (where necessary), and reuse has the added benefit of creating more jobs in the region (in addition to the jobs and investment that come with EfW), while replacing the use of virgin materials, particularly in civil construction, as detailed below.

Overseas experience however, has shown that the creation of new markets for IBA requires careful consideration of the impediments to its use, including perceived complexity, time delays (e.g., approvals), perceived risk, and perceived increase in cost. As such, there needs to be a robust regulatory framework in place to tilt the balance in favour of IBA reuse over the use of virgin material.

WMRR's full submission can be found below. Please do not hesitate to contact the undersigned if you would like to further discuss our end of waste proposal.

Yours sincerely

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Matters to be addressed	WMRR's response
The proposed use of the waste.	This end of waste code proposal relates to IBA where metals have already been removed for recycling. IBA has a number of demonstrated applications, notably (though not exclusively) in civil construction/ construction materials including: • Concrete (bound - construction); • Sub-base for road construction (unbound - construction); • Road pavement (bound and unbound – geotechnical) • Permeable blocks (e.g., retaining walls - construction); • Pipe bedding (construction); • Ceramics (construction); • Glass and glass ceramics (vitrified IBA and gasifier slag – construction); • Geopolymers (construction); • Embankment/fill (geotechnical); • Fertiliser in agriculture; and • Absorbent.
If the proposed use of the waste may, or is likely to, cause any: serious environmental harm; material environmental harm; or environmental nuisance.	There are more than 450 incineration plants across the EU, Norway, and Switzerland, resulting in the generation of some 17.6 megatrons of IBA per year. As such IBA has been the subject of research into its reuse as well as its chemical composition, and to mitigate any potential environmental risks. The main environmental area of concern is leachability. WMRR recommends that for IBA Aggregates (IBAA), leaching data analysis is used to assess its suitability for reuse, in addition to other general hydrogeological risk factors. As IBAA has various applications (noted above), including bound and unbound materials, sampling and testing requirements should focus on IBAA leach tests; a risk-based approach is a

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	better fit for the beneficial and safe reuse of IBAA. WMRR suggests that DES considers the safe reuse of bottom ash in accordance with UK Standard Rules SR2012 No. 13 of the Environmental Permitting (England & Wales) Regulations 2010. These rules also stipulate the conditions and limits of specified activity and waste types related to IBA.
Potential market and sustainability of the proposed use of the waste.	There are opportunities for direct and secondary beneficial reuse of IBA including in civil construction, which in the immediate term, will be the major market for this material. With the significant volumes of IBA that will be produced each year (given it is expected that IBA will make up between 16% and 25% of waste input) and the fact that EfW facilities are built with a view to operate over a long timeframe (25-30 years), there will be no lack of feedstock for reuse markets. There is a long history of the use of IBAA in the UK and EU. Confidence in this re-use market is highlighted by the international company, Blue Phoenix, which recently signed a 25-year contract to own and operate Australia's first IBA processing facility in WA. The company been processing IBA for more than 20 years, having processed more than four (4) million tonnes globally across 21 operational sites.
How the proposed use of the waste supports waste recovery or re-use.	As highlighted above, the reuse of IBAA supports landfill diversion goals and drives greater resource recovery and reuse. Moreover, there are numerous opportunities to develop technical and non-technical solutions to reuse IBAA given the myriad applications noted above.
Relevant standards, guidelines, certifications and/or industry codes including any Australian Standards, ISO standards or other industry accepted standards.	WMRR proposes that DES considers the following Australian and international standards/guidelines/industry codes: • The UK has a well-established framework for the beneficial re-use of IBAA and this best practice solution

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	should be considered by DES. The UK's guidance can be found here. • Standard rules SR2012 No13 – the Environmental Permitting (England & Wales) Regulations 2016, which cover the treatment of IBA. • EU Directive 2010/75/EU on industrial emissions which stipulate minimum requirements including operating conditions that ensure the conversion of waste results in IBA with a total organic carbon content of less than 3wt%. It also requires EfW operators to minimise the harmfulness of residues and to recycle them where appropriate. An assessment is required prior to recycling, of the residues chemical and physical properties where the pollution potential is reviewed in accordance with parameters set out in the directive.
Details of any investigation(s) or report(s) that would support this submission.	WMRR recommends that DES considers the IBA research and market development work undertaken by Sustainability Victoria and ARRB. A copy of a recent presentation is attached to this submission.

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