

Government of **Western Australia** Office of the **Appeals Convenor** Environmental Protection Act 1986

# Appeals Convenor's Report to the Minister for Environment

Appeals objecting to Report and Recommendations of EPA Report 1704 – Mardie Project



Appellants	MG Kailis Group Western Australian Fishing Industry Council Inc Protect Ningaloo
Proponent	Mardie Minerals Pty Ltd
Authority	Environmental Protection Authority (EPA)
Appeal No.	030 of 2021
Date	November 2021

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### Acknowledgement of Country

The Office of the Appeals Convenor acknowledges the traditional custodians throughout Western Australia and their continuing connection to the land, waters and community.

We pay our respects to all members of the Aboriginal communities and their cultures, and to Elders past, present and emerging.

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# **1** Executive summary

# 1.1 Decision under appeal

The Mardie Project proposes to use seawater to produce raw salts as a feedstock for processing high purity salt, fertiliser grade sulphate of potash, and other commercial by-products. The proposal is located 80 kilometres south-west of Karratha, in the Pilbara region of Western Australia (Figure 1) and includes a seawater intake, concentrator and crystalliser ponds, processing plant, bitterns disposal to the marine environment, and a trestle jetty export facility.

The proposal was referred to the Environmental Protection Authority (EPA) in April 2018 and assessed at the level of Public Environmental Review (PER). The proposal was also determined to be a controlled action under the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) and was assessed by an accredited process under the *Environmental Protection Act 1986* (EP Act).



Figure 1: Location of the Mardie Project proposal (diagonally filled outline), Report 1704

Having formed the view that the impacts of the proposal could be managed consistent with the EPA's objectives for the above environmental factors, the EPA recommended that the proposal may be implemented subject to conditions. The findings of the assessment were released in EPA Report and Recommendations 1704 on 29 June 2021.

These appeals are against the content of and recommendations in the EPA Report.

# 1.2 Grounds of appeal and appellant concerns

The appellants are MG Kailis Group, the Western Australian Fishing Industry Council (WAFIC) and Protect Ningaloo. Appellants raised concerns about the scale and extent of the project, impacts to regional and local habitat values and the recommended conditions, including environmental offsets. One appellant sought for broader consideration of the proposal's value to Western Australia and the region and for implementation to be refused at the location and scale. Two of the appellants sought for further conditions related to fishery and a marine species. The appellants' specific concerns are summarised in Table 1 below and described in detail in section 3 (Supporting information).

#### Ground Main concerns the appellants submitted Habitat values The scale of the project along some 28 kilometres of the Pilbara coastline intertidal and have impacts that are significant in a local and regional context. subtidal Significant residual impacts to terrestrial flora, vegetation and fauna, and habitats intertidal and marine values cannot be offset. The assessment of intertidal and subtidal habitats is inadequate for the early life stages of the bluespotted emperor, prawn species and the green sawfish. The key associations between the above species and specific habitats cannot be assessed on the basis of widespread presence of similar habitat across a region. The proposal within the Fortescue Size Managed Fish Ground, may significantly impact prawn productivity. Adequacy of Conditions, in particular the environmental offsets, are insufficient to recommended prevent environmental harm to benthic communities and habitat, and flora conditions and vegetation due to: the large scale of the proposal, with clearing and disturbance that • are significant in a local and regional context and habitats of high value that provide important ecosystem services • The recommended 'research- only' offsets are inconsistent with the WA Environmental Offsets Policy (2011) and WA Environmental Offsets Guidelines (2014), as the following have not been applied: • The recommended offsets have no measurable long-term ecological outcomes. • The recommended research offsets are not related to the significance and marine conservation values impacted. There is insufficient transparency, governance and government management frameworks for research offsets.

### Table 1Grounds of appeal

# 1.3 Key issues and conclusions

The appeals relate to the EPA's report and recommendations for the Mardie Project.

A key element of Protect Ningaloo's appeal is that 'due to the significant residual impacts of this proposal, the proponent, EPA and the WA Government more broadly should assess and demonstrate the wider need and value of this project in a regional and state context and how that value outweighs the significant environmental impacts'.

The role of the EPA in assessing a referred proposal is advisory. The EPA is required to prepare an assessment report, which identifies key environmental factors and makes a recommendation as to whether or not the proposal may be implemented. In making its recommendation, the EPA is confined to a consideration of environmental factors and to the impact of the proposal on the environment.

The final decision on whether or not a proposal the subject of an assessment report may be implemented is made by the decision-making authorities under section 45 of the Act and that agreement or decision is not restricted to environmental factors. It is for the decision-makers to determine the weight to be given to environmental factors, and the balancing of those factors with economic, social, cultural and other considerations.

This report is therefore limited to the consideration of the adequacy of the EPA's assessment in the context of its role – a final decision on the proposal is a matter for others. The key question for the appeal investigation to determine is was the EPA's assessment of the potential impacts on habitat values at a local and regional scale appropriate? And if so, given the EPA's recommendation that implementation be allowed, are the recommended conditions adequate, including the EPA's recommendations in relation to offsets?

The appeal investigation focused on these 2 determinative issues, which are summarised below. Section 2 provides our further details about our reasons and supporting information is provided in Section 3.

## Did the EPA adequately consider impacts to habitat values?

We conclude that the EPA has assessed the proposal as referred to it, which included consideration of habitat values within a regional framework and accept the EPA's conclusion that the proposal is consistent with its environmental factor objectives.

The EPA identified 7 key environmental factors relevant to its assessment of the proposal. including Flora and vegetation, Marine Environmental Quality, Benthic Communities and Habitat (intertidal and subtidal), Terrestrial fauna, Marine Fauna, Inland Waters and Social Surroundings.

The EPA assessed impacts to habitat values within the context of relevant guidance and strategic advice for the region and considered:

• the high terrestrial habitat values of the project location mostly in the Roebourne subregion of the Pilbara<sup>1</sup>,

<sup>&</sup>lt;sup>1</sup> EPA (2014) Cumulative environmental impacts of development in the Pilbara region - Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the *Environmental Protection Act 1986* 

- the project location is mostly within coastal regional habitat designated as of 'high conservation value' on the Pilbara coast, and overlapping and bordering coastal habitat designated 'regionally significant very high conservation value'<sup>2</sup>, and
- the proponent avoided high value coastal benthic habitats, excised the Mardie pool and a buffer area and minimised impacts to the 'regionally significant – very high conservation value' Robe River Delta Mangrove Management Area.

As a result of its assessment, the EPA considered that its objectives for the key environmental factors the proposal could be met if the proposal is approved subject to the recommended conditions. In coming to this view, the EPA identified that the implementation of the proposal will result in 'significant residual impacts' to numerous environmental values. This includes, for example, clearing of 2,319 hectares of good to excellent condition native vegetation, clearing of up to 9 per cent of the regional extent of foraging habitat for the Northern coastal free-tailed bat and clearing of 1,204 ha of habitat for 26 listed migratory bird species and up to 880 hectares of algal mat (up to 14 per cent of the regional extent).

The EPA considered the impacts to marine and commercial fishing species primarily through its assessment of benthic communities and habitat, including habitat associations for the juvenile phases of the species identified in the appeals:

- macroalgal habitats bluespotted emperor
- seagrass and macroalgal habitats brown tiger prawns and blue endeavour prawns
- sandy/muddy habitats western king prawns and
- mangrove creeks, river mouths and estuaries green sawfish

We find that the EPA's assessment of impacts to benthic communities and habitat focused on changes to habitat values from the proposal rather than the identification of species as a measure of biological diversity or specific associations with the habitat.

However, available information indicates that juveniles bluespotted emperor in particular are exclusively associated with subtidal macroalgae habitat and that the presence of juveniles and their macroalgae habitat have been confirmed within the subtidal area adjacent to the Mardie Project.

Notwithstanding the above, it is clear that the EPA's assessment did consider intertidal and subtidal habitats relevant to the species raised in the appeals. The EPA applied conditions to limit the amount of disturbance (including direct and indirect impacts) to critical intertidal habitat (algal mats) assuming that the consequential effect would be to prevent impacts to adjacent subtidal habitats.

While we have found that the EPA's assessment did not expressly identify risks to subtidal habitat for species identified in the appeals outside of the areas impacted by dredging and bitterns disposal, we consider that these risks were implicitly addressed through the EPA's conclusions that the proposal will not interfere with critical benthic habitats and communities.

We therefore consider that it is open to the Minister to accept the assessment considered risks to subtidal habitat and the species that rely on that habitat. If the Minister agrees with that approach, the following section considers the adequacy of the conditions that the EPA has recommended be applied to the proposal.

<sup>&</sup>lt;sup>2</sup> EPA (2001) EPA Advice: Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline - In accordance with section 16(j) of the Environmental Protection Act 1986

## Are the recommended conditions adequate, including in relation to offsets?

Overall, the investigation found that the EPA's recommended conditions in relation to flora, vegetation and habitat values comprise generally of the following types: limits; management measures; monitoring and substantiation of outcomes; offsets; and contingency measure for project-attributable impacts.

We note that the EPA acknowledged, in recommending research-only Marine and Intertidal Offsets, that research is usually only a small part of a balanced offset strategy. We consider that the recommended conditions are generally appropriate, and that the research-only offsets are consistent with the EPA's assessment, relevant policy and guidance.

However, to improve transparency and clarify the intent of the conditions consistent with the assessment, we recommend a number of changes to the conditions.

We recommend that the conditions are amended to clarify that the proposal is to have no impacts on the subtidal habitat (including macroalgae habitat), within the area managed under condition 4-2(d) and outside the authorised Zones of impact under condition 7, this will ensure that the monitoring and management actions specified in condition 6 include consideration of this habitat. These changes also ensures that the contingency fund specified in condition 14-1(4) includes provision for further financial contributions for research should where proposal-attributable impacts are identified.

We also recommend that condition 14 is amended to improve transparency and provide for broader government oversight in the design of the offset projects ensuring they contribute towards conservation outcomes and/or State Government initiatives or policies.

The proponent advised that it has put forward additional marine-based offsets under the *Environment Protection and Biodiversity Conservation Act 1999* and initiated discussions with the Western Australian Marine Science Institute (WAMSI) for the management of some research offset projects. The EPA advised that it considered WAMSI advice in determining the value of research offsets, but also the relevant area that is limited to the West Pilbara coast, the key knowledge gaps and the ability of a program to provide guidance and protection in a timely way.

Noting that the appellants sought for increased transparency and the EPA's advice for changes to enhance the delivery of the offset research programs and more flexible funding arrangements, we recommend additional conditions to this effect.

# 1.4 Recommendation to the Minister

Overall, we consider that the EPA's assessment was adequate and that the recommended conditions are generally appropriate. However, noting that key outcomes sought on appeal were for:

- a review of conditions and management plans for regional intertidal and subtidal habitat, including the habitat for juvenile fishery species, and
- increased transparency for offsets,

it is recommended that the appeals be upheld to the extent that:

- A new outcome be added to condition 6-1 specifying no project attributable loss of subtidal benthic communities and habitat (including subtidal macroalgae habitat) within the area specified in condition 4-2(d) and outside the authorised zones of impact authorised in condition 7.
- Amendments to condition 6-2 to require reference to subtidal macroalgae habitat in the objectives ensuring it is included in the relevant monitoring and management plans and linked to condition 14-1(4)
- condition 14-3 be amended to ensure that DPIRD and DBCA are consulted in the selection of the third party to carry out the work required to meet the outcomes specified in 14-1
- a new requirement in condition 14-4 for the preparation of a Summary Offset Plan, that includes the design for the proposed research and management programs and completion criteria for each project to meet the specified outcomes, and
- the Summary Offset Plan will be made available publicly, within a reasonable time period in a manner agreed by the CEO.
- add a condition to require the proponent to ensure that the financial arrangements recommended in schedule 2 are maintained to achieve the outcomes of Projects A, B and C, to the extent that:
  - funding between projects is redirected in the event of a surplus or deficit on approval of the and
  - additional funds up to a maximum of 10% are contributed to complete project outcomes, on approval of the CEO.

It is also recommended that the following minor amendments are made for consistency and to correct administrative errors:

- amend condition 6-4(2) by deleting '4-1' and inserting '4-2',
- amend condition 7-1 by inserting the words 'and habitat' after 'benthic communities'.
- Schedule 2: Switch the 'Value and Timeframe' column descriptors for Project C(ii) and Project C(iii) to align with conditions 14-1(4) and 14-1(5).
- Amend conditions 14-4(1) and 14-4(2) by deletion of 'objectives' and inserting 'outcomes'.

We otherwise recommend the appeals be dismissed.

# 2 Reasons for recommendation

Appellants raised concern that the scale of the project along some 28 kilometres of the Pilbara coastline have impacts that are significant in a local and regional context.

Appellants raised concern that the EPA report acknowledged that the proposal would have a significant residual impact to terrestrial flora, vegetation and fauna as well as intertidal and marine values. Appellants submitted that the impacts are significant on a local and regional scale and the project should not be allowed to proceed in its current location and scale.

We note that the role of the EPA in assessing a referred proposal is confined to a consideration of environmental factors and to the impact of the proposal on the environment<sup>3</sup> and for the reasons described in Section 1.3 above, this report is limited to our consideration of the adequacy of EPA's report and recommended conditions and not whether or not the proposal should be implemented

It is not in dispute that the EPA identified that the implementation of the proposal will result in 'significant residual impacts' to numerous environmental values.

This includes the clearing of 4 ha of mangrove habitat and further potential indirect impacts to 130 ha mangrove habitat within the Robe River Delta Mangrove Management Area, up to 880 hectares of algal mat (up to 14 per cent of the regional extent) and 296 ha of coastal samphire, clearing of 2,319 hectares of good to excellent condition native vegetation, clearing of up to 9 per cent of the regional extent of foraging habitat for the Northern coastal free-tailed bat and clearing of habitat of 3 conservation significant fauna species and 1,204 ha of habitat for 26 listed migratory bird species.

This section considers the EPA's assessment of impacts to regional habitat values for both terrestrial and marine environmental values and then looks at the key issues raised by MG Kailis Group and the Western Australian Fishing Industry Council (WAFIC) in relation to potential impacts to habitats that may support important life stages of commercial fishing species.

The question as whether the impacts identified can be addressed through conditions is considered at section 2.2.

# 2.1 Did the EPA adequately consider impacts to habitat values?

We conclude, that the EPA has assessed the proposal as referred to it, which included consideration of habitat values within a regional framework and accept the EPA's conclusion that the proposal is consistent with its environmental factor objectives.

We find that the EPA's assessment of impacts to benthic communities and habitat focused on changes to habitat values from the proposal rather than the identification of species as a measure of biological diversity or specific associations with the habitat.

Notwithstanding the above, it is clear that the EPA's assessment considered intertidal and subtidal habitats relevant to the species raised in the appeals. The EPA applied conditions to limit the amount of disturbance (including direct and indirect impacts) to critical intertidal habitat (algal mats) assuming that the consequential effect would be to prevent impacts to adjacent subtidal habitats.

<sup>&</sup>lt;sup>3</sup> Environmental Protection Act 1986, section 44(2)

While we have found that the EPA's assessment did not expressly identify risks to subtidal habitat for species identified in the appeals, outside of the areas impacted by dredging and bitterns disposal, we consider that these risks were implicitly addressed through the EPA's conclusions that the proposal will not interfere with critical benthic habitats and communities.

We therefore consider that it is open to the Minister to accept the assessment implicitly considered risks to subtidal habitat and the species that rely on that habitat. Section 2.2 considers the adequacy of the conditions that the EPA has recommended be applied to the proposal.

We explain our reasoning below.

# The EPA assessed impacts to habitat values form the referred proposal

All 3 appellants included reference to the large scale of the project in their appeal submissions and linked specific concerns about the adequacy of the assessment and the extent to which the conditions can address the impacts in the absence of a government framework. Appellant concerns about habitat values relate to the significance of the environmental values impacted, specifically flora, vegetation and marine habitat conservation values.

The proposal includes terrestrial, marine, and dredging development envelopes and a combined disturbance footprint of 11,283 hectares (ha). The disturbance footprints and development envelopes are comprised of:

- terrestrial 11,221 ha disturbance footprint, within the 15,667 ha terrestrial development envelope,
- marine 7 ha disturbance footprint, within the 53 ha marine development envelope and
- dredge channel 55 ha disturbance footprint, within the 304 ha dredge channel development

The EPA's assessment considered project-related impacts against its objective that 'biological diversity and ecological integrity are maintained' for the key environmental factors (Flora and Vegetation, Benthic Communities and Habitat, Terrestrial Fauna and Marine Fauna). Refer to section 3.2, Key environmental factors, Table 2 for the key environmental factors and the associated objectives for each.

The EPA considered impacts from the project within the context of an existing regional framework and had regard for the following guidance and strategic advice for the region:

- Guidance Statement 1 *Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline*<sup>4</sup> (referred to as Guidance Statement 1 in this report)
- Cumulative environmental impacts of development in the Pilbara region<sup>5</sup>

<u>Guidance Statement 1 - Protection of Tropical Arid Zone Mangroves Along the Pilbara</u> <u>Coastline</u>

Guidance Statement 1 states that its purpose is:

<sup>&</sup>lt;sup>4</sup> EPA (2001) EPA Advice: Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline - In accordance with section 16(j) of the Environmental Protection Act 1986

<sup>&</sup>lt;sup>5</sup> EPA (2014) Cumulative environmental impacts of development in the Pilbara region - Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986

...to provide advice to proponents, and the public generally, about the minimum requirements for environmental management which the EPA would expect to be met when the Authority considers a proposal during the assessment process.<sup>6</sup>

Guidance Statement 1 considers 'tropical arid zone mangroves, habitats and dependent habitats' characterises mangrove formations between Cape Kerauden and the Exmouth Gulf. Importantly, it identifies those areas considered to be 'regionally significant' and of 'very high conservation value' and while it acknowledges that the remaining mangroves along the Pilbara coast are not 'regionally significant', they are considered important and of high conservation value.

Guidance Statement 1 describes four types of management areas, or 'Guidelines', for which it provides advice as to how the EPA might consider proposal that fall within these areas.

Regionally significant mangroves that fall outside designated industrial areas and associated port areas are described as falling within a Guideline 1 management area. These areas are the highest value with an objective that no development should take place that would adversely affect the mangrove habitat, the ecological function of these areas and the maintenance of ecological processes which sustain the mangrove habitats. Guidance Statement 1 states

The EPA will give these mangrove formations the highest degree of protection with respect to geographical distribution, biodiversity, productivity and ecological function.

Proponents should be aware that where developments are proposed in these areas the EPA will adopt a presumption against finding the proposals environmentally acceptable.

Guideline 2 management areas are described as 'Other mangrove areas' that fall outside designated industrial areas and associated port areas. Similar advice applies to these areas as Guideline 1 areas, and it states that 'the EPA still places a high priority on protection' and a general 'presumption against' finding a proposal environmentally acceptable, however, it goes further and describes the performance objectives a proponent would need to demonstrate to satisfy the EPA that there are no unacceptable impacts and the outcomes that would need to be delivered to enable an evaluation of the environmental impacts of a proposed development. These objectives are:

- demonstrate a significant understanding in relation to the scale and nature of potential environmental impacts on the mangrove systems;
- evaluate how the mangrove system (the mangroves, habitats, dependent habitats, ecological function and ecological processes which sustain the mangrove habitats) would be affected by the proposed development and the environmental significance of any such impacts, including cumulative impacts; and
- demonstrate that the proposed development adopts good engineering design and 'best practice' processes for minimising potential environmental impacts and maintains the ecological function and overall biological value and environmental quality of the area.

In this case, the majority of the Mardie Project area is located in within a Guideline 2 management area, however the proposal overlaps to the south with the Robe River Delta and borders to the north with the Fortescue River Delta management areas, both of which fall within a Guideline 1 management area.

The EPA gave particular consideration to the high conservation values of the Robe River Delta Mangrove Management Area (RRDMMA) and recommended that the proposal may only proceed in that area if the proponent submits a revised design which demonstrates that

<sup>&</sup>lt;sup>6 6</sup> EPA (2001) EPA Advice: Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline - In accordance with section 16(j) of the Environmental Protection Act 1986 p1.

development will not have an adverse impact on the maintenance of ecological processes that sustain mangrove habitats (condition 2). This is discussed further in section 2.2 below.

We reviewed the EPAs consideration of the outcomes described in Guidance Statement 1 for Guideline 2 management areas in section 3 of this report. This included consideration of the outcomes against the EPA's assessment and recommended conditions for the project.

In summary, we find that the EPA's consideration of the marine habitat values is consistent with the approach set out in Guideline 1, including consideration of areas designated as 'regionally significant'-'very high conservation value' and 'high conservation value', the EPA has assessed the proposal against the outcomes specified in the guidance and recommended conditions that it is satisfied would prevent inconsistency with the EPA's objectives for the key environmental factors. The adequacy of the conditions recommended by the EPA are discussed further in section 2.2.

Finally and by way of comparison, we note that the EPA's consideration of environmental values in the region, undertaken in 2008<sup>7</sup> for the Yannarie Solar Salt proposal, concluded that the project did not meet its environmental objectives. In this regard we note that the entire Yannarie Solar Salt proposal location is in a Guideline 1 management area recognised as containing 'regionally significant'-'very high conservation value' habitat under Guidance Statement 1. Key considerations also included that the entire proposal location was within a wetland listed as of 'national importance', which the EPA regarded as a 'critical asset' under policy applicable at the time.

### Cumulative environmental impacts of development in the Pilbara region

The EPA's strategic advice on the cumulative impacts in the Pilbara<sup>8</sup> for terrestrial values, states that without intervention, the increasing cumulative impacts of development and land use in the Pilbara region will significantly impact on biodiversity and environmental values.

The advice recommended a whole-of-Government strategic plan for biodiversity conservation in the Pilbara over the long-term, including rehabilitation, knowledge sharing, and the implementation of strategic offset funds. The EPA's strategic advice supported the establishment of the Pilbara Environmental Offsets Fund.

The EPA considered impacts to terrestrial environmental values from the project within the region, noting that only 3.45% of the Roebourne IBRA subregion in which the project is located is currently reserved for conservation.

### EPA report 1704 (p 109) states:

In assessing the proposal, the EPA has afforded the highest degree of protection to the geographical areas of high conservation values, with particular regard to the RRDMMA, Mardie Pool, and areas of intertidal benthic communities and habitat (BCH).

The EPA's assessment of terrestrial and marine habitat values further included consideration of proponent surveys and investigations, the identification of potential impacts from the proposal on environmental values, avoidance and minimisation measures and consideration of impacts after application of these measures.

<sup>&</sup>lt;sup>7</sup> EPA Report 1295, Yannarie Solar Salt East Coast of Exmouth Gulf – Report and recommendations of the Environmental Protection Authority; July 2008

<sup>&</sup>lt;sup>8</sup> EPA (2014) Cumulative environmental impacts of development in the Pilbara region - Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986

### Conclusions from the EPA's assessment

In arriving at its conclusions about the potential impacts from the proposal the EPA had regard for the following:

- the high terrestrial habitat values of the project location are mostly in the Roebourne subregion of the Pilbara,
- coastal regional habitat values were understood to have fallen in the following categories 'regionally significant mangroves very high conservation value' and 'high conservation value' on the Pilbara coast,
- the pristine marine environment and a 'maximum' level of ecological protection for the Mardie coastline,
- the proponent avoided high value coastal benthic habitats, excised the Mardie pool and a buffer area and minimised impacts to the regionally significant RRDMMA.
- the extent of direct clearing and disturbance of habitat and project-related indirect impacts to the remaining habitat,
- what it might mean for significant marine and terrestrial species that use the habitat for breeding, as nurseries and for foraging,
- the availability of similar habitat types in the area and the quality and conservation status of these habitat types, and
- existing knowledge about the relevant habitats in the Pilbara and along the coastline.

In considering impacts to terrestrial and marine habitat values against the objective, 'to maintain *biological diversity and ecological integrity*' the EPA identified that the following significant residual impacts would remain:

- benthic communities and habitat values including direct disturbance and indirect impacts to intertidal coastal samphire (296 ha), algal mat (880 ha) and mangroves inside (4 ha direct, 130 ha indirect) and outside (13 ha direct, 13 ha indirect) the Robe River Delta Mangrove Management Area.
- terrestrial environmental values the clearing of good to excellent condition vegetation (2,319 ha), Horseflat PEC (145 ha, indirect impacts up to 20 ha) and clearing of foraging habitat for the Pilbara leaf-nosed bat (2,562 ha), northern coastal free-tailed bat (1,132 ha), northern quoll (64.5 ha), migratory bird habitat for 26 listed species (1,204 ha) and habitat of the Pilbara olive python (6 ha).

The EPA advised that it considered whether its recommended conditions reduced the residual impacts of the proposal consistent with the Environmental Factor Guidelines and proposed offsets only where a significant residual impact was identified. The EPA concluded that the proposal could be implemented consistently with Environmental Factor Guideline objectives, subject to strict outcomes-based conditions, management plan requirements and offsets. Refer to section 2.2 for consideration of the recommended conditions.

In summary, we found that the EPA assessed the proposal within the context of available regional guidance and strategic advice.

# The EPA considered impacts to the habitats of marine species

MG Kailis Group and the Western Australian Fishing Industry Council (WAFIC) submitted that the EPA's assessment of impacts to marine species and productivity was inadequate as it was limited to fishing activities within or immediately adjacent to the proposal area. The

appellants submitted that marine species may only be resident in the marine domain in or adjacent to a proposal for part of their life span and direct effects from loss of ecological function may have consequential long-lasting impacts away from the habitats affected.

In essence MG Kailis Group and WAFIC submitted that the intertidal and subtidal marine habitats in the project area, known to be critical habitat for commercial and significant marine juvenile species, were inadequately considered by the EPA.

Specifically, the appellants assert that the critical association between bluespotted emperor, commercial prawn species and the green sawfish and recruitment sites, nursery areas, or important feeding areas were not adequately assessed. Appellants submitted that key associations between the above species and specific habitat cannot be assessed on the basis of widespread presence of similar habitat across a region.

The EPA considered potential impacts to fishing activities under its environment factor 'Social Surroundings' and impacts to subtidal habitat principally under 'Benthic Communities and Habitat'.

### Social surroundings

The potential impacts on commercial fishing and aquaculture operation resulting from the proposal under the EPA's key environmental factor, Social Surroundings<sup>9</sup>, identified commercial fisheries within the Mardie region and 4 commercial fisheries in the Mardie area, including the Onslow Prawn Managed Fishery (OPMF). The EPA's environmental objective for social surroundings is *to protect social surroundings from significant harm*.

The EPA considered that there is unlikely to be a significant impact from the proposal upon the current commercial fisheries industry operations near the marine and dredge channel development envelope area. The EPA concluded that the project is likely to be consistent with the EPA's objective for this factor.

Appellants submitted that the consideration of fishing effort within or immediately adjacent to the proposal area is inadequate, as the impacts to species of concern have not been assessed in sufficient detail. The EPA's advised that it considered impacts to the habitat of marine species under its environment factor 'Benthic Communities and Habitat' (BCH).

### Benthic Communities and Habitat (subtidal and intertidal)

The EPA's stated environmental objective for its environmental factors for Benthic Communities and Habitat (subtidal and intertidal) is "To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained".

The *Environmental Factor Guideline – Benthic Communities and Habitats* recognises that benthic communities and habitats are linked to a number of other environmental factors and supports a range of environmental values.

Relevantly, the guideline describes examples of environmental values including provision of habitat and refuge, increase of food supply, important recruitment and nursery areas for marine fauna species, and primary producer habitats that form the foundation of many marine food webs, which, in turn, support productive and economically important fisheries.

The guideline includes important values in relation to benthic communities and habitat, but states that the assessment of impacts is mainly concerned with changes that are likely to significantly impact on biological diversity and ecological integrity of benthic communities and habitat.

<sup>&</sup>lt;sup>9</sup> Report 1704, section 2.8

The EPA's considerations included the proponent's design of the project footprint in the development and assessment of its proposal to:

- avoid intertidal benthic habitat and
- reduce the development envelope to minimise impacts to the regionally significant mangroves in the Robe River Delta Mangrove Management Area.

The EPA's considerations in the assessment include direct disturbance and changes in marine environmental quality from the project, which are set out under the key environmental factor for Marine environmental quality (Report 1704, section 2.2). These impacts and changes mainly from dredging and bitterns disposal, and its effects on subtidal habitat are considered under <u>Benthic Communities and Habitat</u> (Report 1704, section 2.5). The impacts and changes to subtidal habitat under the previous 2 section are included in the assessment for Marine Fauna (Report 1704, section 2.7).

## Impacts to BCH from dredging and bitterns disposal

The EPA considered that the main impacts to subtidal habitat were from dredging for construction of the trestle jetty export facility and bitterns disposal at the end of the trestle jetty approximately 5 kilometres offshore (Report 1704, section 2.5). The study area for the assessment of these impacts was determined in consultation with the DWER (Local Assessment Unit 7<sup>10</sup>).

In summary, the EPA's considerations included the following:

- mapping of subtidal BCH in the study area identified bioturbated/bare sand, filter feeder/macroalgae/seagrass and coral/macroalgae
- direct disturbance of 55ha of BCH habitat from dredging
- modelling studies of sedimentation and increased turbidity from dredge plumes
- modelling studies of bitterns disposal
- loss of subtidal BCH from irrecoverable impacts to 128 ha and recoverable indirect impacts to 797 ha within the study area of 7,574 ha mitigation measures include disposal of dredging material on-shore and limits for bitterns discharge and salinity concentrations,

The EPA concluded that reasonable conditions could be imposed to prevent inconsistency with the EPA's factor objective for BCH, included considerations that:

- the benthic communities and habitat in the area predicted to be impacted are of low quality, due to the low abundance, diversity and density of coral.
- high quality coral/macroalgae BCH are present at offshore islands, which are listed as Class C Nature Reserves, outside the study area and.
- impacts to marine environmental quality from bitterns disposal are likely to meet the EPA's objective for Marine Environmental Quality, subject to conditions.

The EPA assessed the impacts from bitterns disposal and dredging against its Environmental Quality Management Framework (EQMF), which is used to assess impacts in the WA marine environment. The designated levels of ecological protection which are spatially defined, includes four levels of ecological protection - maximum, high, moderate and

<sup>&</sup>lt;sup>10</sup> Defined in consultation with DWER and consistent with EPA *Technical Guidance – Protection of benthic communities and habitats* 

low. The end of the trestle jetty and the diffuser are located in waters currently designated as 'high' level of protection.

The EPA considered that the impacts from dredging and bitterns disposal are limited to a relatively small area, were supported by information prepared in accordance with published guidance<sup>11</sup> and manageable, through conditions, so that the biological diversity and ecological integrity for subtidal BCH are maintained. Refer to section 2.2 for the consideration of conditions.

The investigation sought further advice on the predicted impacts from modelling. The DWER Marine Ecosystems Branch advised that the proposed backhoe dredging which operates from a barge with a hopper alongside, is relatively simple and more localised than dredging with large dredging ships. They reviewed the dredge plume modelling report and were satisfied with:

- · geotechnical investigations undertaken to understand the composition of seabed material which will be dredged,
- assumptions made in the model,
- the type of modelling undertaken, and
- the expertise and experience of the modelling consultant.

The DWER Marine Ecosystem Branch further advised that the impacts from bitterns discharge is predicted to be highly localised and contained within the dredge channel.

### Impacts to BCH from other project activities

The EPA identified the main impacts to intertidal habitat would arise from the placement of proposal infrastructure which could result in changes to tidal inundation, overland freshwater flow and the interaction of saline seepage with groundwater. The EPA's considerations for impacts to intertidal habitat included the following:

- detailed mapping identified habitat types in the study area including algal mat, • foreshore mudflat/tidal creek, mangroves, samphire, mudflats and sandy beach,
- the values of algal mat were assessed as 'high' in response to conflicting advice on the ecological values of this habitat type,
- impacts to intertidal habitat from changes to groundwater and surface water, • including:12
  - two drainage corridors in the proposal design, and use of surface water spreading structures in the intertidal zone to minimise changes to surface water regimes
  - modelling of changes to tidal inundation and surface water flood events<sup>13</sup>
  - modelling of brine seepage and potential impacts to groundwater quality and 0 regimes 14,
  - modelling and analysis of the impacts of the proposal under sea-level rise conditions

<sup>&</sup>lt;sup>11</sup> Department of Environment, 2006, Department of Environment Marine Series MR1 Pilbara Coastal Water Quality Consultation Outcomes — Environmental Values And Environmental Quality Objectives. <sup>12</sup> Report 1704 section 2, Key environmental factor – Inland Waters

<sup>&</sup>lt;sup>13</sup> Report 1704, section 2.1 <sup>14</sup> Report 1704, section 2.1

 direct disturbance and indirect impacts for proposal infrastructure to intertidal coastal samphire (296 ha), algal mat (880 ha) and mangroves inside (4 ha direct, 130 ha indirect) and outside (13 ha direct, 13 ha indirect) the Robe River Delta Mangrove Management Area,

The EPA identified that values of intertidal BCH likely to be impacted by the proposal include, primary productivity, ecosystem maintenance, nutrient cycling and habitat values (migratory birds (samphire), breeding and nursery habitat for significant marine species (mangroves), and intermittent foraging habitat for marine species (algal mat).

Noting the EPA's object for this factor, '*to protect benthic communities and habitats so that biological diversity and ecological integrity are maintained*', its assessment identified that the impacts to the diversity of intertidal BCH are unlikely to be material<sup>15</sup>. However, the EPA determined that direct impacts to algal mat are a significant residual impact due to the loss of ecosystem maintenance functions associated with the loss of 880 ha of algal mat, representing almost 14% of the regional occurrence.

The EPA concluded that nutrient cycling and other ecosystem maintenance functions of algal mat would be supported by the remaining local (75 per cent) and regional (up to 86 per cent) extent of algal mat and mangrove communities (given the current extent of algal mat in the region). The EPA determined that the significant residual impact associated with the disturbance of algal mat could be managed to be consistent with the EPA's objective for BCH, if counterbalanced through an environmental offset.

## Marine Fauna

The EPA considered the potential impacts to the Green sawfish from clearing, degradation or modification of marine fauna (Section 2.7). Acoustic studies have indicated that sawfish do not travel more than 700 m upstream from the mouth of the river. The proposal includes minor disturbance more than 700 m upstream to 2 of the 15 tidal creeks within the study area. The EPA assessed that the proposal is unlikely to have a material impact on the habitat associated with the green sawfish and is likely to be consistent with the EPA's objective to protect marine fauna. The EPA advised in response to appeals, that it primarily assessed impacts to critical habitat for marine fauna through its assessment of benthic communities and habitat. The EPA advised that the critical habitats for the species identified in the appeals included:

- Green sawfish: shallow coastal marine and estuarine waters of northern Australia area are associated with mangrove (tidal) creek habitat (EPA Report 1704, Section 2.4)
- Prawns: adult prawns are harvested in deeper water offshore from nursery areas generally over soft sandy mud habitats. Nursey areas are shallow coastal or estuarine environment- seagrasses and mangroves (EPA Report 1704, Section 2.4)

The EPA stated that coastal algae beds, the habitat of this species, was mentioned in a report from Fishwell Consulting (2020)<sup>25</sup>, submitted by the proponent. The EPA advised, in response to the appeals, that it did not specifically consider the risk to the sustainability of the bluespotted emperor fishery from the proposal, but that the EPA's objectives for benthic communities and habitat relates directly to marine fauna and is likely to provide surrogate protection for fisheries.

<sup>&</sup>lt;sup>15</sup> Report 1704, section 2.4

The EPA advised that it considered direct and indirect impacts to fishing activity, as well as impacts from the interconnections between benthic habitat and communities, marine fauna, water quality and social surrounds in its holistic assessment.

During the assessment process the EPA had access to a range of information relating to the habitat associations of the species identified in the appeals:

- macroalgal habitats bluespotted emperor (exclusive association)<sup>16</sup>
- seagrass and macroalgal habitats brown tiger prawns and blue endeavour prawns<sup>1,2</sup>
- sandy/muddy habitats western king prawns<sup>1,17</sup>
- mangrove creeks, river mouths and estuaries green sawfish<sup>18</sup>, <sup>19</sup>.

MG Kailis Group submitted in response to the EPA's advice the following information from communication with the Department of Primary Industries and Regional Development (DPIRD):

We currently have a well-established biannual monitoring program for juvenile blue spotted emperor (*Lethrinus punctulatus*) in the Dampier Archipelago. We have also recently sampled the areas in and around the proposed Mardie Salt project and have identified that juvenile blue spotted emperor and their associated exclusive macroalgal habitat is present and abundant, (communication with DPIRD, 14/9/21).

The appeals investigation confirmed the above with representatives from DPIRD whom further advised that:

- juvenile bluespotted emperor (< 2 years of age) are exclusively associated with macroalgal habitats,
- the habitat partitioning is very specific and shallow subtidal macroalgal habitat is therefore critical for juvenile bluespotted emperor, and
- this habitat is already impacted from development in Karratha<sup>20</sup>.

The proponent submitted an updated commercial fishing operations report<sup>21</sup> including a quantitative review that show the highest fishing effort for the Onslow Prawn Managed Fishery opposite the Mardie Project area and that the target catch of the fishery is currently under caught. The report confirmed the high value of subtidal habitat for the Onslow Prawn Managed Fishery. The original and updated report includes the habitat association between bluespotted emperor and macroalgae and states that bluespotted emperor has limited (geographical) distribution, but in the absence of information did not comment on potential impacts to fisheries.

We note that the EPA's consideration that 'coral is generally of low abundance, diversity and density' and that the BCH is of 'low quality' (sections 2.5 and 4) apply to the subtidal area that would be impacted by dredging. The nearshore marine waters on the Mardie coastline outside this area is assigned a 'maximum' level of ecological protection for marine water quality and within the area designated as of 'high conservation value' (Guidance Statement

<sup>&</sup>lt;sup>16</sup> DPIRD advice, 23 September 2021

<sup>&</sup>lt;sup>17</sup> Fish well Consulting, Potential impacts on commercial fishing and aquaculture operations resulting from the Mardie Project development; 1 August 2021

<sup>&</sup>lt;sup>18</sup> BCI Minerals Limited; Environmental Review Document Mardie Project; page 231

<sup>&</sup>lt;sup>19</sup> Mardie Dredge Management Plan (R190043Rev2B, 24 June 2021)

<sup>&</sup>lt;sup>20</sup> Meeting of 22 September 2021 and written advice (23 September 2021)

<sup>&</sup>lt;sup>21</sup> Fishwell Consulting (2021) Potential impacts on commercial fishing and aquaculture operations resulting from the Mardie development

1). The available information indicates that the 'high conservation value' specifically for juvenile bluespotted emperor, is associated with the presence of subtidal macroalgal habitat.

The EPA's approach to assess impacts on the habitat of the juvenile marine species of concern, implies that protection of this habitat, would also protect the species from project-related impacts.

### **Conclusion**

We consider the EPA's approach to assessing the impacts on critical BCH consistent with the stated objective for BCH Environmental Factor guide, in that it focussed on the maintenance of biological diversity and ecological integrity, which supports a range of environmental values, including the habitat of juvenile marine species.

However, available information indicates that juveniles bluespotted emperor are exclusively associated with subtidal macroalgae habitat and that the presence of juveniles and their macroalgae habitat have been confirmed within the subtidal Mardie Project area.

The concept of a holistic assessment is defined in the EPA's Procedures Manual<sup>22</sup> as 'connections and interactions between impacts, and the overall impact of the proposal on the environment as a whole'. The holistic assessment for the project (section 3) states that the EPA considered:

- the cumulative impacts of the proposal on each of the sensitive receptors identified.
- 'a particular risk that intertidal BCH could be subject to cumulative impacts from direct disturbance, changes to surface water and groundwater associated with the proposal.'
- the monitoring of the intertidal BCH (remaining after disturbance) and adaptive management actions would ensure that 'the processes of primary productivity, ecosystem maintenance, and nutrient cycling, as well as habitat values' would be maintained.
- marine fauna habitat would be protected outside the areas bitterns disposal and dredging.

Having regard for:

- the adjoining locations of intertidal and subtidal habitats,
- the different and successive impacts to components of the intertidal habitat,
- the potential causal and cumulative effects to subtidal benthic communities and habitat over the large area of coastline,
- the level of uncertainty identified for impacts to algal mats,
- the maximum' level of ecological protection for marine water quality and designated 'high conservation value' of the subtidal habitat outside the areas of dredging and bittern disposal, and
- the confirmed high value of the habitat, including macroalgae, to juvenile marine species

<sup>&</sup>lt;sup>22</sup> EPA, (2020) Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual - Requirements under the Environmental Protection Act 1986 Procedures Manual, section 1.5.

we consider that the holistic assessment has not fully and explicitly accounted for the risks of indirect impacts to subtidal habitat. We note that the EPA has not published guidance in relation to the assessment of holistic impacts.

Notwithstanding the above, it is clear that the EPA's assessment considered intertidal and subtidal habitats relevant to the species raised in the appeals. The EPA applied conditions to limit the amount of disturbance (including direct and indirect impacts) to critical intertidal habitat (algal mats) assuming that the consequential effect would be to prevent impacts to adjacent subtidal habitats.

While we have found that the EPA's assessment did not expressly identify risks to the subtidal habitat for species identified in the appeals, outside of the areas impacted by dredging and bitterns disposal, we consider that these risks were implicitly addressed through the EPA's conclusions that the proposal will not interfere with critical benthic habitats and communities.

We therefore consider that it is open to the Minister to accept the assessment implicitly considered risks to subtidal habitat and the species that rely on that habitat. If the Minister agrees with that approach, the following section considers the adequacy of the conditions that the EPA has recommended be applied to the proposal.

Alternatively, the Minister could consider that in the absence of express consideration of the impacts to the marine species raised in the appeals, the proposal should be remitted to the EPA for further assessment of potential risks.]

# 2.2 Are the recommended conditions adequate, including in relation to offsets?

We conclude that the recommended conditions are generally appropriate and consistent with the EPA's assessment, relevant policy and guidance. However, to improve transparency and clarify the intent of the conditions we recommend a number of changes.

We recommend that the conditions are amended to clarify that the proposal is to have no impacts on the subtidal habitat (including macroalgae habitat), within the area specified in condition 4-2(d) and outside the authorised zones of impact authorised in condition 7, this will ensure that the monitoring and management actions specified in condition 6 include consideration of this habitat. These changes also ensures that the contingency fund specified in condition 14-1(4) includes provision for further financial contributions for research should it be required.

We also recommend that condition 14 is amended to improve transparency and provide for broader government involvement in the design of the offset projects ensuring they contributes towards conservation outcomes and/or State Government initiatives or policies.

Specifically, we recommend that:

- A new outcome be added to condition 6-1 specifying no project attributable loss of subtidal benthic communities and habitat (including subtidal macroalgae habitat) within the area specified in condition 4-2(d) and outside the authorised zones of impact authorised in condition 7.
- Amendments to condition 6-2 to require reference to subtidal macroalgae habitat in the objectives ensuring it is included in the relevant monitoring and management plans and linked to condition 14-1(4)

- condition 14-3 be amended to ensure that DPIRD and DBCA are consulted in the selection of the third party to carry out the work required to meet the outcomes specified in 14-1
- a new requirement in condition 14-4 for the preparation of a Summary Offset Plan, that includes the design for the proposed research and management programs and completion criteria for each project to meet the specified outcomes, and
- the Summary Offset Plan will be made available publicly, within a reasonable time period in a manner agreed by the CEO.
- add a condition to require the proponent to ensure that the financial arrangements recommended in schedule 2 are maintained to achieve the outcomes of Projects A, B and C, to the extent that:
  - funding between projects is redirected in the event of a surplus or deficit on approval of the and
  - additional funds up to a maximum of 10% are contributed to complete project outcomes, on approval of the CEO.

Our reasons for the above are set out below, firstly considering the adequacy of conditions to limit and manage impacts, followed by the 'research-only' offsets applied for marine values.

# The EPA recommended conditions to ensure consistency with its environmental objectives

Protect Ningaloo submitted that:

"...the conditions imposed by the EPA in recommending that the Mardie proposal be implemented are not consistent with the objectives of the EPA under the *Environmental Protection Act 1986* to prevent environmental harm. Our view is that the conditions, in particular the environmental offsets, are not sufficient to prevent significant impacts to the environment, including to important benthic communities and habitat (BCH), and flora and vegetation."

The EPA advised that it considered whether its recommended conditions reduced the residual impacts of the proposal consistent with the Environmental Factor Guidelines and proposed offsets only where a significant residual impact was identified. The EPA concluded that the proposal could be implemented consistent with its Environmental Factor Guideline objectives, subject to strict outcomes-based conditions, management plan requirements and offsets.

The EPA considered the geographical areas that include high conservation values, with particular regard to the RRDMMA and recommended condition 2 to limit impacts to ensure that impacts do not undermine the ecosystem or environmental processes. Condition 2 requires the proponent to submit a revised design for proposal-related disturbance. The revised design should include an evaluation of the direct and indirect impacts associated with the revised design, as well as a peer review. The proponent is also required to provide arial imagery after construction to demonstrate that the loss of mangroves within the RRDMMA are not greater than 4 ha.

Our investigation found that the EPA's recommended conditions in relation to the assessed regional and habitat values (refer to section 3.2, Key environmental factors and Table 2) comprise the following types:

- limits: clearing, loss and disturbance of vegetation, flora and intertidal and subtidal habitat, including the habitat types for marine species identified in the appeals,
- management: outcomes and objectives to manage direct and indirect impacts to the remaining habitat, as well as further surveys and reporting,
- substantiation: implement management plans including monitoring, early warning trigger criteria, threshold criteria and management and/or contingency actions,
- offsets for clearing and disturbance: measures to counterbalance (or offset) the identified significant residual and unavoidable) impacts, and
- Risk Management Measures for project-attributable impacts (linked to the Benthic Communities and Habitat Monitoring and Management Plan).

We consider that the recommended conditions are reasonable to limit, manage and substantiate that the impacts predicted in the assessment would not be greater than assessed. Our consideration of the impacts identified in the appeals and the extent to which conditions manage those impacts are discussed below and provided in section 3.2, Tables 1 and 2.

# Impacts to marine fauna habitat could be conditioned to ensure consistency with the EPA's objectives

Appellants submitted that the recommended conditions for management plans, including the Benthic Communities and Habitat Monitoring and Management Plan, are inadequate due to the incomplete assessment of the marine species identified under section 2.1. Noting the finding in section 2.1 that the holistic assessment has not explicitly accounted for the risks of potential impacts to subtidal habitat, we agree with the appellants to the extent that the potential indirect impacts to the habitat of commercial marine species should be monitored and managed under the Benthic Communities and Habitat Monitoring and Management Plan.

The EPA has recommended ongoing control of impacts from dredging and bitterns disposal, which the EPA identified as the main impacts to subtidal habitat of marine fauna. A number of conditions have been recommended, including condition 7 which includes the implementation of the proponent's Dredge Management Plan (R190043Rev2B, 24 June 2021) and condition 4 which requires the implementation of a Marine Environmental Quality Monitoring and Management Plan.

The EPA advised that the consideration of direct fishing opportunity issues, combined with the assessment of benthic communities and habitat which directly considered ecological functioning, satisfied the EPA the proposal could be implemented consistent with the EPA's objectives, subject to implementation of conditions and offsets.

The EPA advised that the proposal could be implemented to protect the critical habitat to marine fauna through the recommended conditions 2, 3, 4, 6, and 7 to meet the EPA factor objectives for Marine Environmental Quality, Benthic Communities and Habitat and Marine Fauna. The EPA advised that the protection of fisheries (included under factor Social Surroundings) relates to the protection of values for marine fauna.

However, having confirmed the high environmental values of subtidal habitat (section 2.1), the investigation turned to the adequacy of conditions to protect these values. We agree that the main impacts to subtidal habitat are controlled through condition 7 for dredging operations (including maintenance dredging during operations) and condition 4 for bitterns discharge.

These conditions provide spatial limits for dredge plume and bitterns discharge impacts and require the implementation of management plans. Implementation of management plans include monitoring, early warning criteria that triggers management conditions and threshold criteria that triggers contingency actions. The conditions both specify that the exceedance of a threshold criteria represents a non-compliance. When monitoring indicates an exceedance of either early warning or threshold criteria, the proponent is required to report to the CEO, implement management actions, investigate the cause and implement further controls.

Noting the advice provided by the DWER Marine Ecosystems Branch, (section 2.1) we accept that these recommended conditions would be sufficient and translate the findings of the assessment to requirements for the implementation of the proposal.

However, while the major impacts to subtidal habitat from dredging and bitterns disposal are appropriately limited and required to be substantiated and managed, given the high value confirmed for this habitat, including macroalgae, we consider that an additional outcomes should be included to ensure require no project attributable impacts to subtidal habitats (including macro algal habitats, to ensure that the consequential monitoring and management required include consideration of potential impacts to this habitat under the Benthic Communities and Habitat Monitoring and Management Plan.

Given that impacts to the ecological maintenance of subtidal BCH in this location may be linked to the significant residual impacts identified for adjacent intertidal benthic communities and habitat, financial contributions as part of the EPA's recommended condition 14-1 will also apply in the event of indirect impacts to subtidal BCH, including macroalgae.

In addition, a minor amendment is recommended for correction of descriptors for Projects in Schedule 2 - Switch the 'Value and Timeframe' column descriptors for Project C(ii) and Project C(iii) to align with conditions 14-1(4) and 14-1(5).

## Timing and duration of proposal activities should be restricted

WAFIC stated that the limited consideration of impacts to subtidal habitat for juvenile marine species resulted in the replacement of avoidance and mitigation measures with offsets. Appellants suggested conditions to regulate the timing and duration of proposal activities, to avoid where possible and report on impacts.

The EPA advised that the proponent's mitigation and management measures to minimise the risk of loss of ecological function in benthic communities and habitat also minimises potential impacts to the marine environment and marine fauna. The measures include avoidance of significant mangrove habitat, minimisation of the dispersal of bitterns in the marine environment, management of changes to surface water drainage and avoidance of impacts to groundwater from saline seepage below evaporation ponds.

EPA Report 1704 (section 2.2.2 - Minimisation measures) includes the consideration of key environmental windows for marine fauna (breeding seasons) in the planning of construction activities. We note from the proponent's conditioned Dredge Management Plan (R190043Rev2B, 24 June 2021) that:

- Dredging is planned over a period of 10 to 18 months (weather-dependent), carried out for 12 hours per day, 7 days per week.
- Dredging will not take place from September to December to avoid the ecological windows for green sawfish pupping and the southern migration of Humpback Whales (section 3.5.3).

The proponent's Dredge Management Plan restricts dredging to 8 months of the year, avoiding the months that adult sawfish and Humpback Whales might move through the area

and allows dredging from January to August. Noting that dredging will avoid the pupping season of one of the species of concern in the appellant's submission, the investigation considered the key ecological windows for bluespotted emperor and the relevant commercial prawn species.

The proponent's supporting information provides the key ecological windows for different commercial fishing species, which demonstrates different key life stages occurring throughout the year. Our analysis of the key ecological windows for the commercial species identified in the appeals (section 3.3) demonstrates that dredging activities specified in the Dredge Management Plan will avoid the key ecological windows for brown tiger prawns and parts of the ecological windows for western king prawns, blue endeavour prawns and the bluespotted emperor.

Applying this analysis, the proponent advised that further limitation of dredging operations to less than 8 months per year in combination with potential weather events that constrain dredging operations, would not be practical.

The changes to conditions recommended to manage and monitor impacts to subtidal habitat apply at any time of the year. Provided these changes to conditions are included as suggested, we do not support the appellant's requested restriction of project activities to avoid key ecological windows for commercial fishery species and species monitoring.

## Adequacy of 'research-only' offset

Appellants raised concern that the use of a 'research only' offset recommended by the EPA was inadequate to counterbalance the significant residual impacts to intertidal and marine values.

MG Kailis Group submitted that relevant offset guidance documents require:

.... more than a general improvement in information for decision makers. The [EPA] conflates what is an output with an outcome. The EPA does acknowledge the need to ensure that offsets lead to an 'outcome' and ... suggest some possibilities. More action is, however, required than is contemplated...

### Protect Ningaloo submitted:

...we do not believe it is possible for the proponent to ensure the outcome as it is too high level and broad, is not measurable and is not within the proponent's ability to deliver as it is not responsible for the protection and management of the values in question, nor in how the research information is used.

MG Kailis Group further submitted that circular reasoning has been applied:

The EPA has recommended approval notwithstanding significant loss of habitats such as those covered by Guidance Statement No 1 (see for example Report, p 44-45). The reasoning is that offsets will be effective to address these values, yet the EPA also states that the (Offset) Policy and Guidelines can be applied flexibly. The reasoning is circular, as a departure from Guideline Statement Number 1 is justified by reference to the application of the Offset Guidelines, but the Guidelines themselves are capable of a flexible (and hence uncertain application).

### The EPA's assessment

Relevant to the appeals, Report 1704 identified that the implementation of the proposal would have a significant residual impact to the following values:

- disturbance of up to 296 ha coastal samphire
- disturbance of up to 880 ha algal mat
- disturbance of up to 13 ha mangrove habitat outside the RRDMMA.

To offset these impacts, the proponent put forward an offset strategy, which the EPA described as including:

... research programs that would improve efforts to protect intertidal BCH and its associated values in the region. The proponent was not able to identify any rehabilitation or onground programs that would offset the values to be impacted by the proposal.

The EPA recommended that three research programs be applied:

- Project A mapping of agal mats to 'provide an understanding of the regional extent and distribution of algal mat and complement existing mangrove mapping'.
- Project B 'provide guidance to the EPA, future proponents, and decision-making authorities on the potential impacts of sea-level rise on intertidal BCH on the West Pilbara Coast, and the significance of salt projects in preventing the adaptation of intertidal BCH to sea-level rise.'
- Project C(i) 'provide guidance to the EPA, future proponents and decision-making authorities in regard to the ecological roles and values of algal mat.'

These projects are reflected in recommended condition 14, which requires the proponent to make financial contributions toward 'the strategic protection and management of the ecological values of these habitats on the west Pilbara coast, which include migratory bird habitat and ecological maintenance of marine fauna habitat.'

In coming to these recommendations, Report 1704 sets out the EPA's consideration of the offsets against the WAEOP and WAEOG. The EPA acknowledged that while research is usually included as only a small part of a balanced offset strategy, research is likely to comprise the entirety of the offset proposed for this proposal. The EPA further stated:

For this proposal, the EPA is of the view that research offsets for impacts to algal mat, coastal samphire and mangroves are appropriate due to the high degree of uncertainty regarding impacts to these values, and the lack of available options for direct offsets to be undertaken.

The EPA is of the view that the research projects will provide new science to develop better mitigation measures for impacts to mangroves and algal mat from future salt farms and provide valuable scientific knowledge to inform regional and strategic protection of these values. The research must be designed to result in positive conservation outcomes, address priority knowledge gaps and provide critical information to improve environmental assessment of future projects. Outcomes of research projects must be publicly available and provided to the relevant agencies.

### Statutory context

After Report 1704 was published, changes to Part IV of the EP Act include a new provision setting out the types of conditions that can be applied to a proposal through implementation conditions (section 45A(1)). This list of the types of conditions that can be applied to a proposal relevantly includes a proponent being required to:

(b) at the proponent's expense, take environmental protection, abatement or restoration measures on the subject land, or on other land, in order to directly or indirectly offset the impacts of the implementation of the proposal on the environment;

(c) contribute moneys to be used for the purpose of taking environmental protection, abatement or restoration measures on the subject land or other land...

Nothing in section 45A(1) prevents other types of conditions being agree or decided under section 45 (section 45(9)).

### Policy context

The *WA Environmental Offsets Policy* (2011) provides an overarching framework for environmental offsets. The introduction to the Policy provides that 'Offsets will be ... designed to achieve long-term outcomes, building upon existing conservation programs and initiatives'. The Policy distinguishes between two categories of offsets:

- 'Direct offsets: are actions designed to provide for on-ground improvement, rehabilitation and conservation of habitat.'
- 'Indirect offsets': are actions aimed at improving scientific or community understanding and awareness of environmental values that are affected by a development or activity. These actions are designed to result in positive conservation outcomes and may include research to improve the management and protection of existing conservation estate or contributions to State Government initiatives, policies or strategic funds.

The WA Environmental Offset Guidelines identify three types of environmental offsets – land acquisition, on ground management and research. The Guidelines provide options for the application of the three types of offsets including the impact predicted, available options for offsets in the vicinity of the project and the state of knowledge of the environmental value being impacted.

Specifically in relation to research offsets, the Guidelines state:

Research project offsets can only be applied under Part IV of the EP Act and must be reasonably related to the impact. Research projects can add significant value to the outcomes of on-ground management and the understanding of the environmental value being impacted. The research must be designed to result in positive conservation outcomes, and may be targeted at improving the management and protection of existing conservation estate, adding to existing State Government initiatives, policies or strategies ...

Research projects are generally only appropriate as offsets where there is a high degree of uncertainty regarding impacts of a project and new science is required to develop better mitigation measures or predictive tools to avoid and minimise the particular type of impact.

In addition to the Policy and Guidelines, the EPA Procedures Manual provides that in preparing its draft assessment report, the EPA will consider and include content, including 'whether any offsets (if proposed) are likely to counterbalance any significant residual environmental impacts.'

Where an offset condition is recommended by the EPA, the Procedures Manual 2020 provides that an offset condition will require one or more of the follow options:

- direct action
- funding by the proponent directly to a third party to undertake agreed offset action
- contributions by the proponent to a fund for the purpose of undertaking agreed offset actions. (page 39)

In response to the appeals, the EPA advised that the Offsets Guidelines include the ability to apply research projects. In this case, it considered that (consistent with the Procedures Manual applying at the time of the assessment) funding by the proponent directly to a third party to undertake agreed offset action was identified as the most appropriate for impacts to BCH.

The EPA further advised that:

There is practical difficulty in applying 'traditional' ... offsets (land acquisition and on-ground management) in the Pilbara which was acknowledged by the proponent and the EPA:" (EPA Report No. 1704 Pg. 112)

From the above, the relevant Policy, Guidelines and Manual contemplate that research offsets can be applied to offset the significant residual impacts from the implementation of a proposal.

### Is the offset appropriate?

Noting that the Guideline and EIA Procedures Manual provide for the application of research offsets, the appeals investigation focused on whether the recommended research projects will be 'designed to result in positive conservation outcomes'.

The EPA recommended research offset conditions that require the proponent to 'contribute to the strategic protection and management of ecological values of habitats on the **west Pilbara coast**, which include migratory bird habitat and ecological maintenance of marine fauna habitat' as an outcome. These offset measures shall contribute to a relevant scientific initiative (conditions 14-1(1) to (3)).

In short, these conditions require the proponent to:

- make specified financial contributions to fund Projects A, B and C (as described Schedule 2 to the recommended conditions),
- select a third party to carry out the work and achieve the outcomes,
- provide documentation of an agreement between the proponent and the third party to the CEO, including objectives, timing, milestones and the methodology of the proposed research and management programs, and
- identify how outcomes of the proposed programs will be made available publicly.

Condition 14-5 requires the proponent to report on the implementation of the Projects against completion criteria and details of payments in Compliance Reports, which should be made publicly available.

We note that:

- the recommended conditions state a broad conservation outcome,
- the design of the research projects to contribute towards the achievement of a conservation outcome has not been specified, and
- the Offsets Guidance suggests that research offsets improve the management and protection of existing conservation estate and add to existing State Government initiatives, policies or strategies.

The EPA advised in response to the appeals that it:

... identified that Guidance Statement 1, with its aim of strategic protection and management of the ecological values of BCH habitats on the Pilbara coast, was an appropriate basis on which to frame the development of offsets projects to support the achievement of the objectives. The EPA identified Projects (EPA Report 1704, Schedule 2) to address priority knowledge gaps, and where the outcomes of the projects will improve the environmental assessment of future projects. Appellants sought for the translation of research outputs into measurable ecological outcomes, a policy or contextual framework to achieve these outcomes and increased transparency. The EPA advised that further transparency, consultation and reporting mechanisms could be incorporated for delivery of the research programs.

The investigation agrees that conditions should be added to clarify that a summary plan for the research projects is to be made publicly available, including the design and completion criteria for the proposed research and management programs. We consider that advice from DPIRD and DBCA on this summary plan would provide further opportunities for State Government initiatives, policies and conservation outcomes to be considered in the development of the offset projects.

The proponent advised in response to the appeals that it put forward additional marine-based offsets under the *Environment Protection and Biodiversity Conservation Act 1999* and initiated discussions with Western Australian Marine Science Institute (WAMSI) for the management of some research offset projects. We consulted with WAMSI representatives who confirmed, consistent with advice from the EPA, that the research offset projects recommended would contribute towards addressing of priority knowledge gaps.

## **Costings**

The EPA provided information on WAMSI advice in relation to research for projects in the Pilbara, which informed the funding for Projects A, B and C, summarised below:

Project A: Map samphire and algal mat

• Estimated cost: \$1.5 to \$3 million; recommended value \$1.5 million

Project B: Climate change effect on intertidal habitat

• Estimated cost: \$0.5 million; recommended value: \$ 0.5 million

Project C: Ecological roles, values and functions of algal mat

• Estimated cost: \$1.0 million for one or two habitat values; recommended value \$ 0.5 million

The EPA advised that it considered WAMSI advice in determining the value of research offsets, but also the relevant area that is limited to the <u>West</u> Pilbara coast, the key knowledge gaps and the ability of a program to provide guidance and protection in a timely way.

MG Kails Group submitted in response to the EPA's advice that a requirement to ensure that offset outcomes are met is at odds with the advice for a very modest maximum of 10% in additional funding.

We note that the Pilbara Offsets Fund was formally established in 2018, some years after the first proponent was required to 'pay their environmental offsets into a strategic fund for conservation'<sup>23</sup>. The fund includes staged project plans to promote collaboration and leverage against existing programs.

Appellants sought for increased funding and the EPA advised for more flexible funding arrangements to support delivery of the research projects. We agree with the EPA's advice that funding could be transferred between projects if there were surplus or deficit, and for additional funds to be required up to a reasonable amount (such as 10%) to complete a project outcome and recommend additional conditions to this effect.

<sup>&</sup>lt;sup>23</sup> Program: Pilbara environmental offsets fund; https://www.wa.gov.au/service/environment/business-and-community-assistance/program-pilbara-environmental-offsets-fund

In addition to the research offsets, the EPA has also recommended conditions be applied to the project requiring the proponent to fund additional works where monitoring shows impacts above those predicted (conditions 6-2(2) and 14-1(4)). With the changes to the conditions recommended in respect to subtidal habitat, the requirement to provide contingency funding will extend to impacts to these areas.

# **3** Supporting information

# 3.1 Grounds of appeal and appellants' concerns

MG Kailis Group, Western Australian Fishing Industry Council Inc (WAFIC) and Protect Ningaloo raised a number of concerns in their appeals. We have structured these under bullet points under 2 key issues in Table 2.

Table 2 Summ	nary of concerns raised in the appeals
Ground	Main concerns the appellants submitted
Habitat values	<ul> <li>Avoidance and minimisation of impacts have not been adequately demonstrated in the application of offsets, including:</li> </ul>
	<ul> <li>the wider need for the project in a regional and state context and</li> </ul>
	<ul> <li>the consideration of alternative locations for the project or alternatives for accessing the resource.</li> </ul>
	<ul> <li>The project should not proceed in its current location and scale given the significant impacts on environmental values and the lack of ability of the conditions to adequately address impacts.</li> </ul>
	<ul> <li>Significant residual impacts to terrestrial flora, vegetation and fauna, and intertidal and marine values cannot be offset.</li> </ul>
	<ul> <li>Conditions, in particular the environmental offsets, are insufficient to prevent environmental harm to benthic communities and habitat, and flora and vegetation due to:</li> </ul>
	<ul> <li>the large scale of the proposal, with clearing and disturbance that are significant in a local and regional context and</li> </ul>
	<ul> <li>habitats of high value that provide important ecosystem services</li> </ul>
	<ul> <li>The research offset will not offset the scale of clearing and disturbance and the value of the habitats impacted.</li> </ul>
	<ul> <li>The lack of protection in the area increases the likelihood of incremental habitat decline in the subregion due to ongoing cumulative impacts.</li> </ul>
	<ul> <li>The assessment of impacts to the blue spotted emperor, prawn species and the green sawfish does not meet the requirements of the Benthic Communities and Habitat Guideline.</li> </ul>
	<ul> <li>There are known associations with intertidal and subtidal marine habitats for early life stages of these species.</li> </ul>
	<ul> <li>The consideration fishing activities only within or adjacent to the study area is inadequate, as loss of ecological habitat function may have long term impacts away from the affected habitats.</li> </ul>
	<ul> <li>Key associations between the above species and specific habitat cannot be assessed on the basis of widespread presence of</li> </ul>

similar habitat across a region.

Ground	Main concerns the appellants submitted						
	<ul> <li>The proposal location within the Fortescue Size Managed Fish Ground, which is seasonally closed to provide protection for the recruitment and spawning of prawns, may significantly impact prawn productivity.</li> <li>The assessment of impacts to key fishery and endangered marine fauna should be more detailed and transparent.</li> </ul>						
Recommended conditions and offsets	<ul> <li>The limited consideration of impacts to marine species critical habitat (ground 1) resulted in the replacement of avoidance and mitigation measures with offsets.</li> <li>Appellants sought for conditions for the timing and duration of proposal activities, to avoid where possible and report on impacts.</li> <li>The recommended management plans, such as the Benthic Communities and Habitat Monitoring and Management Plan, may be inadequate due to the inadequate assessment for these marine species.</li> <li>Gaps in offset research on the basis of inadequate assessment of significant marine species</li> <li>'Research only' offsets applied for significant residual impacts are inconsistent with the WA Environmental Offsets Policy (2011) and WA Environmental Offsets Guidelines (2014).</li> <li>There is no clear and direct connection identified between increased knowledge (output) and outcomes. A supportive government policy framework is needed to ensure that any research findings will have an outcome and build on existing conservation programs and initiatives'. A regional research fund, a formal EPA cumulative impact review and a policy statement for protection by government are required.</li> <li>The offsets have no measurable long-term ecological outcomes and mechanisms to monitor progress and proponent non-performance.</li> <li>The levels of offset must directly relate to the significance of the marine generation within the commention used the output of the marine state of the marine state offset must directly relate to the significance of the marine state optime offset policy formation.</li> </ul>						
	<ul> <li>extent of the potential impacts, the offsets are too narrowly formulated.</li> <li>Research must be relevant, therefore cover all areas of residual risk to marine and intertidal areas. The conditions appear to prioritise only some risks relating to specific</li> </ul>						
	losses.						
	<ul> <li>The offsets are not 'like-for-like'</li> </ul>						
	<ul> <li>The Offset research is not applied in a 'transparent manner to engender certainly and predictability'</li> </ul>						

# Ground Main concerns the appellants submitted

transparency, governance and government management frameworks for research offsets

- Circular Reasoning The EPA has recommended approval notwithstanding significant loss of habitats such as those covered by Guidance Statement No 1 (see for example Report, p 44-45). The reasoning is that offsets will be effective to address these values, yet the EPA also states that the Policy and Guidelines can be applied flexibly. The reasoning is circular, as a departure from Guideline Statement Number 1 is justified by reference to the application of the Offset Guidelines, but the Guidelines themselves are capable of a flexible (and hence uncertain application).
- The methodology for developing specific research offset projects and costs and WAMSI advice should be disclosed.
- A requirement to ensure that offset outcomes are met is at odds with the advice for a very modest maximum of 10% in additional funding.

# 3.2 EPA's consideration of guidance in the assessment of environmental factors

## **Regional Guidance**

The EPA's consideration of habitat values for intertidal and subtidal habitat values was informed by Guidance Statement 1. Guidance Statement 1 for tropical arid zone mangroves, habitats and dependent habitats characterises mangrove formations between Cape Kerauden and the Exmouth Gulf into 'regionally significant mangroves - very high conservation value' and the remaining mangroves of 'high conservation value'. The following criteria were applied in the classification:

- internal diversity and extent or rarity of the habitat,
- ecological significance of a given stand (pertaining to productivity, feeding grounds, and fish nurseries), and
- nationally to internationally significant features.

The majority of the Mardie Project area is located in an area designated as of 'high conservation value' in Guidance Statement 1. The southern part (LAU 6) of the project is located within the Robe River Delta Management the Robe River Delta Mangrove Management Area (RRDMMA) Area, while the project borders on the Fortescue River Delta to the north, both of these areas are recognised as of 'regionally significant'-'very high conservation value'.

We note that Guidance Statement 1 states a presumption against development proposals. For benthic communities and habitat designated as of 'high conservation value', proponents are therefore required to deliver nine outcomes for the evaluation of environmental impacts (Guideline 2 Areas, section 3.2.2, Guidance Statement 1). Our review of the consideration of the delivery of the nine outcomes in the assessment for the Mardie Project (section 3.2, Table 1) demonstrates that the specified outcomes were addressed in the assessment. The recommended conditions translate the findings of the assessment into requirements for the implementation of the project.

In summary, the EPA considered from Guidance Statement 1 the presumption against development in areas designated as of 'regionally significant'-'very high conservation value' and 'high conservation value', assessed the proposal against nine outcomes specified in the guidance and considered that reasonable conditions could be imposed on the proposal to prevent inconsistency with the EPA's objectives for the key environmental factors.

Outcomes	Assessment	Avoidance, minimisation and conditions
water quality in undisturbed mangrove areas adjacent to the development should meet the ANZECC Water Quality Guidelines, unless there is ecological justification for it not doing so	<ul> <li>Inland waters</li> <li>Pollution from: <ul> <li>Spillages (brine, chemicals, hydrocarbons)</li> <li>Leachate from onshore spoil disposal</li> </ul> </li> <li>Groundwater quality and flows <ul> <li>(EPA Report 1704 section 2.1)</li> </ul> </li> </ul>	<ul> <li>Minimisation measures include: <ul> <li>Implement groundwater seepage recovery</li> <li>Leak detection devices on pipelines</li> </ul> </li> <li>Condition 3 – Inland waters <ul> <li>Outcomes-based condition 3-1(4) limits impact to BCH from changes to groundwater regimes or groundwater quality Implementation of a Groundwater Monitoring and Management Plan</li> </ul> </li> <li>Regulation by the Department of Mines and Industry Regulation (DMIRS) and DWER</li> <li>Impacts to surface water quality from operations (e.g. spills of brine, chemicals and hydrocarbons, seepage from pond walls, pond wall breaches, and leachate)</li> </ul>
existing groundwater flow, freshwater inflows and quality should be maintained in undisturbed mangrove areas	Inland waters Changes to surface water flows (EPA Report 1704 section 2.1) Benthic Communities and Habitat (intertidal) Changes to surface water flows Impacts to groundwater quality (saline seepage) (EPA Report 1704 section 2.4)	<ul> <li>Minimisation measures (section 2.1) include:</li> <li>Relocation and redesign of intertidal rock causeway</li> <li>Proposal design includes two drainage corridors and surface water spreading structures to minimise changes to surface water regimes in the intertidal zone</li> <li>Overflow structures to divert surface water from high rainfall events to concentrator ponds</li> <li>Minimisation measures (Section 2.4.7) include:</li> <li>Two drainage corridors (300 m wide) and surface water management structures to maintain the surface water regime in the intertidal zone.</li> <li>Surface water management structures and diversions to maintain the volume of discharge from Peter's creek to the intertidal zone.</li> <li>Culverts and floodways in the rock causeway to maintain flow regimes on both sides of the causeway.</li> </ul> Condition 2 – Robe River Delta Mangrove Management Area <ul> <li>Revised design for proposal that satisfies CEO that development will not impact mangroves within the RRDMMA.</li> </ul>

### Table 1: Evaluation - Consideration of the Outcomes specified in Guidance Statement 1 in the assessment of the Mardie Project

Outcomes	Assessment	Avoidance, minimisation and conditions					
		<ul> <li>Condition 3 – Inland waters         <ul> <li>Outcomes-based condition - limits the decrease in freshwater inundation attributable to the project for coastal samphire, and mangroves inside and outside the RRDMMA</li> </ul> </li> <li>Condition 6 – Benthic Communities and Habitat Monitoring Plan         <ul> <li>Objectives for maintenance of remaining benthic communities and habitat</li> <li>Benthic Communities Habitat Monitoring and Management Plan</li> </ul> </li> <li>Condition 12 Monitoring and Adaptive Management Program including:         <ul> <li>Monitoring, criteria, adaptive management and reporting to meet the outcomes of conditions 3-1(5) to 3-1(7) are met.</li> </ul> </li> <li>Condition 14 – Marine and Intertidal Research Offsets         <ul> <li>Where monitoring from implementation of the Benthic Communities and Habitat Monitoring Plan indicates adverse impacts intertidal BCH – Risk Management Measure contribution in condition 14 - monetary contribution for Project C(ii) (Schedule 2)</li> </ul> </li> <li>Disturbance or adverse impact to mangrove habitat within the RRDMMA requires Risk Management Measure contribution in condition 14 - monetary contribution in condition for Project C(iii)</li> </ul>					
mangrove decline should not occur through secondary effects such as shading or dust settlement	Shading and ambient dust settlement from the proposal not identified as potentially significant impact	Not applicable					
mangrove decline should not occur as a result of wastewater, coolant water or runoff water discharge or irrigation, or from pollution	<ul> <li>Marine environmental quality (EPA Report 1704: section 2.2)</li> <li>Pollution from: <ul> <li>Bitterns disposal</li> <li>Spillages including port operations (brine, chemicals, hydrocarbons)</li> </ul> </li> </ul>	<ul> <li>Avoidance measures include: <ul> <li>On-shore disposal of dredge spoil material</li> </ul> </li> <li>Minimisation measures include: <ul> <li>Limit bitterns discharge to 3.6 GL/a</li> <li>Limit bitterns salinity concentrations (dilute bitterns prior to discharge)</li> <li>Saline seepage recovery at evaporation and crystalliser ponds</li> </ul> </li> <li>Rehabilitation measures</li> </ul>					

Outcomes	Assessment	Avoidance, minimisation and conditions				
	<ul> <li>Leachate from onshore spoil disposal</li> <li>Boat launching facility (not identified under 2.2.4)</li> <li>Seawater intake (7.9 ha area) (not identified under 2.2.4)</li> </ul> Inland waters (EPA Report 1704: section 2.1) Impacts to groundwater quality and flows <ul> <li>Saline seepage from evaporation and crystalliser ponds into groundwater</li> </ul> Benthic communities and habitat (subtidal) (Section 2.5) <ul> <li>bitterns disposal</li> </ul>	<ul> <li>Condition 3 Inland Waters</li> <li>Outcomes-based condition limits adverse impacts from changes in groundwater regimes and quality.</li> <li>Implementation of Groundwater Monitoring and Management Plan</li> <li>Condition 4 – Marine Environmental Quality (operations)</li> <li>Bitterns disposal</li> <li>Outcomes-based conditions 4-2(1) (a) to (d) that limit the loss of environmental quality (and impact to benthic communities and habitat) from <ul> <li>(a) high to low to 17.3 ha</li> <li>(b) high to moderate to 56.8 ha and specification of</li> <li>High Ecological Protection Area and</li> <li>Maximum Ecological Protection Area</li> </ul> </li> <li>Marine Environmental Quality Monitoring and Management Plan</li> </ul>				
mangrove decline should not occur as a result of recontouring any land	Not identified as potential significant impact					
sedimentation patterns should be maintained so that erosion and deposition within mangrove habitats is within natural variations.	Benthic communities and habitat (subtidal) EPA Report 1704 section 2.5 Inland waters Potential impacts	<ul> <li>Condition 7         <ul> <li>Benthic communities and marine environmental quality – Dredge Management Plan (DMP)</li> </ul> </li> <li>Regulation by the Department of Mines and Industry Regulation (DMIRS)</li> </ul>				
Appeals Convensio Report to the Minis	tor for Environment Nevember 2021	24				

Outcomes	Assessment	Avoidance, minimisation and conditions
	(EPA Report 1704 sections 2.1.4 and 2.1.7)	Erosion and sedimentation from diversion of surface water through drainage channels
there should be no significant loss of algal mats associated with mangrove areas	Benthic Communities and Habitat (intertidal) EPA Report 1704 section 2.4 Direct impacts (clearing) of algal mat – 880 ha representing 25% of the extent within the study area	Same as below
any unavoidable mangrove loss should not adversely affect the general amenity and recreational facilities nor interfere with fisheries in the area (breeding grounds, protection habitats for juveniles or adult fish or shellfish)	<ul> <li>Benthic Communities and Habitat (intertidal) (EPA Report 1704 section 2.4)</li> <li>Direct Impacts to intertidal BCH: <ul> <li>coastal samphire – 296 ha (7.2% of the extent within the study area)</li> <li>algal mat – 880 ha (25% of the extent within the study area; 14% of regional extent)</li> <li>mangroves outside of the RRDMMA – 13 ha (less than 0.5% of the extent within the study area)</li> <li>mangroves inside the RRDMMA – 4 ha (less than 0.5% of the extent within the study area)</li> </ul> </li> <li>Benthic Communities and Habitat (subtidal) (EPA Report 1704 section 2.5)</li> <li>Social Surroundings</li> <li>EPA Report 1704 section 2.8</li> <li>Consideration of fishing effort – economic risk</li> </ul>	<ul> <li>Avoidance measures include: <ul> <li>Re-design of proposal (pond layout) to avoid direct impacts to mangrove habitat in the RRDMMA</li> </ul> </li> <li>Minimisation measures include: <ul> <li>Location of evaporation ponds as far inland as practicable to reduce impacts to mangrove habitat.</li> </ul> </li> <li>Conditions for the protection of habitat of juvenile fishery and vulnerable species are: <ul> <li>Condition 1 – Proposal Implementation</li> <li>Limitations on extent of clearing and disturbance</li> </ul> </li> <li>Condition 2 – Robe River Delta Mangrove Management Area</li> <li>Development within the RRDMMA is subject to consideration of the maintenance of ecological processes supporting mangroves.</li> </ul> <li>Condition 3 - Inland Waters <ul> <li>Outcome-based condition limits impacts from changes to tidal inundation and groundwater regimes and quality.</li> <li>Outcomes-based condition limits the decrease in freshwater inundation inside and outside the RRDMMA</li> <li>Implementation of Groundwater Monitoring and Management Plan</li> </ul> </li> <li>Condition 4 – Marine Environmental Quality (operations) <ul> <li>Outcomes-based conditions limit the loss of environmental quality (and impacts to benthic communities and habitat)</li> <li>Marine Environmental Quality Monitoring and Management Plan</li> </ul> </li>
Appeals Convenor's Report to the Minist Appeals objecting to Report and Recomm	ter for Environment – November 2021 mendations of EPA Report 1704 Mardie Project	35

Outcomes	Assessment	Avoidance, minimisation and conditions
		<ul> <li>Condition 6 - Benthic Communities and Habitat Monitoring Plan (intertidal)</li> <li>Outcomes to limit the direct impacts to coastal samphire and direct and indirect disturbances and impacts to algal mat.</li> <li>Objectives for maintenance of remaining benthic communities and habitat</li> <li>Benthic Communities Habitat Monitoring and Management Plan</li> <li>Condition 7 - Benthic communities and marine environmental quality – Dredge Management Plan (DMP)</li> <li>Outcomes-based conditions that limit loss of BCH (7-1(1) and indirect impacts to BCH(7-1(2)), where recovery is expected</li> <li>Implementation of a Dredge Management Plan</li> <li>Condition 14 – Marine and Intertidal Research Offsets</li> <li>Financial contributions for research (disturbance of algal mat and coastal samphire) for (Projects A, B and C(i) (Schedule 2))</li> <li>Where monitoring from implementation of the Benthic Communities and Habitat Monitoring Plan indicates adverse impacts intertidal BCH – Risk Management Measure contribution in condition 14 - monetary contribution for Project C(ii) (Schedule 2)</li> <li>Disturbance or adverse impact to mangrove habitat within the RRDMMA requires Risk Management Measure contribution in condition 14 - monetary contribution for Project C(iii)</li> </ul>

# Key environmental factors, objectives and conditions

The EPA identified 7 key environmental factors during their its assessment, including:

- Inland Waters
- Marine environmental quality
- Flora and vegetation
- Benthic communities and habitats
  - o intertidal
  - o subtidal
- Terrestrial fauna
- Marine fauna
- Social surroundings.

The key environmental factors, objectives associated with each and the EPA's recommended condition types in relation to the environmental factors are provided in Table 2.

EF	Objective	Condition	Limits	Management and reporting	Substantiate	Offsets	Contingency fund - Risk management measures
Inland waters	maintain the hydrological	2	al		al		
	regimes and quality of	3	N	N	N	-	
	groundwater and surface water	6-4	-	N	N	N	
	protected	12	-		N	-	
Marine	maintain the quality of water,	_	1				
quality	environmental values are protected	4				-	
		7					
Flora and	protect flora and vegetation so						
vegetation	that biological diversity and ecological integrity are maintained	1-1	$\checkmark$	-	-	-	
		5	$\checkmark$	$\checkmark$	$\checkmark$	-	
		13	-	-	$\checkmark$	$\checkmark$	
Benthic	protect benthic communities and						
communities	habitats so that biological	1-1	$\checkmark$	-	-	-	-
and habitat	diversity and ecological integrity	2			$\checkmark$		$\checkmark$
(intertidal)	are maintained	6		$\checkmark$	$\checkmark$		$\checkmark$
		14	-				

Table 2: Key environmental factors identified by the EPA, associated objectives and condition types recommended by the EPA

Appeals Convenor's Report to the Minister for Environment – November 2021 Appeals objecting to Report and Recommendations of EPA Report 1704 Mardie Project

EF	Objective	Condition	Limits	Management and reporting	Substantiate	Offsets	Contingency fund - Risk management measures
Benthic communities and habitat (subtidal)	protect benthic communities and habitats so that biological diversity and ecological integrity are maintained	1-1 7	$\sqrt{1}$	- √	- √	-	
Terrestrial fauna	protect terrestrial fauna so that biological diversity and ecological integrity are maintained	1-1 8 13	イ イ -	- √ √	- √ √	- - \	
Marine fauna	protect marine fauna so that biological diversity and ecological integrity are maintained	9 10	$\checkmark$			-	
Social surrounds	protect social surroundings from significant harm	11				-	-

Appeals Convenor's Report to the Minister for Environment – November 2021 Appeals objecting to Report and Recommendations of EPA Report 1704 Mardie Project

## Key ecological windows for marine species

### Table 3: Analysis of ecological windows for marine species

Source Document	Species		Feb	March	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Dredge Management Plan	Sawfish pupping												
(R190043Rev2B, 24 June 2021)	Turtle nesting, hatching & post-hatch												
	Migration - Humpback Whales												
Potential impacts on commercial	Brown Tiger Prawns spawning												
fishing and aquaculture	Blue Endeavour Prawn (in Queenslan												
operations resulting from the	Western King Prawns		ns thro	ughout	t year,	recruit	summ	ner&a	utumn				
Mardie Project development*	Bluespotted Emperor spawning												

\*Fishwell Consulting (1 August 2021) Potential impacts on commercial fishing and aquaculture operations resulting from the Mardie Project

No dredging No dredging between dusk and dawn Not included

# WA Environmental Offsets Policy and Guidance

The EPA considered that residual impacts to terrestrial flora, vegetation, and fauna values could be offset through the provision of funds to the Pilbara Environmental Offsets Fund (PEOF) (Report 1704 section 4).

Report 1704 states that the PEOF is designed specifically to deliver terrestrial and landbased outcomes and is not sufficiently relevant to intertidal and marine values to meet the requirements of the WA Environmental Offset Guidelines (2014).

# EPA section 16(e) advice for the Pilbara region and the Pilbara environmental offsets fund

In 2012, the Western Australian Minister for Environment mandated that proponents in the Pilbara pay their environmental offsets into a strategic fund for conservation, while the federal Minister for Environment gave proponents the option of doing so.

The EPA provided advice<sup>24</sup> in 2014 for the Pilbara region under section 16(e) of the EP Act recognising very high biodiversity values, key threats and challenges to the conservation of biodiversity. The Pilbara Environmental Offsets Fund, within the context of this strategic advice and the WA Environmental Offsets Policy, provides a formal mechanism to offset significant residual terrestrial impacts through a landscape-scale approach. The EPA applied the following rates under the requirements of the Pilbara Environmental Offset Fund, noting that the Hamersley sub-region base rate was applied in the absence of a base rate for the Roebourne sub-region:

- a base rate for impacts to native vegetation in good to excellent condition and impacts to several fauna habitats.
- a higher rate for impacts to regarded as 'specialised environmental values', including clearing of Priority 3 PEC – Horseflat Land System of the Roebourne Plains and riparian vegetation that is critical vegetation for the Pilbara Olive Python including but not limited to impacts on:
  - o riparian vegetation
  - o Threatened or Priority Ecological Communities
  - important vegetation types
  - o specialised fauna habitat.

The Pilbara Offsets Fund pools offset funds to achieve broad scale biodiversity conservation outcomes for the Pilbara and offset conditions have already been applied in a number of Ministerial Statements for the environmental values that are the same or similar to those identified in this assessment. The program has an emphasis on landscape-scale outcomes to deliver projects that are linked and integrated across the Pilbara bioregion and build on existing successful regional programs such as State Government conservation initiatives.

<sup>&</sup>lt;sup>24</sup> EPA (2014) Cumulative environmental impacts of development in the Pilbara region - Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the *Environmental Protection Act 1986* 

# Appendix 1 Appeal process

### The Minister assesses the merits of a decision

Environmental appeals follow a merits-based process. This means the Minister can consider all the relevant facts, legislation and policy aspects of the decision and decide whether it was correct and preferable.

For appeals in relation to an EPA report and recommendations, the Appeals Convenor normally considers the environmental merits of the assessment by the EPA, based on objectives as set by the EPA as well as other environmental factors. The appeals process considers environmental significance, additional information not considered by the EPA, technical errors and attainment of policy objectives.

### We report to the Minister, as does the decision-making authority

To decide an appeal's outcome, the Minister for Environment must have a report from both:

- the Appeals Convenor [see section 109(3) of the EP Act], and
- the authority that originally made the decision under appeal [see section 106(1)].

To properly advise the Minister in our report, our investigation included:

- reviewing the appeal and supporting documents from the appellant
- reviewing documents from the EPA
- review documents provided by the proponent in response to the appeal
- meeting with the appellants on 2 and 6 September 2021
- meeting with the proponent on 6 September and 6 and 19 October 2021
- meeting with EPA and DWER on 14 September 2021
- meeting with DPIRD on 22 and 23 September 2021
- meeting with DWER on 28 September 2021
- meeting with WAMSI on 19 October 2021.

### **Table 3** Documents we reviewed in the appeals investigation

Document	Date
EPA Appeal Report 1704	25 August 2021
EPA Report and Recommendation 1704	29 June 2021
EPA Cumulative environmental impacts of development in the Pilbara region - Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the <i>Environmental Protection Act 1986</i>	2014
EPA Advice: Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline - In accordance with section 16(j) of the Environmental Protection Act 1986	2001