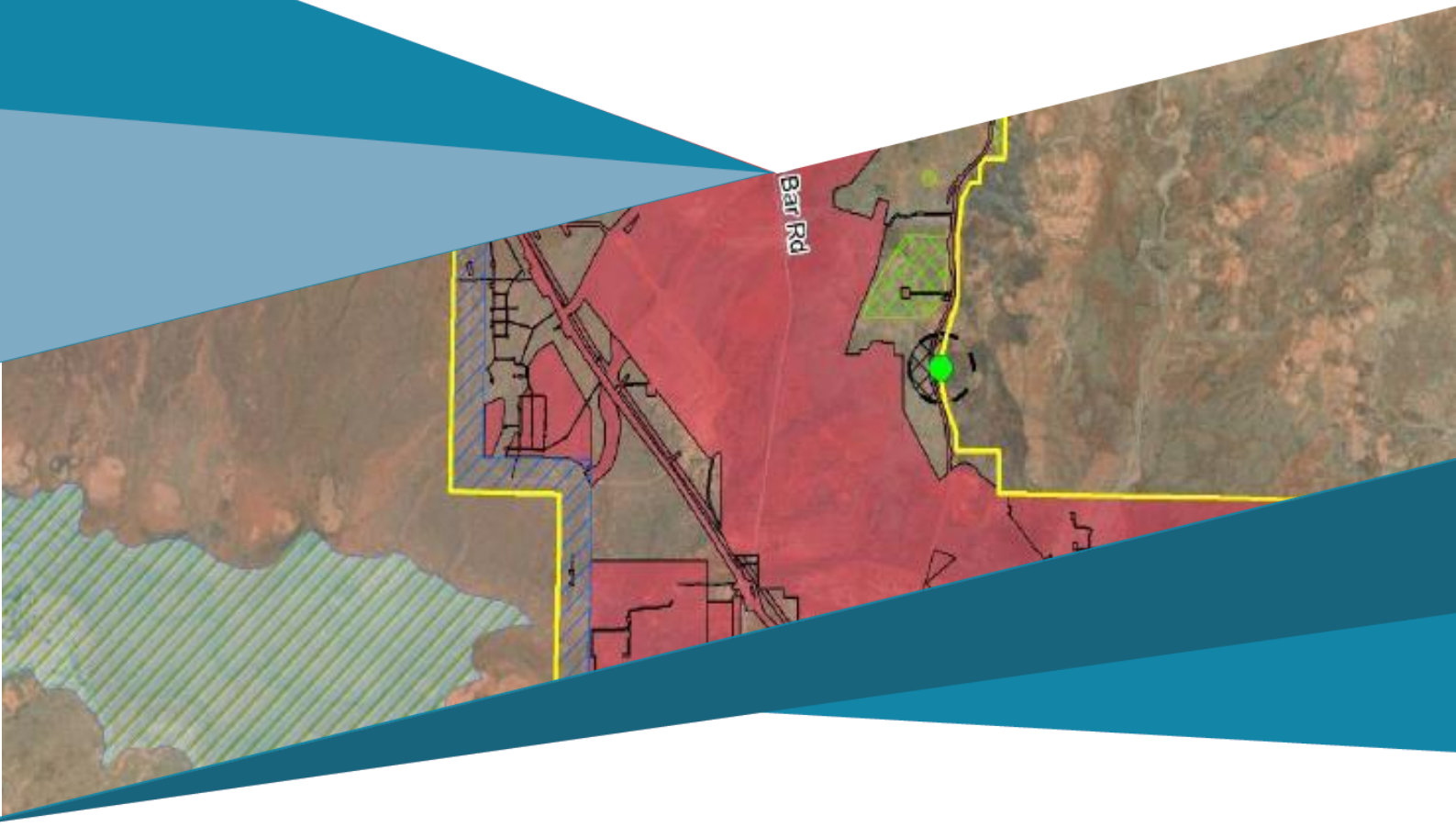
Government of **Western Australia**
Office of the **Appeals Convenor**
Environmental Protection Act 1986

Appeals Convenor's Report to the Minister for Environment

Appeal objecting to Report and Recommendations of EPA Report 1716 – Revised Proposal for the Roy Hill Iron Ore Mine



Appellant	Conservation Council of WA Inc
Proponent	Roy Hill Iron Ore Pty Ltd
Authority	Environmental Protection Authority (EPA)
Appeal No.	050 of 2021
Date	April 2022

Office of the Appeals Convenor

08 6364 7990 or TTY 13 36 77 (National Relay Service)

admin@appealsconvenor.wa.gov.au

www.appealsconvenor.wa.gov.au

221 St Georges Terrace
Perth WA 6000

Appeals Convenor

Emma Gaunt

Investigating Officers

Michael Power

Jean-Pierre Clement

Cover image source: EPA Report 1716

Please contact us if you need the report in a different format.

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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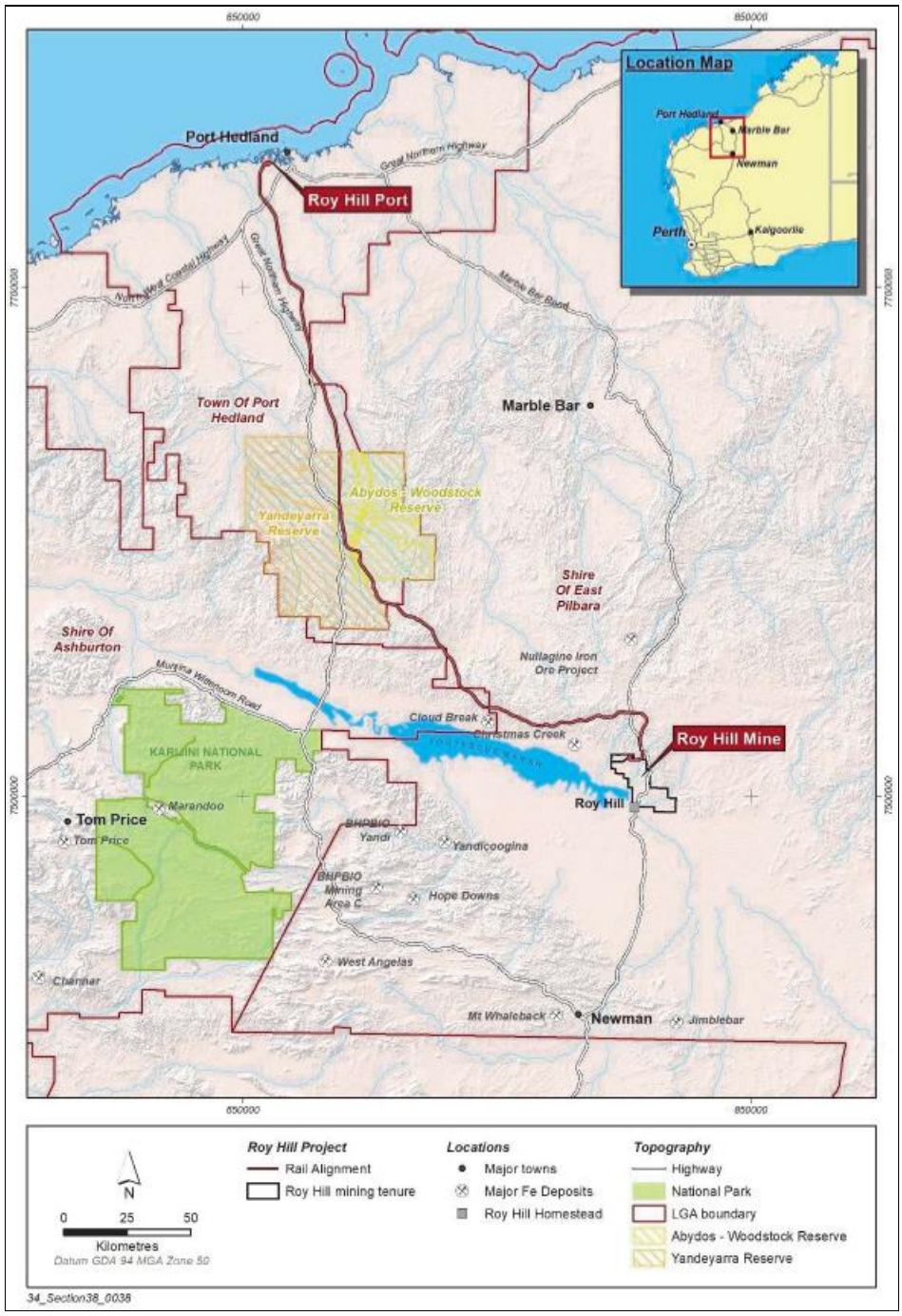
1 Executive summary

1.1 Decision under appeal

Roy Hill Iron Ore Pty Ltd (the proponent/RHIO) plans to revise the existing Roy Hill Iron Ore Mine located 110 kilometres (km) north of Newman in the Pilbara region of Western Australia (Figure 1).

Figure 1 Location of proposal



(Source: Roy Hill Iron Ore Pty Ltd, December 2020)

The development envelope and layout of the proposal are shown in Figures 3 and 4 in Section 4.

The proposal was referred to the Environmental Protection Authority (EPA) in March 2019 by the proponent. Under the *Environmental Protection Act 1986* (EP Act), the EPA set the assessment level at Assess – Public Environmental Review. The EPA identified six key environmental factors during its assessment, which were:

- Inland waters
- Flora and vegetation
- Terrestrial fauna
- Subterranean fauna
- Greenhouse gas emissions
- Social surroundings

Having formed the view that reasonable conditions could be imposed on the proposal to ensure its implementation is unlikely to be inconsistent with its objectives for the environmental factors, the EPA recommended that the proposal may be implemented subject to conditions.

In October 2021 the EPA published Report 1716, and it is against this report and recommendations that the appeal was lodged.

1.2 Grounds of appeal and appellant concerns

An appeal was lodged against the EPA's report and recommendations by the Conservation Council of Western Australia (CCWA/the appellant).

The issues raised in the appeal largely related to the content of the EPA's report in respect to its assessment of the environmental factor Greenhouse gas emissions (GHGe). A key concern raised through the appeal was that there were flaws in the EPA's assessment, and that the EPA did not adequately consider the impacts of the proposal's greenhouse gas emissions.

We summarise the appellant's main concerns in Table 1.

Table 1 Grounds of appeal

Ground	Main concerns the appellant submitted
1. Increase in GHG emissions	Failure to consider the increase in GHGe from the revised proposal. Failure to consider cumulative impacts of GHGe. Inadequate application of GHG Guideline and improper application of State policy in developing the proponent's Greenhouse Gas Management Plan (GHGMP). Inadequate mitigation of GHG emissions.

1.3 Key issues and conclusions

Having regard for the concerns of the appellant and the scope of the appeal, the key question for the appeal investigation to determine is whether the EPA adequately assessed the proposal in relation to the issues raised by the appellant. We also consider the extent to

which the recommended conditions are adequate in the context of the concerns raised in the appeal.

In this context, this report summarises the key appeal issues and our conclusions below, with full details in Section 3. Section 2 sets out the background to the proposal and Section 4 sets out supporting information.

Did the EPA adequately assess GHGe?

The appellant raised concerns about the GHGe resulting from the proposal. It contended that the proponent and EPA have taken the goal of net zero by 2050 out of context as a way of justifying short term increases in emissions, and are of the view that this is not consistent with climate science and the goal of immediately reducing global emissions. The appellant submitted that no further growth of GHGe should be approved from proposals such as this.

The appellant also questioned the adequacy of the proponent's GHGMP. Particularly in relation to the application of State and EPA policy during preparation of the GHGMP, and on the adequacy of the proponent's measures to mitigate GHGe.

The EPA advised that emission reduction initiatives proposed by the proponent will result in reduced estimated scope 1 GHGe of 4.2 million tonnes (Mt) of CO2-e over the life of the mine[1] (LOM) (2021 to 2032), down from the estimate of 5.1 Mt of CO2-e listed in the proponent's Environmental Review Document (ERD)[2] and Report 1716. Based on this information, over the LOM, the conditions recommended by the EPA would result in a reduction of scope 1 GHG emissions of about 900,000 tonnes of CO_2-e.

The proposal will also consume power from third party sources (scope 2 emissions) estimated to be 3.4 Mt CO2-e over the LOM. Total scope 1 and 2 GHGe over the LOM are therefore expected to be 7.6 Mt CO2-e versus 8.5 Mt CO2-e if the mitigations were not in place.

On further analysis, it appears the 5.1 million tonnes of pre mitigation emissions was calculated assuming a 12 year LOM while the 4.2 million tonnes mitigated emissions were calculated over 11 years. In addition, the emissions permitted under the EPA's recommended condition 9 would result in total GHGe of 4.39 million tonnes over 11 years, not 4.2 million tonnes. As a result, it appears the emission reductions are in the order of 320,000 tonnes over the life of the proposal. This is about a third of the reduction in scope 1 emissions suggested by the EPA.

In Report 1716, the EPA acknowledged that there is an established link between GHGe and the risk of climate change and that climate change will impact on Western Australia's environment and environmental values.

While we find that there is a need for urgent reductions in global GHGe this decade if global warming is to be kept to no more than 1.5°C and that failure to keep global warming to 1.5°C or below 2°C will have significant implications for Western Australia, the EPA advised that its role is to minimise GHGe from new proposals, and a decision on whether residual emissions are acceptable is ultimately a matter for the decision makers under section 45 of the EP Act. We consider that the EPA's approach is consistent with its approach to other recent

[1] EPA, Response to Appeal 050/21, 4 January 2022, page 3.
[2] RHIO, Revised proposal for the Roy Hill Iron Ore Mine – Environmental Review Document, 22/12/20.

proposals, and that on that basis, the acceptability of the proposal's residual GHGe is a matter for the decision makers under section 45.

We also note that the approach recommended by the EPA contemplates the emissions limits reflected in the conditions is a current maximum, but that evolving science and policy may require more significant reductions in the future. We consider this contemplation is reflected in the EPA's proposed wording of the conditions, including the power for the CEO to request a review of the GHGMP at any time (in addition to the power for the Minister to seek a review of the conditions under section 46 at any time).

While there are a number of uncertainties raised by the EPA's assessment of GHGe from the proposal, we do not consider it necessary to remit the proposal for further assessment. However, we recommend that the calculations underpinning the EPA's assessment be revisited within 12 months of any approval of the proposal through a review of the proponent's GHGMP. We recommend this review also include confirmation of average and total scope 2 emissions to effectively measure benchmarking of GHGe intensity for comparison purposes.

1.4 Recommendation to the Minister

We recommend that the appeal be allowed in part by amending condition 9 to require a review of the GHGMP within 12 months of any approval of the proposal under section 45 of the EP Act. The review to include confirmation of average and total scope 2 emissions to effectively measure benchmarking of GHGe intensity for comparison purposes.

2 Background

2.1 The proposal

The existing (original) proposal was assessed and approved as two separate proposals, Stages 1 and 2, as set out in Ministerial Statements 824 and 829 respectively. Changes to the implementation conditions were subsequently approved through Ministerial Statements 979 (Stage 1) and 980 (Stage 2).

The EPA states in Report 1716 that the revised proposal involves multiple pits operating at once to produce a consistent quality of ore. There is a requirement to increase dewatering to maintain dry mining conditions and mining multiple pits at once creates the need for additional above ground waste rock dumps due to reduced availability of pit voids for waste rock disposal during mine operation. Additional ground disturbance is required to accommodate the above ground waste rock dumps, aquifer injection infrastructure to dispose of mine dewater and pit abandonment bunds for mine closure.

The development envelope of the proposal is shown in Figures 3 and 4 in Section 4.

Key elements of the revised proposal are set out in Table 2 below.

Table 2 Revised proposal

Original Proposal	Revised Proposal
Total ground disturbance allocation of 11,993ha across Stage 1 and 2, including remote borefield within defined Development Envelope	Increase of 5,995ha of ground disturbance to total 17,988ha for Mine and Remote MAR and Southern borefields
	Increased Development Envelope
Backfilling of Stage 1 mine pit voids to surrounding ground level. Backfilling of Stage 2 mine pit voids to above the pre-mining water table and contoured to blend in with the natural topography	Revised materials management strategy including backfilling of all mine pits voids to above the pre-mining water table and constructed with abandonment bunds. Additional ex-pit WRLs to that included in the Original Proposal
Evaporation Ponds and short-term MAR strategy for the management of surplus saline water through recharge basins, re-injection bores and evaporation pond for a period of 24 months	Life of Mine water management strategy including use of saline water and decant water for dust suppression and MAR, with evaporation ponds as contingency
396GL of dewatering	626GL of dewatering
With the exception of Kulbee Creek, which will be permanently diverted into West Kulbee Creek, surface water diversion structures will be temporarily diverted and reinstated following back fill of mine pits and decommissioning of mine infrastructure	Permanent surface water diversion structures with the option to reinstate over backfilled pits if required.
Tailings disposed into above ground TSF and Zulu 5 In-pit TSF	Inclusion of in-pit tailings in Zulu and Bravo Pit areas as in-pit TSFs
Greenhouse gas emissions to 280,000 tonnes CO_2 equivalent per annum	Greenhouse gas emissions to be up to 450,000 tonnes CO_2 equivalent per annum

(Source: Roy Hill Iron Ore Pty Ltd, December 2020)

2.2 Appeal process

EPA Report 1716 was published under section 44(3) of the EP Act on 27 October 2021.

By section 100(1)(d) of the EP Act, any person who disagrees with the content of, or recommendation in, a report of the EPA under section 44 may lodge an appeal with the Minister within 21 days of the date the report is published.

On receipt of the appeal, the Appeals Convenor requested the EPA to report to the Minister on the issues raised in the appeal under section 106(1)(a) of the EP Act. The proponent was also provided with the details of the appeal and provided an opportunity to respond.

The appellant was consulted through the appeal investigation. A meeting was also held with representatives of the proponent.

This report is prepared for the consideration of the Minister for Environment under sections 106(1)(d) and 109(3)(b) of the EP Act. In reporting to the Minister, the Appeals Convenor is confined to environmental factors: broader economic, commercial and social factors are relevantly a matter for decision makers under section 45 of the EP Act.

The Minister has three options in dealing with an appeal against a report of the EPA:

- Dismiss the appeal (section 101(1)(a))
- Allow the appeal by remitting the proposal to the EPA for further assessment or reassessment (section 101(1)(d)(i))
- Allow the appeal by varying the EPA's recommendations by changing the implementation conditions (section 101(1)(d)(ii)).

The Minister's decision under section 101(1) is final and without appeal.

The Minister does not, on appeal, have authority to decide that the proposal should not be implemented. Rather, this along with broader economic and social considerations are matters for the decision makers under section 45 of the EP Act.

2.3 Issues for determination

Given the nature of the appeal as discussed above, the issue for determination in this appeal is (in effect) whether the EPA's assessment was appropriate and justified based on the information available at the time of the assessment or any new information made available through the appeal investigation.

If defects or shortcomings in the EPA's assessment are identified, the question is whether this requires further assessment or reassessment through remittal to the EPA, or whether it can be remedied through varying the EPA's recommended conditions.

It follows from the above that this report will consider:

- the nature of the environmental concerns raised by the appeal
- how each of the environmental concerns were assessed by the EPA
- whether the EPA's assessment and recommended conditions were adequate
- if shortcomings are identified, whether these are best remedied through either:
    - remitting the proposal to the EPA for reassessment
    - varying the EPA's recommended conditions.

3 Reasons for recommendation

3.1 Greenhouse gas emissions

Appellant's concerns

The appellant submitted that:

- the combined scope 1 and 2 GHGe from the proposal are approximately 0.75 Mt per annum (Mtpa), with much larger scope 3 emissions. Even considering direct (scope 1 and 2 emissions alone) this is a significant amount of pollution
- the proponent and EPA have taken the goal of net zero by 2050 out of context as a way of justifying short term increases in emissions, which is not consistent with the goal of immediately reducing global emissions
- any interpretation of the science or policy on carbon pollution and climate change that produces a result which allows GHGe to rise, over any timeframe, is unacceptable. What is far more important than the date for reaching net zero emissions, is the total amount of CO_2-e released
- approving what may appear to be a modest increase in GHGe from this project contributes to an overall effect where Western Australia fails to reduce overall emissions and continues the trajectory of growth. Western Australia is the only state with carbon pollution above the 2005 baseline set under the Paris Agreement, with emissions now over 20 per cent above that level. Continuing this trajectory of growth undermines global action on climate change and is inconsistent with Australia's national emission reduction commitments
- in the absence of a policy framework that includes science-based short and medium term emissions goals and policies to achieve them, the EPA must at a minimum recommend that no further emissions growth can occur from developments such as this
- in developing the GHGMP, the proponent did not properly apply the GHG Guideline and inappropriately relied on the State GHG policy for Major Projects
- the State policy includes economic considerations, which are irrelevant to environmental impact assessment and cannot be considered by the EPA. It is not the role of the EPA to balance economic and environmental considerations in the EIA process. Economic factors may be considered by the Minister at the decision making stage of the environmental approvals process
- the mitigation measures for GHGe proposed by the proponent are inadequate.

The proposal is a significant source of GHGe

The proposal will extend operations at the mine until mid-2032 (11 years). In Report 1716, the EPA characterised the emissions from the proposal as follows:

- scope 1 emissions for the projected LOM are estimated to be up to 466,000t CO2-e per annum, with a forecast average of 430,981 t CO2-e per annum and total emissions of 5.1 Mt CO2-e
- scope 2 emissions for the projected LOM are estimated to be up to approximately 302,000 t CO2-e per annum, with a forecast average of 288,000 t CO2-e per annum and total emissions of 3.4 Mt CO2-e
- scope 3 emissions arising from the projected LOM are estimated to be for Shipping is approximately 5.1 Mt CO2-e per annum (based on 0.08 t CO2-e/t Iron Ore (IO) at 62

Mtpa) and Steelmaking is approximately 54.3 to 83.7 Mt CO2-e per annum (based on ~0.88 – 1.35 t CO2-e/t IO at 62 Mtpa)[3]

Through the assessment, the EPA indicated that commitments from the proponent would result in 'cumulative scope 1 emissions [reducing] from of approximately 5.1 Mt CO2-e to approximately 4.2 Mt CO2-e for the 2022 to 2032 period.'[4]

Condition 9 recommended by the EPA includes a limit in scope 1 GHGe based on five-yearly intervals. Cumulatively, the scope 1 emissions contemplated under condition 9-1 is 4.39 Mt CO2-e. This is approximately 190,000 tonnes higher than the 4.2 Mt referenced in Report 1716.

On further analysis, it also appears that the 5.1 Mt CO2-e unmitigated scope 1 emissions quoted in Report 1716 does not correspond to the proponent's estimated emissions for the 11 years ending 30 June 2032: on that analysis, unmitigated emissions are calculated to be 4.7 Mt CO2-e. It appears the 5.1 Mt may be an artefact of the proposal being intended to commence a year earlier (financial year 2021) but which is not reflected in condition 9-1.

Taking the above into account, it appears the mitigation levels contemplated by recommended condition 9-1 are in the order of 318,000 tonnes CO2-e. This is about one third of the emissions reductions of approximately 900,000 tonnes identified by the EPA.

In addition to the above, the characterisation of scope 2 emissions of 288,000 t CO2-e per annum also appears to be slightly understated, with the proponent's published emission predictions for the 11 years ending 30 June 2032 averaging approximately 292,000 t CO2-e per annum (3.2 Mt CO2-e over LOM).[5]

Taking into account the above, total scope 1 and 2 emissions for the LOM are approximately 7.6 Mt CO2-e after mitigation. For present purposes, it is sufficient to conclude that these emissions represent a significant addition to GHGe in Western Australia.

In relation to scope 3 emissions (that is, other indirect greenhouse gas emissions, other than scope 2 emissions), the proponent estimates that total emissions will be up to 88.8 Mt CO_2-e per annum or a total of 976.8 Mt CO_2-e assuming full production for 11 years.

The EPA says an approximately linear trajectory to net zero by 2050 is generally consistent with its guidelines

Citing the objective of its GHG Guideline as being to reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change, Report 1716 notes that the State's GHG emissions are expected to continue to increase in the short to medium term:

> The EPA notes that the GHG Guideline does not mandate net zero emissions over the life of a proposal. Rather, its objective is reduction of emissions having regard to the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement and the Intergovernmental Panel on Climate Change's (IPCC) 1.5 report which recommend achievement of net zero emissions by 2050. When assessing proposals where GHG emissions are a key environmental factor, the EPA therefore usually considers a proposal's

[3] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 72.
[4] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 73.
[5] RHIO, Revised Proposal for the Roy Hill Iron Ore Mine – Environmental Review Document, 22 December 2020, page 376.

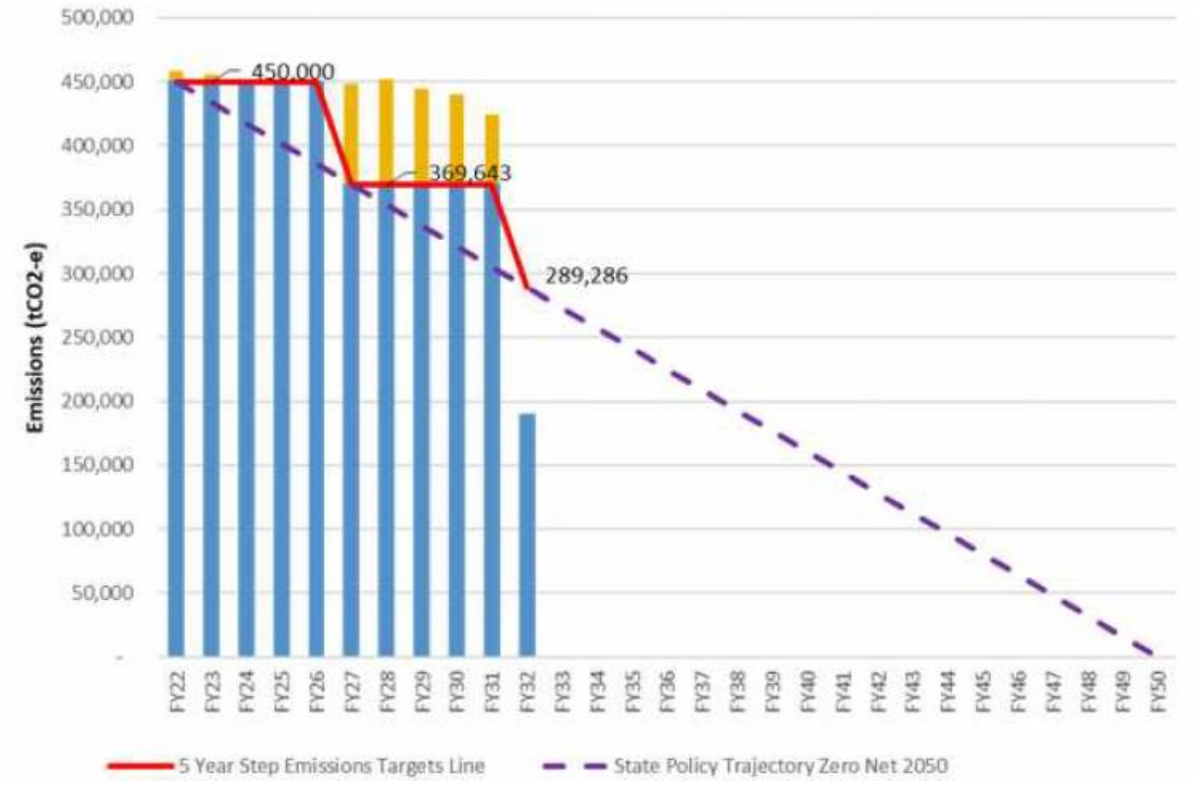
> annual and total contributions to GHG emissions, but also assesses the proponent's contribution and trajectory towards this net zero by 2050 goal.[6]

Report 1716 notes that the proponent was encouraged to revise and improve the GHGMP (version 1) originally submitted with the ERD. A revised GHGMP was subsequently developed (version 4 dated 22 July 2021), which the EPA used as the basis for its assessment.

In the revised GHGMP, RHIO proposes:

> … to achieve an incremental reduction in emissions over the life of the project in line with the state's aspiration to achieve zero net emissions by 2050.
>
> … The targets proposed are for cumulative 5-year periods and are consistent with the zero net emissions by 2050 trajectory. To meet these targets Roy Hill will implement emission reduction initiatives to either avoid, reduce or offset emissions to achieve the interim targets.
>
> … In the event that Roy Hill is not able to meet the proposed targets, Roy Hill will offset the excess emissions by purchasing carbon credits (local or international) that meet offset integrity principles and are based on clear, enforceable and accountable methods such as ACCUs [Australian Carbon Credit Units].[7]

As discussed above, the EPA advised that emission reduction initiatives proposed by the proponent will result in reduced estimated scope 1 GHG emissions to 4.2 Mt of CO2-e over the life of the mine[8] (2021 to 2032), down from the estimate of 5.1 Mt of CO2-e listed in the proponent's ERD.[9] Figure 2 (below) shows RHIO's proposed trajectory of scope 1 GHGe for the projected LOM using these figures.



[6] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 74.
[7] RHIO, Greenhouse Gas Management Plan, Rev 4, 22 July 2021, pages 18 to 19.
[8] EPA, Response to Appeal 050/21, 4 January 2022, page 3.
[9] RHIO, Revised Proposal for the Roy Hill Iron Ore Mine – Environmental Review Document, 22 December 2020, page 371.

Figure 2 Interim Emissions Targets - Scope 1 emissions (Revised Proposal)[10]

Having considered the proponent's revised GHGMP and its objective for GHGe, the EPA recommended conditions be applied to the proposal which the EPA advised:

> … requires the proposal to achieve GHG emissions limits along an approximately linear trajectory (based on 5 yearly limits) to net zero by 2050. To provide certainty and transparency, the recommended condition is based on the proposal achieving (or bettering) emission reduction limits as proposed within the GHGMP.[11]

Through condition 9, the EPA recommended that the proponent implements the GHGMP, and that the plan is subject to five yearly reviews to support continuous improvement. Conditions relating to reporting, audits, peer reviews, and summary plans and reports are also recommended.[12]

Condition 9-4(1)(b)(iii) requires the proponent to report on GHGe offsets, which must include:

> … the type, quantity, identification or serial number, and date of retirement or cancellation of any **authorised offsets** which have been retired or cancelled and which have been used to calculate the **net GHG emissions** referred to in condition 9- 4(1)(b)(ii), including written evidence of such retirement or cancellation[13]

Current science confirms urgent reductions in GHGe are required globally

In previous appeals, we summarised the state of the current science in respect to GHGe in the context of the UNFCCC Paris Agreement. Central to the Paris Agreement is the goal of providing a global framework to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.[14] The Paris Agreement acknowledges that emissions will need to reach net zero in the second half of this century.[15]

The Paris Agreement came into effect in 2016. Since then, the IPCC has published a number of reports updating knowledge of the impacts of climate change and progress towards achieving the goal set under the Paris Agreement. These reports, which are considered in earlier appeal reports, establish the following:

- Every tonne of GHGe contributes to global warming – The Physical Science Basis Report (IPCC AR6) reaffirmed earlier findings 'that there is a near-linear relationship between cumulative anthropogenic CO_2 emissions and the global warming they cause'.[16]
- Limiting global warming to 1.5°C requires urgent reductions in emissions – the IPCC Special Report on Global Warming of 1.5°C (IPCC 1.5)[17] found that the then current (2018) pledges under the Paris Agreement (referred to as nationally determined contributions (NDCs)) were unlikely to limit global warming to 1.5°C, even if supplemented by very challenging increases in the scale and ambition of emissions reductions after 2030.[18]

[10] RHIO, Greenhouse Gas Management Plan, Rev 4, 22 July 2021, page 19.
[11] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 75.
[12] Ibid
[13] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 112.
[14] United Nations, Framework Convention on Climate Change, Adoption of the Paris Agreement, 21st Conference of the Parties, 12 December 2015, Article 2.
[15] Ibid, Article 4.
[16] IPCC, Summary for Policymakers in Climate Change 2021: The Physical Science Basis, August 2021, para D.1.1.
[17] https://www.ipcc.ch/sr15/
[18] IPCC, Summary for Policymakers in Special Report on Global Warming of 1.5°C, 2018, para D.1.

- Global warming very likely to exceed 2°C by 2100 without major reductions in emissions – in intermediate to very high emissions scenarios (i.e. no significant reductions in emissions this decade) global temperatures are very likely to be in the range of 2.1°C to 5.7°C above pre-industrial levels by 2100.[19]
- Current commitments to reduce emissions are insufficient to limit warming to 1.5°C – the UNFCCC Secretariat in October 2021 noted there is an urgent need for either a significant increase in the level of ambition of NDCs between now and 2030 or a significant overachievement of the latest NDCs, or a combination of both, in order to attain cost-optimal emission levels suggested in many of the scenarios considered by the IPCC for keeping warming well below 2°C or limiting it to 1.5°C.[20]

In April 2022, the IPCC Working Group III Sixth Assessment Report was published.[21] This Report confirms earlier elements of the Sixth Assessment Report about the need for rapid GHGe reductions this decade to limit global warming to well below 2°C and pursuing 1.5°C:

> All global modelled pathways that limit warming to 1.5°C (>50% [level of confidence]) with no or limited overshoot, and those that limit warming to 2°C (>67%) involve rapid and deep and in most cases immediate GHG emission reductions in all sectors. Modelled mitigation strategies to achieve these reductions include transitioning from fossil fuels without CCS [carbon capture and storage] to very low- or zero-carbon energy sources, such as renewables or fossil fuels with CCS, demand side measures and improving efficiency, reducing non-CO2 emissions, and deploying carbon dioxide removal (CDR) methods to counterbalance residual GHG emissions.[22]

The report states that reducing GHGe 'across the full energy sector requires major transitions, including a substantial reduction in overall fossil fuel use, the deployment of low-emission energy sources, switching to alternative energy carriers, and energy efficiency and conservation' and that 'the continued installation of unabated fossil fuel infrastructure will 'lock-in' GHG emissions.'[23]

Western Australia faces significant climate risks

The EPA acknowledged that there is an established link between GHG emissions and the risk of climate change and that climate change will impact on Western Australia's environment and environmental values.[24]

In February 2022, the IPCC published its latest report as part of AR6, relating to Climate Change Impacts, Adaptation and Vulnerability.[25] That report identifies particular risks to Western Australia from climate change, including:

- biodiversity loss is projected for more regions with increasing warming, and to be worst in northern South America, southern Africa [and] most of Australia[26]
- high confidence in anthropogenic influence on increased meteorological drought in south-western Australia[27]

[19] IPCC, Summary for Policymakers in Climate Change 2021: The Physical Science Basis, August 2021, page 13.
[20] Ibid, para 15.
[21] IPCC, Climate Change 2022: Mitigation of Climate Change, April 2022.
[22] IPCC, Climate Change 2022: Mitigation of Climate Change, Summary for Policy Makers, April 2022, Section C.2.
[23] Ibid, Section C.4.
[24] EPA, Report and Recommendations on the Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 73.
[25] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability, February 2022.
[26] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability, February 2022, page 2-6.
[27] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability, February 2022, page 4-34.

- transition or collapse of northern jarrah forests due to hotter and drier conditions with more fires, e.g. declining rainfall over the past 30 years has led to drought-induced canopy dieback across a range of forest and woodland types, and death of fire-sensitive tree species due to unprecedented wildfires[28]
- northern Jarrah forests of south-western Australia have experienced tree mortality and dieback from long term precipitation decline and acute heatwave-compounded drought[29]
- estuaries of south-western Australia, sustained warming and drying trends have caused dramatic declines in freshwater flows of up to 70% since the 1970s, and increased frequency and severity of hypersaline conditions; enhanced water column stratification and hypoxia; and reduced flushing and greater retention of nutrients.[30]

In analysis by the Department of Primary Industries and Regional Development (DPIRD), rainfall in the southwest of Western Australia is expected to decline by up to 15 per cent in a medium emissions scenario, up to 35 per cent in a high emission scenario by 2090, with streamflow decline of 24 per cent by 2030, and 45 per cent and 64 per cent for intermediate- and high-emission scenarios in 2090.[31]

In relation to drought, DPIRD advised:

> The number of dry days is likely to increase over all of WA. Agricultural drought months (defined as a month of extremely low soil moisture) are projected to increase by up to 20% over most of Australia by 2030 and up to 80% in the south-west by 2070. The projected duration and frequency of droughts in the south-west increased for all emission scenarios, with a high level of confidence in these projections.
>
> One study found that there is greater than 66% probability that drought will affect twice as much of southern WA and/or twice as often by 2030.
>
> Drought can be expected to continue to be an occasional feature of the Kimberley climate, but there is low confidence in projections of how the frequency or duration may change.[32]

More recent information published by the Department of Water and Environmental Regulation (DWER) is consistent with these findings, identifying that by 2090 under a high emissions scenario, rainfall in the south west will decline by 45 per cent.[33] The report also noted:

> With a significant part of the population living in coastal cities and towns, rising sea levels pose significant risks to Western Australia's coastal infrastructure and iconic sandy beaches. In Fremantle, coastal flooding has increased threefold (Church et al. 2006), while parts of Perth along the Swan River including Elizabeth Quay, Heirisson Island and sections of East Perth are at risk of being submerged by early next century (Department of Biodiversity, Conservation and Attractions 2019). Mandurah, Busselton, Rockingham and Bunbury are also at great risk of inundation and sea levels rise.[34]

Other changes to Western Australia's climate identified in the DWER report include:

[28] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability, February 2022, page 11-4.
[29] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability, February 2022, page 11-20.
[30] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability, February 2022, page 11-32.
[31] DPIRD, Climate projections for Western Australia, 15 April 2021 https://www.agric.wa.gov.au/climate-change/climate-projections-western-australia
[32] Ibid.
[33] DWER, Western Australian climate projections, September 2021, page 11.
[34] DWER, Western Australian climate projections, September 2021, page 12.

- extreme temperatures in all regions are very likely to increase into the future, with the number of very hot days (>40°C) projected to increase from about 1.5 to 5 days per year in Perth and from 6 to 16 days in Broome
- Western Australia can expect longer fire seasons, with about 40 per cent increase in very high fire danger days
- rainfall variability and extreme rain events are projected to become more intense, leading to more very wet and very dry years
- tropical cyclones are projected to decrease in frequency, but it is expected that a greater proportion will have higher intensity.[35]

On the basis of the current science, we find the EPA was correct to link increases in GHGe (including from this proposal) with potential impacts to Western Australia's environment.

Cumulative impacts of GHGe

This element of the appeal concerns cumulative greenhouse gas emissions, and how these were assessed by the EPA.

By their nature, GHGe add to a load of gases in the atmosphere that contribute to global warming. As noted above, the EPA's recommended condition 9-1 contemplates that the proposal will emit approximately 4.39 Mt CO2-e scope 1 emissions for the projected LOM.

In response to this ground of appeal, the EPA advised that:

> The EPA report specifically acknowledges the cumulative impacts that the proposal would contribute to, that its GHG emissions that [sic] would contribute to global emissions of GHG, and that (for the purpose of understanding an approximate contribution of this proposal to WA's scope 1 emissions) these emissions are 0.48% of the WA's GHG emissions for 2019 based on the National Greenhouse Accounts 2019 (Commonwealth Department of Industry, Science, Energy and Resources 2021).
>
> The EPA advises that in undertaking an assessment, an assessment is not able to identify and assess the specific effect that any proposal's GHG emissions will have on WA's environment, either on its own or cumulatively.
>
> The EPA's consideration of the precautionary principle for the proposal (EPA Report 1716 - Appendix C Consideration of Environmental Protection Act principles) also dealt with cumulative impacts, stating that "The EPA notes that climate change as a result of cumulative GHG emissions has the potential to cause serious damage to WA's environment. The specific impact of any single proposal's GHG emissions are not able to be known with certainty at this time. However, the EPA has not used this as a reason for postponing assessment of the proposal's contribution to the State's GHG emissions or recommending practicable conditions to reduce emissions in order to minimise the risk of environmental harm associated with climate change."[36]

The EPA acknowledged the cumulative nature of greenhouse gas emissions and climate change, and that the emissions from this proposal would add cumulatively to the problem of climate change.

The acceptability of the emissions from the proposal in the context of other emission sources in Western Australia is considered below.

[35] DWER, Western Australian climate projections, September 2021, page 9.
[36] EPA, Response to Appeal 050/21, 4 January 2022, page 5.

EPA's approach consistent with relevant policy

In response to the appellant's concern that the EPA did not properly apply its GHG Guideline and inappropriately relied on the State GHG policy for Major Projects, the EPA advised:

> The EPA did not give specific consideration or any determinative weight to the WA Greenhouse Gas Emissions Policy for Major Projects in its assessment of the proposal.
>
> The EPA advises that although the proponent's GHGMP includes reference to the WA Greenhouse Gas Emissions Policy for Major Projects, this did not constrain the EPA's assessment of the proposal. Instead, the EPA conducted the assessment against the EPA's own Environmental Factor Guideline: GHG Emissions (EPA 2020) (EPA Report 1716 section 2.5).
>
> … the EPA did have regard to the international, Australian and WA Greenhouse Gas Emissions Policy for Major Projects policies when developing its Environmental Factor Guideline: GHG Emissions (EPA 2020). No single policy was determinative on its own, however, and the EPA did not inflexibly apply the WA Greenhouse Gas Emissions Policy for Major Projects or give it determinative weight when developing its own Environmental Factor Guideline: GHG Emissions (EPA 2020).[37]

In our investigation of a previous appeal, the EPA advised that the GHG Guideline goes significantly further that the GHG Emissions Policy for Major Projects by requiring from proponents:

- credible estimates of scope 1, scope 2 and scope 3 GHG emissions (annual and total) over the life of a proposal
- a breakdown of GHG emissions by source inclusive of, but not limited to, stationary energy, fugitives, transport, and emissions associated with changes to land use; and
- projected emissions intensity (emissions per unit of production) for the proposal and benchmarking against other comparable projects.[38]

In addition, the GHG Guideline states that at a minimum, a GHGMP should outline:

- intended reductions in scope 1 emissions over the life of the proposal
- regular interim and long-term targets that reflect an incremental reduction in scope 1 emissions over the life of the proposal
- strategies which demonstrate that all reasonable and practicable measures have been applied to avoid, reduce and offset a proposal's scope 1 emissions over the life of the proposal.[39]

As noted above, it appears that the proponent's GHGMP is consistent with these requirements.

As to the appellant's concern that the EPA's placed too much emphasis on a 2050 target in the context of the need for steep declines in emissions now, this was considered in some detail in previous appeals.[40] In this case, part of the EPA's consideration was based on benchmarking of emissions from this proposal against other comparable operators. In that regard, the EPA noted that:

[37] EPA, Response to Appeal 050/21, 4 January 2022, page 6.
[38] Appeals Convenor, Report to the Minister for Environment, Waitsia Gas Project Stage 2, January 2021, pages 36-37.
[39] EPA, Environmental Factor Guideline: Greenhouse Gas Emissions, April 2020, page 5.
[40] See for example Appeals Convenor's Report, Pilbara Energy Generation Power Station, January 2021, pages 32-34.

> … the proponent's benchmarking assessment [was] that its projected 2025 scope 1 GHG emissions are currently expected to be the one of the lowest emissions intensities for iron ore projects in WA.[41]

This is based on the analysis undertaken by the proponent which suggested scope 1 GHGe from the proposal would generate 7.6 kilograms (kg) of CO_2-e per tonne of iron ore shipped, compared to 8 kg/t for BHP Mining Area C, 8.2 kg/t for Fortescue Metals Group Ltd (FMG) Solomon and BHP Jimblebar and 9 kg/t for Rio Tinto's West Angelas.[42]

Factoring in scope 2 emissions (i.e. adding 288,000 t CO_2-e)[43] to the calculations for this proposal, emissions are in the order of 12.5 kg/t. By way of comparison, FMG's 2021 Climate Change Report indicates it emitted 2.02 Mt CO_2-e against shipments of 182.3 Mt iron ore in the 2021 financial year.[44] This equates to 11.1 kg/t. Rio Tinto's Climate Change Report for 2021 states that against 3 Mt CO_2-e emissions for the year, it shipped 266.8 Mt of iron ore, equating to 11.2 kg/t.[45]

From the above, while the proponent's scope 1 emissions are (as the EPA observed) below those quoted for other operators in the Pilbara, factoring in scope 2 emissions suggests emissions are slightly higher intensity than FMG and Rio Tinto reported in 2021.

In relation to the appellant's submission that it is not for the EPA 'to balance economic and environmental considerations in the EIA process', the EPA advised:

> … that the appellant may be referring to the constraints on the EPA from considering aesthetic, cultural, economic and other social surroundings other than to the extent they directly affect or are affected by physical or biological surroundings (section 3 (2) EP Act)). This would include for example the loss that the proponent would suffer if it was unable to mine (see page 150 *Coastal Waters Alliance v EPA* (1996) 90 LGERA 136).
>
> The EPA advises it is not empowered to include in its report reference to considerations which do not have an environmental character – such as broader economic, cultural, social or political considerations pertaining to the proposal (*Conservation Council of Western Australia (Inc) v The Hon Stephen Dawson MLC*).
>
> The EPA advises it did not consider economic issues, and it did not consider the economic benefits or disbenefits of the proposal proceeding, as these considerations are outside of the assessment scope included with in the EP Act.[46]

The EPA has indicated in response to this element of the appeal that its role does not include consideration of broader economic and social matters. We discuss below the EPA advice that the scope of the decision-making role under section 45 of the EP Act is wider than the scope of the EPA's role (this refers to the final decision on whether the proposal may be implemented, and if so, the conditions to which it should be subject).

We accept the EPA's position on its role.

[41] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 74.
[42] RHIO, Revised Proposal for the Roy Hill Iron Ore Mine - Environmental Review, December 2020, Table 4-67.
[43] As noted above, it appears this figure may slightly understate average scope 2 emissions, which from Table 4-65 from the proponent's ERD, are calculated to be approximately 292,000 for the 11 years ending 30 June 2032.
[44] FMG, Climate Change Report FY21, August 2021, pages 5 and 32. Note that FMG offset 0.2 Mt CO2-e in 2021 – the intensity calculation is based on the mitigated figure.
[45] Rio Tinto, Our Approach to Climate Change 2021, August 2021, page 4.
[46] EPA, Response to Appeal 050/21, 4 January 2022, page 7.

Residual emissions will need to be met by significant reductions elsewhere

The need for reductions to counter approving increases in emissions from the current proposal appears to be accepted by the EPA:

> The EPA advises that a final decision on whether the proposal's increase in emissions is acceptable is ultimately a matter for the decision makers under section 45 of the EP Act. The scope of that decision making role is wider than the scope of the EPA's role on assessment and includes the identification of other opportunities for emission reductions elsewhere in the State to counterbalance approving new emissions (which are outside the EPA's scope for assessment of this proposal).[47]

This advice, and the EPA's advice that 'Limiting the EPA to only assess proposals against the objective of having *no* impact on the environment, at *any* time, is not consistent with the EPA's statutory role and responsibilities',[48] are taken to reflect the EPA's position that it is for the decision making authorities to make determinations on 'acceptability' under section 45 of the EP Act.

The EPA's position is in similar terms to its responses to previous appeals. In our consideration of those appeals, we concluded that the question for the Minister was whether:

> … the EPA's assessment was based on inadequate information, and in particular, whether [the EPA] ought to have had regard to how the new emissions from the proposal fit within a carbon budget or warming scenario reflected in (for example) the IPCC 1.5 Report.[49]

It is considered that if the Minister accepts the EPA's view as to its role, the question remains for the Minister and other decision makers under section 45 as to how any increase in emissions as a result of this proposal are countered by reductions elsewhere.

Consistent with our advice on the Perdaman Urea Project appeals, it may be appropriate for the EPA to consider including additional guidance when assessing proposals where GHGe are a key environmental factor to assist decision makers under section 45 with objective information on the implications of approving new sources of emissions and how such increases could be countered by other reductions or mitigations elsewhere in the economy.

Emissions reduction is open to decision makers

It follows from the above that the EPA considers that the acceptability the proposal's increase in emissions of the GHGe is a matter for the decision makers under section 45 of the EP Act. This report, and the EPA's Report 1716, provide guidance on the current state of knowledge of global warming, and that rapid and steep reductions in emissions are required this decade to limit warming to 1.5°C. Decision makers could therefore consider the acceptability of the trajectory reflected in the EPA's report and the analysis in this report that the emission reductions are less than referenced by the EPA. The decision makers may (for example) consider more ambitious trajectories as part of weighing the broader considerations reflected in the EPA's advice and the need for rapid reductions in GHGe this decade. The accuracy of the trajectory set in condition 9-1 against the total scope 1 LOM emissions referenced by the EPA in Report 1716 are considered below.

[47] EPA, Response to Appeal 050/21, 4 January 2022, page 2.
[48] EPA, Response to Appeal 050/21, 4 January 2022, page 4.
[49] Appeals Convenor, Report to the Minister for Environment, Pilbara Energy Generation Project, January 2021, page 17.

Mechanisms to review the GHGMP to ensure accuracy and reflect best practice

Condition 9-1 recommended by the EPA places a limit on emissions from the proposal for the 11 years ending 30 June 2032, with mitigation stepping up over five-yearly intervals. Under this formula, total scope 1 GHGe for the period are limited to about 4.39 Mt CO_2-e. As discussed above, this figure is in contrast to the claimed 4.2 Mt CO_2-e mitigated emissions quoted by the EPA in Report 1716. This discrepancy is in the order of 5 per cent. While this difference is not of an order that would warrant remittal to the EPA for reconsideration, we recommend below that the calculations underpinning the assessment be revisited within 12 months of any approval of the proposal through a review of the proponent's GHGMP.

We note that recommended condition 9-6 sets out the mechanisms for reviewing the GHGMP, including as and when directed to by the CEO, within the time specified by the CEO.

Recommended condition 9-7 states:

> Each revision of the **greenhouse gas management plan** referred to in condition 9-6 which is submitted to the CEO shall:
>
> 1. be consistent with the achievement of the **net GHG emissions** limits in condition 9-1 (or achievement of emission reductions beyond those required by the emission limits)[50]

The text, 'achievement of emission reductions beyond those required by the emission limits', appears to indicate that more ambitious reductions are contemplated. This is reflected in the EPA's advice in Report 1716 that:

> The EPA notes that the science and policy of GHG emissions and climate change are rapidly evolving. The EPA advises that the GHG condition framework is expected to be able to be responsive to such evolution, particularly by enabling reviews of the GHGMP to reflect any significant changes (e.g. if there are material changes to relevant State, Commonwealth or international GHG science or policy). The EPA also notes that the Minister has the ability to direct the EPA to inquire into Ministerial Statement conditions (including GHG conditions) at any time.[51]

In short, and consistent with other recent proposals, the EPA has indicated that the capacity for the CEO to trigger a review of the GHGMP at any time provides a mechanism to ensure regulation of GHGe from the proposal keep pace with 'rapidly evolving science and policy'. In addition, it is open to the Minister for Environment to request the EPA to review the conditions applying to a proposal under section 46 of the EP Act at any time.

In addition to an initial review to reconcile the figures identified in Report 1716, either of the above mechanisms also provides an avenue to ensure emissions from the proposal are consistent with industry best practice. As an example of how this is a rapidly evolving area, other iron ore miners in the Pilbara have announced ambitious 2030 GHGe targets. For example, FMG's Climate Change Report for 2021 states:

> We recognise the urgency needed to reduce emissions during this critical decade and despite our continued growth and expansion, we will reduce our net operational emissions from our FY20 baseline by at least three per cent annually and achieve carbon neutrality by 2030.[52]

[50] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 112.
[51] EPA, Revised Proposal for the Roy Hill Iron Ore Mine, Report 1716, October 2021, page 76.
[52] FMG, Climate Change Report FY21, August 2021, page 12.

In its 2020 Climate Change Report, FMG committed to 'a reduction in Scope 1 and 2 emissions from Existing Operations by 26 per cent from 2020 levels, by 2030.'[53] That commitment excluded the Iron Bridge proposal, which was included in the 2021 report commitments. We considered separately earlier in the report the GHGe intensity of the proposal against the latest information published by FMG and Rio Tinto which suggests the current proposal has slightly higher emissions per unit of production than those operators (on a scope 1 and 2 basis). Benchmarking should remain a key element of all reviews of the GHGMP, as contemplated in recommended condition 9.

It is expected that drivers for rapid reductions this decade will gather pace and should be reflected in regulatory instruments where appropriate.

On the basis of the information available on appeal, we consider that the power for the CEO to request a review of the GHGMP at any time (combined with the recommendation above that a review be conducted within 12 months of any approval of the proposal) provides sufficient assurance that GHGe from the proposal will be maintained in line with evolving science and industry best practice.

In the interests of procedural fairness, the proponent was provided the opportunity to comment on the above and was agreeable to a review of the GHGMP through condition 9-6, conducted within 12 months of any approval of the proposal.

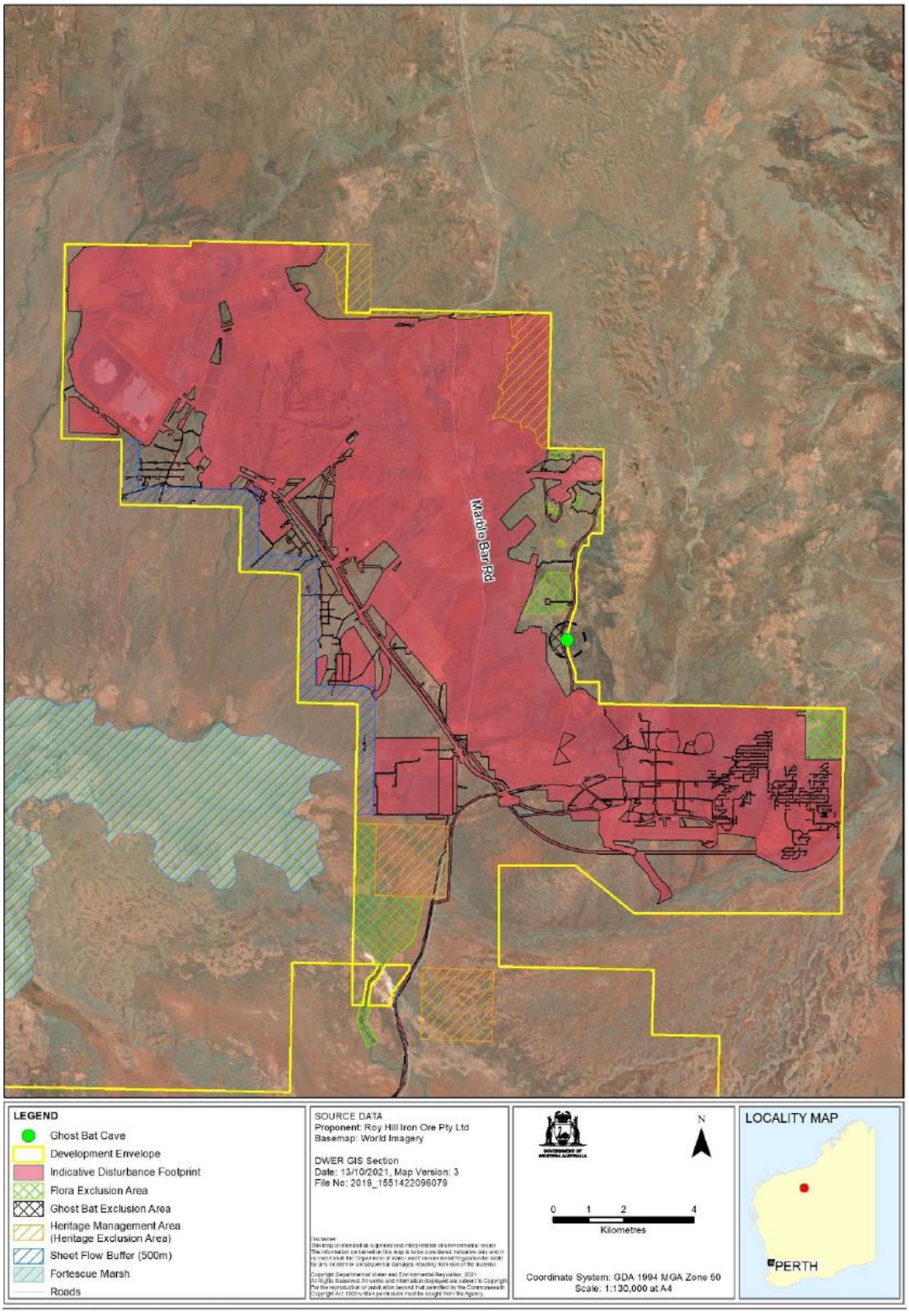
It follows from the above that we recommend that this appeal be allowed in part by amending condition 9 to require a review of the GHGMP within 12 months of any approval of the proposal under section 45 of the EP Act.

[53] FMG, Climate Change Report FY20, August 2020, page 8

4 Supporting information

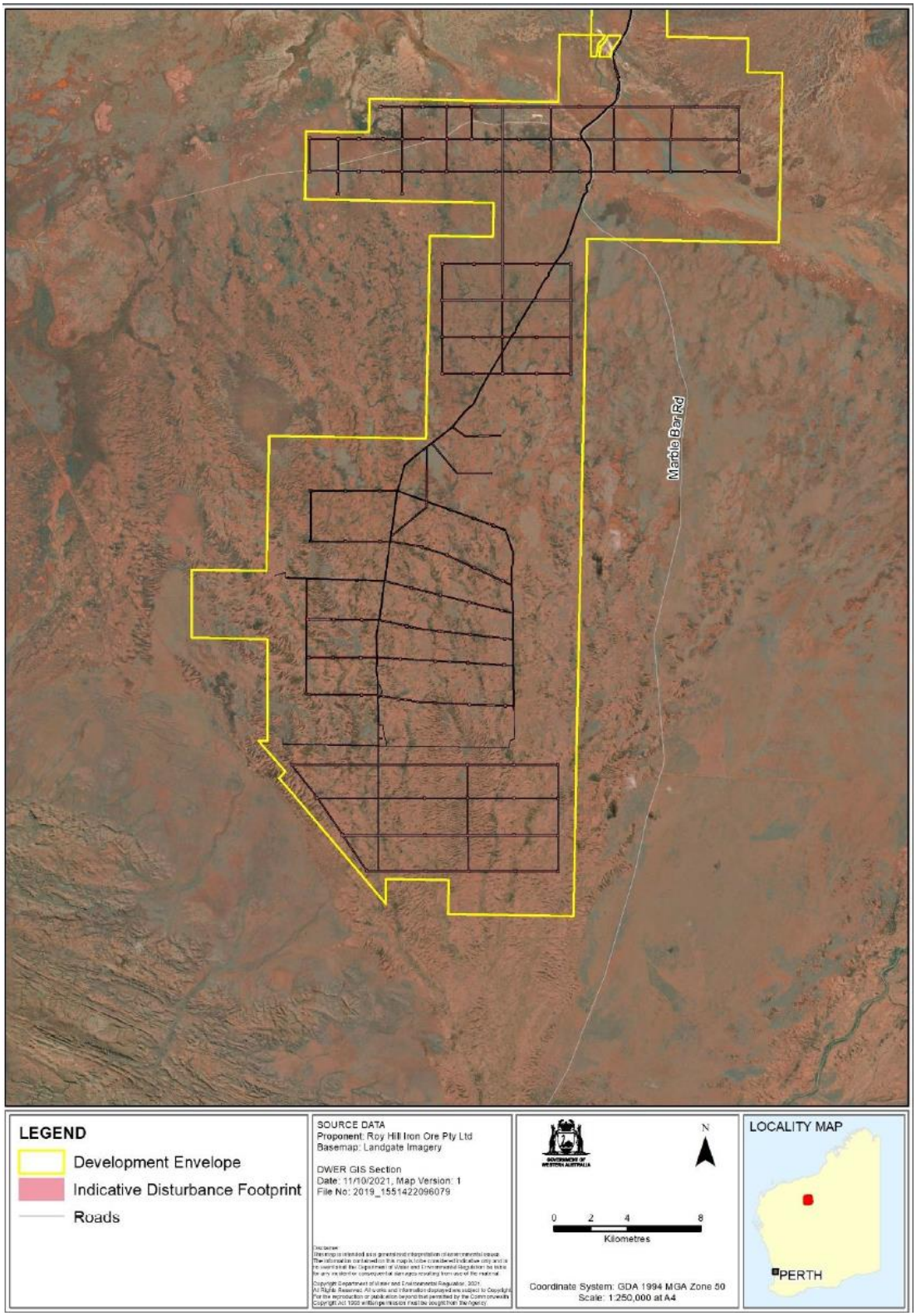
4.1 Maps

Figure 3 Development envelope (north)



(Source: EPA Report 1716)

Figure 4 Development envelope (south)



(Source: EPA Report 1716)