GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

Covalent Lithium Hydroxide Refinery

Covalent Lithium Pty Ltd

Report 1700

May 2021

This assessment report has been prepared by the Environmental Protection Authority (EPA) under s. 44 of the *Environmental Protection Act 1986.* It describes the outcomes of the EPA's assessment of the Covalent Lithium Hydroxide Refinery proposal by Covalent Lithium Pty Ltd.

This assessment report is for the Western Australian Minister for Environment and sets out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- the EPA's recommendations as to whether or not the proposal may be implemented and, if the EPA recommends that implementation be allowed, the conditions and procedures, if any, to which implementation should be subject.

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Chair

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Summary

Proposal

The proposal is to construct and operate a lithium hydroxide refinery at Lot 15 Mason Road, Kwinana within the Kwinana Industrial Area, approximately 31 kilometres south of Perth.

The proposal will process spodumene ore concentrate to produce battery grade lithium hydroxide monohydrate, primarily for use in lithium-ion batteries for electric vehicles. The proposal will produce refinery derived wastes which the proponent considers are likely to have a beneficial reuse as end products, but which in the meantime are considered to be waste products.

Mitigation hierarchy

The mitigation hierarchy is a sequence of proposed actions to reduce adverse environmental impacts. The sequence commences with avoidance, then moves to minimisation/reduction/rehabilitation, and offsets are considered as the last step in the sequence.

The proponent has considered the mitigation hierarchy in the development and assessment of its proposal, and as a result has:

- applied avoidance measures when siting the proposed refinery, including utilising cleared (or degraded) land within an industrial area
- avoided disposal of any refinery process derived waste material to landfill on the Swan Coastal Plain
- applied measures to minimise risks from the construction and operation of the refinery such as use of water carts for dust minimisation and temporary bunding for construction materials
- applied reduction measures to greenhouse gas (GHG) emissions by selection of efficient design and equipment technologies
- reduced GHG emissions to achieve net zero scope 1 emissions by 2050 along a linear trajectory from commencement of operations, including by use of offsets if continuous improvement does not achieve the trajectory
- given consideration to whether refinery process derived waste products can be avoided or reduced by considering them as beneficial reuses of waste as secondary co-products.

Assessment of key environmental factors

The EPA has identified the key environmental factors (listed below) in the course of the assessment and has assessed the likely residual impacts to these factors.

Greenhouse gas emissions

- With no mitigation:
  - scope 1 GHG emissions are estimated at 159,874 tonnes CO_2-e per annum
  - combined scope 1 and scope 2 GHG emissions are estimated at 317,449 tonnes CO_2-e per annum
  - the total estimated scope 1 GHG emissions over the 40-year life of the proposal are estimated at 6,394,960 tonnes CO_2-e.
- With proposed mitigation, implementation of a greenhouse gas management plan and implementation of the EPA's recommended conditions (condition 2):
  - scope 1 GHG emissions will be required to be net zero by 2050 and follow a linear trajectory (based on 5 yearly limits) to achieve this
  - scope 1 GHG emissions will be below 100,000 tonne CO_2-e per year within 10 years of commencement of operations, through continuous improvement or the purchase of carbon offsets
  - total scope 1 GHG emissions over 40 years are estimated to be reduced to 2,129,308 tonnes CO_2-e.
- The EPA advises that the batteries developed from the proposal may contribute to the more widespread use of renewable energy sources and electric vehicles, which is expected to reduce emissions compared to use of conventional energy sources and vehicles.

Terrestrial environmental quality

- Potential impacts to soil quality through the storage and/or disposal of waste materials and excavation of potentially contaminated soils during earthworks are unlikely to be significant provided:
  - the EPA's recommended conditions to manage potential impacts from waste and the waste management plan are implemented (conditions 1, 3, 4 and 5)
  - minimisation measures are complied with and are subject to regulation under Part V of the *Environmental Protection Act 1986*, the *Contaminated Sites Act 2003* and the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.

Holistic impact assessment

The EPA has also considered connections and interactions between relevant environmental factors to inform a holistic view of impacts to the whole environment. The EPA formed the view that the impacts would not lead to additional inconsistency with the EPA's factor objectives.

Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- residual impacts, emissions and effects in relation to the key environmental factors, separately and holistically (this has included considering cumulative

impacts of GHG emissions on the Western Australian environment, and cumulative impacts in and from the Kwinana Industrial Area)

- likely environmental outcomes (taking into account the EPA's recommended conditions), and consistency of these with the EPA's objectives for the key environmental factors
- the EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the *Environmental Protection Act 1986*.

It is the EPA's view that reasonable conditions could be imposed on the proposal to ensure its implementation is likely to be consistent with the EPA's objectives for environmental factors.

The EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.

Contents

1 Proposal

The proposal is to construct and operate a lithium hydroxide refinery at Lot 15 Mason Road, Kwinana within the Kwinana Industrial Area (KIA), approximately 31 kilometres (km) south of Perth.

The proposal will process spodumene ore concentrate, to produce battery grade Lithium Hydroxide Monohydrate, primarily for use in lithium-ion batteries for electric vehicles. The proposal will produce refinery derived wastes which the proponent considers are likely to have a beneficial reuse as end products, but which in the meantime are considered to be waste products.

The spodumene ore concentrate will be sourced from the Earl Grey Lithium Project Mt Holland Mine, located approximately 105 km south-southeast of Southern Cross in the Shire of Yilgarn. The environmental impacts of this mine were assessed by the EPA and is subject to Ministerial Statement 1118 issued on 21 November 2019.

The proponent is Covalent Lithium Pty Ltd (Covalent). The proponent referred the proposal to the EPA on 24 September 2020. On 9 February 2021, the EPA decided to assess the proposal and set the level of assessment at Referral Information, with additional information required.

The original proposal is set out in section 2.3 ‘Proposal description’ of the referral supporting report (Covalent 2020), which is available on the EPA website.

Proposal amendments

The proponent requested a change to the proposal during the assessment. The change was unlikely to significantly increase any impacts of the proposal. The EPA Chair’s notice, dated 8 April 2021, consenting to the change is available on the EPA website.

The consolidated and updated elements of the proposal which has been subject to the EPA’s assessment is included as Table 1.

Proposal alternatives

Alternatives to the proposed Kwinana refinery would result in the facility being located off-shore, with the spodumene ore from Mt Holland being exported to an international location for processing; or a ‘no-development’ approach, which would result in the resource not being developed for use in batteries.

The location of the proposal was selected by the proponent to be situated within an existing industrial area (KIA) which already consists of a wide range of industries and utility operations and is a specialist centre for chemical and resource-based processing industries. The proponent considered the location optimal when compared to alternative locations in terms of access to infrastructure, including logistics (rail, road and port), energy (natural gas and electricity), chemical reagents suppliers, and skilled labour.

The KIA includes several load out facilities outside the Port of Fremantle, which all have direct shipping access to southeast Asia, the expected primary market for the refinery products. The specific location of the proposal within the KIA was selected on a previously disturbed site subject to degraded vegetation, thereby minimising the potential disturbance and impacts to the existing environment compared to alternative locations which have good native vegetation coverage.

Table 1: Location and proposed extent of proposal elements

Proposal element	Location	Maximum extent or range
Physical elements		
Lithium refinery	Figures 1 and 2	Clearing of no more than 11.2 ha within the 76 ha development envelope.
Associated infrastructure: • processing plant • drying and storage facilities • dangerous goods storage • containment infrastructure • on-site laboratory	Figure 2	Clearing of no more than 11.2 ha within the 76 ha development envelope.
Services corridor	Figure 2	
Utilities corridor	Figure 2	
Clearing	Figure 2	No more than 11.2 ha within the 76 ha development envelope.
Laydown area	Figure 2	
Operational elements		
Processing of spodumene ore		Up to to 382,860 dry t/a.
Lithium hydroxide production		Up to 50,276 dry t/a.
Refinery Co Product		Up to 116,531 dry tonnes per annum Sodium Sulphate Anhydrous.
Refinery process derived waste volume		Up to 380,551 dry t/a De-lithiated Beta Spodumene. Up to 9,479 dry t/a Mixed Salt Material. Up to 4,394 dry t/a Polished Filter Material.
Treatment of refinery process wastewater prior to disposal to Sepia Depression Ocean Outfall Line at Cape Peron	Figure 1	Treatment of up to 252 ML/a.

Units and abbreviations
ha - hectares; ML/a - megalitres per annum; t – tonnes; t/a - tonnes per annum

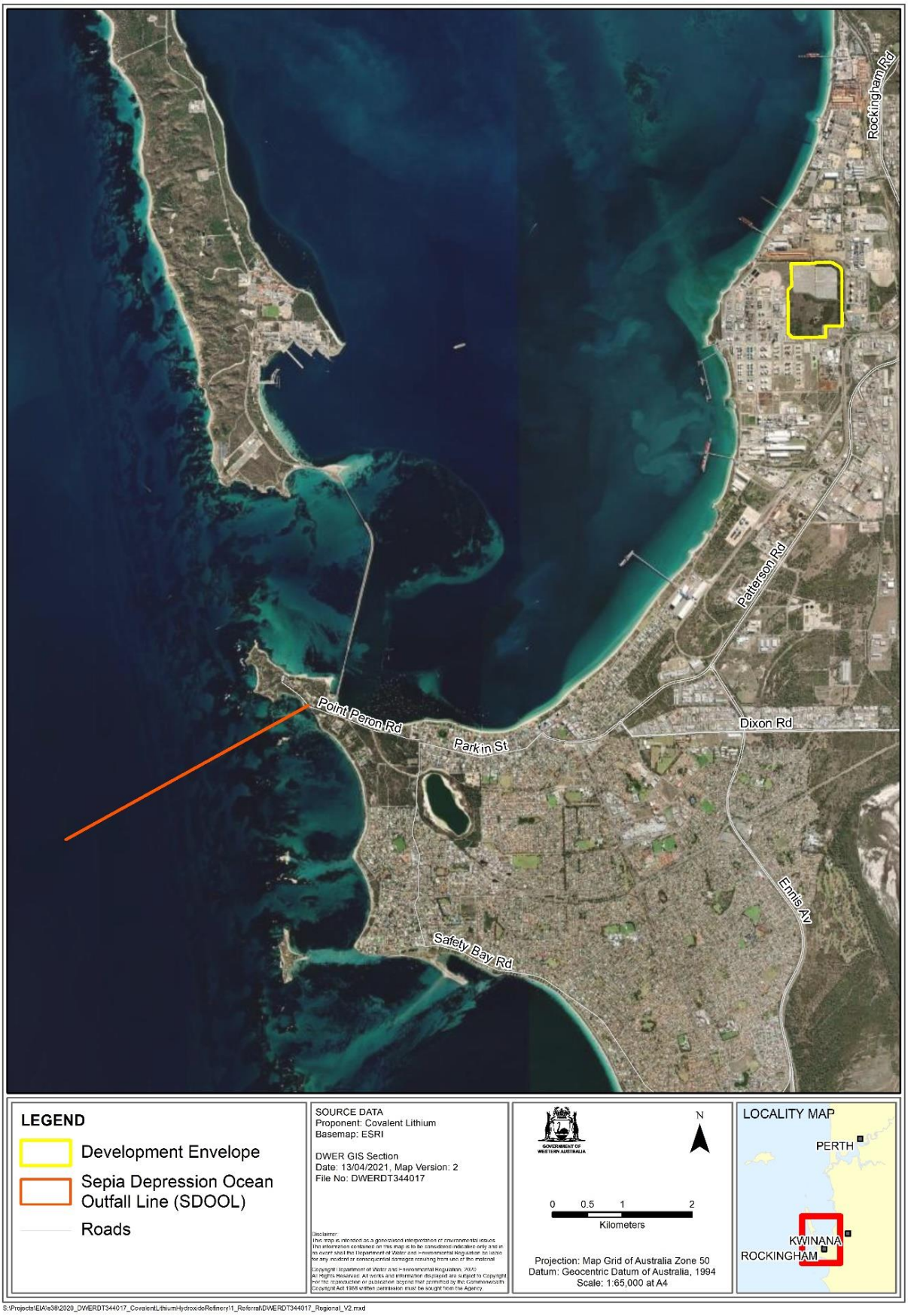

Figure 1: Project location

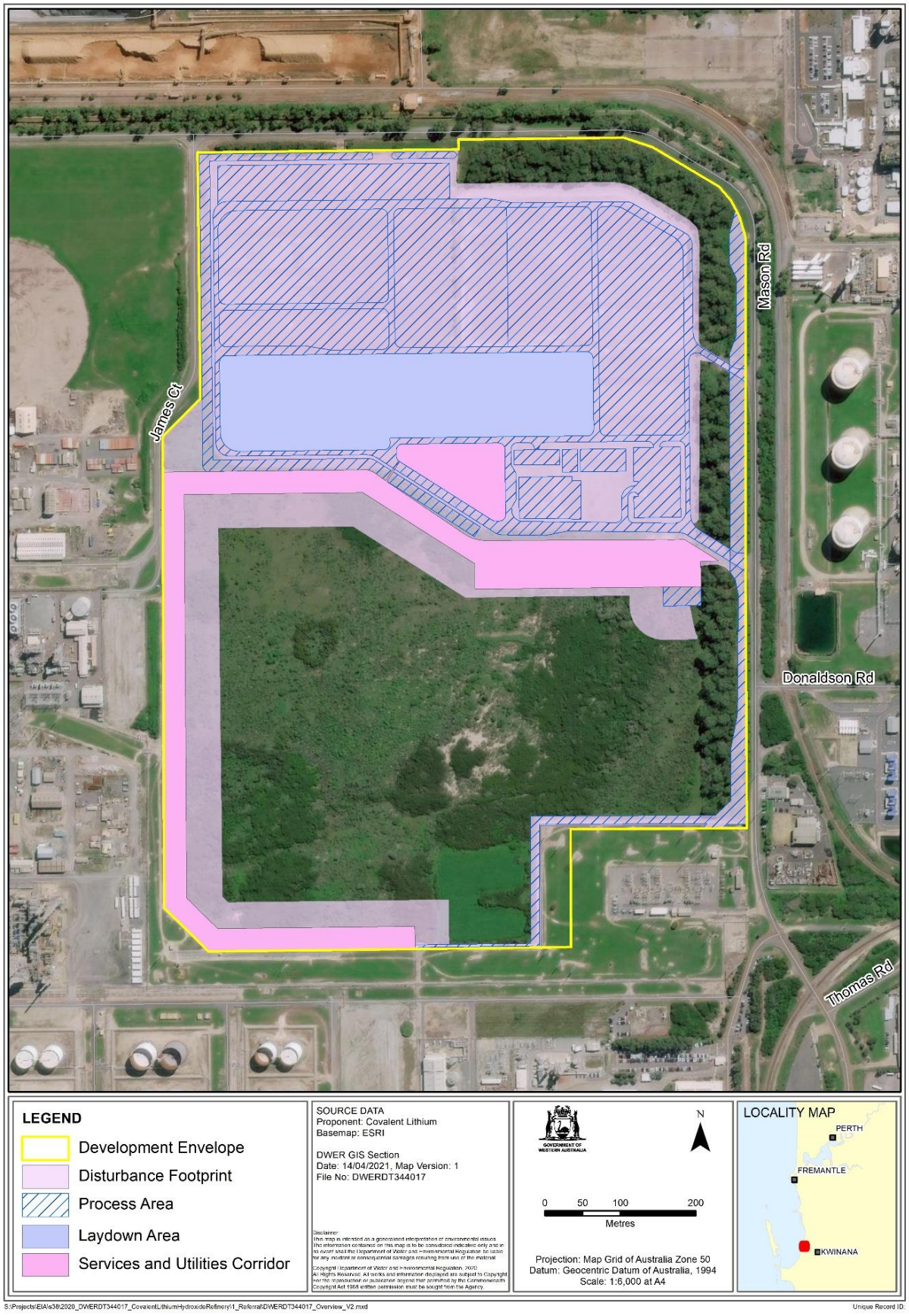

Figure 2: Development envelope and disturbance footprint

2 Assessment of key environmental factors

2.1 Greenhouse gas emissions

2.1.1 Environmental objective

The EPA's environmental objective for greenhouse gas (GHG) emissions is *to reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.*

2.1.2 Potential emissions from the proposal

The refinery will produce GHG emissions during two phases of the proposal:

1. construction – associated with combustion of diesel for stationary purposes
2. operation of the refinery – consumption of grid electricity (scope 2 emissions) and the combustion of natural gas for steam generation and calciner firing (scope 1 emissions).

The *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020a) (GHG Guideline) provides that, generally, GHG emissions from a proposal will be assessed where they exceed 100,000 tonnes of scope 1 emissions each year measured in tonnes of CO_2-e. This is currently the same as the threshold criteria for designation of a large facility under the Australian Government's *Safeguard Mechanism.*

The proposal has the potential to emit GHGs which exceed 100,000 tonnes of CO_2-e scope 1 emissions per year. The proponent has provided the following estimates of scope 1 and scope 2 GHG emissions:

- Total scope 1 GHG emissions arising from construction of the proposal is 14,163 t of CO_2-e, associated with emissions from combustion of diesel.
- Scope 1 operational emissions are 159,874 tonnes CO_2-e per annum. This represents 3.2 tonnes of CO_2-e per tonne of lithium hydroxide produced, associated with the combustion of natural gas.
- Scope 2 operational emissions are estimated at 157,575 tonnes CO_2-e per annum. This represents 3.1 tonnes of CO_2-e per tonne of lithium hydroxide produced, associated with the consumption of grid electricity.
- The estimated total scope 1 and scope 2 GHG emission arising from the operation of the proposal is 317,449 tonnes CO_2-e per annum. This represents 6.3 tonnes of CO_2-e per tonne of lithium hydroxide product produced.

Scope 3 emissions arising from the proposal are predicted to be 12,305,120 tonnes CO_2-e over the 40-year proposal life (Covalent 2020). In relation to scope 3 emissions, the EPA notes that the batteries developed as a result of the proposal may also contribute to the more widespread use of renewable energy and electric vehicles, which is expected to reduce emissions compared to the use of conventional energy sources and vehicles.

Over the 40-year life, the proposal is estimated to have a total scope 1 GHG emissions of 6,394,960 tonnes CO_2-e under worst case scenarios with no additional mitigation.

2.1.3 Consultation

The 7-day public comment period (25 November 2020 to 1 December 2020) on the referral information for the proposal raised concerns regarding the proposal's contribution to climate change from the release of GHGs.

2.1.4 Minimisation measures (including regulation by other DMAs)

The proponent has identified the following minimisation measures:

- Reducing GHG emissions though selection of efficient design and equipment technologies.
- Implementation of the *Lithium Hydroxide Refinery Project - Greenhouse Gas Management Plan* (GHGMP). The proponent submitted version 1 (September 2020) of the GHGMP with the referral. During the assessment process, the EPA encouraged the proponent to revise and improve the GHGMP. The proponent submitted a revised GHGMP (version 7 - February 2021), which the EPA has used as the basis for its assessment. Both versions of the GHGMP are available on the EPA website.
- The GHGMP (February 2021) includes:
    - commitment to achieve specific GHG emissions reduction targets over the first 10 years of operation of the refinery
    - commitment to reduce scope 1 GHG emissions to below 100,000 tonne CO_2-e per year within 10 years of commencing operation, through continuous improvement or the purchase of carbon offsets
    - support of the Western Australian Government's aspiration to achieve net zero scope 1 emissions by 2050
    - application of five-yearly targets intended to achieve net zero scope 1 GHG emissions by 2050, along a linear trajectory from commencement of operations
    - five-yearly performance and industry reviews to interrogate the GHG emissions intensity and performance of the proposal
    - five-yearly reviews and updates of the GHGMP to embed the outcomes of reviews and continuous improvement to reduce the proposal's emissions intensity.

With these mitigation measures, the proponent estimates lifetime (40 years) emissions would be reduced from 6,394,960 tonnes CO_2-e to 2,129,308 tonnes CO_2-e (Covalent 2021a).

The EPA notes that, until emissions are under 100,000 CO_2-e per year, the proponent will be subject to reporting requirements of the Clean Energy Regulator to comply with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act), and also subject to the NGER Emissions Reduction Fund Safeguard which requires

facilities whose net emissions exceed the safeguard threshold to keep emissions at or below baseline.

2.1.5 Residual impact assessment

Environmental values: There is an established link between GHG emissions and the risk of climate change. The EPA recognises that climate change will impact on Western Australia's (WA) environment and environmental values. For example, climate change has already caused a significant drying of the State's south-west, which in turn places significant additional pressures on water resources, flora and fauna, marine environmental quality, and social surroundings. The EPA therefore considers GHG emissions to be a key environmental factor in the assessment of the proposal.

Total scope 1 GHG emissions from the proposal would be 6,394,960 tonnes CO_2-e under worst case scenarios with no additional mitigation. With mitigation, the proposal will result in GHG emissions estimated at 2,129,308 t CO_2-e over 40 years.

The annual estimated Scope 1 GHG emissions (with mitigation) from the proposal would constitute approximately 0.06% of Western Australia's total emissions (based on 2018 emissions of 91.5 Mt CO_2-e) and 0.01% of Australia's total reported GHG emissions for 2018 of 537.45 Mt CO_2-e (Commonwealth of Australia 2021).

The GHG Guideline recognises that WA's GHG emissions are expected to continue to increase in the short to medium term. However, the objective of the GHG Guideline is *to reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change*.

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 (UNFCC) 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 greenhouse gas emissions are a key environmental factor, the EPA therefore usually considers a proposal's annual and total contributions to GHG emissions, but also assesses the proponent's contribution and trajectory towards this net zero by 2050 goal.

The intent of the EPA's GHG Guideline is to inform the development and assessment of proposals, not determine the outcome of the EPA's assessment. Consistent with this, the EPA assesses proposals where GHG emissions are a key environmental factor on a case-by-case basis and recognises that a flexible approach is important to drive innovation and improvement in best practice technologies.

In relation to the Covalent Lithium Hydroxide Refinery proposal, the EPA has had particular regard to: annual and total contributions to GHG emissions (see above); the emissions intensity of the proposal *(*including by considering industry benchmarking); whether the proponent has committed to achieving reduction targets over time in accordance with a linear trajectory (based on 5 yearly targets) to

achieve net zero by 2050; whether it has incorporated continual improvement; and whether it has considered offsetting emissions.

In considering these, the EPA has noted:

- the proponent's benchmarking assessment that its projected 2025 GHG emissions are currently expected to be the lowest emissions intensity for any like refinery in the world
- the proponent's commitment to delivering against (at worst) a linear trajectory (based on 5 yearly targets) of net zero greenhouse gas emissions by 2050
- the proponent's adoption of a continuous improvement approach to ensure improvement opportunities are identified and implemented every 5 years, and in particular that there is a review of best practise at the 10-year mark of operations
- the proponent's consideration of best practice design to reduce impacts
- the proponent's use of offsets to ensure a linear trajectory (based on 5 yearly targets) of net zero greenhouse gas emissions by 2050 can be achieved (if continuous improvement opportunities are not sufficient).

The GHG Guideline acknowledges GHGs from a cumulative range of sources may have an impact on WA's environment, even if the specific impact of a particular proposal's emissions may not be known with certainty. In response to this, and to minimise cumulative impacts to WA's environment, the GHG guideline therefore generally applies to proposals emitting greater than 100,000 tonnes CO_2-e per year of scope 1 emissions, so the GHG Guideline's objective to reduce emissions can be applied to those particular proposals. The EPA's consideration of the GHG Guideline in its assessment of this proposal therefore means the impact of cumulative emissions on WA's environment have been taken into account for this proposal.

2.1.6 Consideration of conditions

The EPA has considered whether the residual emissions from the proposal are consistent with the principles of the *Environmental Protection Act 1986* (EP Act) (see Appendix C) and with the EPA factor objective for GHG emissions.

In doing so, the EPA has also considered whether reasonable conditions could be imposed to reduce potential inconsistency with the EP Act principles and EPA's factor objective.

The EPA believes it is reasonable to recommend a condition which requires the proposal to achieve GHG emissions limits along a 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, rather than the approach based on targets and 10 years projections proposed in the GHGMP.

The EPA also believes it is reasonable to recommend the proponent implement the GHGMP (February 2021), provided it is subject to the emission reduction limits, and also subject to continuous improvement by going through ongoing 5 yearly reviews. Conditions relating to reporting, audits, peer reviews, and summary plans and

reports are also recommended to increase transparency of the proposal's GHG emissions and emissions intensity.

The GHG condition framework recommended by the EPA requires achievement of specific GHG emission limits but is flexible enough to be able to ensure the GHGMP include innovation and improvement in best practice technologies.

The EPA notes that GHG emissions and climate change is a rapidly moving subject area. The EPA advises the GHG condition framework is expected to be able to be responsive to this, particularly by enabling reviews of the GHGMP. for example, if there is a material risk that the emission reduction limits will not be achieved, and every 5 years following a report, audit and peer review of the proposal GHG emissions, offsets and GHG measures. The EPA also notes the Minister can direct the EPA to inquire into Ministerial Statement conditions (including GHG conditions) at any time.

The EPA believes the GHG condition framework it is recommending, combined with the Minister's powers, will be responsive enough to take account of changes in this rapidly moving subject area as well as the need for innovation and improvement in best practice technologies. The framework would also be consistent with the GHG Guideline which is based on a continuous improvement approach to emissions reduction.

The EPA has considered whether its conclusions are consistent with other recent assessments, including EPA Report 1687 and EPA Report 1686.

The EPA advises that, with the application of the recommended conditions, and the proponent's adoption of efficient technology, continuous improvement, and commitment to delivering against (at worst) a linear trajectory of net zero greenhouse gas emissions by 2050, the proposal is generally consistent with the EPA's GHG Guideline.

However, residual emissions remain estimated to add a potential 2,129,308 tonnes of CO_2-e over 40 years to WA emissions. Although this represents a significant reduction in the 6,394,960 tonnes CO_2-e tonnes which were estimated from the proposal without mitigation, whether this reduction is sufficient to minimise the risk to climate change impacts to WA's environment depends on the state of cumulative emissions (such as whether any current emission sources discontinue).

Table 2: Summary of assessment, recommended conditions and DMA regulation of greenhouse gas emissions

No.	Residual impact	Assessment finding	Recommended conditions and DMA regulation
1.	Scope 1 and scope 2 GHG emissions commence at 317,449 tonnes CO_2-e per annum. This is estimated to represent 0.34 % WA annual emissions (based on 2018 data). Scope 1 emissions are expected to commence at 159,874 tonnes CO_2-e per annum and reduce to net zero by 2050. GHG emissions contribute to climate change, which impacts on WA's environment.	2,129,308 tonnes scope 1 GHG emissions CO_2-e over 40 years The following aspects of the proposal are generally consistent with the GHG Guideline: • reduction of scope 1 emissions to net zero by 2050, and a linear trajectory (based on 5 yearly targets / projections) from commencement of operations to achieve this • continuous improvement approach • use of efficient technology • benchmarking that projected 2025 GHG emissions are expected to be the lowest emissions intensity for any like refinery in Australia.	Direct regulation through conditions 2-1 to 2-4: require achievement of and reporting on specific emissions limits. Direct regulation through conditions 2-5 to 2-8: require implementation and review of the GHGMP. Complementary reporting requirements to the Clean Energy Regulator to comply with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act). Complementary application of the NGER Emissions Reduction Fund Safeguard which requires facilities whose net emissions exceed the safeguard threshold to keep emissions at or below baseline.

2.2 Terrestrial environmental quality

2.2.1 Environmental objective

The EPA's environmental objective for terrestrial environmental quality is *to maintain the quality of land and soils so that environmental values are protected* (EPA 2016).

2.2.2 Proposal context: existing environment

The development envelope for the refinery is relatively flat and low lying, at approximately 3 to 5 metres (m) above sea level and has been selected to be within an existing industrial area, on a previously disturbed site.

The Department of Water and Environmental Regulation (DWER) Contaminated Sites classification for the site is '*Remediated for restricted use*', meaning the development envelope is deemed suitable for industrial use subject to the implementation of an existing Construction and Operational Environmental Management Plan ((Golder and Associates 2012), or a replacement to this approved by DWER.

The Mt Holland mine site (the subject of Ministerial Statement 1118), which is proposed to receive refinery process derived waste unless a secondary beneficial use is approved, is currently an abandoned mine site which will be significantly further disturbed when operations recommence and any waste is disposed to it.

2.2.3 Surveys and baseline data

The proponent engaged Golder to conduct soil investigations at the refinery site to assess site conditions (Covalent 2020). The investigations were consistent with quality assurance and quality control guidance outlined in the contaminated sites guidelines (DER 2014) (Golder 2019) and results were consistent the existing Department of Water and Environmental Regulation (DWER) Contaminated Sites classification for the site of "*Remediated for restricted use*.

2.2.4 Potential impacts from the proposal

The proposal has the potential to impact on terrestrial environmental quality from:

- wastewater emissions to the marine environment
- operational emissions from the refinery
- excavation of potentially contaminated soils during construction, which could potentially cause mobilisation of contaminants
- waste outputs to be generated by the refinery – projected solid refinery waste outputs are estimated to total approximately 510,955 tonnes per annum, and will include:
    - De-lithiated Beta Spodumene (DBS)
    - Polished Filter Material (PFM)
    - Mixed Salts Material (MSM)
    - Sodium Sulphate Anhydrous (SSA)

Regulation of wastewater emissions

The EPA notes the proponent proposes to manage treated refinery process wastewater from the onsite wastewater treatment via discharge to the Water Corporation's Sepia Depression Ocean Outfall Line (SDOOL) at Cape Peron (Figure 1). The EPA notes this discharge of water from the SDOOL would be regulated under Ministerial Statement 665. The proponent has confirmed that the Water Corporation is prepared to receive this wastewater via an 'Effluent Services Agreement'.

Taking this into account, the EPA did not further consider wastewater from the refinery in its assessment of key environmental factors.

Regulation of operational emissions from the refinery

The operation of the refinery will require approval under a licence under Part V of the EP Act. The Part V Licence will regulate emissions to land, groundwater or surface water at the refinery site. The DWER has confirmed that emissions from refinery activities including onsite processing and the storage and handling of waste will be regulated and managed under this instrument to minimise pollution and environmental harm as far as reasonably practicable and meet the same principles of the EP Act and on that basis the EPA is satisfied.

Taking this into account, the EPA did not further consider emissions from the refinery in its assessment of key environmental factors.

2.2.5 Consultation

During the 7-day public consultation on the referral, concerns were raised regarding waste impacting on the environment and groundwater.

2.2.6 Avoidance measures

The proponent has committed to avoiding the disposal of any refinery process derived waste material to landfill on the Swan Coastal Plain.

2.2.7 Minimisation measures (including regulation by other DMAs)

Construction impacts

The proponent has proposed measures to manage construction impacts including use of dust carts to minimise dust and bunding of construction materials.

The DWER Contaminated Sites classification for the site is '*Remediated for restricted use'*, meaning the development envelope is deemed suitable for industrial use, subject to the implementation of an approved Construction and Operational Environmental Management Plan (CEMP).

The EPA understands the CEMP will be required by DWER as part of the proponent seeking a works approval for construction. The CEMP will ensure appropriate measures are in place to manage the potential impacts associated with the disturbance of any contaminated soil or dewatering required for construction.

Covalent have stated they will be seeking an amendment to the 'Restricted Use' classification of the site under the *Contaminated Sites Act 2003*. The EPA notes that if this occurs, it will include an update to any approved Construction and Operational Environmental Management Plan.

Construction of the proposal will be regulated through the implementation of a works approval issued under Part V of the EP Act. This approval will regulate the emissions and discharged during the construction phase.

Commercial re-use of refinery process derived waste products as secondary refinery co-product outputs

The proponent is actively seeking potential commercial reuse options for waste products as secondary refinery co-product outputs. The proponent is considering opportunities for secondary refinery co-product outputs to be used in a variety of applications, including cement and construction aggregate. They are an active partner in research in this area with the Future Battery Industries Cooperative Research Centre.

The location of the proposal within the KIA is suitable to establish new industrial symbiosis pathways for its secondary refinery co-product outputs with neighbouring industries. Industrial symbiosis and efficient access to shared infrastructure are two significant strategic advantages that the KIA is internationally recognised for, and Covalent has in part selected the KIA for establishing its proposal for these reasons (GHD 2020).

The proposal has identified primary, alternative and long-term waste management options for the waste output streams from the refinery (Covalent 2021b, GHD 2020).

DBS, PFM, MSM

The proponent is exploring options for beneficial reuse of DBS in concrete, mortar and related applications as a construction materials component. Covalent has also undertaken an extensive body of test work and trials to build a database of applications for DBS.

While these options are being established, the refinery derived wastes including DBS, PFM and MSM are proposed to be sent back to the Mt Holland minesite for disposal.

Sodium Sulphate Anhydr*ous (SSA)*

SSA is used in a number of chemical manufacturing processes and the proponent is proposing to sell the SSA to overseas customers.

Non-process waste

All non-processing waste such as general site waste, packaging and municipal waste will be collected and directed to recycling facilities or landfill disposal.

Regulation of waste disposal at mine site – Part V of the EP Act

The waste material originated from the Mt Holland mine site (separately assessed by the EPA and subject to Ministerial Statement 1118). The proponent has determined that from the characterisation work it has undertaken at the mine site, the material when neutralised through treatment after going through processing would be inert for most parameters and can be safely disposed of at the minesite in suitably constructed and approved waste facilities which are appropriately designed for this purpose.

Transport of refinery derived waste to the Mt Holland minesite would occur in sealed containers, thereby removing the risk of product loss and/or dust emissions from the material.

Until options for secondary refinery co-product outputs are confirmed and approved, the DWER has confirmed it would manage and regulate the disposal of the waste at the Mt Holland mine as a category 5 waste according to the Environmental Protection Regulations 1987, which includes:

Processing or beneficiation of metallic or non-metallic ore: premises on which –

- *(a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; or*
- *(b) tailings from metallic or non-metallic ore are reprocessed; or*
- *(c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.*

The DWER has confirmed that waste disposal at the minesite could be regulated and managed under this instrument to minimise pollution and environmental harm as far as reasonably practicable and meet the same principles of the EP Act.

Regulation of waste disposal at minesite – *Mining Act 1978*

The Department of Mines, Industry Regulation and Safety (DMIRS) would also regulate and manage the disposal of the refinery derived waste at the Mt Holland mine site in appropriately designed waste disposal locations under the *Mining Act 1978* (Mining Act) through the implementation of the Mining Proposal and Mine Closure Plan. The objective of these documents is to ensure the operation is constructed, operated and closed to ensure the final landform is safe, stable and non-polluting.

2.2.8 Residual impact assessment

Environmental values: The EPA considers that the key existing terrestrial environmental quality element for this assessment is soil quality. The EPA recognises the fundamental link between soil quality and the protection of ecological and social values that good soil quality supports.

Soil quality at the refinery during construction

As noted above, the development envelope is deemed suitable for industrial use, subject to the implementation of an approved Construction and Operational Environmental Management Plan.

The EPA notes the DWER Contaminated Sites classification for the site (*Remediated for restricted use*) takes into account cumulative impacts in the area.

The Construction and Operational Environmental Management Plan will be required by DWER as part of the works approval to ensure impacts associated with potential disturbance of contaminated soils and dewatering are appropriately managed.

Taking this into account, the EPA is satisfied soil quality at the refinery is likely to be able to be managed so it is consistent with the EPA's objective for terrestrial environmental quality.

Soil quality affected by dealings with non process and process derived waste

The EPA notes there is a risk of residual impact to soil quality due to the storage, transport and disposal of waste outputs. Different risks arise whether the waste is transported to and disposed of at the minesite, or whether it can be used as secondary refinery co-products.

The EPA notes the risk or residual impacts from storage and disposal of waste at the mine-site are likely to be able to managed to meet the EPA's objectives by regulation under Part V of the EP Act, and the Mining Act.

The EPA notes the risk or residual impacts from transport of the waste are likely to be able to be managed to meet the EPA's objectives by being done in sealed containers and subject to the Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007.

The EPA notes there is a risk of impacts to storage of waste products at the refinery. The EPA believes this can be managed to be consistent with its objective for terrestrial environmental quality by limiting the time waste products are allowed to be stored on site to 12 months (condition 4).

The EPA has not been able to assess the risks from dealings with waste as secondary refinery co-products, as there is no firm proposal to do this at this stage. The EPA has proposed conditions to ensure the outcome of any proposal is consistent with the EPA's objectives, and that approval and a waste management plan is needed for secondary refinery co-product proposals. However, the EPA notes that use of secondary refinery co-products, rather than waste disposal, is consistent with EPA's principle of waste minimisation.

Summary of likely residual impacts of the proposal

The EPA has assessed the likely residual impacts of the proposal on terrestrial environmental quality to be:

1. Unlikely to be significant from waste storage, transport or disposal, provided the proposed avoidance and minimisation measures are implemented and regulation under complementary regulation occurs.
2. Unable to be assessed for secondary refinery co-products at this stage, but likely to be consistent with the EPA's principle for waste minimisation, and likely to be able to be regulated by requiring approval of any proposal for beneficial reuse of secondary refinery co-products.
3. Unlikely to be significant from the excavation of contaminated soils during construction provided the CEMP is implemented and regulated under complimentary legislation.

2.2.9 Consideration of conditions

The EPA has considered whether the residual impacts are consistent with the EP Act principles and the EPA environmental objective for the terrestrial environmental quality factor. In doing so, the EPA has also considered whether reasonable conditions could be imposed to reduce potential inconsistency with the EP Act principles and EPA's factor objective.

The EPA has recommended a condition be imposed to ensure the environmental outcome that there is no contamination of soil through the storage, transport and disposal of waste outputs or refinery process derived co-products as a result of the implementation of the proposal.

The EPA has also recommended a condition be imposed to ensure that refinery derived wastes are appropriately disposed of at an approved storage facility at the minesite or reused in accordance with the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) 'Waste Hierarchy'.

The EPA has considered whether its conclusions are consistent with other recent assessments, including EPA Report 1618.

Table 3: Summary of assessment, recommended conditions and DMA regulation of terrestrial environmental quality

No.	Residual impact	Assessment finding	Recommended conditions and DMA regulation
1.	Potential impacts to soil quality through the storage, transport or disposal of waste materials.	Potential impacts to soil likely to be able to be managed to be consistent with the EPA's objective provided: • Environmental outcome of no contamination of soil is imposed. • Waste is required to be removed the	Direct regulation through conditions 3, 4 and 5. Part V of the EP Act • Construction and operation of refinery and mine site facilities classified as prescribed premises. • Regulation of emissions and discharges

No.	Residual impact	Assessment finding	Recommended conditions and DMA regulation
		refinery within 12 months. • Waste Management Plan which applies waste management hierarchy under the WARR Act required to be implemented. The Plan is also to require application of the EP Act principle of waste minimisation. • There is complementary regulation of storage, transport or disposal under other legislation.	associated with the storage and handling of waste products on site. • Regulation of waste disposal at mine site through Part V licence. *Mining Act 1978* • Regulation of waste disposal at mines site through a mining proposal. Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007.
2.	Potential impacts to soil quality through the potential beneficial reuse as secondary co-products.	Unable to be assessed for secondary refinery co-products at this stage, but likely to be consistent with the EPA's principle for waste minimisation. Likely to be able to regulated by requiring prior approval of Waste Management Plan prior to any beneficial reuse of secondary refinery co-products	Direct regulation through conditions 3, 4 and 5.
3.	Excavation of potentially contaminated soils during earthworks and mobilisation of contaminants.	Potential impacts to soil likely to be able to be managed to meet the EPA's objective provided there is regulation under other statutory decision making processes	Regulation under Part V of the EP Act during construction and operation. Regulation under the *Contaminated Sites Act 2003* (Construction and Operations Environmental Management Plan).

3 Holistic assessment

While the EPA assessed the impacts of the proposal against the key environmental factors individually, given the link between GHG emissions, air quality, flora and vegetation, terrestrial fauna, inland waters, terrestrial environmental quality and social surroundings, the EPA also considered connections and interactions between parts of the environment to inform a holistic view of impacts to the whole environment.

The EPA's evaluation of other environmental factors (that is, those which were not considered key factors for assessment) is included in Appendix D. The below diagram summarises the key relationships and links between the key environmental factors and the other environmental factors, to inform the EPA's holistic assessment.

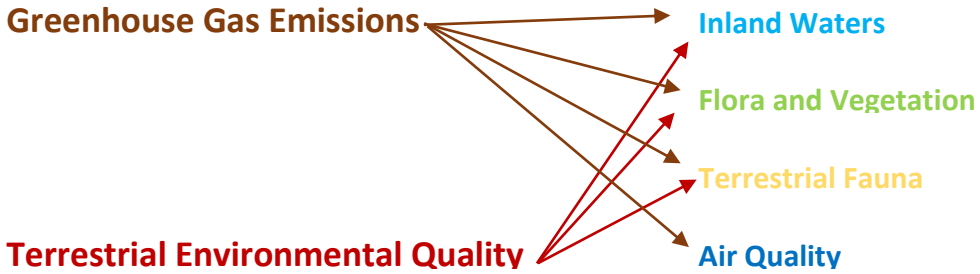

Figure 3: Intrinsic interactions between environmental factors

The proposal has been sited within an existing industrial zone, to reduce the clearing of native vegetation and terrestrial fauna habitat, and to maximise the use of the existing hardstand. Of the 11.2 ha of vegetation to be cleared, surveys found this vegetation to be in degraded to completely degraded condition. Clearing is proposed to include removal of two potential black cockatoo habitat trees, but these have been assessed to have low foraging value and are not in use for roosting or breeding. There are no creeks or waterways intercepted by the proposal. The proposal impacts to inland waters, flora and vegetation and terrestrial fauna are therefore unlikely to be significant, even when considered holistically with the key environmental factors of greenhouse gas emissions and terrestrial environmental quality.

The EPA has considered the connectivity between the key environmental factor of greenhouse gas emissions and other environmental factors of air quality and inland waters. There is an established link between GHG emissions and the risk of climate change, however, it is not possible to directly link emissions from a single proposal to specific environmental harm or impacts. The lack of a direct link did not however prevent the EPA from assessing and recommending conditions that reduce the GHG emissions from the proposal, hence minimising impacts on other environmental factors.

The EPA has also considered the connection between the key environmental factor of terrestrial environmental quality and other environmental factors of air quality, flora and vegetation, terrestrial fauna and inland water. The EPA notes that construction

impacts and waste disposal impacts relates closely to other environmental factors through potential contamination of soils and transfer of contaminants through food chains, water or air.

The EPA considers that the regulation of construction impacts will adequately mitigate potential impacts to other environmental factors, and the holistic connections between factors.

The EPA also considers that by managing its waste materials as proposed (including avoiding disposal of refinery process derived waste on the Swan Coastal Plain and seeking beneficial use of refinery secondary co-products) the proponent has adequately reduced potential impacts to other environmental factors, and the holistic connections between factors. The EPA has also recommended conditions on waste disposal and reuse (conditions 3, 4 and 5) which would ensure the waste is disposed in accordance to meet the EPA's objectives for terrestrial environmental quality and other environmental factors.

4 Conclusions and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values likely to be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- EPA's confidence in the proponent's proposed mitigation measures
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment and
- EP Act principles.

It is the EPA's view that reasonable conditions could be imposed on the proposal to ensure it is implemented to be consistent with the EPA's objectives for the key environmental factors.

Given the above, the EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.

5 Other advice

The EPA may, if it sees fit, include other information, advice or recommendations relevant to the environment in its Assessment reports, even if that information has not been taken into account by the EPA in its assessment of a proposal.

The EPA provides the following information for consideration by the Minister:

- Wesfarmers Limited has announced its intention to reduce to zero its net Scope 1 and 2 emissions by 2050. Wesfarmers Chemicals, Energy & Fertilisers Ltd (WesCEF) is a 50/50 joint venture participant in the proponent.
- SociedadQuimica y Minera de Chile S.A, also a 50/50 joint venture participant in the proponent, has announced its intention to become carbon neutral in lithium products by 2030.
- The proponent expects the refinery to have the lowest initial scope 1 and 2 emissions intensity for a spodumene refinery in the world.
- The proponent has committed to disposing of process derived waste to the mine and not on the Swan Coastal Plain.
- A Construction and Operation Environmental Management Plan will be required to manage construction related impacts by the Contaminated Sites Regulations and by the works approval issued under Part V of the EP Act.
- The proponent is an active partner in research in this area with the Future Battery Minerals Cooperative Research Centre.

Appendix A: Recommended conditions

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

COVALENT LITHIUM HYDROXIDE REFINERY

Proposal: The proposal is for the construction and operation of a lithium hydroxide refinery at Lot 15 Mason Road, Kwinana, within the Kwinana Industrial Area. The proposal will process spodumene ore concentrate, sourced from the Earl Grey Lithium Project at Mt Holland, to produce battery grade Lithium Hydroxide Monohydrate, primarily for use in lithium-ion batteries for electric vehicles.

Proponent: Covalent Lithium Pty Ltd
Australian Company Number 623 090 139

Proponent Address: Level 3 109 St Georges Terrace Perth WA 6000

Assessment Number: 2282

Report of the Environmental Protection Authority: 1700

Pursuant to section 45 of the *Environmental Protection Act 1986,* it has been agreed that the proposal described in section 2.3 of the proponent's Environmental Referral Supporting Report (November 2020), as amended by the change to proposal approved under section 43A on (8 April 2021) may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

1 Limitations and extent of proposal

When implementing the proposal, the proponent shall ensure the proposal does not exceed the following extents:

Proposal element	Location	Limitation or maximum extent
Physical elements		
Development envelope	Figures 1 and 2	76 ha
Development footprint	Figure 2	Up to 44.5 ha

Direct disturbance of native vegetation (disturbance footprint)		Up to 11.2 ha
Operational elements		
Processing of spodumene ore		Up to 382,860 dry tonnes per annum
Lithium hydroxide production		Up to 50,276 dry tonnes per annum
Wastewater disposal via Sepia Depression Ocean Outfall Line at Cape Peron	Figure 1	Up to 252 Megalitres per annum
Refinery Co Product		Up to 116,531 dry tonnes per annum Sodium Sulphate Anhydrous
Refinery process derived waste volume		Up to 380,551 dry tonnes per annum De-lithiated Beta Spodumene. Up to 9,479 dry tonnes per annum Mixed Salt Material. Up to 4,394 dry tonnes per annum Polished Filter Material.
Timing elements		
Project life		40 years

2 Greenhouse gas management

2-1 The proponent shall take measures to ensure that **net greenhouse gas (GHG) emissions** do not exceed:

(1) The **first emissions limit**, for the period between the **commencement date** and 30 June 2025;

(2) 799,370 tCO_2-e for the period between 1 July 2025 and 30 June 2030;

(3) 649,685 tCO_2-e for the period between 1 July 2030 and 30 June 2035;

(4) 500,000 tCO_2-e for the period between 1 July 2035 and 30 June 2040;

(5) 333,335 tCO_2-e for the period between 1 July 2040 and 30 June 2045;

(6) 166,665 tCO_2-e for the period between 1 July 2045 and 30 June 2050; and

(7) zero (0) tCO_2-e per annum for every five (5) year period from 1 July 2050 onwards.

2-2 The proponent shall submit a report to the CEO each year by 31 March, commencing on the first 31 March after the date of this Statement specifying for the previous financial year:

(1) the quantity of **proposal GHG emissions** and lithium hydroxide produced; and

(2) the **emissions intensity** for the proposal.

2-3 The proponent shall submit to the CEO by 31 March 2026, and every fifth 31 March thereafter:

(1) a report specifying:

(a) for each of the preceding five (5) financial years, the matters referred to in conditions 2-2(1) and (2);

(b) for the period specified in conditions 2-1(1), (2), (3), (4), (5), (6) or (7) that ended on 30 June of the year before the report is due:

(i) the quantity of **proposal GHG emissions**;

(ii) the **net GHG emissions**;

(iii) 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 2-3(1)(b)(ii), including written evidence of such retirement or cancellation; and

(iv) any measures that have been implemented to avoid or reduce **proposal GHG emissions**.

(2) an audit and peer review of the report required by condition 2-3(1), carried out by an independent person or independent persons with suitable technical experience dealing with the suitability of the methodology used to determine the matters set out in the report, whether the report is accurate and whether the report is supported by credible evidence. This report is to be made publicly available as required by condition 2-8.

2-4 A summary document comprising of a summary plan and progress statement outlining key information from the **greenhouse gas management plan** (and reports to that time) must be provided within six (6) months and every five (5) years thereafter as per condition 2-3 and also if the **greenhouse gas management plan** is revised under condition 2-6. The summary, where feasible must include:

(a) a graphical comparison of scope 1 emission reduction commitments in the **greenhouse gas management plan** with 'actual' emissions for compliance periods;

(b) proposal performance against benchmarking for comparable facilities;

(c) **emissions intensity**;

(d) a summary of emission reduction measures undertaken by the proponent; and

(e) a clear statement as to whether emission limits to date have been achieved, and whether future emission limits are likely to be achieved.

2-5 Subject to, and consistently with condition 2-1, the proponent shall implement:

(1) **greenhouse gas management plan** revision 7 dated February 2021; or

(2) if that plan has been revised, the latest version of the plan that the CEO has confirmed in writing meets the requirements of condition 2-7.

2-6 The proponent:

(1) may revise the **greenhouse gas management plan** at any time;

(2) must revise the **greenhouse gas management plan** if there is a change to the proposal which means there is a material risk that condition 2-1 will not be achieved;

(3) must revise the **greenhouse gas management plan** at least every five (5) years to align with the five (5) yearly reporting requirements specified in condition 2-3; and

(4) must revise the **greenhouse gas management plan** as and when directed to by the CEO, within the time specified by the CEO.

2-7 Each revision of the **greenhouse gas management plan** referred to in condition 2-6 which is submitted to the CEO shall:

(1) be consistent with the achievement of the emission limits in condition 2-1 (or achievement of emission reductions beyond those required by the emission limits);

(2) specify the estimated **proposal GHG emissions** and **emissions intensity** for the remainder of the life of the proposal;

(3) include comparison of the estimated **proposal GHG emissions** and **emissions intensity** for the remainder of the life of the proposal against other comparable projects;

(4) identify and describe any measures that the proponent will implement to avoid, reduce and/or offset **proposal GHG emissions** or reduce the **emissions intensity** of the proposal; and

(5) provide for a program for the future review of the plan to:

(a) assess the effectiveness of measures referred to in condition 2-7(4); and

(b) identify and describe options for future measures that the proponent may or could implement to avoid, reduce and/or offset **proposal GHG emissions** or reduce the **emissions intensity** of the proposal.

2-8 The proponent shall make all **greenhouse gas management plans** and all reports required under this condition 2 (including audits and peer reviews, summary plans and progress statements) publicly available on the proponent's website within the timeframes specified below for the life of the proposal, or in any other manner or time specified by the CEO:

(1) the **greenhouse gas management plan** referred to in condition 2-5(1) within two (2) weeks of the issue of the Statement;

(2) the report referred to in condition 2-2 within two (2) weeks of the report being accepted by notice in writing by the CEO;

(3) the reports, audits and peer reviews, summary plans and progress statements referred to conditions 2-3 and 2-4 within two (2) weeks of the relevant reports, summary statements and progress reports being accepted by notice in writing by the CEO; and

(4) any revised **greenhouse gas management plan** referred to in condition 2-6 within two (2) weeks of receiving confirmation from the CEO as referred in condition 2-5(2).

3 Terrestrial environmental quality outcomes

3-1 The proponent shall ensure the following outcomes are achieved:

(1) no contamination of soil through the handling and transport of refinery **process derived waste** as a result of the implementation of the proposal; and

(2) no disposal of any refinery **process derived waste** to landfill on the Swan Coastal Plain.

4 Waste management

4-1 During operation of the Covalent Lithium Hydroxide Refinery, the proponent shall, within 12 months of any production of refinery process derived waste, or ensuring storage does not exceed the capacity of any dedicated storage infrastructure, remove that waste to:

(1) an approved waste facility located at the Earl Grey Lithium - Mt Holland Mine; or

(2) an alternate location, as agreed by the CEO in writing, where the proponent has identified the **process derived waste** as a secondary co-product which is able to be reused for a beneficial purpose.

4-2 Within three (3) years of the publication of this Statement or six (6) months prior to the reuse of secondary refinery co-products, whichever is sooner or as otherwise agreed by the CEO, the proponent shall prepare and submit a waste management plan to the CEO. The waste management plan shall:

(1) when implemented, substantiate and ensure that condition 4-1 is being met;

(2) specify targets to be met, and detail actions undertaken to meet those targets by applying principles of Waste Management Hierarchy under the *Waste Avoidance and Resource Recovery Act 2007*, including Avoidance, Recovery and Disposal;

(3) quantify the outcome/s of applying the principle of the Recovery (re-use, reprocessing, recycling) under the Waste Avoidance and Resource Recovery Act 2007; and

(4) provide evidence that all reasonable and practicable measures have been undertaken to avoid and recover waste.

5 Environmental management plan: monitoring and adaptive management

5-1 The proponent must prepare and submit to the CEO an Environmental Management Plan to substantiate that the outcomes of condition 3-1 will be met.

The Plan must include:

(1) threshold criteria that provide a limit beyond which the environmental outcomes are not achieved;

(2) trigger criteria that will provide an early warning that the environmental outcomes are not likely to be met;

(3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure threshold and

trigger criteria. Include methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;

(4) baseline data;

(5) data collection and analysis methodologies;

(6) adaptive management methodology; and

(7) contingency measures which will be implemented if threshold or trigger criteria are met.

5-2 The exceedance of a threshold criteria (regardless of whether threshold contingency measures have been or are being implemented), and/or failure to comply with the requirements of the environmental management plan represents a non-compliance with these conditions.

5-3 The proponent must not commence operations until the CEO has confirmed in writing that the environmental management plan satisfies the requirements of this condition.

6 Environmental management plans: general provisions

6-1 After receiving notice in writing from the CEO that the management plans in conditions 2, 4 and 5 satisfy the requirements of conditions 2, 4 and 5 respectively, the proponent shall:

(1) implement the proposal in accordance with the management plans; and

(2) continue to implement the management plans until the CEO has confirmed by notice in writing that it has been demonstrated that the outcomes specified in conditions 3-1 and 4-1 have been met and therefore the implementation of the actions in the management plans are no longer required.

6-2 The proponent may review and revise the management plans.

6-3 The proponent shall review and revise the management plans as and when directed by the CEO.

6-4 The proponent shall implement the latest version of the management plans, which the CEO has confirmed by notice in writing, satisfies the requirements of conditions 4 and 5 respectively.

6-5 Despite condition 6-4, but subject to conditions 6-6 and 6-7, the proponent may implement minor revisions to a management plan if the revisions will not result in a new or increased adverse impacts to the environment or result in a risk to the achievement of the management plan limits, outcomes or objectives.

6-6 If the proponent is to implement minor revisions to a management plan under condition 6-5, the proponent must provide the CEO with the following at least twenty (20) business days before it implements the revisions:

(a) revised management plan clearly showing the minor revisions;

(b) explanation of reasons for the minor revisions; and

(c) explanation of why the minor revisions will not result in a new or increased adverse impacts to the environment or result in a risk to the achievement of the management plan limits, outcomes or objectives.

6-7 The proponent must cease to implement any revisions which the CEO notifies the proponent (at any time) in writing may not be implemented.

6-8 Management Plans must be provided in electronic form suitable for publication on the EPA's website within ten (10) business days of endorsement, and also be published on the proponent's website.

7 Contact details

7-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

8 Time limit for proposal implementation

8-1 The proponent shall not commence implementation of the proposal after five (5) years from the date of this Statement, and any commencement, prior to this date, must be substantial.

8-2 Any commencement of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

9 Compliance and exceedance reporting

9-1 The proponent shall prepare and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 9-5, or prior to implementation of the proposal, whichever is sooner.

9-2 The Compliance Assessment Plan shall indicate:

(1) the frequency of compliance reporting;

(2) the approach and timing of compliance assessments;

(3) the retention of compliance assessments;

(4) the method of reporting of potential non-compliances and corrective actions taken;

(5) the table of contents of Compliance Assessment Reports; and

(6) public availability of Compliance Assessment Reports.

9-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 9-2, the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 9-1.

9-4 The proponent must provide an annual Compliance Assessment Report to the CEO for the purpose of determining whether the implementation conditions are being complied with.

9-5 The first annual Compliance Assessment Report must be submitted within twelve months of the issuing of this statement commencing on the first 31 March after the date of this statement, and subsequent Compliance Assessment Reports must be submitted annually from that date, unless a different date is approved by the CEO.

9-6 Each annual Compliance Assessment Report must be endorsed by the proponent's Chief Executive Officer and must:

(1) state whether each condition of this Statement has been complied with;

(2) provide evidence to substantiate statements of compliance, or details of where there has been a non-compliance and describe corrective and preventative actions taken; and

(3) be provided in a form suitable for publication on the EPA website.

9-7 If the proponent becomes aware a limit, outcome or threshold criteria contained in these conditions, or a management plan required in these conditions, has, or is likely to be exceeded, the proponent must:

(a) report this to the CEO within seven (7) days;

(b) implement contingency measures;

(c) investigate the cause of the exceedance;

(d) investigate environmental impacts of the exceedance;

(e) propose rectification measures;

(f) propose measures to ensure no further impact as a result of the exceedance; and

(g) provide a further report to the CEO within twenty-one (21) days of the original report, detailing the measures required under this condition.

10 Public availability of data

10-1 Subject to condition 5-1, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal, the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

10-2 If any data referred to in condition 10-1 contains particulars of:

(a) a secret formula or process; or

(b) confidential commercially sensitive information,

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

Table 1: Abbreviations and definitions

Acronym or abbreviation	Definition or term
Authorised offsets	Units representing GHG emissions issued under one of the following schemes and cancelled or retired in accordance with any rules applicable at the relevant time governing the cancellation or retiring of units of that kind: (a) Australian Carbon Credit Units issued under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth); (b) Verified Emission Reductions issued under the Gold Standard program; (c) Verified Carbon Units issued under the Verified Carbon Standard program; or (d) other offset units that the CEO has notified the proponent in writing meet integrity principles and are based on clear, enforceable and accountable methods.

CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his/her delegate.
Commencement date	The date on which a licence under Part V of the *Environmental Protection Act 1986* is granted for the operation of the lithium hydroxide refinery that is the subject of this proposal.
Emissions intensity	**Proposal GHG emissions** per tonne of lithium hydroxide produced.
First emissions limit	The limit on**net GHG Emissions** for the period between the **commencement date** and 30 June 2025 calculated as follows: • 159,874 divided by 365 multiplied by the number of days in the 2020–21 financial year that are on or after the **commencement date** • plus 159,874 divided by 365 multiplied by the number of days in the 2021–22 financial year that are on or after the **commencement date** • plus 159,874 divided by 365 multiplied by the number of days in the 2022–23 financial year that are on or after the **commencement date** • plus 159,874 divided by 365 multiplied by the number of days in the 2023–24 financial year that are on or after the **commencement date** • plus 159,874 divided by 365 multiplied by the number of days in the 2024–25 financial year that are on or after the **commencement date**.
GHG emissions	Greenhouse gas emissions expressed in tonnes of carbon dioxide equivalent (CO2-e) as calculated in accordance with the definition of 'carbon dioxide equivalence' in section 7 of the *National Greenhouse and Energy Reporting Act 2007* (Cth), or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the CEO.
Greenhouse gas or GHG	Has the meaning given by section 7A of the *National Greenhouse and Energy Reporting Act 2007* (Cth) or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the CEO.

Greenhouse gas management plan	*Greenhouse Gas Management Plan – Lithium Hydroxide Refinery Project* Version 7 dated February 2021 or subsequent versions of the plan that the CEO has confirmed in writing meets the requirements of condition 2-7.
Hectares	ha
Net GHG emissions	Proposal scope 1 GHG emissions for a period less any reduction in GHG emissions represented by the cancellation or retirement of authorised offsets which: (a) were cancelled or retired between the first day of the period until 1 March in the year after the period has ended; (b) have been identified in the report for that period as required by condition 2-3(1)(b)(iii); (c) have not been identified as cancelled or retired in the report for that period as required by condition 2-3(1)(b)(iii); (d) have not been used to offset GHG emissions other than proposal GHG emissions; and (e) were not generated by avoiding proposal GHG emissions.
Process derived waste	A by-product material produced through the refining process which is surplus to any specific customer demand and is not used as a recognised commodity or material within an established commercial application.
Proposal GHG emissions	GHG emissions released to the atmosphere as a direct result of an activity or series of activities that comprise/s or form/s part of the proposal.
tCO_2-e	Tonnes of carbon dioxide equivalent. A metric used to compare emissions from various greenhouse gases by converting amounts of other gases to the equivalent amount of CO_2 based on their Global Warming Potential.

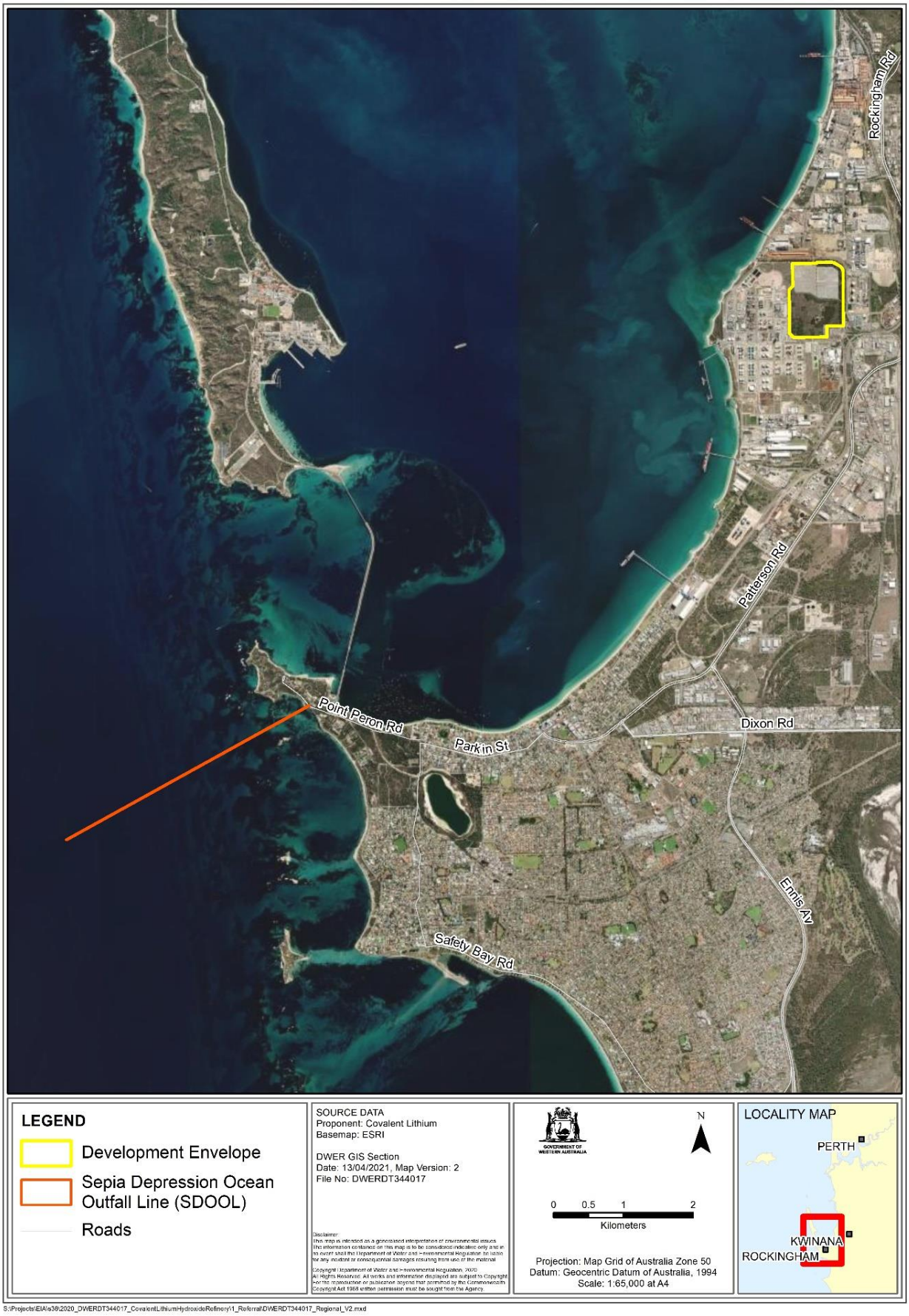

Figure 1: Project location

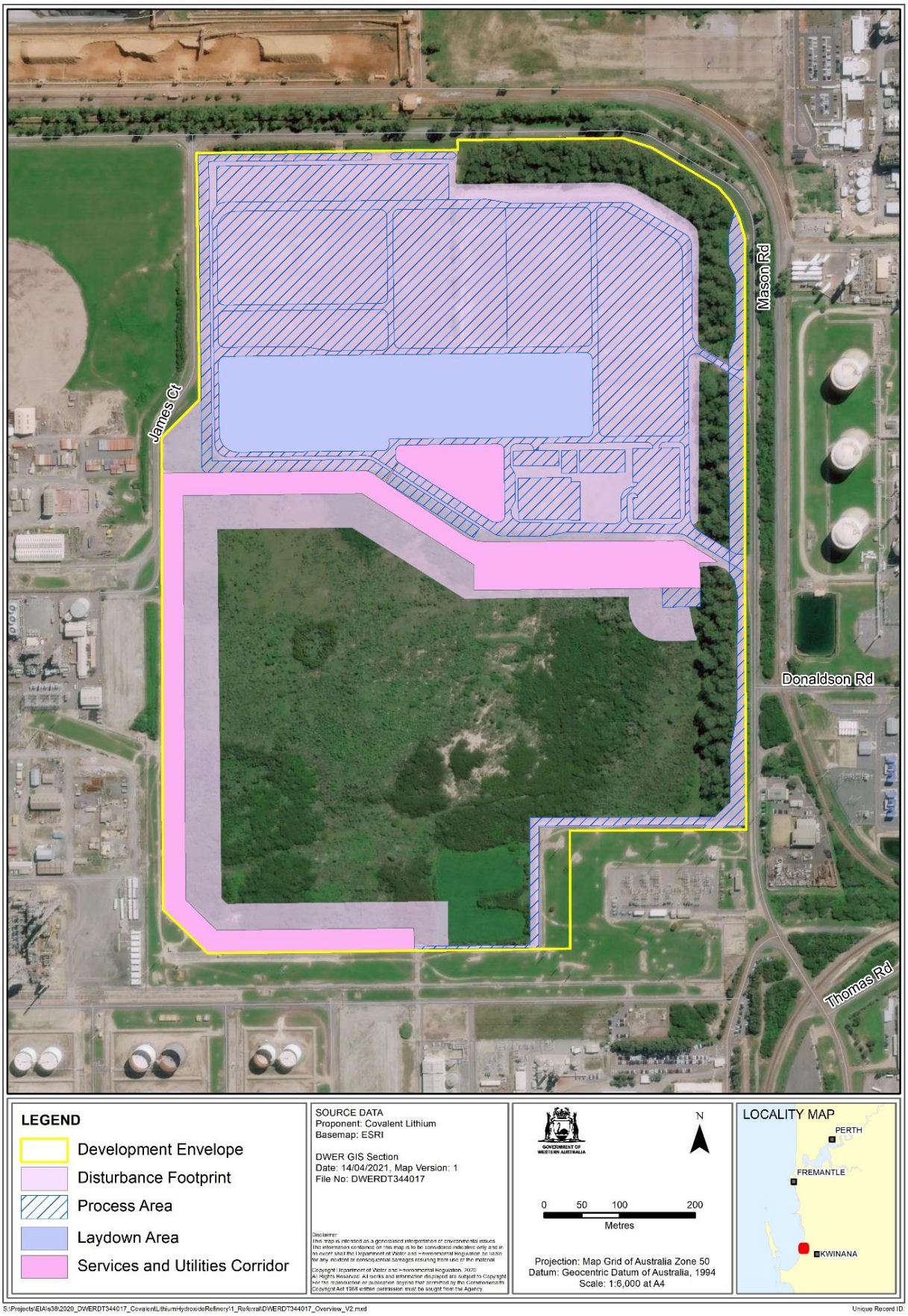

Figure 2: Development envelope and disturbance footprint

Schedule 1

All coordinates are in metres, listed in Map Grid of Australia Zone 51 (MGA Zone 51), datum of Geocentric Datum of Australia 1994 (GDA94).

Coordinates defining the development envelope are held by the Department of Water and Environmental Regulation, Document Reference Number 2021 – DWERDT370213.

Notes

The following notes are provided for information and do not form part of the implementation conditions of the Statement:

- The EPA notes that many of the potential emissions and discharges associated with the proposal will be regulated under Part V of the *Environmental Protection Act 1986* via the implementation of a licence. This includes the storage of process derived waste which is expected to be far less than 12 months prior to removal off site. The Department of Water and Environmental Regulation will assess the emissions and discharges in detail, and mitigation and monitoring conditions are expected to be applied to the proposal.

Appendix B: Decision making authorities

Section 45(1) of the *Environmental Protection Act 1986* requires the Minister for Environment to consult with decision-making authorities (DMAs), and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following DMAs have been identified:

Decision-Making Authority	Legislation (and approval)
1. Minister for Environment	*Environmental Protection Act 1986* (Part IV approval)
2. Minister for Planning	Metropolitan Scheme Amendment
3. Chief Dangerous Goods Officer Department of Mines, Industry Regulation and Safety	*Dangerous Goods Safety Act 2004* (Dangerous goods licence)
4. Chief Executive Officer City of Kwinana	*Planning and Development Act 2005* *Local Government Act 1995* (Development approval and scheme amendment) *Health Act 1911* (Permit for treatment of sewage)
5. Chief Executive Officer Department of Water and Environmental Regulation	*Environmental Protection Act 1986* (Works approval and licence)

Note: In this instance, agreement is only required with DMA 1-2, these DMAs are Ministers.

Appendix C: Consideration of Environmental Protection Act principles

EP Act Principle	Consideration
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by –* *a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *b) an assessment of the risk-weighted consequences of various options.*	The EPA notes that climate change as a result of cumulative greenhouse gas (GHG) emissions has the potential to cause serious damage to Western Australia's environment. The specific impacts 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. The EPA notes the proposal will result in 2,129,308 tonnes of CO_2-e over 40 years. The proponent has committed to following a linear trajectory to net zero emissions by 2050 consistent with the Paris Agreement and IPCC 1.5 report, and to use offsets should these targets not be met. The EPA has recommended conditions to ensure these limits are met. The EPA has also recommended conditions to ensure other measures related to key environmental factors are implemented: condition 2-5 requires the implementation of the greenhouse gas management plan (GHGMP) to ensure the proponent continues to review emissions and implement continuous improvement to reduce emissions; and condition 4 which enables the proponent to continue to investigate whether waste products can instead be used as secondary coproducts, and so avoid impacts from waste disposal.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	The EPA has noted that GHG emissions pose a risk to future generations, however, also notes that the proponent has committed to following a linear trajectory to net zero emissions by 2050 consistent with the Paris Agreement and IPCC 1.5 report, and to use offsets should these targets

EP Act Principle	Consideration
	not be met by continuous improvement. The EPA has recommended conditions to ensure this. The EPA also notes that waste products pose a risk to future generations. The EPA has recommended conditions to allow the proponent to continue to investigate whether waste products can instead be used as secondary coproducts, and, if this is not possible, to ensure the risk waste products to future generations is minimised regardless.
3. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	In considering this principle, the EPA notes that the proponent proposes to minimise waste streams through implementation of management actions. The proponent is also continuing to investigate potential sale of secondary coproducts. The EPA has had regard to this principle during the assessment of the proposal and has recommended conditions which allow the proponent to continue to investigate whether waste products can instead be used as secondary coproducts, and, if this is not possible, to apply the waste mitigation hierarchy under the *Waste Avoidance and Resource Recovery Act 2007* and the *Environmental Protection Act 1986* principle of waste minimisation.

Appendix D: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Land			
Flora and vegetation	Clearing of native vegetation	**Public comments** • The submitter questioned whether native vegetation clearing would cause further isolation of the environment in the area, causing dangerous crossings for animals. • The submitter questioned why native flora was being cleared in 2020. • The submitter raised concern over the ability to comment, lobby or advocate when the EPA deliberately withholds all vegetation data. • The submitter raised concerns regarding marine flora of Cockburn which is highly threatened by industrial and urban waste into surrounding waters.	The area was surveyed in 2019 (GHD) and found to be in degraded or completely degraded condition due to a long history of clearing and associated disturbance. There were also no State listed priority ecological communities, threatened or priority flora known to occur within the development envelope. The proposal would not impact any marine flora beyond that already authorised through Ministerial Statement 665. The EPA requires proponents to prepare Index of Biodiversity Survey for Assessments (IBSA) data packages to accompany biodiversity survey reports used to support assessments. IBSA consolidates this data and provides a platform to make it publicly available online. Accordingly, the EPA did not consider the factor flora and vegetation to be a key environmental factor at the conclusion of its assessment.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Terrestrial fauna	Potential habitat for Carnaby's black cockatoo and forest red-tailed black cockatoo.	**Public comments** • The submitter raised concern regarding three species of threatened and endangered black cockatoos. The submitter raised that approval of the proposal would mean the permanent loss of foraging habitat and an unspecified amount of future breeding habitat trees and the lack of clarity in the referral around number of trees that would be removed. • The submitter raised that the threatened species habitat assessment (GHD 2019d) was contradictory to the referral supporting document which stated there were no Matters of National Environmental Significance (MNES) within or immediately adjacent to the proposal development envelope. • The submitter raised the issues of cumulative impacts when considering the impact of clearing on black cockatoos.	The proponent confirmed that the number of potential habitat tress that would be removed would be limited to two trees. The proponent outlined that the trees were determined to not have been actively used by cockatoos for breeding or roosting purposes. The proponent considered that the foraging habitat is of low value. The EPA notes that two potential habitat trees would be removed, and the trees are not being actively used for breeding or roosting habitat for black cockatoo species. The EPA notes that the vegetation has been subject to historical disturbance and is in a degraded to completely degraded condition. Accordingly, the EPA did not consider the factor terrestrial fauna to be a key environmental factor at the conclusion of its assessment.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Water			
Inland waters	Accidental release of environmentally hazardous materials during storage and handling resulting in contamination of land and stormwater runoff.	**Public comments** • The submitter raised the concern that the project would produce large volumes of toxic wastewater and hazardous waste. • Concern over spills and waste impact on the environment and groundwater (possibly leading into marine impacts).	The EPA notes that there are no direct discharges to groundwater from the proposal and wastewater would be discharged to Water Corporation managed facilities. The proponent has confirmed that the Water Corporation is prepared to receive this wastewater via an 'Effluent Services Agreement"' Any spills on site would be regulated and managed in accordance with requirements under Part V of the *Environmental Protection Act 1986* (EP Act), Department of Mines, Industry Regulation and Safety regulations (dangerous goods) and planning requirements. Accordingly, the EPA did not consider the factor inland waters to be a key environmental factor at the conclusion of its assessment.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Air			
Air quality	• Emission of air pollutants during construction. • Processing of spodumene ore concentrate, resulting in the emission of air pollutants.	**Public comments** • The submitter raised concern over further air pollution in Kwinana and surroundings, in an area already highly polluted.	The EPA has characterised the potentially harmful emissions and the pathways by which they could be released to air and has summarised that they would be: direct emissions to air from the refinery; and emissions during clearing and construction activities. The *National Environment Protection Measures* (NEPMs) provide the basis for managing and protecting air quality in the region and emissions to air are regulated by the *Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999* (EPP) and Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992. Air quality modelling has indicated that emissions from the proposal will remain under the NEPM criteria for cumulative emissions (background plus proposal emissions) for all modelled air quality parameters ($PM_{10,}$ NO_2, SO_2 and CO) with the majority of modelled parameters not exceeding 24% of the criteria. Modelling has also indicated that emissions from the proposal will meet the requirements of the Kwinana EPP. The EPA notes that the construction of the refinery would require a works approval, and

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			operation of the refinery would require a licence to be issued under Part V of the EP Act. Accordingly, the EPA did not consider the factor air quality to be a key environmental factor at the conclusion of its assessment.
People			
Social surroundings	• Noise emissions impacts to nearby sensitive receptors associated with operation. • Dust released during construction and operation.	**Public comments** There were no concerns raised on social surroundings.	Noise emissions from the proposal would comply with and are required to comply with existing Environmental Protection (Noise) Regulations 1997. Emissions of dust are below the air quality criteria mentioned above. The site is a brownfields site and does not contain listed heritage sites. DWER Industry Regulation have provided advice that noise emissions can be regulated under Part V of the EP Act. The proponent will be required to obtain an Environmental Protection Licence and air quality will undergo further assessment. Accordingly, the EPA did not consider the factor Social Surroundings to be a key environmental factor at the conclusion of its assessment.

Appendix E: Relevant policy, guidance and procedures

The EPA had particular regard to the policies, guidelines and procedures listed below in the assessment of the proposal.

- *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020)
- *Environmental Factor Guideline – Terrestrial Environmental Quality* (EPA 2016)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014)
- State of Western Australia 2016, *Western Australia Government Gazette, No. 223*, *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures,* 13 December 2016.

Appendix F: Assessment timeline

Date	Progress stages	Time (weeks)
9 February 2021	EPA decided to assess – level of assessment set	
19 February 2021	Request for Additional Information	
31 March 2021	EPA received final information for assessment	6
31 March 2021	EPA accepted Additional Information	1 day
22 April 2021	EPA board completed its assessment	3
26 May 2021	EPA provided report to the Minister for Environment	5
31 May 2021	EPA report published	3 days
14 June 2021	Close of appeals period	2

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the Environmental Protection Authority (EPA) decides to assess the proposal and records the level of assessment.

In this case, the EPA met its timeline objective to complete its assessment and provide a report to the Minister.

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