Report and recommendations of the Environmental Protection Authority

Lake Way Sulphate of Potash Project

Piper Preston Pty Ltd

Report 1699

January 2021

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
18/12/2019	EPA decided to assess – level of assessment set	
14/05/2020	EPA approved Environmental Scoping Document	21
03/11/2020	EPA accepted Environmental Review Document	25
10/12/2020	EPA board considered assessment	5
27/01/2021	EPA provided report to the Minister for Environment	7
01/02/2021	EPA report published	3 days
15/02/2021	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.

Prof Matthew Tonts
Chair

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Summary

This document is an assessment report for Western Australia's Minister for Environment. It describes the outcomes of an Environmental Protection Authority (EPA) environmental impact assessment of the Lake Way Sulphate of Potash Project (the proposal), located 25 kilometres south of Wiluna in the Mid-west region of Western Australia. The proponent is Piper Preston Pty Ltd, a wholly-owned subsidiary of Salt Lake Potash Limited.

Proposal

The proposal is to produce sulphate of potash (potassium sulphate) though the abstraction of sulphate rich brines found in the paleochannel aquifer underlying Lake Way to produce approximately 260 kilo tonnes per annum product.

The proposal includes the establishment and operation of evaporation ponds, brine abstraction infrastructure including trenches and paleochannel production bores, brine transport infrastructure including brine pumps and pipework, access roads and miscellaneous supporting infrastructure, and excess salt disposal areas.

This proposal extends the lifespan of infrastructure currently in place but not formally assessed under the Lake Way Demonstration Plant Project from demonstration to long-term operations. The proposal includes modifications to the process plant that will allow for increased production capacity up to 260 kilo tonnes per annum.

Background and Context

The proponent referred the proposal to the EPA on 18 September 2019. On 18 December 2019 the EPA decided to assess the proposal and set the level of assessment at Environmental Review – No Public Review. The EPA approved the Environmental Scoping Document for the proposal on 14 May 2020.

Key Environmental Factors and Relevant Principles

The EPA identified the following key environmental factors during the course of its assessment:

Inland Waters – Abstraction of brine would lead to drawdown of groundwater and removal of surface waters, while placement of infrastructure would redirect natural flows. Storage of waste salts on the playa surface have the potential to impact surface water quality.

Flora and Vegetation – Clearing would reduce the abundance of *Tecticornia* plants and associated vegetation units containing priority flora, while drawdown may indirectly affect this biota.

Terrestrial Fauna – Clearing may directly impact terrestrial fauna and reduce the habitat available to conservation significant species. Noise may deter fauna from using habitat surrounding the proposal. Indirect impacts to hydrological regimes may reduce habitat available for aquatic invertebrates.

- **Social Surroundings** – Disturbance of vegetation and playa surface has the potential to impact known or unknown heritage sites on the playa surface. Changes to surface water and groundwater regimes could change the values of cultural sites by impacting vegetation quality. There is potential for the proposal to restrict access for cultural sites and activities.

In identifying the key environmental factors, the EPA had regard to the object and principles set out in s. 4A of the *Environmental Protection Act 1986*. The EPA considered that the following principles were particularly relevant to this assessment:

1. **Precautionary principle** – risk based assessment of the likelihood and consequences of potential environmental impacts to the species, ecosystems and resources of Lake Way will enable the avoidance of significant irreversible harm to the environment.
2. **Principle of intergenerational equity** – maintenance of the species and ecosystems at Lake Way, and prudent use of its resources, will ensure they remain for the use and enjoyment of future generations.
3. **Principle of the conservation of biological diversity and ecological integrity** – Lake Way supports a diverse array of *Tecticornia* species, some of which may be new to science. Listed fauna may occur in the local area and the lake may form an important ecological resource for aquatic invertebrates and water birds, particularly after flooding events. These organisms are likely to rely on the integrity of the local environment for their continued existence at Lake Way.

Conclusion

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

- impacts to all the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- relevant EP Act principles and the EPA's objectives for the key environmental factors
- EPA's view that the impacts on the key environmental factors, considered both separately and cumulatively, are manageable provided the recommended conditions are imposed.

Recommendations

Having assessed the proposal, the EPA recommends that the proposal may be implemented subject to conditions.

The EPA recommends that the Minister for Environment notes:

1. The proposal assessed is for the development of the Lake Way Sulphate of Potash Project to produce sulphate of potash through the abstraction, evaporation and processing of potassium and sulphate rich brines found at Lake Way, located 25 kilometres south of Wiluna.

2. The key environmental factors identified by the EPA in the course of its assessment are Inland Waters, Flora and Vegetation, Terrestrial Fauna and Social Surroundings, are set out in section 4 of this report.
3. The EPA has recommended that the proposal may be implemented, provided that implementation is carried out in accordance with the recommended conditions and procedures set out in Appendix 3. Matters addressed in the conditions include:
    a) control of the proposal summarised in Schedule 1 through the proposal implementation limits in condition 1 of the Recommended Environmental Conditions (Appendix 3)
    b) limits to groundwater drawdown to the extent predicted in the proponent's Environmental Review Document (condition 6-1).
    c) limits to clearing within restricted vegetation units to the extent predicted in the proponent's Environmental Review Document (condition 7-1)
    d) limits on disturbance to significant or potentially significant flora species to the extent predicted in the proponent's Environmental Review Document (condition 7-1)
    e) avoidance of direct disturbance of restricted terrestrial fauna habitat types and known locations of short range endemic species (condition 8-1)
    f) limits to direct impacts on aquatic invertebrate habitat, to changes to surface water flows, and to groundwater drawdown impacts (condition 9)
    g) preparation and implementation of environmental management plans to minimise impacts to flora, vegetation and fauna, with particular regard to *Tecticornia* taxa, vertebrate terrestrial fauna, and aquatic invertebrate fauna (condition 7-2, conditions 8-2, and condition 9-2)
    h) ongoing consultation with native title holders for the Wiluna People Native Title determination area (condition 10).
4. Other advice set out in section 6, within which the EPA considers that all future proposals impacting salt lakes in the arid interior of Western Australia need to assess potential regional and cumulative impacts to this environment.

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1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the outcomes of the EPA's environmental impact assessment of the Lake Way Sulphate of Potash Project (the proposal). The proponent for the proposal is Piper Preston Pty Ltd, a wholly-owned subsidiary of Salt Lake Potash Limited (abbreviated in this report as SO4).

The proposal is to produce sulphate of potash (potassium sulphate) though the abstraction of sulphate rich brines found in the paleochannel aquifer underlying Lake Way to produce approximately 260 kilo tonnes per annum product.

The proposal includes the establishment and operation of evaporation ponds, brine abstraction infrastructure including trenches and paleochannel production bores, brine transport infrastructure including brine pumps and pipework, access roads and miscellaneous supporting infrastructure, and excess salt disposal areas.

This proposal extends the lifespan of infrastructure currently in place under the Lake Way Demonstration Plant Project, from demonstration to long-term operations. This includes authorisation to retain 757 hectares (ha) of on-playa disturbance and 47 ha of off-playa disturbance beyond the five year life span of the demonstration plant. The project also includes modifications to the process plant that will allow for increased production capacity up to 260 kilo tonnes per annum.

The EPA has prepared this report in accordance with s. 44 of the *Environmental Protection Act 1986* (EP Act). This section of the EP Act requires the EPA to prepare a report on the outcome of its assessment of a proposal and provide this assessment report to the Minister. The assessment report must set out:

(a) what the EPA considers to be the key environmental factors identified during the assessment

(b) 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 to which implementation should be subject.

The EPA may also include any other information, advice and recommendations in the assessment report as it thinks fit.

The proponent referred the proposal to the EPA on 18 September 2019. On 18 December 2019 the EPA decided to assess the proposal and set the level of assessment at Environmental Review – No Public Review. The EPA approved the Environmental Scoping Document for the proposal on 14 May 2020. The EPA accepted the Environmental Review Document on 3 November 2020.

EPA Procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* (State of Western Australia 2016)

and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020a), to the extent that it was appropriate and practicable. The EPA consulted the proponent on the application of the current procedures to its assessment of the proposal.

2. The Proposal

The Lake Way Sulphate of Potash Project is located 25 kilometres (km) south of Wiluna in the Mid-west region of Western Australia (Figures 1 and 2).

The proposal is to produce 260 kilo tonnes per annum of sulphate of potash (potassium sulphate). Trenches and bores would extract brine from Lake Way (Figure 1). Evaporation ponds would concentrate the brine, followed by processing to separate the potassium sulphate product from other salts. The remaining salts would be stored in an excess salt disposal area (Figure 2).

The proposal involves:

- shallow trenches to extract brine from the lake surface
- bores to extract brine from paleochannel aquifers about 120 metres (m) below the lake surface
- pumps and pipes to transport brine for processing
- evaporation ponds
- process plant capacity increase to 260 kilo tonnes per annum
- product, by-product and salt waste disposal areas
- ancillary accommodation, access road, infrastructure and support facilities.

Process and potable water supplies and gas supply[1] were excluded from this referral by the proponent as they would be provided by third party sources.

This assessment includes the expansion of the existing demonstration plant to enable processing of up to 260,000 tonnes per annum (i.e. 260 kilo tonnes per annum) of sulphate of potash at Lake Way. Initial disturbance associated with the demonstration plant was referred to the EPA and a level of assessment of Not Assessed was set by the EPA in June 2019. The disturbance was the regulated under the requirements of the *Mining Act 1978*.This assessment does however take into account that this proposal includes the retention of disturbance carried out for the demonstration plant beyond the five year lifespan of the demonstration plant. Studies for impacts occurring beyond five years, including changes to surface water and groundwater associated with the proposal included consideration of retention of the area disturbed for the demonstration plant.

The key characteristics of the proposal as presented by the proponent are summarised in Tables 1 and 2 below. A detailed description of the proposal is provided in section 2 of the proponent's Environmental Review Document (ERD) (SO4 2020a).

[1] Scope 2 emissions from third party gas supplies were, however, included in the ERD and in the assessment of greenhouse gas emissions in Appendix 3 of this report.

Where proposal limits were relevant to the EPA's assessment of whether the proposal should be implemented or not, the EPA has recommended that condition 1 specify those proposal limits.

A summary of the extent of the key characteristics of the proposal as presented by the proponent is also shown in recommended schedule 1, consistent with current EPA practice.

The EPA notes that, if a future proposal change would require extending the proposal limits as set by condition 1, a parallel process to assess amendments to both the proposal and the conditions could be used. The EPA also notes that the amendments to the EP Act passed in late 2020 will soon permit applications to amend conditions and proposals to be made together, using the amended process under section 45C.

Table 1: Summary of the proposal

Proposal title	Lake Way Sulphate of Potash Project
Short description	To develop and operate the Lake Way Sulphate of Potash Project, located approximately 25 kilometres south of Wiluna in the Mid-West of Western Australia. The proposal involves the abstraction of Sulphate of Potash (SOP) rich brines from sediments underlying Lake Way to produce up to 260 kilo tonnes per annum of SOP product. The proposal includes establishment and operation of evaporation ponds, brine abstraction infrastructure including trenches and paleochannel production bores, brine transport infrastructure including brine pumps and pipework, access roads and miscellaneous supporting infrastructure and excess salt disposal areas. This proposal extends the lifespan of infrastructure currently in place, but not formally assessed under the Lake Way Demonstration Plant Project, from demonstration to long-term operations. The project includes modifications to the process plant that will allow for increased production capacity up to 260 kilo tonnes per annum.

Table 2: Location and proposed extent of physical and operational elements

Element	Location	Proposed extent
Physical elements		
Evaporation ponds, brine abstraction trenches, paleochannel bores, brine pumps and pipework, access roads, infrastructure corridors and excess salt disposal areas	Figure 2	Disturbance footprint of no more than 2,750 ha within the 25,449 ha development envelope. Clearing of no more than 138 ha of native vegetation with direct impact of no more than 50 ha of *Tecticornia* habitat.

Element	Location	Proposed extent
Extension of the demonstration plant lifespan	Figure 2	Retention of 757 ha of on-playa disturbance and 47 ha off-playa disturbance within the 25,449 ha development envelope.
Operational elements		
Brine abstraction from paleochannel brine production bores and trenches	Figure 2	Abstraction of up to 30 gigalitres per annum.
Excess salt disposal	Figure 2	Disposal of no more than 5.1 million tonnes per annum of excess salts into the excess salt disposal areas.
Processing plant	Figure 2	Production of 260 kilo tonnes per annum of Sulphate of Potash over a project life of 20 years.

2.1 Context

The proposal lies within the Murchison Bioregion of the Eremaean Province of Western Australia. Based on the Interim Biogeographical Regionalisation of Australia (IBRA), Lake Way is located within the Eastern Murchison subregion. Vegetation in the Eastern Murchison subregion is dominated by Mulga Woodlands and is often rich in ephemerals, hummock grasslands, saltbush shrublands and samphire shrublands.

Annual rainfall in this semi-arid zone is slightly variable and the region is subject to drought periods. Rainfall occurs from both locally generated thunderstorms and dissipating tropical cyclones tracking to the south east of Western Australia.

Lake Way is the most upstream salt lake in the Lake Carey paleo drainage system. The paleo drainage extends south-east from Lake Way. The drainage basin (catchment) surrounding Lake Way has an area of 110,000 square kilometres. However, only a small proportion of the catchment actively contributes surface runoff to Lake Way.

The proposal lies within the determined Native Title Claim of the Wiluna People. The native title rights and interests of the Wiluna People are managed by the Tarlka Matuwa Piarku Aboriginal Corporation (TMPAC) registered native title body corporate (RNTBC). The development envelope intersects part of the Lake Way Pastoral Lease and the Millibillillie Pastoral Lease.

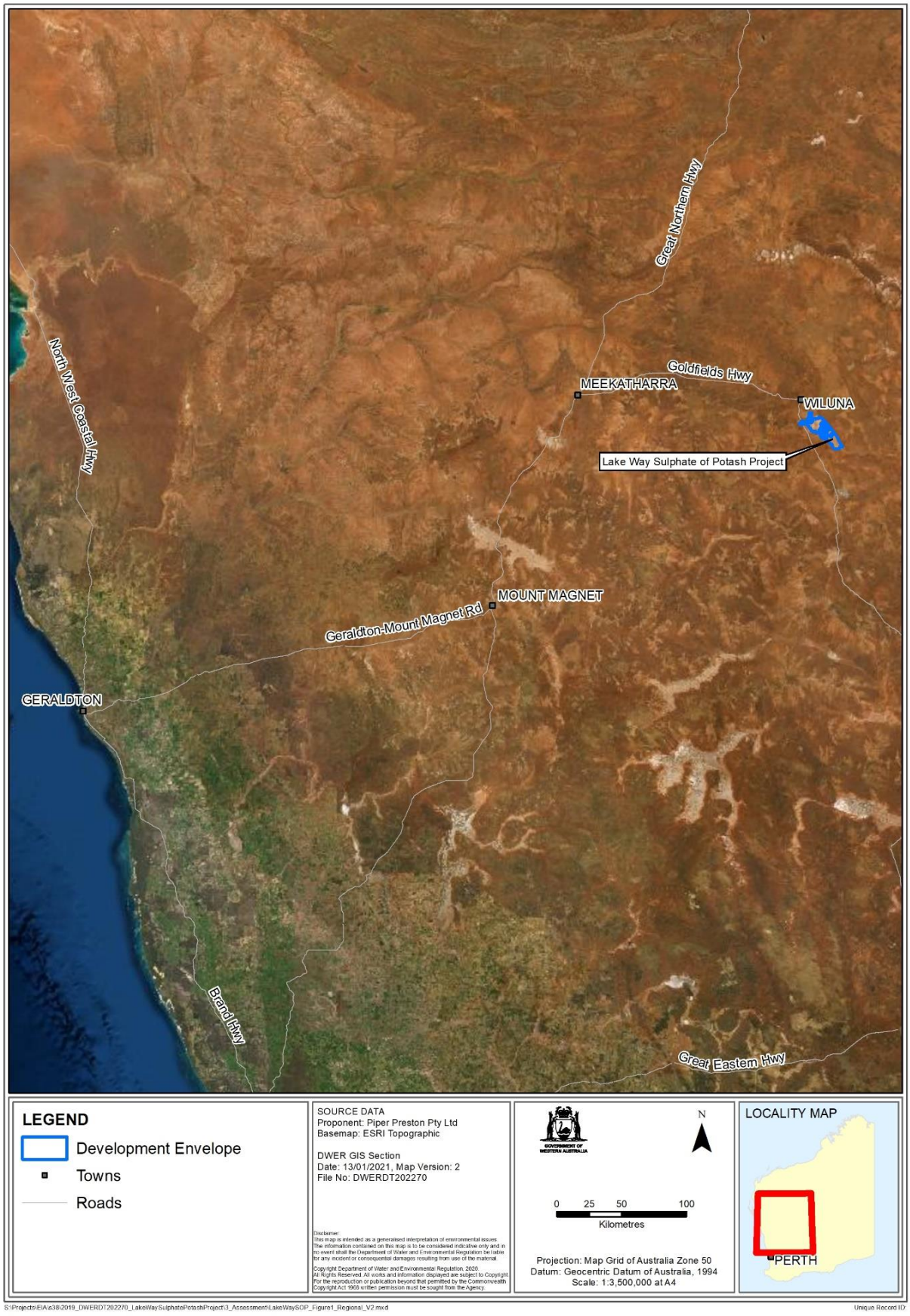

Figure 1: Regional location and development envelope

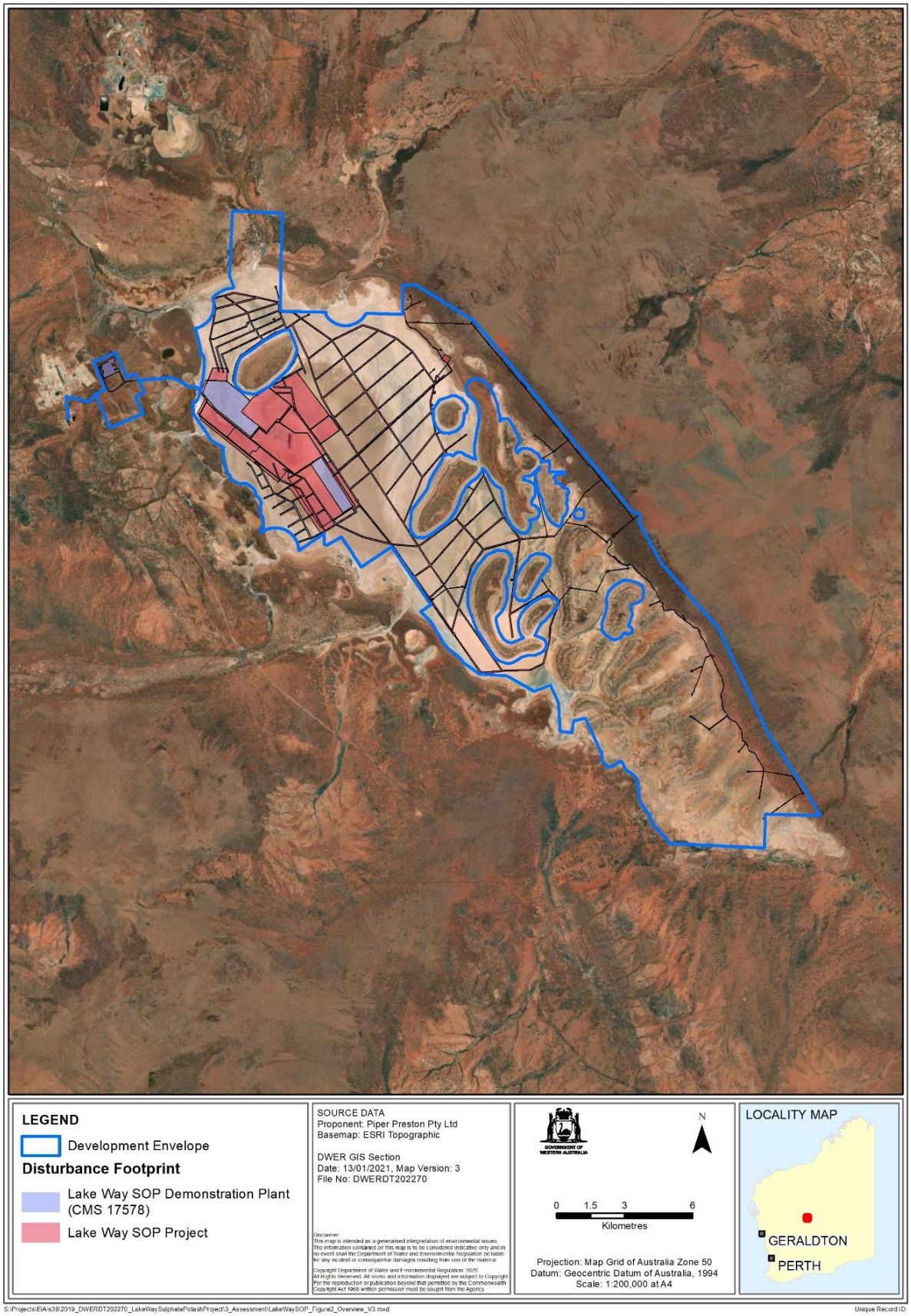

Figure 2: Development envelope and indicative disturbance footprint, including areas retained for the Demonstration Plant

3. Consultation

The EPA advertised the referral information for the proposal for seven days public comment in December 2019 and received four submissions. One submission requested ‘Assess – Environmental Review – No Public Review’ and three submissions requested ‘Assess – Public Environmental Review’.

The proponent consulted with government agencies and key stakeholders during the preparation of the ERD. The agencies and stakeholders consulted, the issues raised, and the proponent’s responses are detailed in Table 3-1 and Appendix I of the proponent’s ERD (SO4 2020a).

The EPA considers that the consultation process has been appropriate and that reasonable steps have been taken to inform the community and stakeholders about the proposed development. Relevant significant environmental issues identified from this process were taken into account by the EPA during its assessment of the proposal.

4. Key Environmental Factors

In undertaking its assessment of the proposal and preparing this report, the EPA had regard for the object and principles in section 4A of the EP Act to the extent relevant to the particular matters that were considered.

The EPA considered the following information during its assessment:

- proponent's referral information and ERD
- public comments received on the referral, stakeholder comments received during the preparation of the proponent's documentation and agency comments received on the ERD
- information gathered during a site visit by the EPA
- EPA's own inquiries
- *Statement of Environmental Principles, Factors and Objectives* (EPA 2020b)
- relevant principles, policy and guidance referred to in the assessment of each key environmental factor in sections 4.1 to 4.4 below.

Having regard to the above information, the EPA identified the following key environmental factors during the course of its assessment of the proposal:

- **Inland Waters** – Abstraction of brine would lead to drawdown of groundwater and removal of surface waters, while placement of infrastructure would redirect natural flows. Storage of waste salts on the playa surface have the potential to impact surface water quality.
- **Flora and Vegetation** – Clearing would reduce the abundance of *Tecticornia* plants and associated vegetation units containing priority flora, while drawdown may indirectly affect this biota.
- **Terrestrial Fauna** – Clearing may directly kill terrestrial fauna and reduce the habitat available to conservation significant species. Noise may deter fauna from using habitat surrounding the proposal. Indirect impacts to hydrological regimes may reduce habitat available for aquatic invertebrates.
- **Social Surroundings** – Disturbance of vegetation and playa surface has the potential to impact known or unknown heritage sites on the playa surface. Changes to surface water and groundwater regimes could change the values of cultural sites by impacting vegetation quality. There is potential for the proposal to restrict access for cultural sites and activities.

Having regard to the EP Act, the EPA considered that the following principles were particularly relevant to its assessment of the proposal:

1. **Precautionary principle** – risk based assessment of the likelihood and consequences of potential environmental impacts to the species, ecosystems and resources of Lake Way will enable the avoidance of any significant irreversible harm to the environment.

2. **Principle of intergenerational equity** – maintenance of the species and ecosystems at Lake Way, and prudent use of its resources, will ensure they remain for the use and enjoyment of future generations.
3. **Principle of the conservation of biological diversity and ecological integrity** – Lake Way supports a diverse array of *Tecticornia* species, some of which may be new to science. Listed fauna may occur in the local area and the lake may form an important ecological resource for aquatic invertebrates and water birds, particularly after flooding events. These organisms are likely to rely on the integrity of the local environment for their continued existence at Lake Way.

Appendix 1 of this report provides a summary of all the principles and how the EPA considered these principles in its assessment.

The EPA considered other environmental factors during its assessment of the proposal. These factors, which were not identified as key environmental factors, are discussed in the proponent's ERD (SO4 2020a). Appendix 2 of this report contains an evaluation of why these other environmental factors were not identified as key environmental factors.

The EPA's assessment of the proposal's impacts on the key environmental factors is provided in sections 4.1 to 4.4. These sections outline whether or not the EPA considers that the impacts on each factor are manageable. Section 7 provides the EPA's recommendation as to whether or not the proposal may be implemented.

EPA Policy and Guidance

In its assessment of the proposal, the EPA considered and had due regard for, wherever relevant, its current environmental impact assessment policy and guidance documents, unless otherwise stated. The EPA consulted with the proponent on the application of the current environmental impact assessment policy and guidance documents relevant to its environmental review and the EPA's assessment of the proposal.

4.1 Inland Waters

The EPA's environmental objective for Inland Waters is *to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*.

Relevant Policy and Guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Inland Waters* (EPA 2018).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Inland Waters* (EPA 2018).

In addition to the relevant current policy and guidance above, the EPA also had regard to the following guideline and policy:

- *Statutory Guidelines for Mine Closure Plans* (DMIRS 2020)
- Operational policy no. 5.12 - Hydrogeological reporting associated with a groundwater well licence (DoW 2009).

EPA Assessment

The EPA notes that potential changes to surface water flows and abstraction of groundwater via trenches and bores have the potential to alter processes that underpin the functioning of ecological processes on Lake Way.

Existing Environment

Lake Way is located at the upper end of a paleo-drainage system that extends to Lake Carey some 275 km to the south-east. The proponent has conducted studies to assess the hydrology and hydrogeology of Lake Way, including modelling of groundwater responses to brine extraction, modelling of surface water flows and the vadose (unsaturated soil) zone (CDM Smith 2020). The interconnected nature of the surface water and groundwater systems of the lake was considered in predicting impacts to groundwater and surface water associated with the proposal.

The EPA considers that the proponent's characterisation of the groundwater and surface water systems of Lake Way is adequate to inform the EPA's assessment of the proposal.

Two key aquifers occur beneath Lake Way, both of which are hyper-saline. A surficial aquifer from 2 m to 20 m thick exists about 0.5 m below the surface of the sediments of the lake playa. A paleochannel sand aquifer up to 40 m thick exists in the old river channel below the lake. These two aquifers are separated by up to 80 m of tight clays that do not conduct water and acts as an aquaclude between the two aquifers. Both aquifers would be used to produce brine for this proposal.

Depth to groundwater in the riparian fringe around Lake Way ranges between 0.5 m and 1.7 m, depending on the thickness of the soil, although it is generally more than 0.8 m, rising above this level following rain. The annual range in groundwater depth at the lake edge is about 1 m. The riparian fringe typically supports *Tecticornia* shrublands (Botanica 2020a).

Calcrete aquifers beyond the development envelope have high environmental values, including Priority Ecological Community (PEC) subterranean fauna populations and support high value vegetation communities. These aquifers are also locally important for potable and stock water (SO4 2020a).

The surface environment of Lake Way is a salt lake playa that is normally dry with average surface water salinities around 250,000 milligrams per litre total dissolved solids. Irregular rainfall events result in freshwater flooding of the lake surface to depths of up to about one metre. Flooding leads to rapid growth of phytoplankton, zooplankton and small crustaceans that can support significant water bird breeding events on lakes in this arid region. Surface waters generally do not flow beyond Lake Way, resulting in the concentration of salts by evaporation to levels many times greater than the salinity of seawater (SO4 2020a).

Potential Impacts

Potential impacts to Inland Waters associated with the proposal include:

- changes to groundwater regimes due to abstraction of brine from the paleochannel aquifer
- changes to groundwater regimes due to abstraction of brine from trenches in the playa surface of Lake Way
- alteration of surface water flows and the frequency, extent, duration and depth of flooding, caused by trenches, ponds and other infrastructure on the playa surface
- impacts to surface water quality caused by runoff from the excess salt disposal area.

The assessment and mitigation of these potential impacts are discussed below.

Assessment of Impacts and Mitigation and Management

Groundwater regimes – paleochannel bores

Abstraction of groundwater is fundamental to this proposal, with 30 gigalitres of brine to be extracted each year at full production. It is noted that this is the total proposed cumulative groundwater abstraction for the proposal, and is not in addition to any abstraction for the demonstration plant. Brine production from trenches in the playa surface is likely to cause drawdown of the shallow groundwater. Abstraction from bores in the deeper paleochannel aquifer is not likely to cause drawdown at the surface due to the 80 m thick clay aquaclude separating the paleochannel from the playa surface sediments (SO4 2020b).

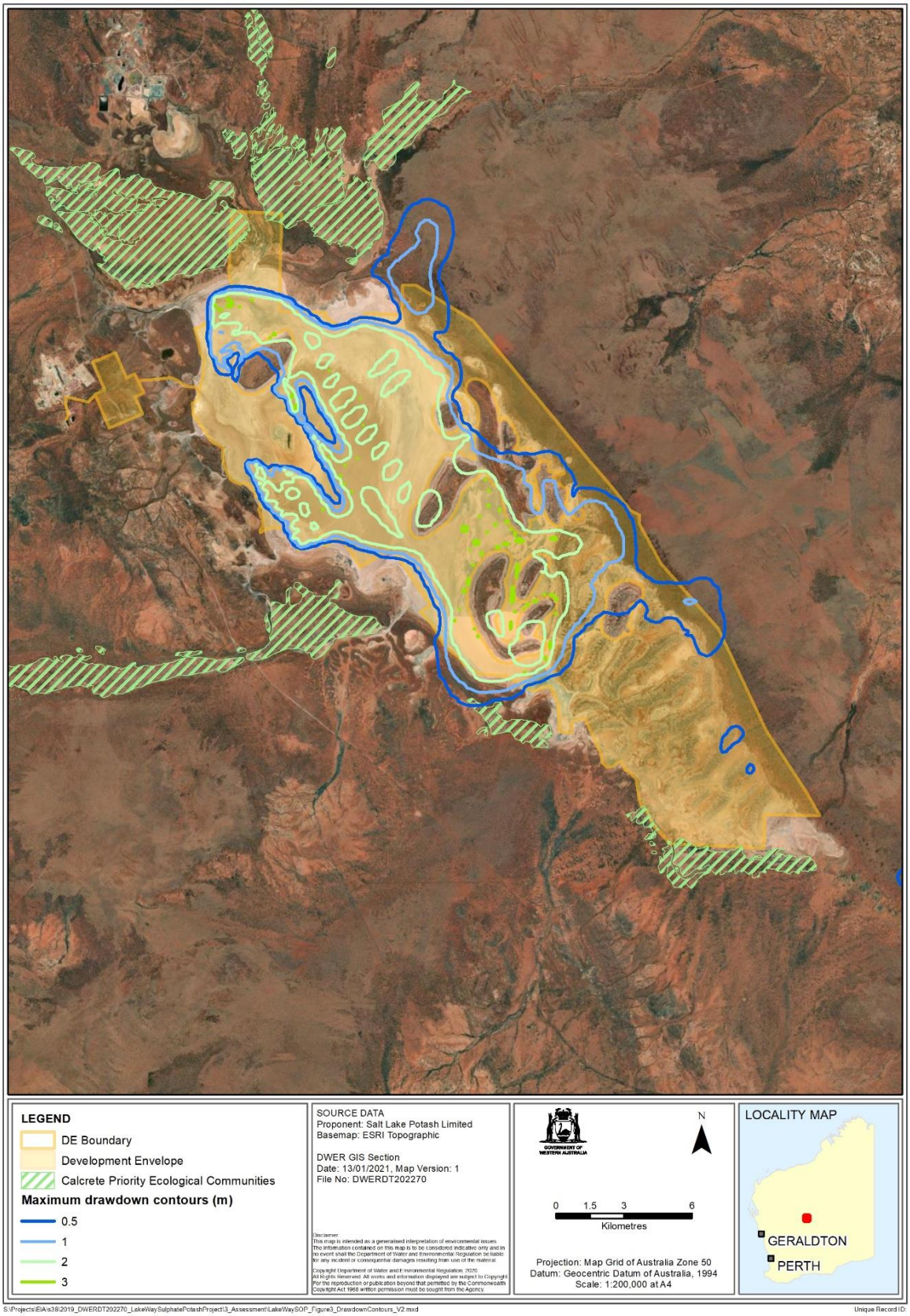

Figure 3: Predicted groundwater drawdown

Groundwater regimes – trenches in the playa sediments

Brine production from trenches in the playa surface would cause drawdown of the shallow groundwater in the lakebed sediments (Figure 3). The proponent has undertaken groundwater investigations to understand the current situation at Lake Way and to provide input data to model changes following abstraction.

Modelling predicts that the water table in the superficial lake sediments may be lowered by as much as 3 m during operations. Drawdown of 2 m or less would occur at some stage of the project life over about 43% of the playa surface by the brine abstraction system. Groundwater levels at the lake edge may typically be lowered by less than one meter. Drawdown is expected to take seven to eight years to reach that level (SO4 2020a).

The impacts of these levels of drawdown on flora and vegetation and fauna are dealt with under sections 4.2 and 4.3 of this report.

Modelled groundwater drawdown in calcrete aquifers outside the development envelope would be about 0.2 m (SO4 2020b) which is not likely to cause significant environmental impacts (Figure 3). Existing groundwater users, and environmental values that are reliant on calcrete or fractured rock aquifers beyond the development envelope for potable or stock water, are not expected to be significantly impacted by abstraction from the lake-bed sediments or the paleochannel for this proposal.

Condition 6 has been recommended to ensure that groundwater drawdown for this proposal remains within the modelled extent described in the ERD, in order to protect the calcrete subterranean fauna PECs, and other users and environmental values associated with the calcretes.

Alteration of surface water flows

Infrastructure on the playa surface has the potential to affect the flow of floodwaters running onto the lake after significant rainfall events. The proponent modelled flows based on a range of rainfall return periods, ranging from annual to 1 in 100 year events. Modelling was prepared based on the full proposal including the demonstration plant, and compared to a pre-development scenario. The results of modelling showed that:

- for rainfall events more frequent than once in ten years, no change in flooding extent or duration was predicted
- for a 1 in 10 year rainfall event, a 14% decrease in the extent of flooding is predicted (Figure 4)
- for a 1 in 20 year rainfall event, a 19% decrease in the in extent of flooding is predicted
- a 1 in 100 year storm would increase the depth of flooding on the lake by about 0.1 m (Emerge Associates 2020) and flooding would persist for an extra 10 days.

The proponent has minimised interruptions to surface flows by brine extraction trenches and their accompanying spoil berms. Trenches would be provided with floodways and berms would be constructed with regular breaks in them to allow

normal flooding and drainage of the lake surface (SO4 2020a). The velocity of post-development flood flows was modelled to be 0.35 m/s, which the proponent's analysis indicates is below the velocity of 0.7 m/s required to induce erosion from increased surface water flows.

Impacts caused by alteration of the distribution, depth and duration of flooding events on flora and vegetation and on fauna are examined under sections 4.2 and 4.3 respectively later in this report.

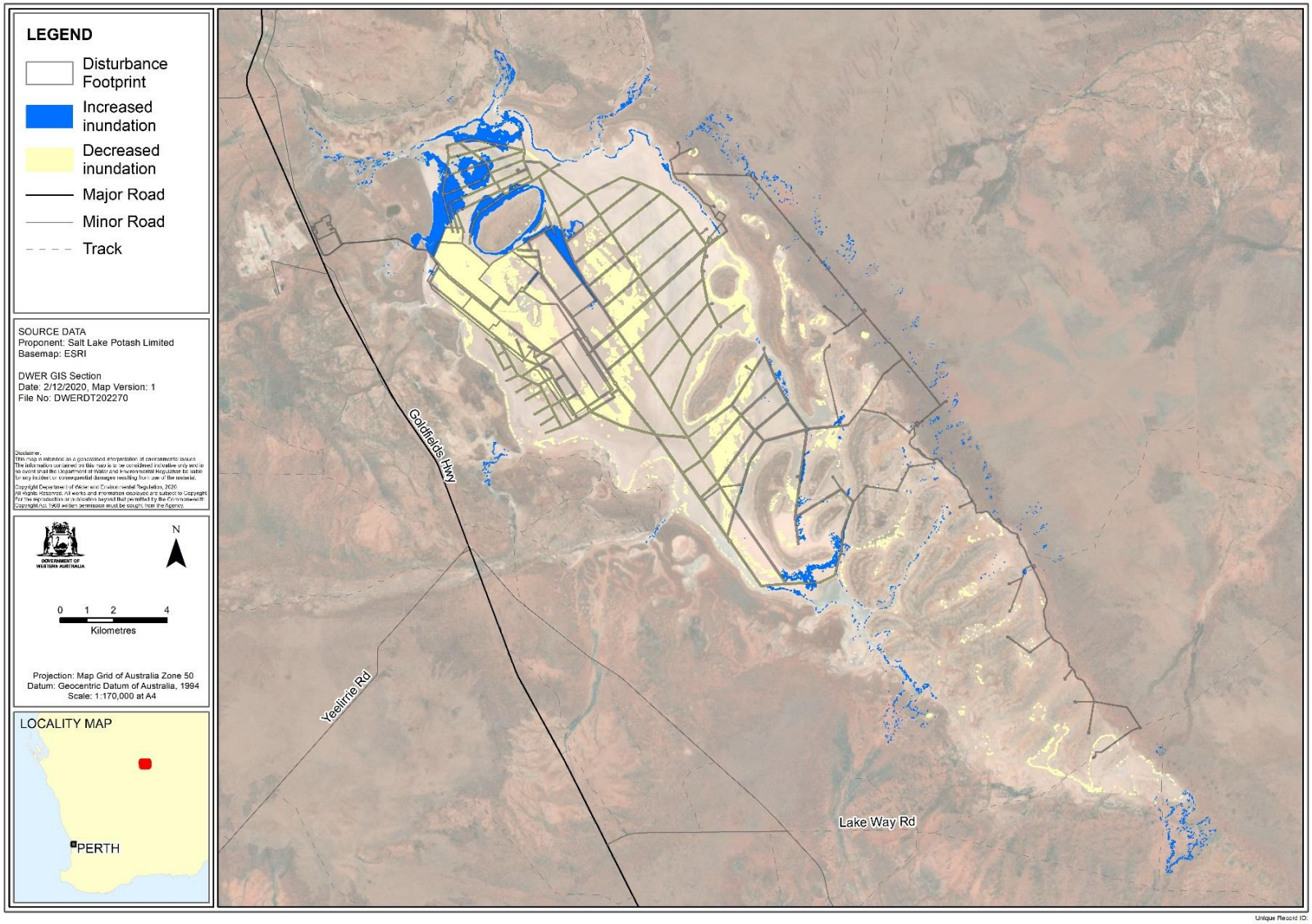

Figure 4: Inundation comparison for pre-development and post-development scenarios for a 1 in 10 year flood event

Excess salt disposal area runoff

Runoff from the excess salt disposal area would be highly saline and might be expected to have deleterious effects on biota on the lake surface. The EPA notes that 75.8 million tonnes of excess salts would be stored in a disposal area on the playa surface. This cumulative total includes waste salts produced by the demonstration plant. The EPA also notes that groundwater in the lake sediments is in the order of 150,000 to 200,000 milligrams per litre of total dissolved solids (SO4 2020a), and that organisms there are likely to be adapted to highly saline conditions.

The proponent has designed a bund around the disposal area to prevent uncontrolled runoff on to the playa surface. The EPA notes that salts in the disposal area would be derived from both the playa and the separate paleochannel aquifer – that is, additional salt from the paleochannel would be stored on the playa surface. Over time, these salts would be expected to dissolve and enter the playa groundwaters around the disposal area.

The EPA expects that Part V EP Act licence conditions would control the operation and maintenance of bunding around the excess salt disposal area. The EPA therefore considers that it is unlikely that runoff from the excess salt disposal area would impact surface or groundwater quality sufficiently far from the stockpile to significantly affect the sustainability of the existing suite of biota across the playa.

The proponent has prepared a preliminary mine closure plan (MCP) consistent with the Statutory Guideline for Mine Closure Plans (DMIRS 2020). Closure objectives in the preliminary MCP include creation of safe, stable, non-polluting landforms and maintenance of hydrological regimes for surface water flows on Lake Way. These objectives are consistent with the EPA's objectives for inland waters.

Summary

The EPA has paid particular attention to:

- *Environmental Factor Guideline – Inland Waters* (EPA 2018)
- hydrological and hydrogeological investigations and modelling conducted by the proponent
- advice from government agencies including the Department of Water and Environmental Regulation (DWER)
- the design of the proposal to mitigate changes to natural drainage
- application of the mitigation hierarchy by the proponent to avoid or minimise impacts to inland waters through modifications to the location and design of infrastructure.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Inland Waters that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through the proposal implementation limits to groundwater abstraction in condition 1 of the Recommended Environmental Conditions (Appendix 3)

- implementation of the recommended condition 6, requiring the proponent to implement the proposal to limit the extent of groundwater drawdown to that predicted in the ERD.

The EPA notes that there is a requirement for:

- Licensing of water abstraction by the DWER under the Rights in Water and Irrigation Act (1914)
- Works Approval and Licensing of the proposal (including of evaporation ponds, processing plant, waste salt disposal, sewage treatment and landfill) by the DWER under Part V of the *Environmental Protection Act 1986*
- Submission of a Mine Closure Plan to the Department of Mines, Industry Regulation and Safety (DMIRS) under the Mining Act (1978) and review and updates to the plan every three years.

4.2 Flora and Vegetation

The EPA's environmental objective for Flora and Vegetation is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained.*

Relevant Policy and Guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016a)
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016a).

In addition to the relevant current policy and guidance above, the EPA also had regard to the following guideline and policy.

- *Statutory Guideline for Mine Closure Plans* (DMIRS 2020).

EPA Assessment

Existing Environment

The proposal lies within the Eastern Murchison subregion of the Murchison bioregion under the Interim Biogeographic Regionalisation for Australia (IBRA) classification system.

The proponent conducted studies of flora and vegetation distributions and an analysis of potential groundwater dependent vegetation. The EPA notes that the requirements of *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) were substantially met during the preparation of studies for the ERD.

The study area for the proposal covered 78,000 ha and encompassed the 25,449 ha development envelope. However, it is noted that, due to cultural restrictions, areas of the development envelope designated as no-go zones were not surveyed. Vegetation in these areas was extrapolated based on aerial imagery. Given that no direct disturbance will occur within these areas, the EPA considers that the surveys conducted for the proposal are adequate to inform the EPA's assessment of the proposal.

Baseline Flora and Vegetation surveys (Botanica 2020a) for the proposal identified the following:

- nineteen vegetation units were mapped in the study area, of which seven, including unvegetated 'bare playa', occur in the development envelope
- no Threatened Ecological Communities or Priority Ecological Communities were recorded or expected to occur within the development envelope

- ninety-five percent of the vegetation in the development envelope was rated as being in 'good to very good' condition
- no groundwater dependent vegetation was identified in the development envelope, however the *Tecticornia* dominated TECT vegetation type may be conservatively assumed to have some dependency on groundwater
- four vegetation units in the study area were identified as being locally significant, due to restricted distribution associated with local landforms. These are identified as H, R, X and TECT
- three Priority species occur within the development envelope
- aTwenty nine *Tecticornia* taxa have been recognised, including common, novel, priority, and range extension species
- eighteen potential taxa are currently only known from sterile specimens, these are specimens without sufficient reproductive material for identification. Further study is required to demonstrate whether these sterile specimens belong to common, restricted or novel taxa.

Potential Impacts

Potential impacts from the proposal on flora and vegetation may occur through:

- clearing of native vegetation to construct infrastructure
- groundwater drawdown to extract brine from the playa surface and the paleochannel aquifer under Lake Way
- alteration of surface water flows and the frequency, extent, duration and depth of flooding on the lake playa.

The assessment and mitigation of these potential impacts are discussed below.

Assessment of Impacts and Mitigation and Management

Clearing of native vegetation

Clearing of no more than 138 ha of native vegetation is proposed within a disturbance footprint of no more than 2,750 ha within the 25,449 ha development envelope. The balance of the disturbance footprint comprises unvegetated areas, predominantly on the surface of the Lake Way playa.

The maximum predicted extent of clearing of any vegetation unit would be less than 1% of the area of that unit within the 78,000ha 'mapped extent' surrounding the development envelope (Botanica 2020b). The proponent has committed to clearing a maximum of 50 ha of the locally significant *Tecticornia* shrubland, which is 0.6% of its current extent within the survey area.

It is noted that, of the 138 ha proposed authorised extent of clearing, only 78 ha has been identified within the current indicative disturbance footprint, and the quantification of disturbance to vegetation types in the proponent's ERD is based on this indicative footprint. The remaining proposed 60 ha of clearing represents a buffer amount to allow flexibility in the proponent's construction process, and could occur in any area of the development envelope. This has the potential to result in additional impacts, in the

event that the indicative disturbance footprint is changed, and additional disturbance falls within restricted vegetation types.

In order to reduce the uncertainty associated with this strategy, the EPA has recommended conditions 7-1(1), 7-1(2), 7-1(3), and 7-1(4)to minimise clearing in vegetation types with the potential to be locally or regionally significant to the amount identified in the ERD, or the maximum disturbance identified by the proponent. These include the following spatially restricted vegetation types:

- TECT – *Tecticornia* sparse low mixed shrubland (impact up to 50 ha, representing 0.6% of the area mapped in the study area).
- R – *Maleleuca* tall shrubland over Tussock Grassland (impact up to 3 ha representing 0.2% of the area mapped in the study area).
- H – *Eucalyptus* and *Acacia* woodlands over low shrubland (no impact to the 6 ha mapped in the study area)
- X – *Eucalyptus* mallee woodland over low chenopod shrubland (impact up to 11 ha representing 0.3% of the area mapped in the study area).

Subject to implementation of this condition, it is considered that clearing of up to 138 ha could be managed to meet the EPA's objective for vegetation types identified in the development envelope. It is noted that there was no clearing of *Tecticornia* vegetation for the area of disturbance from the demonstration plant.

Of the nine priority flora species identified in the study area, three occur within the development envelope. None of these species were identified in the indicative footprint, and the proponent has stated that no impact to these species is likely to occur. It is noted that if the indicative footprint was changed during the final design process so that all of the individuals identified in the development envelope were cleared, the impacts would be as follows:

- *Eremophila arachnoides* subsp. *arachnoide*s (P3) – 1,028 individuals representing 1.63% in the study area
- *Tecticornia* sp. Lake Way (P1) – 40,934 individuals, representing 29.32% of in the study area
- *Tectcornia enodis* (P1) – 4,571 individuals, representing 5.25% in the study area.

The EPA notes that for *Tecticornia* sp. Lake Way, this may represent a significant impact to the species, in the event that the indicative footprint is changed during construction and a larger area of habitat for this species is impacted. Condition 7-1(5) has been recommended to require the proponent to avoid all direct disturbance to individuals of this species.

Of the 29 *Tecticornia* taxa identified in the study area, 16 are identified as common, with ranges extending well beyond the development envelope. Two are identified as priority species and have been addressed above. Of the remaining species, four do not occur within the development envelope, and the remaining seven are considered to be novel species.

Each of the seven novel species has a population of 40,000 to 1,400,00 individuals identified in the study area. Direct impacts to individuals of each of these taxa are expected to be below 1% of the known extent, based on the indicative footprint.

However, it is noted that between 20% and 95% of the identified individuals for six of the novel species occur outside the indicative footprint but within the development envelope. To ensure that impacts do not exceed the assessed impacts, the EPA has recommended condition 7-1(6) to limit clearing of these taxa to that identified in the ERD.

Of the 18 taxa currently represented by sterile specimens, three do not occur in the development envelope. Of the remaining 15, all have between 40% and 100% of their known extent within the development envelope. However, only two – Sterile sp. 3 and Sterile sp. 11 – are within the indicative footprint, with both of the known specimens of Sterile sp. 11 being within the indicative footprint.

The EPA has recommended condition 7-1(7) to ensure that no Sterile specimens are directly disturbed, unless the proponent has demonstrated, through additional studies, that the specimen/s occur outside of the areas of direct and indirect impact of the proposal, and that they are not novel taxa.

Subject to the implementation of the recommended conditions 7-1(1) to 7-1(7), which reduces the potential for changes to the proposal within the development envelope to result in significant impacts to restricted flora and vegetation, and condition 1, which limits the extent of the proposal, the EPA considers that it is likely that impacts to Flora and Vegetation associated with this proposal can be managed to meet the EPA's objective for this factor.

Groundwater drawdown

As noted above, no groundwater dependant vegetation communities have been demonstrated to exist in the development envelope. However, *Tecticornia* species are likely to have some reliance on soil water in the vadose zone, which may be impacted by drawdown of the underlying groundwater resource (Botanica 2020b).

The proponent modelled changes in transpiration efficiency in plants in the riparian zone (along the lake edge where floodwaters are periodically available) following drawdown of brine beneath Lake Way. The studies indicated that increased water stress in plants, due to reductions in water availability caused by drawdown reducing the water content of the vadose zone, were offset by reductions in osmotic stress due to decreased access to salts in the soil.

The studies showed that lowering the water table by as much as 4 m was predicted to reduce transpiration efficiency by less than about 5% (SO4 2020a).

Given the limited supply of useable water available to plants under the dry conditions that typically prevail for long periods in the Lake Way region, it is evident that plants have adapted to highly variable and often meagre water supplies. The proponent therefore considers that plants are able to tolerate wide fluctuations in transpiration efficiency, to the extent that a 5% change is not likely to affect long-term survival.

The proponent has proposed ongoing monitoring for the life of the project to confirm and mange impacts to *Tecticornia* vegetation and species associated with groundwater drawdown.

The EPA has recommended condition 7-2(1) to require the proponent to minimise indirect impacts to the vegetation types, significant *Tecticornia* taxa and sterile *Tecticornia* specimens. It is likely that impacts to flora and vegetation from changes to groundwater regimes can be managed to meet the EPA's objectives for this factor, subject to the implementation of this condition.

Alteration of surface water flows and flooding

Infrastructure on the lake surface comprises trenches about 2 to 6 m deep x 10 m wide with spoil berms alongside them (SO4 2020). The proponent has undertaken modelling to examine the impact of project infrastructure on the distribution of flood waters entering Lake Way and the potential for impacts on riparian vegetation (SO4 2020).

Changes to surface water associated with the proposal are described in section 4.1 - Inland Waters of this report. The proponent has minimised changes to surface water through design of trenches and breaks in spoil berms to allow flood waters to disperse.

Infrequent flood events play an important role in the recruitment of *Tecticornia* species. Studies on the seed of *Tecticornia* species from Lake Way found increased seedling emergence when seeds were flooded (van Etten et al. 2013).

Modelling by Emerge Associates (2020) identified that for a 1 in 100 year flood event, the area of *Tecticornia* vegetation that would experience waterlogging in comparison to the pre-development scenario would increase by 6.5%, due to displacement of flood waters by surface infrastructure increasing the extent of flooding. For a 1 in 5 year flood event, the increase would be 10%. Based on these results, the EPA accepts the proponent's conclusion that species composition change is unlikely due to changed flooding regimes.

The EPA has recommended condition 7-2(1) to require the proponent to minimise indirect impacts to vegetation types, significant *Tecticornia* taxa and sterile *Tecticornia* specimens. It is likely that impacts to flora and vegetation from changes to surface water regimes can be managed to meet the EPA's objectives for this factor, subject to the implementation of this condition.

The potential impact of runoff from the waste salt stockpile is assessed under section 4.1 - Inland Waters above. Other potential impacts to flora and vegetation can occur due to accumulations of dust from increased bare surfaces or from spills of brine, hydrocarbons or other process chemicals. The EPA considers that these impacts are unlikely to be significant, and they would be routinely addressed under other licencing and regulatory processes.

Summary

The EPA has paid particular attention to:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016a)
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b)
- surveys and modelling conducted by the proponent and relevant published literature summarised in the proponent's ERD (SO4 2020a)
- advice from government agencies, including DWER
- avoidance, mitigation and management measures proposed by the proponent to avoid and minimise disturbance of vegetation and significant flora, particularly modifications to the proposal layout and operations to reduce direct and indirect impacts on *Tecticornia* shrubland vegetation and the design of trenches and spoil banks to permit surface water flows over the playa during flooding events.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Flora and Vegetation that the impacts on this factor are manageable and would no longer be significant, provided there is:

- control through the proposal implementation limits in condition 1 of the proposal summarised in Schedule 1 of the Recommended Environmental Conditions (Appendix 3)
- implementation of the recommended condition 7, requiring the proponent to avoid or minimise clearing of significant and restricted flora and vegetation to that described in the proponent's ERD.

The proponent has prepared a preliminary mine closure plan (MCP) consistent with the *Statutory Guideline for Mine Closure Plans* (DMIRS 2020). Closure objectives in the preliminary MCP include creation of safe, stable, non-polluting landforms and maintenance of hydrological regimes for surface water flows on Lake Way. These objectives are consistent with the EPA's objectives for flora and vegetation.

The EPA notes that the MCP would need to be reviewed and updated every three years to meet the requirements of the Department of Mines, Industry Regulation and Safety under the *Mining Act 1978*.

4.3 Terrestrial Fauna

The EPA's environmental objective for terrestrial fauna is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*

Relevant Policy and Guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016c)
- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020d)
- *Technical Guidance – Sampling of short range endemic invertebrate fauna* (EPA 2016d).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016d).

In addition to the relevant current policy and guidance above, the EPA also had regard to the following guidelines:

- *Interim Guideline for Preliminary Surveys of Night Parrot (Pezoporus occidentalis) in Western Australia* (Department of Parks and Wildlife 2017b)
- *Statutory Guideline for Mine Closure Plans* (DMIRS 2020).

EPA Assessment

Existing Environment

Lake Way makes up 3.1% of the 7,871 km^2 occupied by lakes in the Murchison. The proposal disturbance footprint occupies 27.5 km^2 across seven fauna habitat types identified in the ERD (MJ & AR Bamford Consulting Ecologists 2020). While the proposal would require clearing of 138 ha of native vegetation, the unvegetated playa surface is also habitat for fauna such as aquatic invertebrates and water birds. Lake Way is not classified as a Ramsar or any other type of conservation category wetland. The nearest conservation reserve is located approximately 45 km south-southeast of Lake Way.

The proponent commissioned eight fauna studies for this project, including a Level 2 fauna survey which was conducted to the requirements of EPA guidance relevant at the time. These studies covered water birds, other vertebrates (including the greater bilby and night parrot), aquatic invertebrates, and short-range endemic invertebrates. The proponent also mapped habitat types within the proposal area. The EPA considers that the studies and surveys conducted for the proposal were adequate to inform the EPA's assessment of the proposal.

Desktop studies identified that 11 species listed under the *Biodiversity Conservation Act 2016* or listed as Priority Fauna may potentially occur in the region. Of these, three were recorded during surveys – curlew sandpiper (Migratory), brush-tailed

mulgara (Priority 4), and inland long-eared bat (Priority 3). Due to their high conservation significance, the night parrot (Schedule 1) and the greater bilby (Schedule 3) were also considered for this assessment.

Cats and rabbits were recorded in the survey area. Foxes are also considered likely to be present (MJ & AR Bamford Consulting Ecologists 2020) (SO4 2020).

The assessment and mitigation of these potential impacts are discussed below.

Assessment of Impacts and Mitigation and Management

Fauna habitat

Within the development envelope, the proponent has identified and mapped seven habitat types, referred to as vegetation and substrate associations (VSAs). Of these habitat types, VSA 1 and VSA 3 have the potential to be significant fauna habitats.

VSA 1 consists of bare, unvegetated playa, and provides habitat for aquatic invertebrate fauna, and potential habitat for migratory birds. This habitat type is also prospective for short range endemic invertebrate fauna. Direct impacts to this habitat type would be up to 18% of the mapped extent in the development envelope. Impacts to Aquatic invertebrate and short range endemic invertebrate fauna associated with this habitat type are addressed below.

VSA 3 is highly restricted in its distribution to small areas of gypsum and calcrete. This habitat is prospective for a number of significant species, including the night parrot, and short range endemic invertebrate species. Due to its location, this habitat type was surveyed mostly through aerial imagery, therefore, there is some risk that additional fauna values could occur in this VSA.

No clearing or disturbance is currently planned for VSA 3 within the indicative footprint. However, given the restricted distribution of this VSA, small changes to the indicative footprint could result in significant impact to the habitat. The EPA has recommended condition 8-1(1) to avoid all direct disturbance with the habitat type identified as VSA 3.

For all other habitat types, disturbance associated with the proposal would be less than 2% of the mapped extent of the habitat type in the development envelope.

Significant vertebrate fauna

Excluding migratory birds, other conservation significant fauna that have been identified in the proposal area include the brush-tailed mulgara (Priority 4), and the inland long-eared bat (Priority 3). Due to their high conservation significance, the night parrot (Schedule 1) and the greater bilby (Schedule 3) were also considered for this assessment, however, no night parrot or greater bilby were identified in the development envelope, despite targeted surveys (MJ & AR Bamford Consulting Ecologists 2020).

As noted above, outside of the bare playa habitat, which is not prospective habitat for the above species, no habitat type is anticipated to be impacted by more than 2%

of its extent within the development envelope. Therefore, the EPA considers that direct impacts to the habitat of significant vertebrate fauna associated with the proposal can be managed to meet the EPA's objectives for this factor.

Potential indirect impacts to vertebrate fauna associated with the proposal would include entrapment of fauna in trenches or ponds, prevention of movement of small species across pipelines, vehicle strikes, increased feral predators, and disturbance due to noise or light.

It is considered that these aspects of the proposal have the potential to significantly impact terrestrial fauna but are manageable using established management measures including pipeline underpasses, vehicle speed limits, feral animal control and light and noise management. The EPA has recommended condition 8-3 to require the proponent to implement a Terrestrial Fauna Management Plan addressing these issues.

Migratory birds

Bennelongia Environmental Consultants (2020a) counted 1,479 waterbirds from 23 species during waterbird surveys for the proposal (). Only five species were observed within the development envelope, with the remainder occurring at claypans outside of the playa. Four of the species were Migratory Birds under the EPBC Act, however each of these was recorded in low numbers (less than 50) during a limited window of time, indicating that they may have been in transit through the area.

The numbers of each migratory waterbird species seen during the survey were not significant and neither recent nor previous observations at Lake Way would justify the wetland being classified as a nationally or internationally important site for migratory shorebirds according to national guidelines (Bennelongia Environmental Consultants Bennelongia 2020a).

It is noted that the surveys were not conducted following a major flooding event, however at the time of the surveys adequate ponding was observed on the playa surface. There is potential that in the event of a very large rainfall, additional migratory bird species could utilise Lake Way.

If the playa surface was to be considered a significant migratory bird habitat following a major rainfall event, potential impacts to migratory birds associated with the proposal could include:

- *Loss of habitat* – direct impacts to the relevant habitat type VSA 1 would be up to 18%. Negligible changes to surface water flows are predicted for a 1 in 100 year rainfall event. (Based on current surveys smaller rainfall events do not result in large numbers of migratory birds at the lake). It is not expected that these impacts would significantly impact migratory bird use of the playa.
- *Loss of aquatic invertebrate as a food source* – impacts to aquatic invertebrates are assessed below. It is anticipated that any impacts to the lake can be managed so that the food source is maintained, subject to the implementation of recommended condition 9.

- *Indirect impacts including attraction of feral animals of silver gulls resulting in predation of migratory birds, increased noise, light, and vehicle strike* – The predicted impacts are considered to be manageable using established management measures. The EPA has recommended condition 8-2(1) to require the proponent to implement a Terrestrial Fauna Management Plan to address these impacts.

Aquatic invertebrate fauna

The proponent has conducted surveys to determine the diversity and abundance of aquatic invertebrates in the proposal area (Bennelongia Environmental Consultants 2020b). These surveys included sediment rehydration trials and surface water sampling. Studies and surveys conducted are considered adequate to inform the assessment of the proposal.

Aquatic invertebrate fauna were found in two key habitats, being the claypans surrounding the playa, which are not anticipated to be impacted by the proposal, and the playa surface. Aquatic invertebrates identified on the playa were not highly diverse, but were numerically abundant. No species were found to be restricted to the playa.

As well as species diversity, aquatic invertebrate values include a food source for migratory birds and other water birds.

Potential impacts to aquatic invertebrate fauna associated with this proposal include:

- direct disturbance to habitat
- changes to surface water flows (extent and duration)
- drying of lakebed sediments as a result of groundwater drawdown.

For the purposes of this assessment, the aquatic invertebrate habitat has been identified as the area which would experience surface water flows at least once in 10 years (i.e. the pre-development 1 in 10 year flood area) (Figure 5). It is considered that this frequency of flooding would allow the aquatic invertebrate life cycle to be maintained. The mapped extent of this habitat in the development envelope is 9,138 ha (SO4 2020c).

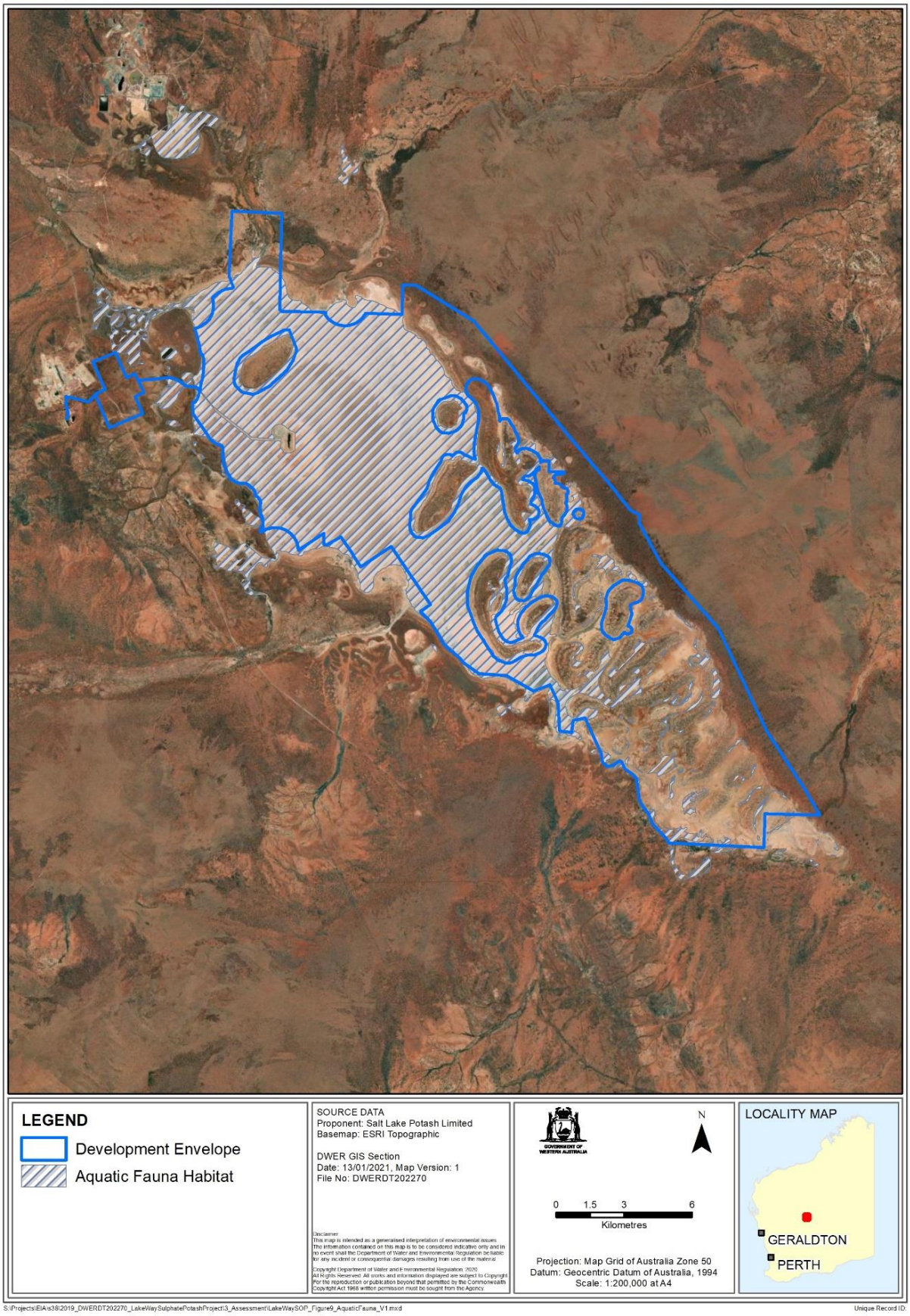

Figure 5: Aquatic invertebrate fauna habitat

Direct disturbance to aquatic invertebrate habitat, including the demonstration plant, would be 1,772 ha, which includes evaporation ponds, pipelines, trenches, bores and other infrastructure. This represents a loss of 16% of available aquatic invertebrate habitat.

Changes to surface water flows have been described in the section 4.1 – Inland Waters of this report. For aquatic invertebrate habitat (i.e, the 1 in 10 year flood extent), the impact would be up to 159 ha decrease in habitat based on the modelling for a 1 in 10 year rainfall event (SO4 2020c), representing 1.4% loss of habitat.

The cumulative adverse direct and indirect impact to aquatic invertebrate habitat would be 17.4% loss of habitat. It is considered that this predicted level of impact is acceptable, given that the remaining area of habitat includes high productivity areas at the margins of the identified aquatic invertebrate habitat, which are important to maintain the life cycle of aquatic invertebrate fauna. However, any greater impact than this, particularly in the margins of the identified habitat, may result in the loss of invertebrate values. Therefore, condition 9 has been recommended to ensure that changes to surface water remain within the extent described in the proponent's ERD.

There is potential for groundwater drawdown to result in drying of lakebed sediments between rainfall events. This drying could result in loss of cohesion and wind erosion of the sediments at the surface of the playa, impacting the dormant and resting stages of the aquatic invertebrate life cycle. Condition 9 has been recommended to require groundwater drawdown impacts on soil saturation remain consistent with the levels predicted in the proponent's ERD.

It is noted that if the area of habitat within the predicted 0.5 m groundwater drawdown contour is added to direct disturbance and surface water changes, the impacts to aquatic invertebrate habitat would be up to 71%. This would represent a significant impact to aquatic invertebrate fauna.

The proponent considers that it is unlikely that drawdown associated with the proposal would result in loss of cohesion or wind erosion of the lakebed sediments, due to annual recharge through rainfall. The proponent has conducted a study identifying that, as a result of expected annual recharge, the vadose zone above the groundwater table would maintain saturation of 45% to 75%, compared to 85% in the no-development case (CDM Smith 2020).

The results of this study are supported by observations of the existing Williamson's pit, an historic mining operation on the Lake Way Playa. The water table in this area has fallen by 3 m, however no observable wind erosion or loss of lakebed cohesion is evident (SO4, 2020).

The proponent considers that the risks to aquatic invertebrate habitat from groundwater drawdown are low. The proponent has proposed monitoring of impacts to aquatic invertebrate habitat for the life of the proposal. The monitoring program would be designed to ensure that changes to soil moisture from groundwater drawdown remain within the extent predicted and inform any management or contingency actions required.

It is considered that the proponent's conclusion that risks to aquatic invertebrate habitat from groundwater drawdown are low is reasonable. In order to further reduce this risk, condition 9 has been recommended to require the proponent to monitor and manage impacts to aquatic invertebrate habitat during the life of the proposal, including monitoring to ensure that changes to soil moisture as a result of groundwater drawdown remain within the predicted average saturation levels, and that visible or measurable erosion of lake bed sediments associated with the proposal does not occur.

The monitoring required by condition 9 would ensure that any unforeseen impacts associated with surface water regimes or surface water quality, groundwater drawdown or erosion are detected as early as possible, and that contingency actions are implemented.

It is noted that feasible contingency actions which the proponent has indicated could be implemented in the event that monitoring indicates impacts to aquatic invertebrate habitat are greater than predicted include reductions in brine abstraction in affected areas, and modification of floodway and berm breaks in trenches to ensure surface water flows.

Subject to implementation of the recommended condition 9, it is considered that the proposal can be managed to meet the EPA's objective for aquatic invertebrate fauna.

Short range endemic (SRE) invertebrate fauna

Surveys for SRE invertebrates were conducted in accordance with EPA Guidance, and are considered adequate to inform the assessment. Some likely SRE habitats were not able to be surveyed due to cultural restrictions, however those areas would be subject to no direct disturbance and minimal indirect disturbance.

Two potential SRE species, *Melyridae* sp. BCO200 and *Philosciidae* BIS415 were only collected from within the development envelope, from locations outside of the current indicative disturbance footprint. Both of these species were collected from the same location, and *Melyridae* sp. BCO200 was also collected from an additional location. No other species were identified as being restricted to the development envelope.

The EPA has recommended condition 8-1 to ensure the proponent avoids direct disturbance within 50 m of the known locations of *Melyridae* sp. BCO200 and *Philosciidae* BIS415, unless the proponent is able to demonstrate, through additional surveys, that the species occurs outside of the development envelope and that an adequate amount of habitat to maintain the species viability occurs outside the areas of direct and indirect disturbance for the project.

Three of the identified habitat types, VSA 1, VSA 2, and VSA 3 have been identified as being prospective habitat for short range endemic invertebrates.

It is noted that potential direct and indirect impacts to VSA 1 from direct disturbance and changes to surface water flows would be less than 25% of the extent of this habitat within the development envelope. Changes to soil moisture levels on the

playa associated with groundwater drawdown are considered unlikely to result in significant drying of the vadose zone (see Aquatic Invertebrate Fauna section) and would be managed under the recommended aquatic invertebrate fauna condition.

Direct impacts to VSA 2 would be less than 2% of the mapped extent of this habitat type. There would be an increase in the area of this habitat type subject to flooding of 1.3%, and 0.2% of this habitat type would be subject to groundwater drawdown associated with the proposal. Cumulative impacts to this habitat type are therefore predicted to be 4% of the extent of the habitat type in the study area, and can be managed to meet the EPA's objective for this factor.

VSA 3 is considered highly restricted and prospective for SRE invertebrate species. As noted above in the habitat mapping section, no direct disturbance to VSA 3 has been proposed for this proposal. No areas of this habitat are expected to be indirectly impacted by changes to surface water or groundwater drawdown. Due to the highly restricted nature of this habitat type, the EPA has recommended condition 8-1(1) to prevent any clearing in this habitat type, in the event that the indicative footprint is changed.

Impacts to SRE invertebrates can be managed to meet the EPA's objective for this factor, subject to the implementation of recommended conditions to monitor and manage drying of lake bed sediments on the Lake Way playa, avoid clearing within VSA 3, and avoid impacts to the known locations of *Melyridae* sp. BCO200 and *Philosciidae* BIS415.

Summary

The EPA has paid particular attention to:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016d), *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020d) and *Technical Guidance – Sampling of short range endemic invertebrate fauna* (EPA 2016d)
- potential impacts on fauna from the combined changes to the flooding regime and from sustained groundwater drawdown beyond the range of natural fluctuations
- the application of the mitigation hierarchy including avoidance of impacts to fauna by redesigning the project layout where possible and avoidance of 'no-go zones' on Lake Way.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Terrestrial Fauna that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control of the proposal summarised in Schedule 1 through the proposal implementation limits in condition 1 of the Recommended Environmental Conditions (Appendix 3)
- implementation of recommended condition 8 and recommended condition 9.

4.4 Social Surroundings

The EPA's environmental objective for social surroundings is *to protect social surroundings from significant harm.*

Relevant Policy and Guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Social Surroundings* (EPA 2016e)
- EPA Guidance Statement No. 41 *Assessment of Aboriginal Heritage* (EPA 2004).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Social Surroundings* (EPA 2016e).

In addition to the relevant current policy and guidance above, the EPA also had regard to the following guideline:

- *Statutory Guidelines for Mine Closure Plans* (DMIRS 2020).

EPA Assessment

Existing Environment

The EPA assesses Aboriginal heritage by considering circumstances where the heritage values are linked directly to the physical and biological attributes of the environment, and when the protection and management of those attributes are threatened as a result of a proposed development (EPA 2004).

Aboriginal culture and heritage

The project is located in the Shire of Wiluna, where Indigenous people comprise 30.5% of the population (ABS 2018). As set out in the proponent's ERD, the project lies within the Wiluna People's Native Title Determination area. Native title rights and interests are held in trust by the Tarlka Matuwa Piarku Aboriginal Corporation (TMPAC) for the Wiluna, Tarlpa and Wiluna #3 native title holders (NT Holders). The project lies on Martu land and many native title holders live in the communities of Kutkububba, Bondini, Windidda and the Wiluna township.

Twenty-seven ethnographic and archaeological surveys have been undertaken on and around the proposal area, and 10 registered sites have been identified in Table 4-88 of the ERD (SO4 2020). Lake Way itself is a registered site. A number of islands within Lake Way are prominent among these sites. Some sites, or the buffer zones around them, are overlapped by the project area.

Potential Impacts

Impacts to known or unidentified Aboriginal or other heritage places may occur by:

- degradation of heritage places as a direct result of project activities

- changes to vegetation or habitat values in areas of cultural value (no-go zones) as a result of changes to surface water or groundwater regimes
- prevention or disruption of access for native title holders to Aboriginal heritage places.

Mitigation and Management

The proponent has developed a Cultural Heritage Management Plan in consultation with TMPAC. The plan:

- identifies all registered Aboriginal sites and places
- specifies management actions for the protection of registered Aboriginal sites and places
- documents no-go zones identified by TMPAC representatives where the proponent has agreed there will be no infrastructure or access. Several islands on Lake Way have been designated as no-go zones
- documents a process for the identification of additional no-go zones for inclusion in future revisions of the CHMP.

The proponent has designed the proposal to avoid 'no-go zones' and other registered sites where possible. Where sites could not be avoided the proponent has consulted with native title holders and applied for consent under section 18 of the *Aboriginal Heritage Act 1972.* Consent has been granted to access nine such areas for infrastructure, including paleochannel bores and trenches, brine evaporation ponds and for brine processing requirements.

The Cultural Heritage Management Plan includes provisions for additional no-go zones to be identified during the construction and operational stages of the proposal, and includes agreed actions to be taken in the event additional no-go zones are identified, including protection and avoidance of the zones. There is potential for infrastructure associated with the proposal, including trenches and pipelines, to be re-designed or moved where additional values are identified.

Groundwater drawdown changes are not expected to have significant impacts on vegetation growing in 'no-go zones' (see section 4.2 above). Therefore drawdown is unlikely to cause any significant impact on the 'no-go zones'. Surface water flooding on 'no-go zones' from a 1 in 100-year event is predicted to increase by 2.3% from proposal infrastructure on Lake Way. This is not likely to cause any significant physical or biological impact in the 'no- go zones'. The EPA notes that it has received a copy of a letter of support for the proposal from TMPAC.

The EPA has also recommended condition 10 to require ongoing consultation with TMPAC to ensure protection of no-go areas, that areas of cultural and heritage value are protected, and that access to areas of cultural and heritage value is maintained where practicable and safe.

Summary

The EPA has paid particular attention to:

- *Environmental Factor Guideline – Social Surroundings* (EPA 2016e)
- EPA Guidance Statement No. 41 *Assessment of Aboriginal Heritage* (EPA 2004)
- the limited potential for and scale of drawdown and flooding impacts on Aboriginal heritage and culture
- the application of a Cultural Heritage Management Plan by the proponent, particularly agreement to abide by 'no-go zones' on Lake Way, including existing identified zones and zones identified in the future
- the avoidance and minimisation of impacts by the proponent during the design of the proposal.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Social Surroundings that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control of the proposal summarised in Schedule 1 through the proposal implementation limits in condition 1 of the Recommended Environmental Conditions (Appendix 3)
- implementation of condition 10 requiring the proponent to continue to consult with the native title holders of the Wiluna People Native Title determination area.

The EPA also notes the engagement of native title holders by the proponent during the development of applications for consents under section 18 of the *Aboriginal Heritage Act 1972*.

5. Conclusion

The EPA has considered the proposal to extract and process sulphate of potash from groundwater at Lake Way, located 25 km south of Wiluna.

Holistic Impact Assessment

While the EPA assessed the impacts of the proposal against the key environmental factors individually and concluded that they are manageable, given the inextricable link between flora and vegetation, terrestrial fauna, inland waters and social surroundings, the EPA also considered the connections and interactions between parts of the environment to inform a holistic view of impacts to the whole environment.

Understanding the environmental processes and interactions was critical to assessing the significance of potential impacts from the proposal on the environmental values.

The proposal has been designed to avoid clearing of native vegetation, through placement of infrastructure on unvegetated areas of the playa surface. This may increase impacts to values associated with the playa surface, including aquatic invertebrate fauna habitat, and habitat for migratory birds, but has resulted in a low level of impact to *Tecticornia* communities which may have high value as habitat for species including short-range endemic invertebrate fauna.

There is a high level of connectivity between the environmental factors considered for the assessment. Groundwater abstraction through bores into the paleochannel aquifer and trenches in the playa surface are an integral part of the proposal, and there are links between groundwater regimes and surface water regimes, flora and vegetation health, terrestrial fauna habitat, and social surroundings.

Groundwater drawdown has the potential to impact surface water regimes by reducing the saturation levels in the vadose zone of the lakebed sediments, resulting in faster infiltration of surface water and reduced ponding duration and extent following rainfall events. The proponent's modelling demonstrated a high level of understanding of this connectivity, and there is confidence that impacts to surface water are adequately described in the proponent's ERD.

Alteration of hydrological regimes could subsequently adversely impact flora and vegetation, terrestrial fauna habitat, and social surrounds. The magnitude of changes to surface water regimes, with particular regards to the spatial extent of these changes to *Tecticornia* communities and aquatic invertebrate fauna habitat have been considered in sections 4.2 and 4.3 respectively, and the EPA has concluded that these impacts are manageable.

The EPA also considered the connection between vegetation condition and social surroundings. Degradation of vegetation health may impact the values of sites with cultural significance. The proponent has designated areas of the development envelope as no-go zones in consultation with the Wiluna people. These areas would be subject to a 2.3% increase in flooding, and lowering of groundwater levels.

Vegetation identified in the no-go zones was not considered likely to be dependent on groundwater, and is therefore unlikely to be significantly impacted by changes to groundwater levels. The increase in flooding may result in changes to the composition of vegetation over the impacted area, however, given the small area impacted by the change this is not considered likely to significantly impact the cultural values of the no-go zones. No other areas of cultural significance were identified that would be impacted by changes to hydrological regimes.

When the separate environmental factors of the proposal were considered together, the EPA formed the view that, due to the relatively small size of the proposal, and application of the mitigation hierarchy, the impacts from the proposal on environmental values would be manageable.

Application of the Mitigation Hierarchy

Consistent with relevant policies and guidance, the proponent has addressed the mitigation hierarchy by identifying measures to avoid, minimise and rehabilitate environmental impacts including:

- amending the proposal disturbance footprint to reduce direct and indirect impacts to conservation significant flora and fauna including *Tecticornia* species
- using existing tracks, infrastructure and cleared areas to limit clearing
- designing infrastructure on the Lake Way playa to reduce changes to surface flows to limit impacts on the physical environment and biota
- being required to rehabilitate the site at the end of operations, consistent with a mine closure plan under the legislative requirements of DMIRS.

Conclusion

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

- impacts to all the key environmental factors
- the EPA's confidence in the proponent's proposed mitigation measures
- relevant EP Act principles and the EPA's objectives for the key environmental factors
- the EPA's view that the impacts on the key environmental factors are manageable, provided the recommended conditions are imposed.

Given the above, the EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix 3.

6. Other Advice

The EPA has identified that there is currently no readily available comprehensive information on the existing cumulative impacts to salt lake environments in Western Australia. There is potential for this to result in impacts to migratory bird populations utilising these areas, in particular where food sources may be adversely impacted by activities.

The EPA notes that the proponent has tenements across a number of similar salt lakes to Lake Way, and that the proponent's website indicates potential for up to 10 similar future projects. The EPA considers that its recommendation that this proposal may be implemented does not foreshadow likely recommendations of implementation of future proposals, given the current lack of knowledge with regard to cumulative impacts to these environments.

The EPA considers that all future proposals to utilise salt lakes in the arid interior of Western Australia would need to assess potential regional and cumulative impacts to this environment.

The EPA notes that this proposal has not been referred to the Commonwealth for assessment under the *Environment Protection and Biodiversity Conservation Act 1999.* Section 7 of the proponent's ERD outlines the reasoning behind the proponent's decision not to refer the proposal.

7. Recommendations

The EPA recommends that the Minister for Environment notes:

1. The proposal assessed is for the development of the Lake Way Sulphate of Potash Project to produce sulphate of potash through the abstraction, evaporation and processing of potassium and sulphate rich brines found at Lake Way, located 25 km south of Wiluna.
2. The key environmental factors identified by the EPA in the course of its assessment are Inland Waters, Flora and Vegetation, Terrestrial Fauna and Social Surroundings, are set out in section 4 of this report
3. The EPA has recommended that the proposal may be implemented, provided that implementation is carried out in accordance with the recommended conditions and procedures set out in Appendix 3. Matters addressed in the conditions include:
    a) control of the proposal summarised in Schedule 1 through the proposal implementation limits in condition 1 of the Recommended Environmental Conditions (Appendix 3)
    b) limits to groundwater drawdown to the extent predicted in the proponent's Environmental Review Document (condition 6-1).
    c) limits to clearing within restricted vegetation units to the extent predicted in the proponent's Environmental Review Document (condition 7-1)
    d) limits on disturbance to significant or potentially significant flora species to the extent predicted in the proponent's Environmental Review Document (condition 7-1)
    e) avoidance of direct disturbance of restricted terrestrial fauna habitat types and known locations of short range endemic species (condition 8-1)
    f) limits to direct impacts on aquatic invertebrate habitat, to changes to surface water flows, and to groundwater drawdown impacts (condition 9)
    g) preparation and implementation of environmental management plans to minimise impacts to flora, vegetation and fauna, with particular regard to *Tecticornia* taxa, vertebrate terrestrial fauna, and aquatic invertebrate fauna (condition 7-2, conditions 8-2, and condition 9-2)
    h) ongoing consultation with native title holders for the Wiluna People Native Title determination area (condition 10).
4. Other advice set out in section 6, within which the EPA considers that all future proposals impacting salt lakes in the arid interior of Western Australia need to assess potential regional and cumulative impacts to this environment.

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Appendix 1: 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.*	This principle was a fundamental and relevant consideration for the EPA when assessing and considering the impacts of the proposal on the environmental factors of Inland Waters, Flora and Vegetation, Terrestrial Fauna and Social Surroundings. The EPA notes that the proponent has identified measures to avoid or minimise impacts including reduction of the footprint and agreement to no-go zones on Lake Way. The EPA has considered these measures during its assessment. The EPA has recommended conditions to ensure that environmental protection outcomes are achieved and that management plans for the operations are implemented. The EPA considers that there may be a threat of serious or irreversible harm to Terrestrial Fauna given the extent and level of groundwater drawdown, which may cause extended drying and subsequent wind erosion of the playa surface, which could degrade the environment for aquatic fauna in their own right and as a food source for migratory wading birds. From its assessment of this proposal the EPA has concluded that the environmental values will be protected provided its recommended conditions are implemented and that the health, diversity and productivity of the environment can thus be maintained for the benefit of future generations.
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.*	This principle is a fundamental and relevant consideration for the EPA when assessing and considering the impacts of the proposal on the environmental factors of Inland Waters, Flora and Vegetation, Terrestrial Fauna and Social Surroundings. The EPA notes that the proponent has identified measures to avoid or minimise impacts including reduction of the footprint and agreement to no-

EP Act Principle	Consideration
	go zones on Lake Way. The EPA has also considered the proponent's commitment to undertake rehabilitation of the entire disturbance footprint. The EPA has considered these measures during its assessment. The EPA has recommended conditions to ensure that environmental protection outcomes are achieved and that management plans for the operations are implemented. The EPA has also recommended a condition to ensure that consultation with stakeholders in regards to social surroundings is ongoing. The EPA considers that the health, diversity and productivity of the environment could be compromised given the extent and level of groundwater drawdown, which may cause extended drying and subsequent wind erosion of the playa surface, which could degrade the environment for aquatic fauna in their own right and as a food source for migratory wading birds. From its assessment of this proposal the EPA has concluded that the health, diversity and productivity of the environment can be maintained for the benefit of future generations provided its recommended conditions are implemented.
3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	This principle was a fundamental and relevant consideration for the EPA when assessing and considering the impacts of the proposal on the environmental factors of Inland Waters, Flora and Vegetation, Terrestrial Fauna and Social Surroundings The EPA notes that the proponent has identified measures to avoid or minimise impacts including reduction of the footprint and agreement to no-go zones on Lake Way. The EPA has considered these measures during its assessment. The EPA has recommended conditions to ensure that environmental protection outcomes are achieved and that management plans for the operations are implemented. The EPA considers that there may be a threat to the conservation of biological diversity and ecological integrity for Terrestrial Fauna given the

EP Act Principle	Consideration
	extent and level of groundwater drawdown, which may cause extended drying and subsequent wind erosion of the playa surface, which could degrade the environment for aquatic fauna in their own right and as a food source for migratory wading birds. From its assessment of this proposal the EPA has concluded that the conservation of biological diversity and ecological integrity will be protected provided its recommended conditions are implemented and that the conservation of biological diversity and ecological integrity can thus be maintained.
4. Principles relating to improved valuation, pricing and incentive mechanisms *(1) Environmental factors should be included in the valuation of assets and services.* *(2) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* *(3) The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* *(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimize costs to develop their own solution and responses to environmental problems.*	In considering this principle, the EPA notes that the proponent would bear the cost relating to containment of excess salt waste stockpiles, and rehabilitation at project closure which is required under law. The EPA has had regard to this principle during the assessment of the proposal.
5. 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 utilise waste spoil from the Williamson pit to construct bunds to minimise waste and that waste (non-product) salts will be stored for future sale where possible. The EPA has had regard to this principle during the assessment of the proposal.

Appendix 2: 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			
Subterranean Fauna	• Modification of groundwater hydrology as a result of brine abstraction. • Removal and/or fragmentation of subterranean fauna habitat at local scale.	**Agency comments** • It is unclear whether there will be additional drawdown associated with the Hinkler Wells calcrete, and subsequently the Yeelirrie Priority Ecological Community (PEC). • Provide a statement regarding cumulative impacts to subterranean fauna, which includes impacts associated with existing operations, including licensed borefields. • Provide figures demonstrating the distribution of individual taxa in relation to the proposal area and provide a discussion regarding the depth of stygofauna habitat in relation to recorded taxa location.	Subterranean Fauna was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal but was included in the Environmental Scoping Document. Having regard to: • the desktop review and sampling of existing bores around and beneath Lake Way for stygofauna • no stygofauna found below Lake Way • groundwater drawdown not extending to calcrete landforms where PECs occur • *Environmental Factor Guideline – Subterranean Fauna* (EPA 2016f) • the significance of considerations in the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020b), the EPA considers it is unlikely that the proposal would have a significant impact on Subterranean Fauna and that

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
			the impacts to this factor are manageable. Accordingly, the **EPA did not consider Subterranean Fauna to be a key environmental factor** at the conclusion of its assessment.
Air			
Greenhouse Gas Emissions	• Emission of greenhouse gases that lead to excess warming of the earth's atmosphere.	No comments on this factor.	Air Quality – Greenhouse Gas Emissions was identified as a preliminary key environmental factor when the EPA decided to assess the proposal and in the Environmental Scoping Document. This factor was subsequently downgraded to 'Other Environmental Factor' during the EPA's assessment because the level of greenhouse gas emissions did not exceed the EPA's trigger value of 100,00 tonnes per annum (tpa) CO_2-e. Having regard to: • scope 1 emissions of 26,300 tpa • scope 2 emissions of 29,000 tpa, for a total of 55,300 tpa (or about 55% of the EPA trigger value for assessment) • emissions intensity for the project at 0.2126 tonnes of CO_2-e per tonne of

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
			SOP product, which is about 29% less than the calculated emissions intensity of another SOP project in Western Australia recommended for implementation by the EPA • *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020c) • the significance of considerations in the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020b), the EPA considers it is unlikely that the proposal would have a significant impact on Greenhouse Gas Emissions and that the impacts to this factor are manageable. Accordingly, the **EPA did not consider Greenhouse Gas Emissions to be a key environmental factor** at the conclusion of its assessment.

Appendix 3: Identified Decision-Making Authorities and Recommended Environmental Conditions

Identified Decision-Making Authorities

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.

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 Aboriginal Affairs	*Aboriginal Heritage Act 1972* (Consent under section 18)
2. Minister for Environment	*Biodiversity Conservation Act 2016* (Permit to take flora and fauna)
3. Minister for Mines	*Mining Act 1978* (Granting of mining lease)
4. Minister for Water	*Rights in Water and Irrigation Act 1914* (Groundwater abstraction licence / License to construct bores)
5. Chief Dangerous Goods Officer, Department of Mines, Industry Regulation and Safety	*Dangerous Goods Safety Act 2004* (Storage and handling of dangerous goods)
6. Chief Executive Officer, Department of Water and Environment Regulation	*Environmental Protection Act 1986* (Works approval and licence / Clearing permit)
7. Chief Executive Officer, Shire of Laverton	*Building Act 2011* (Building permit)
8. Chief Health Officer, Department of Health	*Health Act 1911* Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974
9. Executive Director, Environment Resources and Environmental Compliance Division, Department of Mines, Industry Regulation and Safety	*Mining Act 1978* (Approval of mining proposal)

10. Mining Registrar, Department of Mines, Industry Regulation and Safety	*Mining Act 1978* (Miscellaneous licenses)
11. State Mining Engineer	*Mines Safety and Inspection Act 1994* (Mine safety)

Note: In this instance, agreement is only required with DMAs 1, 2, 3, and 4 since these DMAs are a Ministers.

Recommended Environmental Conditions

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(Environmental Protection Act 1986)

LAKE WAY SULPHATE OF POTASH PROJECT

Proposal: To develop and operate the Project at Lake Way, located 25 kilometres south of Wiluna. The proposal involves the abstraction of sulphate of potash rich brines from the sediments underlying Lake Way to produce approximately 260 kilo tonnes per annum of sulphate of potash product. The proposal includes retention of disturbance from the Demonstration plant for the life of the proposal.

Proponent: Piper Preston Pty Ltd, a wholly owned subsidiary of Salt Lake Potash Limited
Australian Company Number: 142 962 409

Proponent Address: 239 Adelaide Terrace
PERTH WA 6000

Assessment Number: 2228

Report of the Environmental Protection Authority: 1699

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

1 Proposal Implementation

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

1-2 When implementing the proposal, the proponent shall not exceed the following limits:

(1) disturbance of more than 2,750 ha within the 25,449 ha development envelope,

(2) clearing of more than 138 ha of native vegetation;

(3) groundwater abstraction of more than 30 gigalitres per annum from paleochannel bores and lake bed trenches;

(4) disposal of more than 5.1 million tonnes per annum of excess salts into the excess salt disposal area; and

(5) project life of more than 20 years.

2 Contact Details

2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

3 Time Limit for Proposal Implementation

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

3-2 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.

4 Compliance Reporting

4-1 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, or prior to implementation of the proposal, whichever is sooner.

4-2 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.

4-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 the proponent shall assess

compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.

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

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

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

The Compliance Assessment Report shall:

(1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;

(2) include a statement as to whether the proponent has complied with the conditions;

(3) identify all potential non-compliances and describe corrective and preventative actions taken;

(4) be made publicly available in accordance with the approved Compliance Assessment Plan; and

(5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.

5 Public Availability of Data

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

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

(1) a secret formula or process; or

(2) confidential commercially sensitive information,

the proponent may submit a request for approval from the CEO to not make 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.

6 Inland Waters

6-1 The proponent shall implement the proposal to meet the following environmental outcome:

(1) groundwater drawdown associated with the proposal shall be limited to the 0.5 metre drawdown contour shown in Figure 2 of Schedule 1.

6-2 In order to demonstrate that the outcome of condition 6-1 (1) is met, the proponent shall, within the Compliance Assessment Reports required by condition 4-6, provide details of the results of groundwater monitoring conducted in accordance with a Groundwater Monitoring Strategy required by condition 6-3.

6-3 Prior to the commencement of groundwater abstraction for the operation phase of the proposal, the proponent shall prepare and have approved by the CEO a Groundwater Monitoring Strategy which details the methodology, timing and location of monitoring to substantiate and ensure that the outcome of condition 6-1(1) is being met.

6-4 In the event that monitoring indicates that the outcome of condition 6-1(1) is not being met at any time, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;

(2) investigate to determine the cause of the threshold criteria being exceeded;

(3) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded;

(4) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 6-4 (1). The report shall include:

(a) details of contingency actions implemented;

(b) the effectiveness of the contingency actions implemented against the outcome of condition 6-1(1);

(c) the findings of the investigations required by conditions 6-4(2) and 6-4(3);

(d) measures to prevent the outcome of condition 6-1(1) being exceeded in the future; and

(e) measures to prevent, control or abate the environmental harm which may have occurred.

6-5 The proponent shall implement the contingency measures identified in the report required by condition 6-4(4) until the CEO has provided advice by notice in writing that the outcome of condition 6-1(1) is being met.

7 Flora and Vegetation

7-1 The proponent shall implement the proposal to meet the following environmental outcomes:

(1) limit the extent of direct disturbance within the extent of the vegetation type TECT to fifty (50) ha;

(2) limit the extent of direct disturbance within the extent of the vegetation type R identified to three (3) ha;

(3) ensure there is no direct disturbance within the extent of the vegetation type H;

(4) limit the extent of direct disturbance within the extent of the vegetation type X to eleven (11) ha;

(5) ensure there is no direct disturbance to individuals of the species *Tecticornia* sp. Lake Way;

(6) limit direct disturbance to *Tecticornia* species identified within the *Lake Way Sulphate of Potash Project – Environmental Review Document (2 November 2020)* as Priority, Novel, or Range Extensions to the extent described in the *Lake Way Sulphate of Potash Project – Environmental Review Document (2 November 2020)*; and

(7) ensure there is no direct disturbance of any *Tecticornia* specimen identified as Sterile in the *Lake Way Sulphate of Potash Project – Environmental Review Document (2 November 2020),* unless additional examples of the specimen have been identified and demonstrated to occur outside of the areas of direct and indirect impact of the proposal, and are not novel taxa.

7-2 The proponent shall take all reasonable and practicable steps to meet the following environmental objectives:

(1) minimise indirect impacts to the vegetation types, significant *Tecticornia* taxa and sterile *Tecticornia* specimens listed in condition 7-1, inside and outside the development envelope.

7-3 In order to meet the outcomes and objective of conditions 7-1 and 7-2, prior to ground disturbing activities within the development envelope unless otherwise agreed in writing by the CEO, the proponent shall revise and have approved by the CEO a Flora and Vegetation Management Plan. This plan shall:

(1) when implemented, substantiate and ensure that conditions 7-1 and 7-2 are being met;

(2) include provisions to avoid, and minimise direct and indirect impacts to significant and potentially significant Flora and Vegetation as a result of direct and indirect impacts including, but not limited to:

(a) ground disturbing activities;

(b) changes to surface water flows, including increase and decrease in extent of flooding;

(c) changes to groundwater regimes; and

(d) changes to surface water salinity;

(3) specify the details of investigations to be undertaken to identify sterile *Tecticornia* specimens collected during previous and future surveys;

(4) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent direct or indirect impacts to significant or potentially significant *Tecticornia* taxa;

(5) specify threshold criteria to demonstrate compliance with conditions 7-1 and 7-2;

(6) specify monitoring methodologies to determine if trigger criteria and threshold criteria have been met;

(7) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 7-3(4) are exceeded and/or the threshold criteria required by condition 7-3(5) have not been met; and

(8) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that conditions 7-1 and 7-2 have been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

7-4 The proponent shall implement the latest revision of the Flora and Vegetation Management Plan which the CEO has confirmed by notice in writing, addresses the requirements of conditions 7-1, 7-2 and condition 7-3.

7-5 In the event that monitoring or investigations at any time indicate an exceedance of threshold criteria specified in the Flora and Vegetation Management Plan which is confirmed under condition 7-4, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;

(2) implement the contingency actions required by condition 7-3(7) within seven (7) days of the exceedance being reported as required by condition 7-5(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of the threshold contingency actions are no longer required.

(3) investigate to determine the cause of the threshold criteria being exceeded;

(4) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded;

(5) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 7-5(1). The report shall include:

(a) details of threshold contingency actions implemented;

(b) the effectiveness of the threshold contingency actions implemented against the threshold criteria;

(c) the findings of the investigations required by conditions 7-5(3) and 7-5(4);

(d) measures to prevent the threshold criteria being exceeded in the future;

(e) measures to prevent, control or abate the environmental harm which may have occurred; and

(f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that objectives will continue to be met.

7-6 The proponent:

(1) may review and revise the Flora and Vegetation Management Plan; or

(2) shall review and revise the Flora and Vegetation Management Plan as and when directed by the CEO.

7-7 The proponent shall continue to implement the Flora and Vegetation Management Plan or any subsequent revisions as confirmed by the CEO in condition 7-4, until the CEO has confirmed by notice in writing that the proponent has demonstrated that the environmental outcomes and objective detailed in conditions 7-1 and 7-2 have been met.

8 Terrestrial Fauna Management

8-1 The proponent shall implement the proposal to meet the following environmental outcomes:

(1) avoid all direct disturbance with the habitat type identified as VSA 3; and

(2) avoid direct disturbance within 50 metres of the known locations of *Melyridae* sp. BCO200 and *Philosciidae* BIS415, unless the CEO confirms by notice in writing, that the proponent has demonstrated that the species occurs outside the development envelope, and that adequate habitat to maintain the viability of the species occurs outside the area of direct and indirect impact for the proposal.

8-2 The proponent shall take all reasonable and practicable steps to meet the following environmental objective:

(1) minimise direct and indirect impacts to significant terrestrial fauna and significant fauna habitats inside and outside the development envelope.

8-3 In order to meet the outcomes and objective of conditions 8-1 and 8-2, prior to ground disturbing activities within the development envelope unless otherwise agreed in writing by the CEO, the proponent shall prepare and have approved by the CEO a Terrestrial Fauna Management Plan. This plan shall:

(1) when implemented, substantiate and ensure that conditions 8-1 and 8-2 are being met;

(2) include provisions to avoid where practicable and minimise impacts to significant terrestrial fauna, including but not limited to impacts from:

(a) direct disturbance of habitat;

(b) attraction of feral animals;

(c) attraction of silver gulls, resulting in predation of migratory birds;

(d) entrapment of fauna in trenches or ponds;

(e) restriction of movement for small animals from pipeline placement and design;

(f) lighting;

(g) noise;

(h) vehicle strike; and

(i) dust;

(3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent direct or indirect impacts to minimise direct and indirect impacts to significant terrestrial fauna;

(4) specify threshold criteria to demonstrate compliance with conditions 8-1 and 8-2;

(5) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;

(6) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 8-3(3) and/or the threshold criteria required by condition 8-3(4) have not been met; and

(7) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that conditions 8-1 and 8-2 have been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

8-4 The proponent shall implement the latest revision of the Terrestrial Fauna Management Plan which the CEO has confirmed by notice in writing, addresses the requirements of conditions 8-1, 8-2 and condition 8-3.

8-5 In event that monitoring or investigations at any time indicate an exceedance of threshold criteria specified in the Terrestrial Fauna Management Plan, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;

(2) implement the contingency actions required by condition 8-3(6) within seven (7) days of the exceedance being reported as required by condition 8-5(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of the threshold contingency actions are no longer required;

(3) investigate to determine the cause of the threshold criteria being exceeded;

(4) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded;

(5) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 8-5(1). The report shall include:

(a) details of threshold contingency actions implemented;

(b) the effectiveness of the threshold contingency actions implemented against the threshold criteria;

(c) the findings of the investigations required by conditions 8-5(3) and 8-5(4);

(d) measures to prevent the threshold criteria being exceeded in the future;

(e) measures to prevent, control or abate the environmental harm which may have occurred; and

(f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that objectives will continue to be met.

8-6 The proponent:

(1) may review and revise the Terrestrial Fauna Management Plan; or

(2) shall review and revise the Terrestrial Fauna Management Plan as and when directed by the CEO.

8-7 The proponent shall continue to implement the Terrestrial Fauna Management Plan or any subsequent revisions as confirmed by the CEO in condition 8-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated that the environmental outcomes and objective detailed in conditions 8-1 and 8-2 have been met.

9 Aquatic Invertebrate Habitat Management Plan

9-1 The proponent shall implement the proposal to meet the following environmental outcomes:

(1) direct impacts to aquatic invertebrate habitat as defined in Figure 3 of Schedule 1 do not exceed twenty percent (20%) of the available habitat on the Lake Way playa surface;

(2) changes to surface water flows within the area of aquatic invertebrate habitat as defined in Figure 3 of Schedule 1 do not exceed the extent predicted in the *Lake Way Sulphate of Potash Project – Environmental Review Document (2 November 2020)*;

(3) groundwater drawdown associated with the proposal does not result in the mean degree of saturation over a rolling 5 year average of the lake bed sediments within the area of aquatic invertebrate habitat as defined in Figure 3 of Schedule 1 being reduced to less than forty-five percent (45%);

(4) groundwater drawdown associated with the proposal does not result in visible or measurable erosion or dust generation from the lake bed sediments; and

(5) the proposal does not result in an adverse impact to surface water quality, including changes to salinity, nutrients or minerals, outside of designated areas of infrastructure, that is greater than the known tolerance ranges of *Parartemia laticaudidata*. This must consider all requirements to support successful recruitment.

9-2 In order to meet the outcomes of condition 9-1, prior to dewatering from trenches on the playa surface within the development envelope unless otherwise agreed in writing by the CEO, the proponent shall prepare and have approved by the CEO, an Aquatic Invertebrate Habitat Management Plan. This plan shall:

(1) when implemented, substantiate and ensure that condition 9-1 is being met;

(2) include the details of baseline surveys, and monitoring to be completed to inform long-term management of impacts to aquatic invertebrates associated with the proposal;

(3) include the details of baseline surveys, monitoring and reporting to verify the maintenance of aquatic invertebrate habitat, including soil moisture levels, and aquatic invertebrate abundance and diversity in the project area;

(4) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent direct or indirect impacts to meet the objective of condition 9-1;

(5) specify threshold criteria to demonstrate compliance with condition 9-1;

(6) provide the details of baseline data, and specify monitoring methodology, to determine if trigger criteria and threshold criteria have been met;

(7) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 9-2(4) and/or the threshold criteria required by condition 9-2(5) have not been met; and

(8) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition

9-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

9-3 The proponent shall implement the latest revision of the Aquatic Invertebrate Habitat Management Plan which the CEO has confirmed by notice in writing, satisfies the requirements of condition 9-1 and condition 9-2.

9-4 In the event that monitoring or investigations at any time indicate an exceedance of threshold criteria specified in the Aquatic Invertebrate Habitat Management Plan, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;

(2) implement the contingency actions required by condition 9-2(7) within seven (7) days of the exceedance being reported as required by condition 9-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of the threshold contingency actions are no longer required;

(3) investigate to determine the cause of the threshold criteria being exceeded;

(4) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded;

(5) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 9-4(1). The report shall include:

(a) details of threshold contingency actions implemented;

(b) the effectiveness of the threshold contingency actions implemented against the threshold criteria;

(c) the findings of the investigations required by conditions 9-4(3) and 9-4(4);

(d) measures to prevent the threshold criteria being exceeded in the future;

(e) measures to prevent, control or abate the environmental harm which may have occurred; and

(f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that objectives will continue to be met.

9-5 The proponent:

(1) may review and revise the Aquatic Invertebrate Habitat Management Plan; or

(2) shall review and revise the Aquatic Invertebrate Habitat Management Plan as and when directed by the CEO.

9-6 The proponent shall continue to implement the Aquatic Invertebrate Habitat Management Plan or any subsequent revisions as confirmed by the CEO in condition 9-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated that the environmental outcomes detailed in condition 9-1 has been met.

10 Aboriginal Heritage

10-1 The proponent shall continue to consult with the native title holders for the Wiluna People Native Title determination area to meet the following environmental outcomes:

(1) no-go areas as described in spatial data in Schedule 2 are protected from direct impacts;

(2) areas of cultural and heritage value are identified prior to disturbance;

(3) areas of cultural and heritage value are protected where practicable;

(4) contractors and staff associated with the proposal are provided with training in the identification, avoidance and management of areas of cultural and heritage value; and

(5) access to areas of cultural and heritage value, including areas to undertake traditional activities by the Wiluna People is maintained where it is safe and appropriate to do so.

Schedule 1

Table 1: Summary of the proposal

Proposal title	Lake Way Sulphate of Potash Project
Short description	To develop and operate the project at Lake Way, which is located 25 kilometres south of Wiluna in the Mid-West region of Western Australia. The proposal would involve abstraction of sulphate of potash (SOP) rich brines from sediments underlying Lake Way to produce approximately 260 kilotonnes per annum of SOP product. The proposal includes establishment and operation of evaporation ponds, brine abstraction infrastructure including trenches and paleochannel production bores, brine transport infrastructure including brine pumps and pipework, access roads and miscellaneous supporting infrastructure, and excess salt disposal areas. This proposal extends the lifespan of infrastructure currently in place but not formally assessed under the Lake Way Demonstration Plant Project from demonstration to long-term operations. The project includes modifications to the process plant that will allow for increased production capacity up to 260 kilo tonnes per annum

Table 2: Location and authorised extent of physical and operational elements

Column 1	Column 2	Column 3
Element	**Location**	**Authorised extent**
Evaporation ponds, brine abstraction trenches, paleochannel bores, brine pumps and pipework, access roads, infrastructure corridors, and excess salt disposal areas.	Figure 1	Disturbance footprint of no more than 2,750 ha within the 25,449 ha development envelope.
Extension of the demonstration plant lifespan.	Figure 1	Retention of 757 ha of on-playa disturbance and 47 ha off-playa disturbance as described in the demonstration plant referral CMS17578 within the 25,449 ha development envelope.
Brine abstraction from paleochannel brine production bores and trenches.	Figure 1	Abstraction of up to 30 gigalitres per annum

Excess salt disposal.	Figure 1	Disposal of no more than 5.1 million tonnes per annum of excess salts into the excess salt disposal areas.
Processing plant.	Figure 1	Production of 260 kilo tonnes per annum of Sulphate of Potash.

Table 3: Abbreviations and definitions

Acronym or abbreviation	Definition or term
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 delegate.
EP Act	*Environmental Protection Act 1986*
ha	Hectare
Development envelope	The 25,449 hectare development envelope as shown in Figure 1 of Schedule 1 and in the spatial data described in Schedule 2.
Vegetation type	Vegetation types as identified in the *Lake Way – Environmental Review Document – 2 November 2020*
Habitat type	Habitat types as identified in the *Lake Way – Environmental Review Document – 2 November 2020*
Management Plan	A document prepared to address the objectives laid out in the conditions, in accordance with the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA 2020)

Figures (attached)

Figure 1 Development envelope, retained Demonstration plant disturbance and indicative disturbance footprint

Figure 2 0.5 metre groundwater drawdown contour

Figure 3 Aquatic Invertebrate Fauna Habitat

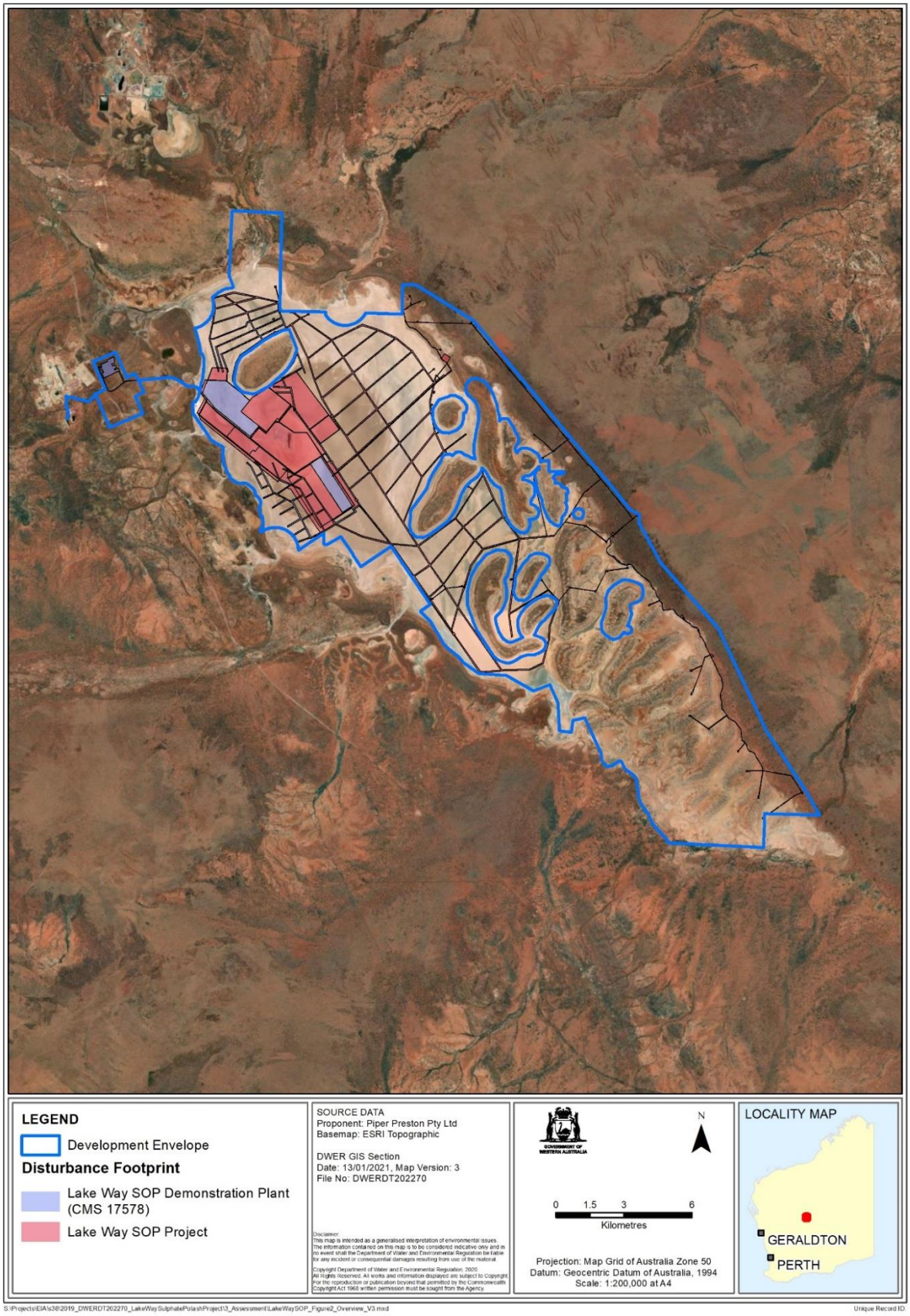

Figure 1: Development envelope, retained Demonstration plant disturbance and indicative disturbance footprint

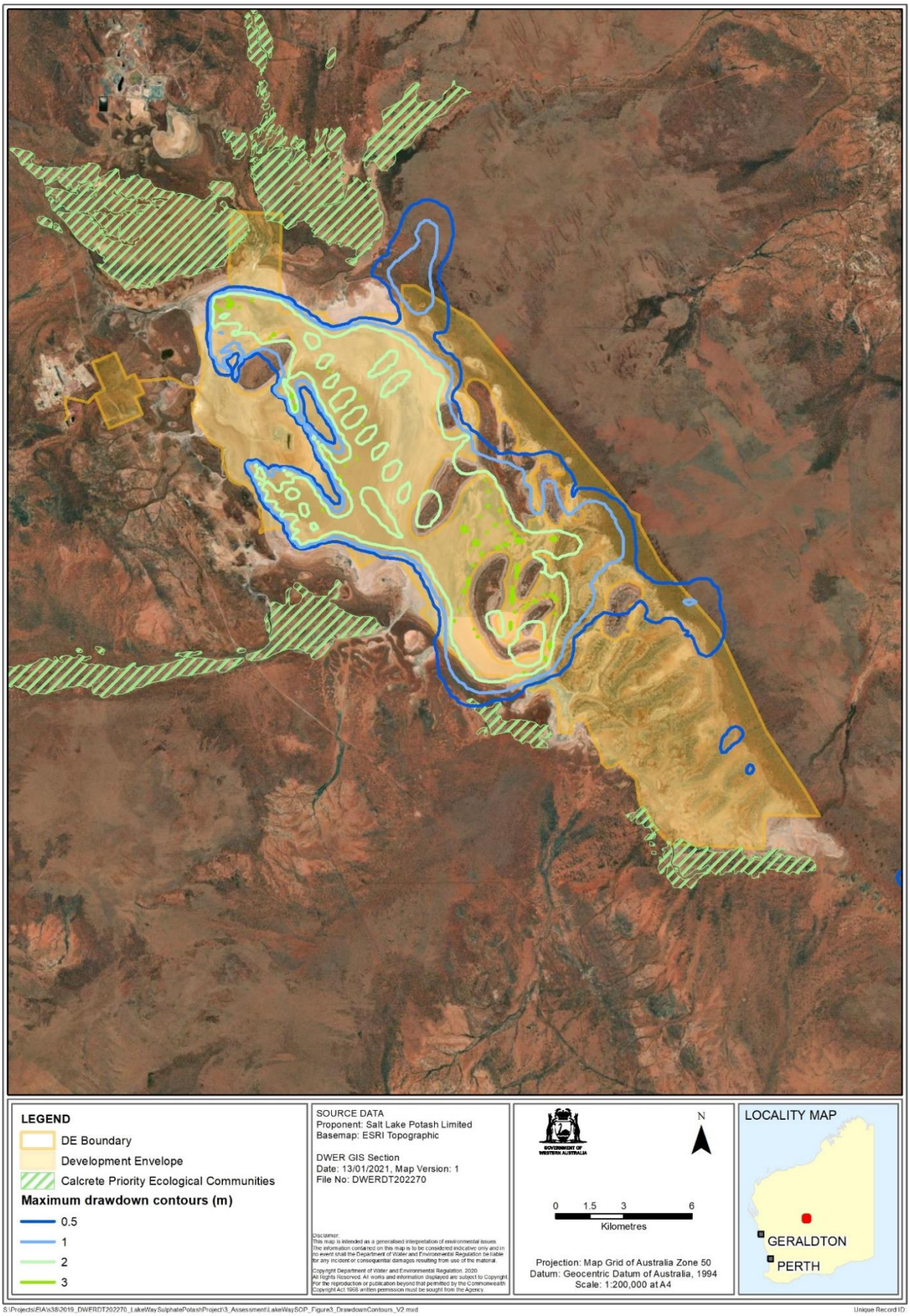

Figure 2: 0.5 metre groundwater drawdown contour

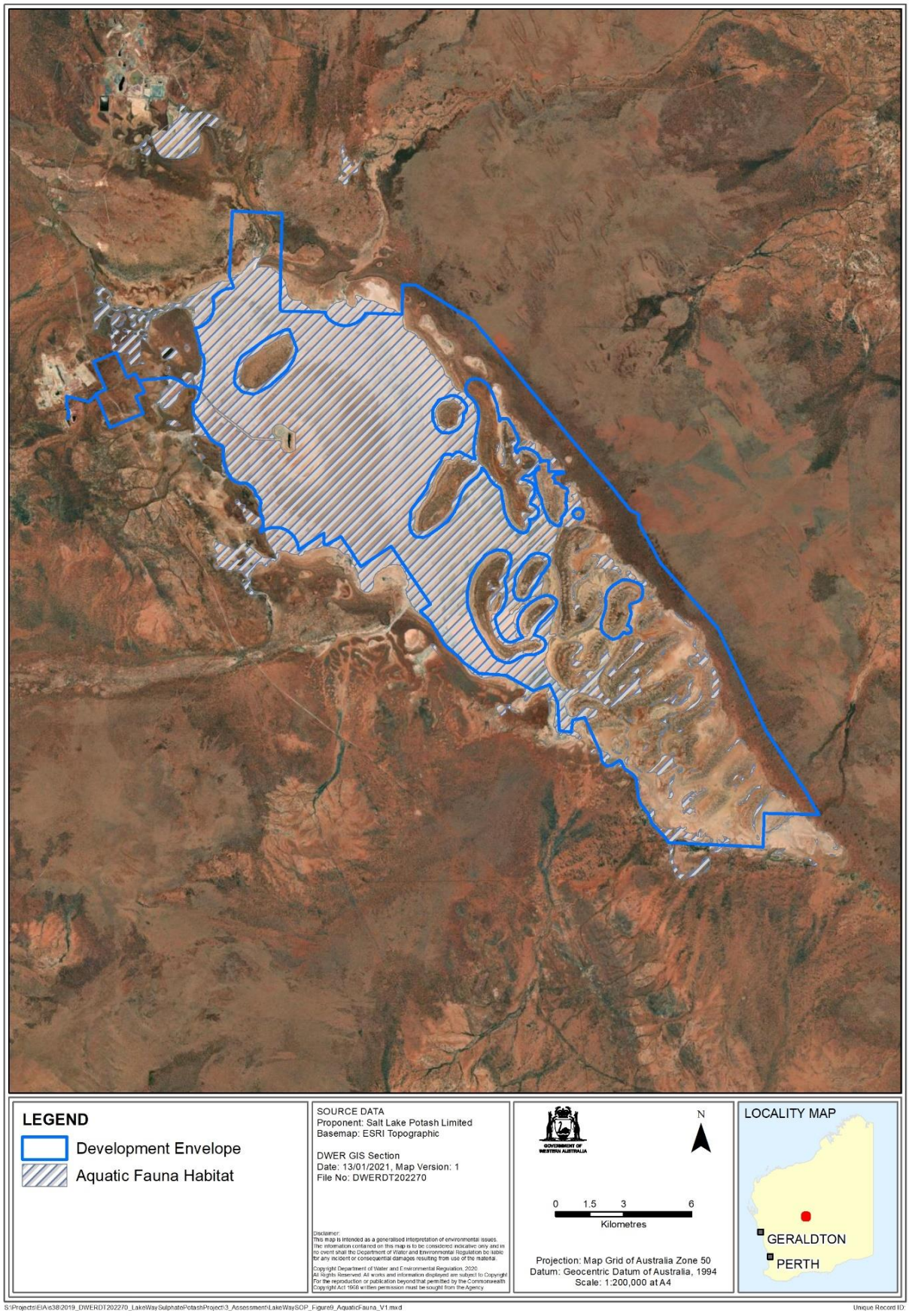

Figure 3: Aquatic invertebrate fauna habitat

Schedule 2

All co-ordinates 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
- extent of groundwater drawdown
- extent of aquatic invertebrate fauna habitat

are held by the Department of Water and Environmental Regulation, Document Reference Number DWERDT379185.

Coordinates defining the no-go zones are held by the Department of Water and Environmental Regulation, Document Reference Number DWERDT380211. This data is confidential and will not be provided outside the Department without the agreement of Tarlka Matuwa Piarku Aboriginal Corporation (TMPAC).