MACKAY POTASH PROJECT

INLAND WATERS ENVIRONMENTAL MANAGEMENT PLAN

PREPARED FOR **AGRIMIN LIMITED**

September 2021

EPA Assessment No. 2193 (WA)

EPBC Act No. 2018/8834 (Commonwealth)

Stantec

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REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
V0.1	26/11/2020	Final Draft for submission addressing DMA comments	CK	FT	MS	FT

Table ES1: IWEMP Summary

Project Name	MacKay Sulphate of Potash Project
Proponent Name	Agrimin Limited
Ministerial Statement Number	N/A – Project is under assessment (Assessment Number 2193)
Purpose of FVEMP	The purpose of the IWEMP is to address the requirements of the Agrimin ESD and present a robust and implementable environmental management framework to protect the environmental values of the Project Area and demonstrate that the EPA's objectives are met during the operation of the Project,
Key Environmental Factors and objectives	The proponent shall manage the operations of the project to meet the following objectives: **Inland Waters:** • Minimise impacts to hydrological regimes and water quality during major inundation events to maintain ecological processes on the lake • Achieve the conservation of water through minimising abstraction rates and water re-use in the borefield • Prevent contaminant (such as hydrocarbons or wastewater) spills from entering the lake environment **Subterranean Fauna:** • Avoid groundwater drawdown to protect subterranean fauna on islands
Condition Clauses	N/A
Key components in the FVEMP	Key provisions are detailed in Section 3
Proposed Construction Date	TBD
EMP required pre-construction?	No

Corporate Endorsement

I hereby certify that to the best of my knowledge, the provisions within this Mackay Sulphate of Potash Project Inland Waters Environmental Management Plan are true and correct.

Name: **Signed:**

Position: **Date:**

Abbreviations

Agrimin	Agrimin Limited
BC Act	Biodiversity Conservation Act 2016
CMCP	Conceptual Mine Closure Plan
Cwth	Commonwealth
DBCA	Department of Biodiversity, Conservation and Attractions
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERD	Environmental Review Document
ESD	Environmental Scoping Document
ha	hectare
km	kilometre
m	meters
NIDE	Northern Infrastructure Development Envelope
NT	Northern Territory
NT	Northern Territory
Off-LDE	Off Lake Development Envelope
On-LDE	On Lake Development Envelope
PEC	Priority Ecological Community
SIDE	Southern Infrastructure Development Envelope
TEC	Threated Ecological Community
WA	Western Australian
WAH	Western Australian Herbarium
WC Act	*Wildlife Conservation Act 1950*

Agrimin Limited

Inland Waters Environmental Management Plan

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1. Context Scope and Rationale

1.1 The Project

Agrimin will own and operate the greenfields potash fertiliser operation Project (the Project) located approximately 450 km south of Halls Creek and 790km west of Alice Springs by road. The Project is located within the East Pilbara region of Western Australia (WA), adjacent to the WA and Northern Territory (NT) border (Figure 1-1).

The Project involves the extraction of brine from a network of shallow trenches established on the surface of Lake Mackay. The brine will be transferred into evaporation ponds for the precipitation of salt which will be harvested and then processed to produce a potash fertiliser product.

The Project is remote and extensive (263,675 ha) and therefore four development envelopes have been defined. The following terms are used throughout the TFEMP (Figure 1-1):

- **Study Area** – refers to the boundary within which all investigations and field surveys were undertaken (443,985 ha).
- **Development Envelopes (post approval terminology - Project Area)** – the boundary within which the elements of the Project are situated. The development envelopes occur entirely within the Study Area and comprise four components that make up the Project. The Project includes disturbance of up to 15,000 hectares (ha) of the lake's surface and clearing of approximately 1,500 ha of native vegetation. The proposed extent of the physical and operational elements includes four development envelopes (Figure 1-1):
    - **On-lake Development Envelope (On-LDE):** On-lake development of trenches, extraction of up to 100 GL/a of brine, and solar evaporation and harvesting ponds for potash salts, including ground disturbance of approximately 15,000 ha with the 217,261 ha On-LDE.
    - **Off-Lake Development Envelopes (Off-LDE)**: Off-lake development of a processing plant and associated site infrastructure, including access roads, accommodation camp, airstrip and solar farm, including clearing of approximately 200 ha of native vegetation within the 688 ha Off-LDE.
    - **Southern Infrastructure Development Envelope (SIDE)**: Development of borefield, water pipeline and access tracks for abstracting up to 3.5 GL/a of processing water and off-lake access to Lake Mackay including clearing of approximately 300 ha of native vegetation within the 11,799 ha SIDE.
    - **Northern Infrastructure Development Envelope (NIDE)**: Haul road for trucking potash production to Wyndham Port, including clearing of approximately 1,000 ha of native vegetation within the 33,928 ha NIDE.
- **Indicative Footprints** – the proposed Indicative Footprints (IFs) occur entirely within the Proposal Area and refers to the area that is proposed to be directly disturbed by the Proposal (e.g. clearing of native vegetation). The layout of the IF may be subject to change, however, total disturbance will not exceed the maximum disturbance for each Development Envelope as presented in the Environmental Review Document (ERD). Proponent-led avoidance and minimise measures has been implemented where possible to reduce and minimise potential impacting on areas of high ecological or heritage value through the detailed design of the indicative footprints.

1.2 Purpose and Objectives

The purpose of the IWEMP is to describe how the environmental impacts of activities related to the Project will be adequately managed during the operational phases of the Project. This IWEMP demonstrates that the potential impact to aquatic ecology, subterranean fauna and surface and groundwater have been avoided and minimised and that the Environmental Protection Authority (EPA's) Environmental Objective for Inland Waters can be met.

The scope of the IWEMP applies specifically to operational activities within the Project Area. The operations activities will entail the following activities:

- abstraction of up to 100 GL per annum (GL/a) of hypersaline brine;

- abstraction of up to 3.5 GL/a of groundwater for processing;
- treatment of no more than 3.5 GL/a of water through a reverse osmosis plant; and
- disposal of no more than 18 million tonnes per annum of waste salt to be retained on the lake surface.

The overarching objective of the IWEMP is to avoid and minimise direct and indirect impacts to Inland waters and the aquatic communities they support.

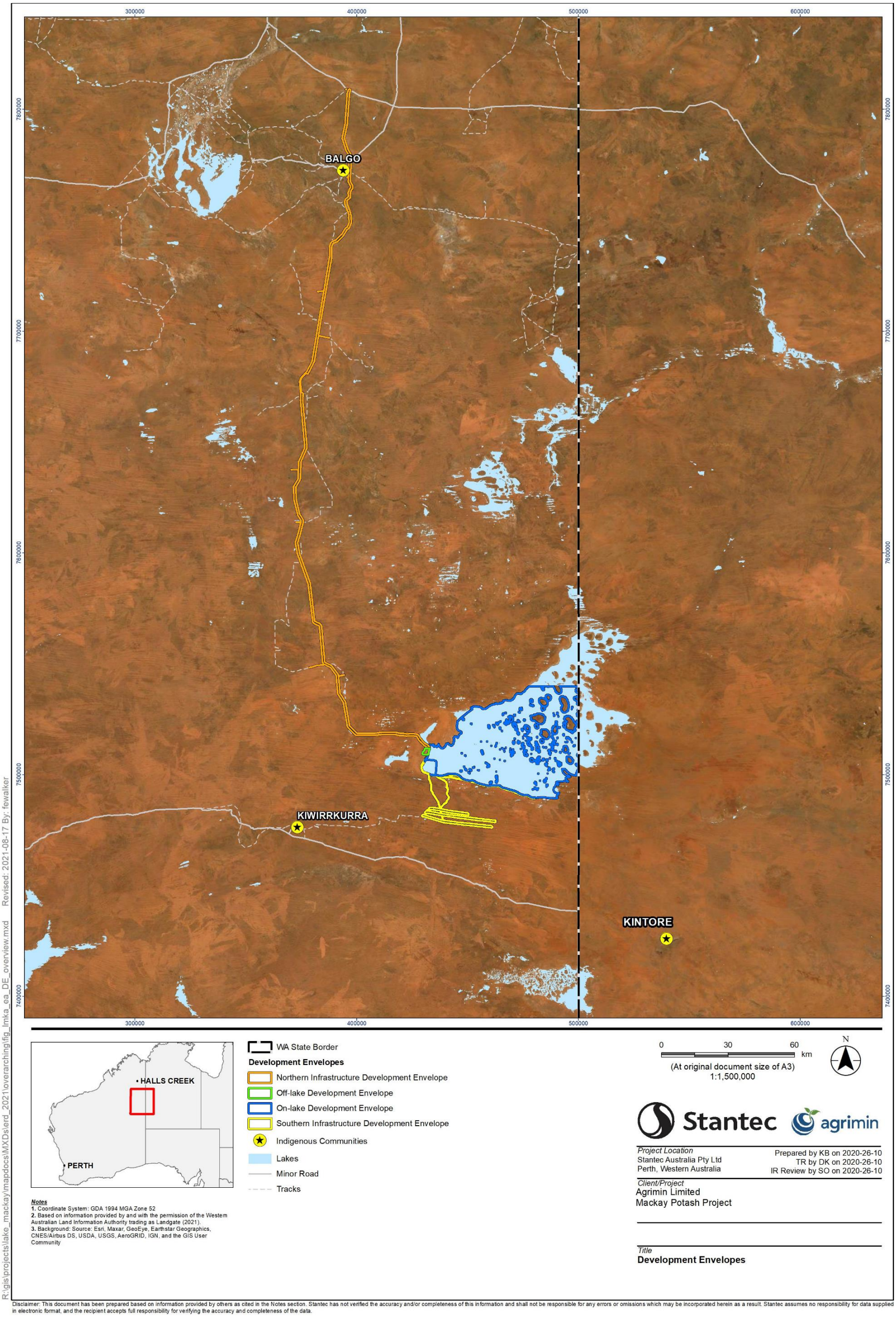

Figure 1-1: Mackay Potash Project Development Envelopes

1.3 Key Environmental Factors

The IWEMP is provided as part of the management framework for the Project and is intended to address the Environmental Protection Authority (EPA's) environmental factors of 'Inland Waters' and 'Subterranean Fauna'.

The development of the Project's infrastructure will require approximately 15,000 ha of direct disturbance of the lake's surface from excavation works within the On-LDE and groundwater abstraction in the borefield contained in the SIDE. The development of the On-LDE will be undertaken in a manner that avoids the extensive network of island outcrops (~2% of the lake) which will be managed through exclusion zones and buffer areas to ensure the ecological function is maintained.

The Project requires groundwater abstraction to allow for hypersaline brine extraction and a potable water supply, including:

- On-Lake brine abstraction of up to 100 GL per annum (GL/a) of hypersaline brine, managed through a series of trenches located across the surface of Lake Mackay
- Abstraction of up to 3.5 GL/a of groundwater for processing from the borefield located in the SIDE
- Disposal of no more than 18 million tonnes per annum of waste salt to be retained on the lake surface.

1.3.1 Inland Waters

The EPA environmental objective for Inland Waters is *'to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected'*. Noting the above, the potential key impacts and risks to the meeting the EPA's Environmental Factor for Inland Waters includes:

- Altered lake surface hydrology and groundwater drawdown, including changes to water quality causing adverse impacts to aquatic biota; and
- Contaminant spills causing adverse effects to water quality and aquatic biota.

1.3.2 Subterranean Fauna

The EPA environmental objective for Subterranean Fauna is *'to protect subterranean fauna so that biological diversity and ecological integrity are maintained'*. Given the activities of implementing and operating the Project, the potential key impacts and risks to the meeting the EPA's Environmental Factor for Subterranean Fauna includes:

- Groundwater drawdown causing loss of subterranean fauna and habitat on the lake islands;

Agrimin notes the interconnected links between managing the surface and groundwater quantity and quality, which by default will allow for the protection of subterranean fauna habitats.

1.4 Condition Requirements

The Project is currently under assessment by the EPA (assessment number 2173). This IWEMP has been prepared for submission with the ERD and provides a draft condition framework for the EPA to consider as part of the ERD process. As the project is still under assessment, a Ministerial Statement has not yet been issued.

1.5 Rationale and Approach

Agrimin is committed to avoiding and minimising potential impacts to aquatic ecology, subterranean fauna and surface and ground water quality and quantity to ensure the environmental values of inland waters are maintained.

The IWEMP proposes a set of outcome-based management provisions which will ensure that a robust and implementable environmental management approach is achieved. The management provisions will be supported by clearly defined environmental management actions and contingencies to avoid and mitigate impacts relating to the Project.

Rationale for the proposed management approach is supported by baseline survey work and an in-depth understanding of the environmental values in the Project area, ensuring that the environment outcomes

are capable of measurement and reporting against trigger and threshold levels. Where impacts are not measurable, and actions can be monitored, objective-based provisions have been applied.

This IWEMP refers specifically to the On-LDE and the borefield in the SIDE, including management provisions for indirect impacts to the lake islands. The management plan excluded peripheral wetlands as there are no expected direct or indirect impacts to these habitats.

1.5.1 Environmental Surveys

The rationale for the proposed management approach in this IWEMP is supported by technical survey work undertaken to date. The Development Envelopes have been subject to extensive field surveying since 2017, including desktop, reconnaissance, and detailed surveys. The findings of the surveys have been used to inform the impact assessment in the ERD and used to develop management and mitigation measures to minimise the environmental impacts arising from Project activities.

1.5.2 Surface Water

1.5.2.1 Lake Hydrology

Lake Mackay is the fourth largest salt lake in Australia and the largest in Western Australia, covering an area of approximately 3,500 km^2, extending more than 100 km east-west and 80 km north-south. The topography of Lake Mackay and surrounds is subdued and flat. Lakebed elevations range from approximately 360 mAHD in the east to 364 mAHD in the west. The deepest parts of the basin are located in the south-eastern extremities during inundation, while the western half of the lake is comparatively shallow. The eastern portion of the lake is also characterised by more than 270 islands varying in size from less than 100 ha to >2,000 ha. The largest of these, classified as landform islands, are more than 13.5 m in height above the lake surface and support a diverse range of geology and biodiversity

Lake Mackay lies within the internally draining Mackay Basin. The lake is a closed system with no outflow or historic evidence of spilling into adjacent lakes (Stantec 2020a). The total catchment area of Lake Mackay is approximately 87,000 km2, of which only approximately 20% is considered effective in terms of contributing direct surface water runoff. The catchment stretches more than 550 km east of the lake into the MacDonnell Ranges and comprises three sub-catchments. The east to west drainage line is uncoordinated along its length, comprising hundreds of small playas that superficially resemble a river flow path, although a dune system substantially impedes surface water movement. Flow paths meander longitudinally along the dunes, with surface water movement only likely to occur intermittently at topographic lows.

The lake is predominantly dry and is rarely subject to inundation. The northern and western portions of the lake are less likely to hold water, attributed to lower infiltration rates and higher surface elevation. In comparison the south-east portion of the lake coincides with higher infiltration rates and lower topographic elevation. Rainfall events of approximately 30 mm typically occur several times each year, resulting in the formation of isolated, pooled surface water usually within the southern half of the lake. However, these shallow bodies of water (<0.1 m) are strongly influenced by prevailing winds, infiltration, and evaporation, rarely persisting on the lake for longer than a few days (Agrimin, pers. comm. 2020).

1.5.2.2 Claypan Hydrology

Lake Mackay is surrounded by numerous smaller claypans and saline wetlands; there are more than 200 of these waterbodies within 10 km of the playa. They are typically inundated during the wet season, by direct rainfall and surface water runoff from the immediate catchment area; however, they can also hold water for short periods (typically less than one week) following approximately 10 mm or more of rain (Agrimin, pers. comm. 2020). They are typically perched surface water features isolated from groundwater due to the low permeability of their substrate. Infiltration is negligible, demonstrated by the persistence of surface water several weeks following a rainfall event. The discharge of water from the claypans is primarily by evaporation.

1.5.3 Groundwater

1.5.3.1 Lake Groundwater

The relatively flat topography of Lake Mackay results in a very low horizontal groundwater flow gradient (<0.0002 m/m) in a northwest to southwest direction (Agrimin 2020a). Groundwater characteristics associated

with the lakebed sediments varies from east to west across the lake, due to the differing geological composition and can be broadly summarised as follows:

- **West lake portion** - relatively low infiltration rates (range 1.8 mm/h to 42 mm/h) and low hydraulic connectivity (range 0.46 m/day to 5.22 m/day). This results in water remaining on the surface for several days following a rainfall event.
- **East lake portion** - high infiltration capacity (range 1280 mm/h and 5750 mm/h) and high hydraulic conductivity (range 6.7 m/day and 200 m/day). The high infiltration rates of this area result in surface water rapidly infiltrating the lakebed sediments following major rainfall events.

In addition, from extensive recharge and evaporation test work, the east and west portions of the lake were further subdivided into four recharge and evapotranspiration zones (Zones1 to 4). Recharge as a percentage of the mean annual precipitation ranged from 38% to 43% in the western recharge Zones 1and 2 respectively, and between 18% to 13% in the eastern recharge Zones 3 and 4 respectively. The relevance of this is that as groundwater levels decrease, the amount of recharge increases. The most recharge is experienced in Zones 1 and 2, with the least recharge occurring in Zone 4. While infiltration is high in Zone 4, evaporation of stored water in the profile is quickly evaporated reducing the amount of time for water to migrate past the groundwater reference depth.

1.5.3.2 Island Groundwater

The depth to groundwater on the islands of Lake Mackay varies, depending on immediate topography, however, is typically less than 5 mbgl (Agrimin 2020b). Groundwater levels are influenced by a dynamic equilibrium between precipitation, evaporation and evapotranspiration.

The largest landform islands in the eastern portion of the lake also appear to host a lower salinity water, within the porous gypsiferous sands that overlay the clay dominant lakebed sediments (brine). The pH is typically circumneutral (mean 6.9), with naturally elevated nitrate concentrations. Salinities range from 6,000 mg/L to 160,727 mg/L, however, are typically below 60,0000 mg/L, Salinities are typically below 60,0000 mg/L, with an ionic composition dominated by Na and Cl.

The lower salinity groundwater is likely associated with the infiltration of rainfall into the shallow, permeable aeolian sediments and where present, with calcrete outcrops. Seasonal fluctuations in water levels are expected on the islands, associated with both temporal water levels within the aeolian sands and the deeper lakebed sediments.

1.5.3.3 Southern Regional Groundwater

Two prospective aquifer units have been identified in the SIDE, with depth to groundwater between 5.8 m bgl and 8.2 m bgl (Agrimin 2020c). These units host groundwater characterised by circumneutral pH (mean7.3), with salinity concentrations ranging from approximately 1,600 mg/L to 6,300 mg/L. In comparison, bores in the surrounding southern regional area range from less than 5,000 mg/L to approximately 47,000 mg/L, with concentrations decreasing with distance from the lake.

1.5.4 Aquatic Biota

1.5.4.1 Aquatic invertebrates

In total, 53 aquatic invertebrate taxa from fiver higher level taxonomic groups, have been collected from Lake Mackay and the peripheral wetlands. The groups included Insecta, Bivalvia and the crustacean classes of Branchiopoda, Maxillopoda (Copepoda) and Ostracoda.

Lake Mackay was characterised by relatively low diversity, with a total of 13 taxa, primarily halotolerant crustaceans, recorded across the various studies that have been conducted (Stantec 2021). The invertebrate community of Lake Mackay was primarily dominated by halophilic branchiopods and copepods. In particular, the anostracan (brine shrimp) *Parartemia laticaudata* and the cyclopoid copepod *Meridiecyclops platypus* formed a major component of the invertebrate community during flood (Stantec 2021), with *Parartemia laticaudata* also hatching during the sediment rewetting trials. Both taxa are well known from saline water bodies (Timms 2012).

For the few lake sites that supported higher diversity, site morphology, in particular basin depth, was identified as an influencing factor. Whereas the slightly higher diversity at the island claypan was likely linked to the freshwater conditions.

1.5.4.2 Algae and macrophytes

A total of 42 algal taxa comprising three phyla were recorded across Lake Mackay and peripheral wetland (Stantec 2021). These taxa comprised benthic and planktonic algae from rewetting trials and flood sampling. Lake Mackay supported higher diversity (37), compared to the peripheral wetlands (25 taxa) (Table 9-14). Bacillariophyta (diatoms) was the most specious phyla (21 taxa), followed by Cyanophyta (cyanobacteria) (13 taxa) and Chlorophyta (green algae) (eight taxa).

Diatoms where the dominant phyla within Lake Mackay (20 taxa), compared to cyanobacteria (12 taxa) and green algae (5 taxa), whereas diversity of diatoms and cyanobacteria was relatively even in the peripheral wetlands (11 and nine taxa, respectively), with green algae depauperate (5 taxa). Both diatoms and cyanobacteria are commonly associated with benthic microbial communities in salt lakes throughout inland Australia (Handley 2003, John et al. 2009, Paerl et al. 1993).

Overall, the taxa recorded were considered widespread, with composition consistent with assemblages known from inland waters throughout Western Australia (Campagna 2007, Handley 2003, Taukulis and John 2009).

1.5.4.3 Diatoms

In total, 25 diatom taxa, comprising 12 genera, were recorded across Lake Mackay, the island claypan and peripheral wetlands, from both field surveys and re-wetting trials. Of these, 14 taxa were identified from Lake Mackay, while 21 taxa were found in the peripheral wetlands (Stantec 2021). Five taxa were recorded from the island claypan (only sampled in flood). Typically, there was greater variability in diversity observed in the peripheral wetlands, compared to lake sites, reflecting differences in substrate composition and water quality, and likely, higher overall biological productivity (Battarbee et al. 2001; van Kerckvoorde et al. 2000; Wolfe 1996).

1.5.5 Subterranean Fauna

1.5.5.1 Habitat characterisation

1.5.5.1.1 Lake habitat

Low porosity lacustrine deposits such as clay and silt, which host hypersaline groundwater (>100,000 mg/L), comprising the lakebed sediments of Lake Mackay, are considered to have a low prospectivity for subterranean fauna. Although stygofauna and troglofauna can occupy a diverse range of geologies, such as karst, fractured rock, vuggy pisolites and unconsolidated alluvial sediments, their presence is typically dependent on the occurrence of interconnected of sub-surface crevices, fractures and voids, which are absent from low porosity lacustrine sediments (Subterranean Ecology 2010).

In addition to restricting the movement, inadequate interconnected void spaces and associated low permeability limit pathways for the infiltration of resources such as oxygen and carbon, key factors influencing subterranean fauna persistence and distribution (Subterranean Ecology 2010). While stygofauna are known to occur in hypersaline groundwaters up to 100,000 mg/L in the northern Yilgarn region, and some species are known to be salt tolerant, the majority of stygofauna appear to be restricted to salinities below 25,000 mg/L (Halse 2018).

1.5.5.1.2 Island habitat

The most prospective subterranean habitat exists on the larger landform islands of Lake Mackay, where calcareous material intercepts the low salinity capillary fringe, although calcrete is not immediately evident in the core photos. Calcrete aquifer systems are recognised as providing optimal habitat for stygofauna in the Pilbara and Yilgarn regions of WA, typically hosting more diverse assemblages than regolith or fractured rock aquifers (Halse *et al.* 2004; Humphreys 2006a; Humphreys 2008; MWH 2016a;c; Outback Ecology 2014).

The vadose (unsaturated) zone of calcrete units is similarly recognised as important habitat for troglofauna, providing suitably sized and extensively connected crevices and cavities, that remain relatively humid. The latter is an important condition considered to be a key requirement for troglofauna existence (Barranco and Harvey 2008; Bennelongia 2009; Halse *et al.* 2002; MWH 2014; Outback Ecology 2011a; Subterranean Ecology 2008).

1.5.5.1.3 Southern regional area and SIDE habitat

In WA, studies have shown that alluvial aquifers associated with palaeodrainage channels of the arid and semi-arid zones can contain rich stygofauna (Halse *et al.* 2004; Humphreys 2006; Humphreys 2008; MWH 2016a,b; Outback Ecology 2014) and troglofauna (MWH 2014; Outback Ecology 2011a; Subterranean

Ecology 2008). As opposed to calcrete units, unconsolidated alluvial aquifers provide interstitial habitats between clastic sediments (primary porosity), with coarser sediments supporting a more diverse range of fauna. Greater hydraulic connectivity also increases supply rates of organic carbon, oxygen, and nitrogen, essential for the subterranean lifecycle (Subterranean Ecology 2010).

While the SIDE borefield occurs in the saturated Neogene alluvials hosting fresh to low salinity groundwaters, the relatively fine textured lithology is likely to restrict subterranean fauna. However, to the northeast of the SIDE and within the Southern Regional area, more prospective subterranean fauna habitat exists within unconfined calcrete and unconsolidated sediments hosting brackish groundwaters.

1.5.5.2 Troglofauna and Stygofauna

In total, at least 18 stygofauna species, one potential stygofauna species, and one potential troglofauna species have been recorded from the Project area across seven separate field surveys. No species have been recorded from lake bed sediments on the playa of Lake Mackay. This habitat is not considered prospective for subterranean fauna, due to hypersaline groundwater and limited interconnected voids. Similarly, the SIDE borefield was also not prospective and was characterised by relatively fine textured alluvial lithology, which is likely to restrict stygofauna and troglofaunal (Stantec 2021b).

The On-LDE islands, predominantly landform islands in the eastern portion of the lake, host stygofauna within the calcrete and gypsiferous sands that comprise lower salinity groundwater, although this habitat is comparatively less diverse than the Southern Regional area. Three stygal copepod species have been recorded from the landform islands, including one undescribed species that may be restricted; *Schizopera* 'bradleyi'. The only potential troglofauna species recorded was the dipluran Projapygidae-OES3.

The majority of stygofauna records from the Study area were associated with the surficial calcrete aquifer in the Southern Regional area (outside of the SIDE borefield). Sixteen species were recorded from this area, including 13 undescribed species. Only one potential stygofauna taxon (affinity to groundwater unknown); Enchytraeidae sp., was recorded from the alluvial aquifer of the SIDE borefield, although is likely more broadly distributed throughout the region.

1.6 Key Assumptions and Uncertainties

1.6.1 Inland Waters Survey Limitations

Due to the infrequent inundation of Lake Mackay and peripheral wetlands, there is limited information on aquatic biota during major flood events. Rewetting trials were undertaken in the laboratory in 2019 to simulate flooding and document the emergence of aquatic biota; however, these trials cannot completely replicate natural conditions. Two opportunistic field surveys were subsequently completed when the lake was inundated in early 2021, which due to the size of the system represented substantial logistical challenges. This was overcome where possible by utilising a helicopter to access remote parts of the lake. However, additional surveys in future flood events will likely identify increased biodiversity from the lake and broaden understanding of the range of conditions expected over the course of the hydroperiod. Regardless, survey effort was considered adequate, both spatially and temporally, to understand and characterise the ecological values, habitats and significant species associated with the lake, islands, peripheral wetlands and riparian zone.

1.6.2 Subterranean Fauna Survey Limitations

Several subterranean fauna field surveys have been undertaken at Lake Mackay, targeting the lake, islands and SIDE. While most of the habitat associated with these areas is not prospective to subterranean fauna, calcareous geology, predominantly on the landform islands, appears to support stygal and potentially troglofauna communities. For stygofauna, the total survey effort of 79 samples in the Study Area, which includes the Proposal area and Southern Regional area, exceeded the guidance for Level 2 surveys (40 samples).. The troglofauna survey effort approached or exceeded the guidance for pilot studies (10 to 15 troglofauna samples) in the two areas sampled.

Survey efforts in 2020 were also hindered by COVID-19 travel restrictions, delaying the retrieval of troglofauna traps and preventing additional subterranean fauna survey work from being undertaken in the early part of the year. Specialist taxonomic identification of specimens was also affected by the travel

restrictions However, every effort was made to access suitably qualified local specialists to complete morphological identification.

Agrimin are committed to addressing knowledge gaps for the islands. Planning is underway to commission additional, seasonal subterranean fauna surveys for the largest landform islands. Therefore, Agrimin will continue to develop understanding of the vadose zone on the islands, which likely supports stygofauna. This will provide improved habitat characterisation, to assist with groundwater management, if required, as the Proposal progresses. Mining in the vicinity of the landform islands is not expected to occur until after year 10 of operations, allowing time to undertake any additional studies.

There has also been no survey work completed in the NIDE. While there will be minor, temporary water abstraction during construction of the haul road, minor abstraction will occur from a limited number of bores along the haul road. However, this is not expected to be significant enough to warrant subterranean fauna surveys and therefore is not discussed further in this section

2. Operational Phase EMP Approach

Agrimin has applied the EPA's mitigation hierarchy to manage the key impacts relating to the construction activities of the Project. This CEMP and subsidiary EMPs have been prepared in accordance with the *'Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans'* (EPA 2020a). This environmental management approach has been informed by best practice; the project teams extensive regulatory experience and professional technical understanding of the environmental impacts associated with construction activities from the Project.

2.1 Objective-based Approach

The IWEMP management approach is centred on objective-based management provisions, aimed to avoid and minimise impacts to environmental values of the Project Area. This approach has been informed by outcomes of extensive hydrological modelling and on ground studies conducted to date, and experience on similar potash infrastructure and other mining projects in Western Australia.

The following management provisions detailed in Section 3 are proposed to ensure the EPA's environmental objectives can be met and can be complied with in practice. The management provisions, as detailed below, are supported by appropriate objectives, management actions, and a monitoring program that includes clear management targets, contingency actions, and adaptive management and reporting protocols.

Outcomes-based provisions were not considered in the management approach for this IWEMP due to the dynamic nature of the lake system, and subsequently the impact pathways, which makes trigger and threshold criteria difficult to set and measure against.

2.1.1.1 Altered Hydrological Regimes and Water Quality

The operations of the Project may cause changes to hydrology and water quality during inundation events, which may adversely affect aquatic biota, waterbirds (impacts to water birds are addressed separately in the TFEMP) and riparian vegetation (impacts to riparian vegetation are addressed in the FVEMP).

These potential impacts will be managed through the design and location of the On-LDE infrastructure which seeks to maintain natural hydrological flows and avoid impacts to lake islands. The design will also avoid clearing drainage features and lines.

The Project has the following aspects inbuilt in the planning which will help to avoid impacts to surface and groundwater:

- GoldSim water balance modelling indicates limited change to the number of large inundation events during operations
- Detailed hydrological modelling of surface water flows, simulation 1:100-year events to determine impacts
- Cohesive salt crust will prevent moisture loss limiting sediment mobilisation
- Removal of potassium (K) will not alter the dominant ionic constituents in groundwater
- Large rainfall events (300 mm within one month) will recharge groundwater levels dissolving salts within the lakebed sediments and restoring the ionic equilibrium
- The dominant constituents of lakebed sediments, NaCl salts, held in the salt stockpiles created during operations of the Project will be gradually returned to the salt lake playa over time

Further detail on management actions and contingency actions for this impact pathway are detailed in Table 3-1.

2.1.1.2 Groundwater Drawdown Impacting Prospective Subterranean Fauna Habitat– On-LDE

It is not expected to be a high potential for trench brine abstraction on the On-LDE during operational activities of the Project to adversely impact the groundwater level and quality resulting in the loss of subterranean fauna and/or prospective habitat. However, provisions have been developed to ensure this impact is avoided, refer to Table 3-1.

The plan to manage drawdown in such a way that mitigates this risk focusses on utilising buffer zones to avoid impacts to the lake islands, where potential subterranean fauna habitat has been identified:

- Limited drawdown is expected beneath the landform islands ranging from 1.75 m on the margins to 0.2 m in the centre of the islands, at year 20. This is considered independent of the prospective subterranean fauna habitat.
- Limited habitat prospective for stygofauna, with the broad extent of comparable geological units (Neogene alluvials) and associated groundwaters implying a wider distribution of Enchytraeids

2.1.1.3 Groundwater Drawdown – SIDE Borefield

The abstraction of water for the borefiled in the SIDE during operational activities of the Project could adversely impact the groundwater level and quality.

The plan to manage drawdown in such a way that mitigates this risk focusses on borefield pumping limited in accordance with the Licencing requirements.

- Drawdown within the SIDE borefield is expected to be limited, with a maximum lateral drawdown extent of 5.2 km and a maximum drawdown depth of 6 mbgl immediately adjacent bores, after 20 years of pumping (equivalent to <7%) of total aquifer thickness
- Limited habitat prospectively for stygofauna, with the broad extent of comparable geological units (Neogene alluvials) and associated groundwaters implying a wider distribution of Enchytraeids

Further detail of management provisions for the SIDE borefield is provided in Table 3-1.

2.1.1.4 Contaminant spills

Unauthorised discharge or seepage of untreated wastewater is an impact pathway of the Project operations. If this were to occur, contamination of the landscape could inhibit root growth and subsequently cause a decline in vegetation health. To mitigate this risk, Agrimin plans to ensure that the processing plant and associated infrastructure are maintained to a high standard and operated according to the O&M Manual such that avoids any accidental or uncontrolled discharge. Wastewater best practice, health and environmental legislation and ANZECC Guidelines for treated wastewater will be adhered to in order to mitigate the risk.

Hazardous substances (such as hydrocarbon and chemicals) storage / handling provides a risk pathway for spills and contamination to occur. All hazardous substances on site will be appropriately stored such that they do not pose a threat to the health and safety of personnel or the environment. All necessary material for mitigation of accidental spillage of hydrocarbons will be kept onsite at all times. All site Contractors and personnel will be required to follow and implementation standard spill response procedures and protocols. In the event of accidental spillage, the Contractor should cease work immediately and ensure contamination is cleaned up prior to recommencing. A comprehensive environmental incident report will then be completed.

3. EMP Provisions

This IWEMP presents an impact mitigation approach focused on objective-based management provisions, aimed to avoid and protect Inland Waters and Subterranean Fauna within the Project Area. This approach has been informed by outcomes of extensive modelling and baseline studies conducted to date, and experience on similar potash infrastructure projects in Western Australia, that were provided with approval under *Part IV* of the EP Act.

This IWEMP outlines the requirements to avoid, minimise, manage, monitor, and rehabilitate potential impacts as per the EPA's mitigation hierarchy. No significant residual environmental are predicted to remain, post the implementation of this IWEMP therefore meeting EPA guidance for Inland Waters and Subterranean Fauna, and offset strategies are not required.

Table 3-1 Inland Waters Management Provisions

EPA Factor/s and Objective/s	Inland Waters – *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.* Subterranean Fauna - *To protect subterranean fauna so that biological diversity and ecological integrity are maintained.*
Management Objectives	The proponent shall manage the implementation of the proposal to meet the following management objectives: • **IW1 Objective:** Minimise impacts to hydrological regimes and water quality during major inundation events to maintain ecological processes on the lake • **IW2 Objective**: Avoid groundwater drawdown to protect subterranean fauna on islands • **IW3 Objective:** Achieve the conservation of water through minimising abstraction rates and water re-use in the borefield • **IW4 Objective:** Prevent contaminant (such as hydrocarbons or wastewater) spills from entering the lake environment
Key Environmental Values	Highly productive ecosystem during inundation events comprising algae, macrophytes and aquatic invertebrates 10 aquatic invertebrate taxa of scientific interest have been recorded from Lake Mackay Large islands on the lake support stygofauna communities
Key Impacts and Risks	• **IW1:** Altered lake surface hydrology and or changes to water quality causing adverse impacts to aquatic biota • **IW2:** Groundwater drawdown causing loss of subterranean fauna and habitat on the lake islands • **IW3:** Abstraction of groundwater for borefiled activities outside of Licence conditions • **IW4:** Contaminant spills causing adverse effects to water quality and aquatic biota

Objective-Based						
ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency	Reporting
IW1	1. Ensure inundation occurs in parts of the lake basin that have the lowest elevation 2. Ensure diversity of aquatic biota is not adversely impacted 3. Ensure groundwater water quality and sediment quality is not adversely affected 4. Ensure no substantial variation in lake environment from baseline conditions	• Develop a monitoring program for both dry and inundated conditions • Develop a Groundwater Monitoring Program • Limit disturbance On-LDE (4.55%; <15,000 ha) • Avoid impacts to NT section of the lake (16.6%; 56,506 ha) • Exclusion heritage zones on WA side of the lake will remain undisturbed (9.5%; 32,261 ha) • Implement buffer zones around islands formations (up to 500 m) • Engineering design and implementation (1 km spacing, install crossovers) of suitable drainage control features. These features will convey flow past On- LDE infrastructure and return flow to its natural path and area of inundation. • Staged development of trenches via BMUs to allow for adaptive management of the engineering design. • Evaporation ponds have been designed for a 1% AEP flood event, with minimum embankment height of 1.5 m, providing sufficient freeboard to limit saline runoff into the lake during major rainfall events • Evaporation ponds will be breached at closure to allow periodic pulsed flows and natural dissipation of salt to the lake over time • Comply with CEMP • Develop site specific criteria to understand the variability of water and sediment quality based on monitoring results	• In dry conditions, monitor sediment chemistry (including moisture content), salt crust thickness, diatoms, resting stages of aquatic biota, and riparian vegetation (in accordance with the FVEMP) • In inundated conditions, opportunistically monitor water and sediment chemistry, aquatic biota, and riparian vegetation (in accordance with the FVEMP) against baseline conditions • Opportunistic monitoring of inundation events and extent to compare against hydrological modelling • Routine monitoring of groundwater levels and quality on the lake during operations	Annual Opportunistic Opportunistic Quarterly	• Review and revise BMU schedule and mine plan • Review and revise engineering design of BMUs and trench network	Technical report appended to Annual Compliance Reports
IW2	1. Minimise changes to groundwater levels and quality 2. Ensure diversity of stygofauna fauna is not adversely impacted	• Develop a groundwater monitoring program for the islands • Implement buffer zones around islands formations (up to 500 m) • Avoid impacts to 15 large islands in the NT that may contain prospective habitat for stygofauna • Staged development of trenches via BMUs to allow for adaptive management of the engineering design. • Groundwater investigations and review of modelling will be used to develop site specific criteria for groundwater levels and quality	• Routine monitoring of groundwater levels and quality on representative islands during operations	Quarterly	• Review and revise BMU schedule and mine plan • Review and revise engineering design of BMUs and trench network	Technical report appended to Annual Compliance Reports

Objective-Based						
ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency	Reporting
IW3	1. Abstraction of groundwater for operational activities in the SIDE borefield will be undertaken in accordance with the approved 5C Licence	• Prior to undertaking dewatering activities: o Apply for a 26D Licence, issued under the provisions of the *Rights in Water and Irrigation Act 1914* to construct or alter wells. o Install all water supply production bores in accordance with the Minimum Construction Requirements for Water Bores in Australia (2012). o Install all monitoring bores in accordance with Water Quality Protection Note No. 30; Groundwater Monitoring Bores (2006). o Complete of either a H1 -Desktop Assessment, or H2 Desktop Assessment, including test pumping in accordance with Operational Policy 5.12. Hydrogeological Reporting associated with a Groundwater Well Licence (2009). o Development of a Groundwater Licence Operating Strategy (GLOS) in accordance with Operational Policy 5.08 o Use of Operating Strategies in Water Licensing Process (2019). o Apply for a 5C Licence, issued under the provisions of the Rights in Water and Irrigation Act 1914 to take water for temporary construction water supply purposes.	• Routine monitoring of bores for groundwater level, quality and quantity, as per the 5C Licence to take water and associated GLOS.	As per 5C Licence	• Non-compliance will be investigated • Review understanding of water balance within borefield and process plant and implement mitigation measures.	Annual Compliance Report for the GLOS
IW4	1. Any wastewater produced as a result of operational activities will be treated to meet relevant ANZ Guidelines and be disposed of in a controlled manner 2. No contamination or spills as a result of operating the Project 3. Avoid uncontrolled discharge of saline water	**Wastewater:** • WWTP and irrigation infrastructure to be operated and maintained in accordance with design specifications • Obtain all required environmental approvals for construction and operation of the WWTP (Part 5 and local council/ DoH approvals) • Maintain high standard of housekeeping around processing plant and associated infrastructure • Adhere to wastewater best practice health and environmental legislation and guidelines for irrigation of treated wastewater **Contaminant Spills:** • Avoid fuel/chemical storage and transfer from occurring outside of designated bunded areas (i.e. dedicated workshop for maintenance) • Ensure spill response equipment available • Spill response training for all personnel and contractors • Maintain high standard of housekeeping around construction activities • Develop an Emergency Spill Response Plan and ensure all personnel and contractors are trained in the correct response. • Develop an Incident Reporting Procedure and ensure all personnel are aware of the procedure. **Uncontrolled Discharge of Saline Water:** • Pipelines to be installed in earthen bunded culverts to prevent spills from discharging into the surrounding environment	• If required, sampling of soils to ensure all contaminated material has been removed and in-situ soils sediments have been remediated • If required, monitoring vegetation health in affected areas and adjacent areas. • Routine testing of treated wastewater to ensure discharged wastewater meets minimum compliance discharge criteria • Regular pipeline inspections and maintenance	As required	• In the event of accidental spillage, the Contractor will cease work immediately and ensure contamination is cleaned up prior to recommencing. A comprehensive environmental incident report will then be completed. • Implement Emergency Spill Response Plan to ensure adequate preparedness for haul road spill response following mitigation hierarchy. • Contain any contaminant spills to prevent seeping to groundwater or becoming runoff to surface water bodies.	Annual Compliance Assessment Report (CAR) Internal incident reporting and investigation process

4. Reporting Provisions

4.1.1 Annual Reporting

Agrimin will prepare Annual Environmental Reports (AERs) to be submitted to regulatory authorities. The format of these reports will be consistent with requirements stipulated by individual regulatory authorities.

Annual Compliance Assessment Report (CAR) will also be submitted to regulatory authorities. The report will document compliance with conditions of approval including assessment of compliance with management plan requirements where management plans form part of approval conditions.

4.1.2 Exceedance Reporting

In the event that a management threshold level is exceeded, the DWER and DBCA will be notified within 7 days of identification of the exceedance.

4.1.3 Incident Reporting

All environmental incidents regardless of the scale and nature of the incident will be required to be reported to the Environment and Heritage Manager as soon as practicable.

All environmental near misses and incidents will be recorded within an incident management system that will be developed by Agrimin. Incidents will be recorded by the person/s who cause or identify the event, within 24 hours of the incident occurring.

Incidents will be investigated, and root causes determined and recorded within the incident investigation, within 2 weeks of the incident occurring, or as instructed by the Registered Mine Manager. Where applicable, environmental incidents will be reported to the relevant government agencies by the Environment and Heritage Manager.

In the event of a non-compliance, the cause of the non-compliance will be investigated and reported as an incident. Corrective actions will be developed and recorded, and outcomes monitored. Non-compliance and incident reports will be closed out by the Environment and Heritage Manager and/or the Registered Mine Manager.

Table 4-1 is an example of how incidents might be reported and maintained in a register.

Table 4-1: Incident Reporting Register

Management Targets	Status report: Management target achieved Management actions implemented

5. Adaptive Management and EMP Review

5.1 Adaptive Management

It is recognised that there is a level of scientific uncertainty and current knowledge gaps relating the hydrology and subterranean fauna protected by the IWEMP, particularly in relation to impacts of the operations of the Project. This makes determination of residual impacts from implementing the Project on local or regional scales difficult to determine with any degree of certainty. Given the long life of the Project, it is reasonable to expect that additional information and knowledge will be gained on the surrounding environment, and effectiveness of the management actions, that may influence the development of future management approaches.

For this reason, Agrimin are committed to ensuring the management approach for Inland Waters and Subterranean Fauna is adaptive and responsive to changes in the scientific understanding and advancements in best management practices, as well as changes occurring to the natural environments (e.g. future climatic changes), enabling adjustments to the mitigation measures and monitoring protocols to meet the Project's management objective, over the long-term.

Through this IWEMP, Agrimin are committed to preparing their adaptive management approach through the identification and application of early response indicators to provide information on changes that are precursors to an environmental impact and supports improved understanding and identification of trends in environmental systems. The IWEMP's early response indicators will be developed in the first three years of the Project's life span and will be informed by the analysis of additional data sets and monitoring results collected over this time.

Review processes for the IWEMP will be based on formalised dates during the operational stages of the Project, and will include:

- **Periodic reviews and evaluation of monitoring data or methodology**: Aimed to determine whether site specific monitoring program results indicate that management targets are not being achieved.
- **Increased understanding of the ecological system**: If additional information about the species use of the project area or region is received that would better inform management approaches.
- **External changes during the life of the Project (e.g. Project design changes, technical advances or innovation):** The relevance and effectiveness of management measures would be considered and reviewed and/or revised following any significant changes to the Project.

Over the first three years of implementing the Project, the baseline data available is considered adequate for Agrimin to commence a review of the effectiveness of the IWEMP management approach. Agrimin is committed to working closely with State and Commonwealth regulatory and conservation agencies over this period to determine the effectiveness of the management plans management actions and targets.

5.2 Auditing

The implementation of this plan will be audited by Agrimin, including audit of compliance and performance against all elements of this IWEMP. The review and audit process will:

- identify issues and proposed changes to the IWEMP;
- monitor and evaluate performance against outcome and management provisions and environmental criteria; and
- determine if management, mitigation and monitoring is effective or is required to be adjusted.

5.3 Corrective Actions

All environmental incidents regardless of the scale and nature of the incident will be required to be reported to the Environment and Heritage Manager as soon as practicable.

All environmental near misses and incidents will be recorded within an incident management system that will be developed by Agrimin. Incidents will be recorded by the person/s who cause or identify the event, within 24 hours of the incident occurring.

Incidents will be investigated, and root causes determined and recorded within the incident investigation, within 2 weeks of the incident occurring, or as instructed by the Registered Mine Manager. Where applicable, environmental incidents will be reported to the relevant government agencies by the Environment and Heritage Manager.

In the event of a non-compliance, the cause of the non-compliance will be investigated and reported as an incident. Corrective actions will be developed and recorded, and outcomes monitored. Non-compliance and incident reports will be closed out by the Environment and Heritage Manager and/or the Registered Mine Manager.

5.4 Review

The IWEMP will be reviewed and updated every three years throughout the operational phases of the Project, or as required. Other triggers for a review of this IWEMP include trigger of early warning indicators, addressing items identified during incident investigations, audits or inspections; and new or revised information becomes available

Ongoing monitoring programs will be reviewed on a regular basis, as required, likely to be annual during the initial phases of the Project and as operations begin.

The Project is subject to further environmental approvals under other legislation, including assessment and approval by DWER and DMIRS. Agrimin will review this IWEMP (and update if required) to ensure it achieves all identified environmental outcomes and objectives.

6. Stakeholder Consultation

Agrimin is committed to ongoing stakeholder communication, engagement and consultation through the planning and approvals phase, as well as the construction, operational and closure phases of the Project. This FVEMP is submitted as a draft for comment and consultation with the EPA.

6.1 Stakeholder Engagement

Agrimin has undertaken extensive community and stakeholder consultation as part of the design and feasibility assessments of the Project. These including presentations and briefings to stakeholder groups including representatives from environment, heritage, community, and Indigenous groups, local, State and Commonwealth Government agencies.

Agrimin maintains a Stakeholder Engagement Register that includes specific consultation with stakeholders and a detailed response to issues is provided. Stakeholder engagement will continue through the construction and operation of the Project and reported through revisions of Environmental Management Plans. Stakeholder consultation will continue to be monitored and reported following revision of the FVEMP as the document is finalised and implemented.

6.2 Key Stakeholders

Key stakeholders have been outlined in Table 6-1.

Table 6-1 Key Project Stakeholders

Group	Stakeholders
Commonwealth Government Agencies	• Commonwealth Department of the Environment and Energy (DoEE).
State Government Agencies	• Environmental Protection Authority (EPA); • Department of Mines, Industry Regulation and Safety (DMIRS); • Department of Water and Environmental Regulation (EPAS); • Department of Water and Environmental Regulation (DWER); • Department of Water and Environmental Regulation (DWER – Regulation); • Department of Biodiversity, Conservation and Attractions (DBCA); • Department of Planning, Lands and Heritage (DPLH); • Main Roads Western Australia (MRWA); • Department of Jobs, Tourism, Science, and Innovation (DJTSI); • Department of Fire and Emergency Services (DFES); • Civil Aviation Safety Authority (CASA); and • Members of Parliament.
Local Government Authorities	• Shire of East Pilbara; • Shire of Halls Creek; and • Shire of Wyndham-East Kimberley.
Native Title Representative Bodies	• Central Desert Native Title Services; and • Kimberley Land Council.
Indigenous Groups	• Tjamu Aboriginal Corporation and Kiwirrkurra People; • Parna Ngururrpa Aboriginal Corporation and Ngururrpa People; and • Tjurabalan Native Title Land Aboriginal Corporation.
Environmental Interest Groups	• Conservation Council of Western Australia (CCWA); • Night Parrot Recovery Team; and • Water bird Conservation Group.
Industry Groups	• Chamber of Commerce and Industry.

7. References

Agrimin Ltd. (2020a). Lake Mackay Stage 1 and Stage 2 Surface Water Assessment. Agrimin Ltd, Western Australia.

Agrimin Ltd. (2020b). Water Supply Assessment for Mackay SOP Project Groundwater Modelling Report. Agrimin Ltd, Western Australia.

Agrimin Ltd. (2020c). Hydrology and Hydrogeology of the Mackay SOP Project. Agrimin Ltd, Western Australia.

Campagna, V. S. (2007). Limnology and biota of Lake Yindarlgooda - an inland salt lake in Western Australia under stress. Doctoral Thesis. Curtin University of Technology.

EPA. (2018). Environmental Factor Guideline: Inland Waters. Environmental Protection Authority (EPA), Western Australia.

EPA. (2016). Environmental Factor Guideline: Subterranean Fauna. Environmental Protection Authority (EPA), Western Australia.

EPA. (2020). Instructions on how to prepare *Environmental Protection Act 1986* Part IV Environmental Management Plans. Environmental Protection Authority (EPA), Western Australia.

Halse, S. A. (2018). Subterranean Fauna of the Arid Zone. In: E. Lambers (ed) On the Ecology of Australia's Arid Zone. Springer Natur

Halse, S., Lyons, M. N., Pinder, A. M. and Shiel, R. J. (2004). Biodiversity patterns and their conservation in wetlands of the Western Australian Wheatbelt. *Records of the Western Australian Mueseum Supplement* 67: 337-364.

Humphreys, G. (2006). BHPBIO Pilbara operations regional stygofauna programme - 2006 annual report. Biota Environmental Sciences Pty Ltd, Pert

Humphreys, W. F. (2008). Rising from Down Under: developments in subterranean biodiversity in Australia from a groundwater fauna perspective. *Invertebrate Systematics* 22: 85–101.

MWH. (2016a). Ethel Gorge Stygofauna Monitoring Program: 2016. Report prepared for BHP Billiton Iron Ore

MWH. (2016b). Salinity Tolerance of Ethel Gorge Stygofauna TEC. Report prepared for BHP Billiton Iron Ore.

Outback Ecology. (2014). Browns Range Project Subterranean Fauna Assessment. Report prepared for Northern Minerals Ltd, Perth, Western Australia.

Stantec. (2021a). Lake Mackay Potash Project: Baseline Aquatic Ecology Study. Stantec Australia Pty Ltd, Australia.

Stantec. (2021b). Lake Mackay Potash Project: Consolidated Subterranean Fauna Study. Stantec Australia Pty Ltd, Australia.

Subterranean Ecology. (2010). Gold Fields, St Ives Gold Mines: Stygofauna Desktop Assessment. Unpublished report for Gold Fields Pty Ltd.

Appendices

Appendix A Key Regulatory Obligations

A.1 Key Regulatory Obligations

Legislation relevant to the scope of this EMP, included, but are not limited to, the following legislation:

- *Aboriginal Heritage Act 1972*
- *Australian Heritage Council Act 2003*
- *Biodiversity and Agricultural Management Act 2007*
- *Biodiversity Conservation Act 2016*
- *Biosecurity Act 2015*
- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- *Contaminated Sites Act 2003*
- *Dangerous Goods (Transport) Act 1998*
- *Dangerous Goods Safety Act 2004*
- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)*
- *Environmental Protection Act 1986*
- *Health Act 2016*
- *Heritage of Western Australia Act 1990*
- *Land Administration Act 1997*
- *Local Government Act 1995*
- *Main Roads Act 1930*
- *Mines Safety and Inspection Act 1994*
- *Mining Act 1978*
- *National Greenhouse and Energy Reporting Act 2007*
- *Native Title Act 1993*
- *Occupational Safety and Health Act 1984*
- *Planning and Development Act 2005*
- *Rights in Water and Irrigation Act 1914*
- *Soil and Land Conservation Act 1945*
- *Waste Avoidance and Resource Recovery Act 2007*
- *Water Services Act 2012*
- *Waters and Rivers Commission Act 1995*
- *Waterways Conservation Act 1976*

A.2 Regaultory Approval Requirements

Table A-7-1: Regaultory approvals relevant to the Mackay Potash Project* (this list is indicative and subject to change throughout the life of mine)

Project Activities	Type of Approval	Legislation Regulating the Activity	Responsible Government Agency	Additional Information
Mackay Project Development (including infrastructure corridors)	Grant of Mining Lease	*Mining Act 1978*	DMIRS	Grant of mining lease required for mining activities, processing, and mining infrastructure such waste landforms.
	Grant of Miscellaneous Licences	*Mining Act 1978*	DMIRS	Grant of tenure required for infrastructure.
	Native Title Agreement	NT Act	Attorney-General's Department (Cwth) DPLH	Required prior to access and works.
	Land Access Agreement		DPLH	Required prior to access of Proposal, clearing and mining activities.
	Aboriginal Heritage Sites	AH Act	DPLH	If the disturbance of any Aboriginal Heritage Sites site is required
Mining and Processing	Mining Proposal and Mine Closure Plan	Division 3 of Part IV of the *Mining Act 1978*	DMIRS	Required prior for mining and processing activities and supporting infrastructure.
	Dangerous Goods Licence	*Dangerous Goods Safety Act 2004* (DGS Act)	DMIRS	Required for the storage, transport and use of Dangerous Goods.
	Project Management Plan	*Mines Safety and Inspection Act 1994* (MSI Act) Mining Safety & Inspection Regulations 1995	DMIRS	Required prior to construction or mining operations commencing.
Clearing of native vegetation	Native Vegetation Clearing Permit	Part V of the EP Act	DMIRS (via administrative agreement with DWER)	Not required if flora and vegetation is formally assessed as a key environmental factor under s38 of the EP Act.

Project Activities	Type of Approval	Legislation Regulating the Activity	Responsible Government Agency	Additional Information
Processing plant construction and operations	Works Approval	Part V of the EP Act Environmental Protection Regulations 1987	DWER - Regulation	Required prior to construction of processing and other associated prescribed premises activities
	Operating Licence	Part V of the EP Act	DWER - Regulation	Required prior to the commencement of official production and shipment.
Construction of trenches, bores for process water supply	Application for 26D Licence	Section 26D RIWI Act	DWER - Water	Required prior to construction of trenches and bores.
Groundwater abstraction – brine and process water	Application for a 5C Licence	Section 5C RIWI Act	DWER - Water	Required for groundwater abstraction.
Support infrastructure (wastewater treatment)	Application to Construct or Install an Apparatus for the Treatment of Sewage	*Health Act 1911* Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations of 1974	Shire of East Pilbara Department of Health DWER - Regulation	Requirement is dependent upon size and treatments options.

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