

Item No.	Environmental Factor	Phase	Activity	Risk Pathway	Impact	Relevant Information	INHERENT RISK RATING			Risk Treatment	RESIDUAL RISK RATING			Planned Outcome	Performance Criteria	Monitoring
							Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level			
1	Biodiversity, Flora, Fauna, Ecosystem	All Phases	Clearing, earthworks, exploration, construction, demolition, rehabilitation	Activities (incl. ground disturbance) result in introduction of new weeds	Weeds spread within disturbed areas. Weeds out-compete local native species.	97% of Beyondie Sulphate of Potash Project Area has been mapped as in Excellent or Very Good condition with minimal weed infestation, if any (Phoenix 2018a) Nine introduced plant species recorded. Vegetation condition is excellent (Phoenix 2017a). No declared weeds recorded but feral grazing animals are a vector for weed seed.	Moderate	Possible	Medium	Contingency weed spraying during rehabilitation. Restrict personnel from accessing reserves. Mandatory requirement that any equipment brought to site be clean and weed free. Workforce education identifies weed species and mandates reporting of weed locations. Annual inspections of cleared and rehabilitated areas to determine if new weed species have established. If annual inspections show new weed species are established, weed mapping to determine the effectiveness of control measures will be commenced. Equipment inspections to be undertaken to check hygiene of earthmoving equipment and vehicles. Eradicate any weed infestations. Seed rehabilitation areas with local native species from reputable supplier (certified seed purity). Seed quality certification from external suppliers. EMS and AER to report incidents and follow ups. Incident reporting	Moderate	Unlikely	Low	No new weed species introduced by mining operations.	No new weed species identified within disturbed areas on site. No new weed species infestations become established within Project work areas.	Annual inspections of cleared and rehabilitated areas to determine if new weed species are becoming established. If annual inspections show new weed species are established, weed mapping to determine the effectiveness of control measures will be commenced. EMS and AER to report incidents and follow ups. Equipment inspections to be undertaken to check hygiene of earthmoving equipment and vehicles. Follow up monitoring on any areas where weeds have required control within 1 year.
2	Biodiversity, Flora, Fauna, Ecosystem	All Phases	Vehicle and earthmoving equipment movements.	Machinery or vehicle movements resulting in fauna deaths.	Injury or death of numerous conservation significant fauna.	Five vertebrate species of conservation significance were recorded during the survey. Two additional conservation significant species were recorded in a waterbird survey concurrently with the terrestrial fauna survey.	Moderate	Unlikely	Low	Workforce education. Drive on existing tracks only. No driving outside of approved disturbance areas. EMS process and internal incident reporting. Statutory incident reporting. Speed limit restrictions.	Moderate	Unlikely	Low	N/A		
3	Biodiversity, Flora, Fauna, Ecosystem	All Phases	Storage of food and food wastes	Increase in feral fauna populations via introduction or poor food waste management	Increased competition for native fauna, predation of native fauna	Eight introduced fauna species recorded in surveys of Beyondie and Ten Mile Lake area (Phoenix 2018). Only small workforce proposed (90 personnel)	Moderate	Unlikely	Low	Compliance with Part IV and EPBC Act approvals. Incidental feral fauna sightings will be recorded, and assessed on an annual basis and information provided in AER. Staff will be trained on identification of feral fauna. No pets brought to site. Food waste stored in sealed bins and disposed offsite or disposed of in landfill onsite. Regular waste management audits. Feral animal control programme in conjunction with adjacent landowners and DBCA guidance. Incident reporting.	Moderate	Unlikely	Low	N/A		
4	Biodiversity, Flora, Fauna, Ecosystem	All Phases	Construction and operational activities, earthmoving activities	Noise resulting from Project activities	Noise significantly alters fauna behaviour or deters fauna	A total of 128 vertebrate fauna species were recorded during the field surveys. Four species of conservation significance were recorded.	Minor	Unlikely	Low	Implement Part V Works Approval (construction) and Licence (operation) mitigation and monitoring procedures. Regular equipment maintenance and inspections. EMS process and reporting. Regular audits. Incident reporting.	Moderate	Very Unlikely	Low	N/A		
5	Biodiversity, Flora, Fauna, Ecosystem	All Phases	Earthmoving activities	Dust resulting from Project activities	Indirect impact on vegetation and fauna habitat causing a measurable decline in vegetation health/habitat quality	Refer to item 2	Minor	Unlikely	Low	Implement dust controls (water carts, dust control agents as required). Implement Part V Works Approval (construction) and Licence (operation) mitigation and monitoring procedures. Unauthorised Discharge Regulations (applicable during construction, operation and closure). Vehicle movements and speeds restricted to reduce dust emissions. EMS process and internal incident reporting. Statutory incident reporting.	Minor	Very Unlikely	Low	N/A		
6	Biodiversity, Flora, Fauna, Ecosystem	All Phases	Construction and operational activities, earthmoving activities	Project activities such as hot work or vehicle movements trigger site fire resulting in loss of conservation significant vegetation or habitat	Temporary impact to conservation significant fauna habitat	Refer to item 2	Moderate	Unlikely	Low	Hot work permits. Emergency Management Plan to include fire. Compliance with Project Management Plan approved by DMIRS during construction, operation and closure. Water cart available for fire control. Trailer mounted water cart able to be used as fire tender. Regular firebreak maintenance schedule.	Moderate	Very Unlikely	Low	N/A		
7	Biodiversity, Flora, Fauna, Ecosystem	Closure	Storage of excess salt on Ten Mile Lake surface	Breach of bund releases saline water into surrounding fringing vegetation	Indirect impact on vegetation and fauna habitat causing a decline in vegetation health/habitat quality. Changes to lake biology caused by impacts on ability of aquatic fauna to complete life cycle.	Ministerial conditions and Part V conditions will be imposed on the stockpile during operations. Scientific literature shows vegetation and aquatic fauna is well adapted to a wide range of saline conditions. Locally significant vegetation (Sapphire shrublands) surrounding salt lakes contains four Priority 1 species of Tectocornia. Surface water modelling by Advisian (2018) shows that flooding on Ten Mile Lake is rare.	Moderate	Possible	Medium	Triennial updates of MCP. Regular inspections of bund integrity and repairs if required, particularly after significant rainfall events. Install erosion protection if required to ensure bund integrity during closure. Utilise operational experience and observations. Cost estimation and provisioning to IFRS Standard. MRF reporting and contributions.	Moderate	Unlikely	Low	No release of saline water into Ten Mile Lake fringing vegetation	No release of saline water beyond bund wall	Post-closure inspection. Verification report of bund integrity.
8	Biodiversity, Flora, Fauna, Ecosystem	Closure	Decommissioning of pipes, pumps, tanks leads to spillage of brine.	Spillage of brine into non-saline vegetation areas.	Vegetation death.	Brine is considered product so the majority will be abstracted and processed prior to closure. Volumes will therefore be minimal.	Moderate	Unlikely	Low	Locate pipelines in roadside drainage where practicable. Decommissioning procedures to consider flushing of pipes, tanks and ponds and release of contained materials. Detailed plans for evaporation pond decommissioning to be included in MCP.	Moderate	Very Unlikely	Low	N/A		
9	Biodiversity, Flora, Fauna, Ecosystem	Closure	Rehabilitation of evaporation ponds	Low quantities of topsoil. Poor quality topsoil.	Poor establishment of plants in rehabilitation.	Concentrator ponds and crystalliser ponds located on areas with previous vegetation.	Serious	Possible	Medium	Implement stripping and storage regime planned in Mining Proposal. Provision made for topsoil stripping and storage. Topsoil stripping and storage procedure. Triennial reporting of materials balances to DMIRS.	Serious	Unlikely	Medium	Minimum of 1000 m3 of topsoil available per hectare for rehabilitation (based on minimum of 10 cm topsoil stripping depth)	Average of at least 10 cm of topsoil stripped and stored for use at closure. Topsoil stockpiles measure less than 2.5 m in height	Topsoil volume assessment and inspection of storage conditions. EMS audit before operations commence. AER. Rehabilitation monitoring after three years
10	Biodiversity, Flora, Fauna, Ecosystem	Closure	Rehabilitation of evaporation ponds	Remaining salts within ponds. Liner causes waterlogging of soils	Poor establishment of plants in rehabilitation.	Concentrator ponds and crystalliser ponds located on areas with previous vegetation. HDPE liner is 1 mm thick, impermeable unless punctured and covers total area of up to 750 ha. Residual salts from crystalliser ponds will be harvested. Significant residual salts at concentrator lakes and ponds unlikely.	Serious	Possible	Medium	Liners to be disposed of according to disposal options identified in MCP. Detailed options analysis for closure to be undertaken. Salts to be removed from liners by harvesting or redissolved prior to backfilling.	Serious	Unlikely	Medium	Pond liners and residual salts do not prevent rehabilitation	Residual salts are removed from crystalliser ponds. Liners are disposed of according to disposal options identified in MCP.	Post-closure inspection. Verification report of liner disposal option.
11	Water Resources	Closure	Placement of infrastructure within lake catchments	Surface water regime and catchment affected by the presence of trenches, salt stockpile and evaporation ponds	Changes to flooding regime	Evaporation ponds make up very low percentage of surface water catchment for Ten Mile Lake. Salt lakes and minor drainage lines, which are dry for most of the year, are the main surface water features present. The presence of sandy soils are expected to result in high infiltration and minimal runoff. Surface water modelling by Advisian (2018) shows no significant change to flooding regime of Ten Mile Lake by presence of trenches or stockpile.	Serious	Very Unlikely	Low	Evaporation ponds will be backfilled and reshaped to the surrounding landform. Liners to be disposed of according to disposal options identified in MCP. Trenches will be backfilled to lake level.	Serious	Very Unlikely	Low	N/A		

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12	Water Resources	Closure	Storage of excess salt on Ten Mile Lake surface	Breach of bund releases saline water into surrounding lake system	Significant increase in overall salinity of floodwaters on Ten Mile Lake	Design includes bund around excess salt stockpile. Ministerial conditions and Part V conditions will be imposed on the stockpile during operations. Scientific literature shows vegetation and aquatic fauna is well adapted to a wide range of saline conditions. Locally significant vegetation (Sapphire shrublands) surrounding salt lakes contains four Priority 1 species of Tectocoma. Surface water modelling by Advisian (2018) shows that flooding on Ten Mile Lake is rare.	Moderate	Unlikely	Medium	Triennial updates of MCP. Regular inspections of bund integrity and repairs if required, particularly after significant rainfall events. Install erosion protection if required to ensure bund integrity during closure. Utilise operational experience and observations. Cost estimation and provisioning to IFRS Standard. MRF reporting and contributions.	Moderate	Very Unlikely	Low	No release of saline water into Ten Mile Lake	No release of saline water beyond bund wall	Post-closure inspection. Verification report of bund integrity.
13	Water Resources	Closure	Groundwater abstraction	Brine abstraction from trenches and bores located at Ten Mile Lake and Sunshine Lake during operations	Drawdown significantly affects salt lake processes for a period post-closure	Drawdown limited to small portion of each lake, with majority less than 0.5m drawdown. 5 yr ARI event required to provide recharge to the aquifer. Hydrological processes will gradually return to existing conditions post-closure	Moderate	Possible	Medium	Groundwater level monitoring will be undertaken as part of the Tectocoma Monitoring Program until pre-mining groundwater levels are reinstated. All pumps are to be shut off at closure. Trenches are to be backfilled to prevent evaporation.	Moderate	Unlikely	Low	Pre-mining groundwater levels are reinstated	Groundwater levels are within the natural range at each lake	Monitoring will be undertaken as part of the Tectocoma Monitoring Program.
14	Water Resources	All Phases	Clearing and cleared work areas, closure works	Sediment runoff during clearing or from cleared areas	Sedimentation of surface water system, degradation of surface water features	Salt lakes and minor drainage lines, which are dry for most of the year, are the main surface water features present. The presence of sandy soils are expected to result in high infiltration and minimal runoff	Minor	Possible	Low	Implement Part V Works Approval (construction) and Licence (operation) mitigation and monitoring procedures. Detailed engineering design will ensure drainage features maintain surface water flows	Minor	Unlikely	Low	N/A		
15	Water Resources	All Phases	Storage and handling of hydrocarbons or chemicals	Hydrocarbon and chemical spills and leaks	Surface water contamination. Seepage into groundwater leading to contamination of the aquifer.	Only minor volumes to be stored on site. Salt lakes and minor drainage lines, which are dry for most of the year, are the main surface water features present. The presence of sandy soils are expected to result in high infiltration and minimal runoff	Moderate	Unlikely	Low	Implement Part V Works Approval (construction) and Licence (operation) mitigation and monitoring procedures. Unauthorised Discharge Regulations (applicable during construction, operation and closure). Implement Spill Management Procedure. Hydrocarbons and chemicals will be stored in bonded facilities compliant with AS 1940-2004. All bonded facilities will be fitted with spill kits. Fuel will be stored in self-bunded tanks. Service vehicles will be fitted with spill kits. Any spills will be controlled, contained and cleaned up. EMS process and reporting. Incident reporting. Regular maintenance, equipment inspections and audits. Contaminated Sites Legislation	Moderate	Very Unlikely	Low	N/A		
16	Water Resources	Closure	Removal of infrastructure	Residual contamination from fuel or chemical storage, WWTP or workshop activities. Hydrocarbon spills during rehabilitation activities.	Contamination of soil, surface or groundwater.	Residues from hydrocarbon storage. Hydrocarbon spills during rehabilitation activities. Spillage, leakage or inappropriate disposal of reagents or dangerous goods stored on site (including laboratory waste). Workshop activities (hydrocarbon residues). Only minor volumes to be stored on site.	Moderate	Unlikely	Low	Contaminated Sites Legislation requires investigations and clean-up if required. Unauthorised Discharge Regulations (applicable during construction, operation and closure). Implement Spill Management Procedure. Hydrocarbons and chemicals will be stored in bonded facilities compliant with AS 1940-2004. All bonded facilities will be fitted with spill kits. Fuel will be stored in self-bunded tanks. Service vehicles will be fitted with spill kits. Any spills will be controlled, contained and cleaned up. EMS process and reporting. Incident reporting. Regular maintenance, equipment inspections and audits	Moderate	Very Unlikely	Low	N/A		
17	Water Resources	Closure	Excavation of trenches on salt lake	Insufficient backfill for trenches due to loss of material from erosion	Disruption to salt lake surface water flows	Ten Mile Lake and Sunshine Lake rarely flood due to sporadic rainfall.	Moderate	Unlikely	Low	Source material from scrapings on lake surface to ensure backfill meets surrounding ground level	Moderate	Very Unlikely	Low	N/A		
18	Land Degradation	Closure	Rehabilitation	Erosion of rehabilitated areas	Soil erosion	The presence of sandy soils are expected to result in high infiltration and minimal runoff	Moderate	Unlikely	Low	Rehabilitation will incorporate controls to minimise erosion. Detailed engineering design will ensure drainage features are reinstated to maintain surface water flows	Moderate	Very Unlikely	Low	N/A		
19	Land Degradation	All Phases	Construction and operational activities	Excessive litter on site	Soil contamination and reduction of environmental values	Remote location. Primary source of litter is accommodation camp	Minor	Unlikely	Low	Provision of adequate bins on site. Rubbish to be disposed of either within the onsite landfill or taken offsite. Visual inspections.	Minor	Very Unlikely	Low			
20	Land Degradation	All Phases	Construction and operational activities	Hydrocarbon and chemical spills and leaks	Soil contamination	Only minor volumes to be stored on site.	Moderate	Unlikely	Low	Implement Part V Works Approval (construction) and Licence (operation) mitigation and monitoring procedures. Unauthorised Discharge Regulations (applicable during construction, operation and closure). Implement Spill Management Procedure. Hydrocarbons and chemicals will be stored in bonded facilities compliant with AS 1940-2004. All bonded facilities will be fitted with spill kits. Fuel will be stored in self-bunded tanks. Service vehicles will be fitted with spill kits. Any spills will be controlled, contained and cleaned up. EMS process and reporting. Incident reporting. Regular maintenance, equipment inspections and audits. Contaminated Sites Legislation	Moderate	Very Unlikely	Low	N/A		
21	Land Degradation	Closure	Operation and closure	Sediment runoff from rehabilitation areas.	Sedimentation of surface water systems, degradation of surface water features.	Soils have high infiltration and surface runoff is minimal.	Moderate	Unlikely	Low	Rehabilitation design will incorporate erosion and sediment controls to minimise erosion. Regular inspections of rehabilitation areas, particularly after significant rainfall events	Moderate	Very Unlikely	Low	N/A		
22	Land Degradation	Closure	Closure of ponds	Plastic liners not properly removed and/or buried. Residual salts remain in ponds.	Soil contamination and reduction of environmental values.	Approximately 750 ha of ponds are proposed. All ponds will be lined with HDPE.	Major	Possible	High	Liners to be disposed of according to disposal options identified in MCP. Subsequent versions of MCP to determine final liner removal and disposal processes. Brine is to be removed from concentrator ponds prior to closure. Brine and salt is to be removed from crystalliser ponds prior to closure.	Major	Unlikely	Medium	Pond liners and residual salts do not cause soil contamination	Residual salts are removed from crystalliser ponds. Liners are disposed of according to disposal options identified in MCP.	Post-closure inspection. Verification report of liner disposal option.
23	Land Degradation	Closure	Unplanned closure	Unfinished rehabilitation of Project due to unplanned closure.	Safety hazard. Visual Impact. Impact on post-mining land use. Site not rehabilitated to required standards. Increased potential for site impacts from contamination, erosion and sedimentation.	Project lies partially within boundary Marymia Pastoral Station and on UCL.	Serious	Unlikely	Medium	Removal of all equipment from site. Triennial updates of MCP. Agreement with landholder for any retained infrastructure. Rehabilitation cost estimation and provisioning to IFRS Standard. MRF reporting and contributions.	Serious	Very Unlikely	Low	Site is safe, non-polluting	All equipment removed from site as per MCP. Closure audit shows all hazardous equipment and infrastructure removed and site made safe.	Closure audit.
24	Air Quality	All Phases	Clearing, vehicle movements, earthworks, construction	Dust emissions	Excessive dust causes visual risks or personnel health issues	The site is remote with no immediate neighbours. Kumarina Roadhouse is the nearest sensitive receptor and is located over 70 km to the east.	Minor	Unlikely	Low	Implement Part V Works Approval (construction) and Licence (operation) mitigation and monitoring procedures. Unauthorised Discharge Regulations (applicable during construction, operation and closure). Vehicle movements and speeds restricted to reduce dust emissions. Regular equipment maintenance and inspections. EMS process and reporting. Regular audits. Incident reporting.	Minor	Very Unlikely	Low	N/A		