

Appendix 23.
Major Hazards Risk Register

Hazard/Aspect	Incident/Event	Impact	Conditions Assessed	Pre-Mitigation		Mitigations/Controls	Residual		Environmental	Health and Safety	Community
				Likelihood	Consequence		Likelihood	Consequence			
1. Construction											
Project ignition sources	Uncontrolled fire caused by Project activities (inappropriate management of flammable substances/explosives, and failure to comply with the Bushfire Management Plan)	Injury/loss of life to Project personnel, damage to Project property, damage to environment or cultural heritage	Normal Operating	Possible	Major	<ul style="list-style-type: none"> Develop and implement the Bushfire Management Plan, which will contain measures such as: <ul style="list-style-type: none"> Conducting seasonal prescribed burning if required in consultation with surrounding pastoral properties Daily checking of bushfire alerts and weather conditions Constructing and maintaining fire breaks No ignition sources outside of designated areas unless hot works permit is approved Firefighting equipment on-site, readily accessible and appropriate to potential sources of ignition on site. Minimising additional sources of ignition (e.g. vehicles to be turned off when not driving, vehicles not to be parked over dry grass). Personnel inductions to include fire awareness Refueling of machinery and vehicles undertaken on cleared areas away from standing or slashed vegetation where practicable Store and transport flammable materials as per relevant SDS Slash vegetation around the Project area to reduce fire risk Not undertaking vegetation clearing with machinery when fire danger rating is 'Very High' or above Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. 	Unlikely	Major	Moderate		
Wildfire	Uncontrolled fire caused by natural occurrence or third party	Injury/loss of life to Project personnel, damage to Project property	Emergency	Possible	Major	<ul style="list-style-type: none"> Develop and implement the Bushfire Management Plan, which will contain measures such as: <ul style="list-style-type: none"> Conducting seasonal prescribed burning if required in consultation with surrounding pastoral properties Daily checking of bushfire alerts and weather conditions Constructing and maintaining fire breaks No ignition sources outside of designated areas unless hot works permit is approved Firefighting equipment on-site, readily accessible and appropriate to potential sources of ignition on site. Minimising additional sources of ignition Personnel inductions to include fire awareness Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. 	Unlikely	Major	Moderate		
Fuels and chemicals on site	Major spill or leak of chemicals, fuels or reagents as a result of incorrect storage, refueling, or bund failure	Adverse effects on soil, groundwater and surface water quality, aquatic and terrestrial biota	Normal Operating	Likely	Minor	<ul style="list-style-type: none"> Storage of fuels in secure self-bunded above ground tanks in accordance with Australian Standard AS1940. All plant, equipment and vehicles to be refueled within specified refueling area. Collection of oil waste from the washbay at the vehicle maintenance workshop with an oil separator and water underflow reporting to a soakage or storage pit for reuse. Waste oil will be collected and stored in drums in bunded and lined area for removal off site by a licensed contractor. Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. Providing spill kits appropriate to the spill risk at the Project site and within vehicles as necessary. All fuel tankers and those tankers transporting hazardous materials shall carry appropriate spill kits. Site contamination assessment and clean-up to be conducted at closure. 	Possible	Minor	Moderate		
Fuels and chemicals on site	Site wide flooding resulting in loss of containment of fuel or chemicals	Loss of containment of fuel or chemical resulting in adverse impacts to the environment	Emergency	Possible	Minor	<ul style="list-style-type: none"> Consider the location of sensitive values and receptors in the design and construction of the Project Develop appropriate procedures to manage the storage of fuel and other chemicals Design and construct Project components with sufficient drainage containment for appropriate level of flooding event. 	Unlikely	Minor	Low		
Evaporation pond	Site wide flooding resulting in loss of containment of water	Damage to Project property and impacts to waterways as a result of release of large volumes of water or sediment to environment	Emergency	Possible	Minor	<ul style="list-style-type: none"> Consider the location of sensitive values and receptors in the design and construction of the Project Develop appropriate procedures to manage the storage of fuel and other chemicals Design and construct Project components with sufficient drainage containment for appropriate level of flooding event Develop site-specific spill prevention and emergency response plans. 	Unlikely	Minor	Low		
Project traffic	Railway collision with Project vehicles	Collision resulting in multiple fatalities	Normal Operating	Possible	Catastrophic	<ul style="list-style-type: none"> Prepare and implement of Traffic Management Plan Undertake an assessment of the level crossing in accordance with ALCAM and implement recommendations of ALCAM assessment 	Unlikely	Catastrophic	High	High	
2. Operations											
Project ignition sources	Uncontrolled fire caused by Project activities	Injury/loss of life to Project personnel, damage to Project property, damage to environment or cultural heritage	Normal Operating	Possible	Major	<ul style="list-style-type: none"> Develop and implement the Bushfire Management Plan, which will contain measures such as: <ul style="list-style-type: none"> Conducting seasonal prescribed burning if required in consultation with surrounding pastoral properties Daily checking of bushfire alerts and weather conditions Constructing and maintaining fire breaks No ignition sources outside of designated areas unless hot works permit is approved Firefighting equipment on-site, readily accessible and appropriate to potential sources of ignition on site. Minimising additional sources of ignition (e.g. vehicles to be turned off when not driving, vehicles not to be parked over dry grass). Personnel inductions to include fire awareness Refueling of machinery and vehicles undertaken on cleared areas away from standing or slashed vegetation where practicable Store and transport flammable materials as per relevant SDS Slash vegetation around the Project area to reduce fire risk Not undertaking vegetation clearing with machinery when fire danger rating is 'Very High' or above Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. 	Unlikely	Major	Moderate		
Wildfire	Uncontrolled fire caused by natural disaster or third party	Injury/loss of life to Project personnel, damage to Project property	Emergency	Unlikely	Major	<ul style="list-style-type: none"> Develop and implement the Bushfire Management Plan, which will contain measures such as: <ul style="list-style-type: none"> Conducting seasonal prescribed burning if required in consultation with surrounding pastoral properties Daily checking of bushfire alerts and weather conditions Constructing and maintaining fire breaks No ignition sources outside of designated areas unless hot works permit is approved Firefighting equipment on-site, readily accessible and appropriate to potential sources of ignition on site. Minimising additional sources of ignition Personnel inductions to include fire awareness Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. 	Virtually Impossible	Major	Moderate		
Fuels and chemicals on site	Major spill or leak of chemicals, fuels or reagents as a result of incorrect storage, refueling, or bund failure	Adverse effects on soil, groundwater and surface water quality, aquatic and terrestrial biota	Normal Operating	Likely	Minor	<ul style="list-style-type: none"> Storage of fuels in secure self-bunded above ground tanks in accordance with Australian Standard AS1940. All plant, equipment and vehicles to be refueled within specified refueling area. Collection of oil waste from the washbay at the vehicle maintenance workshop with an oil separator and water underflow reporting to a soakage or storage pit for reuse. Waste oil will be collected and stored in drums in bunded and lined area for removal off site by a licensed contractor. Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. Providing spill kits appropriate to the spill risk at the Project site and within vehicles as necessary. All fuel tankers and those tankers transporting hazardous materials shall carry appropriate spill kits. Site contamination assessment and clean-up to be conducted at closure. 	Possible	Minor	Moderate		
Fuels and chemicals on site	Site wide flooding resulting in loss of containment of fuel or chemicals	Loss of containment of fuel or chemical resulting in adverse impacts to the environment	Emergency	Possible	Major	<ul style="list-style-type: none"> Consider the location of sensitive values and receptors in the design and construction of the Project Develop appropriate procedures to manage the storage of fuel and other chemicals Design and construct Project components with sufficient drainage containment for appropriate level of flooding event Develop site-specific spill prevention and emergency response plans. 	Unlikely	Minor	Low		
Integrated Waste Landform	Failure of the IWL embankment due to landslide or mass movement	Adverse effects on soil, groundwater and surface water quality, aquatic and terrestrial biota	Normal Operating	Unlikely	Major	<ul style="list-style-type: none"> IWL is designed and constructed in accordance with leading practice to ensure that the final structure is safe, stable and not prone to significant erosion. Geotechnical assessment of IWL to ensure long-term stability. Design of IWL in accordance with ANCOLD guidelines. 20m of waste rock between tailings and outer edge to IWL. Tailings will be filtered with approximate 10% moisture content. 	Virtually Impossible	Moderate	Low		
PAF Stockpile	Flooding of PAF stockpile runoff dam	Adverse effects on soil, groundwater and surface water quality, aquatic and terrestrial biota	Normal Operating	Possible	Major	<ul style="list-style-type: none"> Consider the location of sensitive values and receptors in the design and construction of the Project. Develop appropriate procedures to manage the storage of fuel and other chemicals Design and construct Project components with sufficient drainage containment for appropriate level of flooding event. Develop site-specific spill prevention and emergency response plans. Design PAF stockpile runoff dam with sufficient capacity to contain a 1:100 year, 72 hour rainfall event. Excess water in the runoff dam will be directed to the evaporation pond or the process plant depending on water quality 	Virtually impossible	Moderate	Low		
Process plant	Loss of containment of cyanide	Adverse effects on soil, groundwater and surface water quality, aquatic and terrestrial biota	Abnormal	Unlikely	Major	<ul style="list-style-type: none"> Process plant to be bunded to contain 110% of the CIP tanks All process solutions to be transported via a closed loop system with no discharge to the environment and tanks will be double lined. QA/QC will be undertaken on all liners, welds and pipelines. Groundwater monitoring bores around and downstream of process plant. 	Virtually impossible	Moderate	Low		

Hazard/Aspect	Incident/Event	Impact	Conditions Assessed	Pre-Mitigation		Mitigations/Controls	Residual		Environmental	Health and Safety	Community
				Likelihood	Consequence		Likelihood	Consequence			
Evaporation pond	Overtopping of evaporation pond wall as a result of a cyclone, resulting in the failure of the pond wall	Release of sediment and release of large volume of water, resulting in adverse impacts to aquatic ecosystems	Emergency	Possible	Moderate	<ul style="list-style-type: none"> Consider the location of sensitive values and receptors in the design and construction of the Project Develop appropriate procedures to manage the storage of fuel and other chemicals Design and construct Project components with sufficient drainage containment for appropriate level of flooding event Develop site-specific spill prevention and emergency response plans Complete site water balance model, which contains trigger response actions Construct spillway for 1:100 72 hour rainfall event 	Unlikely	Moderate	Low		
Evaporation pond	Uncontrolled discharge of the evaporation pond through spillway as a result of heavy rainfall over a prolonged period	Release of release of large volume of water, resulting in adverse impacts to aquatic ecosystems	Abnormal	Possible	Moderate	<ul style="list-style-type: none"> Consider the flood risk and location of sensitive vales and receptors in the design and construction of the Project; design and construct the Project in a manner that limits the loss of containment; develop site-specific water balance which contains trigger response actions and emergency response plans. Spillway constructed for 1:100 72hour event. 	Unlikely	Moderate	Low		
Project traffic	Railway collision with Project vehicles	Collision resulting in multiple fatalities	Normal Operating	Possible	Catastrophic	<ul style="list-style-type: none"> Prepare and implement of Traffic Management Plan Undertake an assessment of the level crossing in accordance with ALCAM and implement recommendations of ALCAM assessment 	Unlikely	Catastrophic		High	High
Blasting	Blasting of pit resulting in ejected material colliding with passing trains	Adverse impacts to local community including potential for injuries or fatalities as a result of flying rocks	Normal Operating	Unlikely	Moderate		Virtually impossible	Moderate		Low	
3. Decommissioning and Rehabilitation											
Project ignition sources	Uncontrolled fire caused by Project activities	Injury/loss of life to Project personnel, damage to Project property, damage to environment or cultural heritage	Normal Operating	Possible	Major	<ul style="list-style-type: none"> Develop and implement the Bushfire Management Plan, which will contain measures such as: <ul style="list-style-type: none"> Conducting seasonal prescribed burning if required in consultation with surrounding pastoral properties Daily checking of bushfire alerts and weather conditions Constructing and maintaining fire breaks No ignition sources outside of designated areas unless hot works permit is approved Firefighting equipment on-site, readily accessible and appropriate to potential sources of ignition on site. Minimising additional sources of ignition (e.g. vehicles to be turned off when not driving, vehicles not to be parked over dry grass). Personnel inductions to include fire awareness Refuelling of machinery and vehicles undertaken on cleared areas away from standing or slashed vegetation where practicable Store and transport flammable materials as per relevant SDS Slash vegetation around the Project area to reduce fire risk Not undertaking vegetation clearing with machinery when fire danger rating is 'Very High' or above Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. 	Unlikely	Major	Moderate		
Wildfire	Uncontrolled fire caused by natural occurrence or third party	Injury/loss of life to Project personnel, damage to Project property	Emergency	Possible	Major	<ul style="list-style-type: none"> Develop and implement the Bushfire Management Plan, which will contain measures such as: <ul style="list-style-type: none"> Conducting seasonal prescribed burning if required in consultation with surrounding pastoral properties Daily checking of bushfire alerts and weather conditions Constructing and maintaining fire breaks No ignition sources outside of designated areas unless hot works permit is approved Firefighting equipment on-site, readily accessible and appropriate to potential sources of ignition on site. Minimising additional sources of ignition Personnel inductions to include fire awareness Prepare (and implement as required) an Emergency Response Plan in collaboration with local emergency services. 	Unlikely	Major	Moderate		
Open pit	Overtopping of the open pit resulting in release of large volume of sediment and water to environment	Release of sediment and release of large volume of water, resulting in adverse impacts to aquatic ecosystems	Abnormal	Possible	Moderate	<ul style="list-style-type: none"> Prepare and implement a closure water management plan 	Virtually impossible	Moderate	Low		
Project traffic	Railway collision with Project vehicles	Collision resulting in multiple fatalities	Normal Operating	Possible	Catastrophic	<ul style="list-style-type: none"> Prepare and implement of Traffic Management Plan Undertake an assessment of the level crossing in accordance with ALCAM and implement recommendations of ALCAM assessment 	Unlikely	Catastrophic		High	High