Aspect	Factor	Potential Impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
1.0 Ground disturbance / Clearing	1.1 Landforms / soils	Erosion and loss of soil structure and viability.	C2	L4	Medium		Develop and implement the following management plans: Flora and Vegetation Management and Surface Water Management Plans.	C2	L3	Low	Reasonable
							Manage topsoil to retain structure and viability for use in rehabilitation (e.g. don't disturb soils when wet, stockpile topsoil in low windrows, seed if stored long-term).				
							No clearing / earthmoving to be undertaken when soils are wet or prior to heavy rain forecast.				
							Progressive rehabilitation throughout LOM in accordance with Mine Closure and Rehabilitation Plan.				
		Soil compaction from machinery movement.	C1	L4	Low		Rip areas during rehabilitation.	C1	L2	Very Low	Reasonable
	1.2 Surface Water	Increased sediment in surface runoff and drainage lines from poor erosion controls.	C2	L4	Medium		Develop and implement a Surface Water Management Plan including monitoring of surface water quality.	C2	L3	Low	Low
							Design surface water structures to withstand 1:100 yr 72-hr storm event				
							No clearing undertaken when soils wet or prior to heavy rain forecast.				
							Suitable erosion controls implemented.				
							Progressive rehabilitation throughout LOM in accordance with Mine Closure and Rehabilitation Plan.				
		Alteration of surface water drainage patterns.	C2	L3	Low		Divert surface waters around Project area to natural drainage line	C2	L2	Low	Reasonable
	1.3 Flora and Vegetation	Loss and degradation of vegetation.	C3	L5	High		Develop and implement a Flora and Vegetation Management plan with rehabilitation plans in place before construction begins.	C3	L2	Low	Reasonable
							Minimise areas of clearing and ground disturbance. Clear demarcation of areas to be cleared. Using ground disturbing permits to ensure that all clearing is approved before it occurs.				
		Potential clearing or disturbance of significant flora species such as *Comesperma pallidum* (Priority 3).	C3	L3	Medium	*C. pallidum* has not be recorded during recent surveys possible due to fire.	Take into account the location of significant or restricted flora and vegetation communities in design of the final Project layout.	C3	L2	Low	Low
							Progressive rehabilitation throughout LOM in accordance with Mine Closure and Rehabilitation Plan.				
		Reduced regional representation of significant or restricted vegetation communities.	C4	L2	Medium		Rehab to be monitored and comparison made with defined completion criteria and implement remedial action if necessary.	C4	L1	Low	Reasonable
		Change of fire regimes.	C2	L3	Low		Develop and implement Fire Prevention and Management Plan	C2	L2	Low	Reasonable
							Hot works conducted under internal permit system.				
		Increased risk of fire due to vehicle and machinery movement.	C3	L4	High		Develop and Implement Fire Management Plan.	C2	L2	Low	Reasonable
							No off-road driving				
		Dust pollution from earthworks affecting vegetation condition.	C2	L5	High		Develop and implement a Dust Management Plan	C2	L3	Low	Reasonable
		Impact on vegetation due to saline overspray as part of dust control measures.	C2	L2	Low		Restrict use of saline water for dust suppression to cleared areas only.	C2	L2	Low	Reasonable
		Introduction or spread of weeds.	C2	L5	High		Implement vehicle hygiene measures to reduce the risk of introduction or spread of weeds as part of the Vegetation Management Plan.	C2	L3	Low	Reasonable
	1.4 Terrestrial Fauna	Loss or disturbance of significant fauna species.	C3	L3	Medium		Develop and implement a Fauna Management Plan which includes specific management of significant species.	C3	L2	Low	Reasonable
		Loss or fragmentation of habitat from vegetation clearing.	C3	L4	High		Take into account the location of significant or restricted fauna habitats in design of the final Project layout.	C3	L2	Low	Reasonable
							Undertake progressive rehabilitation in accordance with the Mine Closure and Rehabilitation Plan.				
		Loss of habitat from increase in fires	C3	L3	Medium		Develop and implement a Fire Prevention and Management Plan	C3	L2	Low	Reasonable
							Hot works will be conducted under internal permit system				
		Disturbance of fauna from noise or vibrations.	C2	L4	Medium		Limit noise or vibrations around sensitive or significant fauna populations.	C2	L3	Low	Low
		Attraction of feral fauna which compete with, or prey on native species.	C2	L3	Low		Monitor the presence of feral animals and implement controls in consultation with Department of Environment and Conservation (DEC) and Department of Agriculture and Food (DAF) if required.	C2	L2	Low	Reasonable
		Fauna death as a result of collision or entanglement with vehicles / machinery.	C3	L3	Medium		Conduct pre-clearing survey. Implement Fauna Management Plan. Vehicle / machine operators to check machinery before operation.	C3	L2	Low	Reasonable
							Enforce vehicle speed limits within Project area and along access roads.				
		Impacts on fauna from dust.	C2	L3	Low		Develop and implement a Dust Management Plan	C2	L2	Low	Reasonable
							Undertake progressive rehabilitation in accordance with the Mine Closure and Rehabilitation Plan.				
	1.5 Subterranean Fauna	Loss or disturbance of troglofauna during soil stripping including significant species.	C2	L4	Medium		Develop and Implement a Subterranean Fauna Management Plan.	C2	L3	Low	Low
		Loss of subterranean fauna habitat during soil stripping.	C2	L4	Medium		Should species of conservation significance be present within the Project Area, develop management measures in consultation with DEC and other key stakeholders. This may include avoidance of soil disturbance where significant fauna habitats are present.	C2	L3	Low	Low

Aspect	Factor	Potential impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
	1.6 Conservation Areas	Decrease in regional representation of vegetation communities.	C4	L2	Medium	Project is about 3 km from boundary with National Park.	Take into account the location of significant or restricted vegetation communities in design of the final Project layout. Refer to 1.3.	C4	L1	Low	Reasonable
		Dust from land clearing blowing from the mine site into the National Park.	C2	L2	Low		Develop and implement a Dust Management Plan Undertake progressive rehabilitation in accordance with the Mine Closure and Rehabilitation Plan.	C2	L1	Very Low	Reasonable
		Spread of weeds from the Project area into the National Park.	C3	L3	Medium		Weed management in accordance with the Flora and Vegetation Management Plan, including vehicle hygiene measures.	C3	L2	Low	Reasonable
	1.7 Radiation	Risks of radiation exposure of workers above recognised limits, during overburden removal	C2	L2	Low		Implement dust and radiation management controls well before intersection with mineralisation.	C2	L1	Very Low	Reasonable
	1.8 Air Quality	Clearing and earthmoving results in community dust impacts.	C3	L1	Low	Nearest settlements are 80 km – 113 km.	Implement Dust Management Plan	C3	L1	Low	Reasonable
		Clearing and earthmoving results in dust impacts on workforce and accommodation village.	C3	L3	Medium		Implement Dust Management Plan	C3	L1	Low	Reasonable
	1.9 Greenhouse Gas Emissions	Greenhouse gas emissions as a result of the release of stored carbon in soils during clearing, decomposition of cleared vegetation, and emissions produced by machinery.	C1	L5	Low		Develop and implement a Greenhouse Gas Management Plan. Minimise area of clearing to that required for safe and efficient operation. Progressive rehabilitation throughout LOM in accordance with Mine Closure and Rehabilitation Plan.	C1	L5	Low	Low
	1.10 Noise and Vibration	Noise from clearing activities is a nuisance to workforce and Accommodation village.	C2	L3	Low		Develop and implement a Noise Management Plan.	C2	L2	Low	Reasonable
		Noise impacts on community resulting in non compliance with the Noise Regulations off-site.	C3	L1	Low	Nearest settlements are 80 km – 113 km.	Develop and implement a Noise Management Plan.	C3	L1	Low	High
		Risk to significant or sensitive (e.g. breeding) fauna populations.	C3	L2	Low	Greater Bilby occur in low numbers and are sparsely and patchily distributed throughout Project area.	Develop and implement a Noise Management Plan.	C3	L1	Low	Low
	1.11 Indigenous Heritage	Unplanned disturbance to Indigenous Heritage Sites.	C4	L5	Very High	Consultation with Martu is via WDLAC.	Aboriginal heritage surveys done prior to any ground disturbance activities. Comply with the provisions of the *Aboriginal Heritage Act 1972.*	C4	L2	Medium	Reasonable
		Planned disturbance to Indigenous Heritage Sites.	C3	L5	High		Develop and implement a Cultural Heritage Management Plan. Cultural sites will be assessed and processed, in consultation with Traditional Owners under Section 18 of Aboriginal Heritage Act 1972. Workforce training and induction as part of site procedure. Comply with the provisions of the *Aboriginal Heritage Act 1972.* Communication and engagement with indigenous stakeholders during ground disturbance process.	C3	L2	Low	Reasonable
	1.12 Public Amenity	Visual impact from clearing.	C2	L2	Low	Project is in a remote location.	Progressive rehabilitation throughout LOM in accordance with Mine Closure and Rehabilitation Plan.	C2	L1	Very Low	Reasonable
	1.13 Local Community	Removal of vegetation from areas used for hunting.	C3	L2	Low	Project is in a remote location.	Consultation with the local community on indigenous land management practices under the Cultural Heritage Management Plan.	C3	L1	Low	Reasonable
2.0 Groundwater abstraction / dewatering	2.1 Surface Water	Accidental release of groundwater to surface water bodies (e.g. through pipeline rupture).	C2	L4	Medium		Retain non-potable water pipelines within bunded area. Conduct regular pipeline integrity checks.	C2	L3	Low	Reasonable
		Possible impact from groundwater drawdown on surface water features if there is a connection with the targeted or linked aquifer.	C4	L1	Low	Groundwater studies indicate rock pools not connected to groundwater	Detailed hydrological studies with groundwater modelling has determined hydrological linkages, abstraction requirements and recovery rates. Develop and implement a Groundwater Management Program which includes monitoring aquifer response to abstraction. Develop and implement a Surface Water Management Plan which includes monitoring of surface water features and water quality.	C4	L1	Low	High
	2.2 Groundwater	Alteration of groundwater flows and volumes within the aquifer (i.e. cone of depression).	C3	L5	High		Develop and implement a Groundwater Management Plan for the Project. Rotate production bore use to minimise drawdown across the borefield. Maximise water efficiency within the Project. Implement a groundwater monitoring programme to confirm groundwater modelling.	C2	L4	Medium	High
	2.3 Flora and Vegetation	Possible impact and degradation of groundwater dependent vegetation.	C4	L3	High		Refer to 2.2. Develop and implement a Flora and Vegetation Management plan which includes monitoring of vegetation health within predicted zone of groundwater drawdown.	C4	L2	Medium	Low

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			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
							Implement contingency measures (e.g. cessation of pumping, artificial recharge) if monitoring indicates vegetation is being adversely affected by groundwater abstraction.				
		Vegetation degradation from accidental release of groundwater (e.g. pipeline rupture).	C2	L3	Low		Retain non-potable water pipelines within bunded area. Conduct regular pipeline integrity checks.	C2	L2	Low	High
		Reduced regional representation of vegetation communities due to lost water sources.	C4	L1	Low	Flora survey demonstrates communities not restricted	Implement contingency measures (e.g. cessation of pumping, artificial recharge) if monitoring indicates vegetation is being adversely affected by groundwater abstraction.	C4	L1	Low	Reasonable
	2.4 Terrestrial Fauna	Fauna falling down open boreholes.	C3	L5	High		Bores to be capped once drilled.	C3	L2	Low	Reasonable
		Fragmentation of fauna habitat if loss of groundwater dependent ecosystems.	C3	L2	Low		Refer to 2.3.	C3	L2	Low	Low
		Change in fauna behaviour if loss of surface water sources if connection with targeted or linked aquifer.	C3	L1	Low	Groundwater studies indicate rock pools not connected to groundwater	Refer to 2.1.	C3	L1	Low	High
	2.5 Aquatic Fauna	Impact on aquatic fauna if alteration of hydrology of pools from groundwater abstraction as discussed in Section 2.1.	C4	L1	Low	Groundwater studies indicate rock pools not connected to groundwater	Refer to 2.1.	C4	L1	Low	High
	2.6 Subterranean Fauna	Loss / change of subterranean fauna habitat.	C2	L5	High	Suitable habitat has been identified outside impact zone	Refer to 2.2.	C2	L4	Medium	High
		Direct impact on significant subterranean fauna.	C3	L3	Medium	Unlikely species are restricted to impact area	Undertake further sampling to gain understanding of habitat	C3	L2	Low	Low
	2.7 Conservation Areas	Groundwater abstraction affects vegetation within the National Park.	C4	L1	Low	National Park is 3 km from Project area	Refer to 2.3.	C4	L1	Low	Reasonable
	2.8 Radiation	Radionuclides in abstracted groundwater leading to exposure of people	C3	L2	Low	Potable water bore field outside area of mineralisation.	Drinking water must meet Australian Drinking Water Guidelines.	C3	L1	Low	High
		Off site release of radionuclides in abstracted groundwater leading to off site contamination and potential exposure to people, flora and fauna	C3	L3	Medium	Site would have a zero release policy	Use water from mineralised pit dewatering as process water where possible, otherwise evaporate.	C3	L2	Low	Reasonable
	2.9 Geochemistry	Changes to geochemistry from groundwater drawdown (e.g. oxidation of sulphide materials) which affect groundwater quality once groundwater levels return to pre-abstraction levels.	C3	L2	Low	Geology has low potential acid forming (PAF) mineralisation		C3	L2	Low	Reasonable
	2.10 Indigenous Heritage	Possible impact on indigenous heritage sites associated with surface water if there is a connection with the targeted or linked aquifer.	C4	L1	Low	Groundwater studies indicate rock pools not connected to groundwater	Refer to 2.1.	C4	L1	Low	High
	2.11 Public Amenity / Recreation	Loss of amenity / recreation values if surface water pools are affected by groundwater abstraction.	C3	L1	Low	Groundwater studies indicate rock pools not connected to groundwater	Refer to 2.1.	C3	L1	Low	High
	2.12 Local Community	Possible loss for water sources used by the local Aboriginal people if surface water pools are affected by groundwater abstraction.	C4	L1	Low	Groundwater studies indicate rock pools not connected to groundwater	Refer to 2.1.	C4	L1	Low	High
		Possible loss of 'bush tucker' food sources due to unavailable water sources.	C2	L2	Low			C2	L2	Low	High
3.0 Mining and materials handling	3.1 Landforms / soils	Erosion and loss of soil structure and viability.	C2	L4	Medium		Map soil types to demonstrate suitability for rehabilitation. Implement Ground Disturbance Procedure and permit system. Progressive rehabilitation throughout LOM in accordance with Mine Closure and Rehabilitation Plan.	C2	L2	Low	High
		Creation of unstable landforms.	C3	L4	High		Design landforms (e.g. WRL, TMF) with appropriate erosion controls. No clearing / earthmoving to be undertaken when soils are wet or prior to heavy rain forecast. Manage topsoil to retain structure and viability for use in rehabilitation (e.g. don't disturb soils when wet, stockpile topsoil in low windrows, seed if stored long-term). Avoid using highly dispersive soils for landform construction and rehabilitation.	C3	L2	Low	High
	3.2 Surface Water	Refer to 1.2.					Refer to 1.2.				
		Changes to surface water quality (e.g. acid or metalliferous drainage [AMD], radionuclides) from mining areas and stockpiles.	C3	L3	Medium	Geochemical studies indicate low risk of AMD	Capture potentially contaminated surface water runoff from mining and materials handling areas for use in processing plant, or otherwise retained on site. Mineralised overburden material to be processed through the life of the mine or encapsulated on mine closure. Internal drainage system has no offsite impact. Diversion bunding and internal drainage around minesite area to pond.	C3	L2	Low	High

Aspect	Factor	Potential impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
		Potential contamination of surface water from hydrocarbon leaks and spills in mining / materials handling areas.	C3	L2	Low		Maintain machinery in good working order and implement spill control measures if required.	C3	L1	Low	High
	3.3 Groundwater	Potential contamination of groundwater aquifer source groundwater from hydrocarbon leaks and spills.	C2	L3	Low		Implement the Chemical and Fuel Storage Management Plan. Maintain machinery in good working order and implement spill control measures if required.	C2	L2	Low	High
		Potential contamination of groundwater from handling of mineralised material.	C3	L3	Medium		Mineralised overburden will be stored on an engineered pad to manage rainfall runoff and seepage from the stockpile.	C3	L2	Low	Reasonable
	3.4 Flora and Vegetation	Refer to 1.3.					Refer to 1.3.				
	3.5 Terrestrial Fauna	Refer to 1.4.					Refer to 1.4.				
	3.6 Subterranean Fauna	Loss / change of subterranean fauna habitat.	C2	L5	High	Unlikely species are restricted to area of pit. Suitable additional habitat has been identified outside impact zone.	Refer to 2.6	C2	L4	Medium	Reasonable
		Ground vibrations disturb subterranean fauna populations.	C2	L3	Low			C2	L3	Low	Low
	3.7 Conservation Areas	Refer to 1.6.					Refer to 1.6.				
	3.8 Radiation	Airborne emissions of radioactive dust and radon leading to potential exposures to workers above the recognised limit	C3	L3	Medium		Develop and implement a Radiation Management Plan. Implement occupational and environmental monitoring of radionuclides in dust and radon/radon decay products	C3	L2	Low	High
		Airborne emissions of radioactive dust and radon leading to potential exposures to the public above the recognised limit	C3	L1	Low		No additional controls necessary - radiation impact assessment indicates doses to public are extremely low. Undertaken environmental monitoring to confirm modelling	C3	L1	Low	High
		Run off of contaminated water from mining area (including from haul roads, stockpiles(MOB, Ore, Overburden)) leading to changes in external surface water quality impacting on the environment	C3	L3	Medium		Capture potentially contaminated surface water runoff from mining and materials handling areas for use in processing plant, or otherwise retain on site.	C3	L2	Low	High
		Significant radiological seepage from stockpiles area leading to radiological impacts on the environment	C2	L3	Low		Design of stockpiles on engineered pad to prevent any seepage and contain runoff.	C2	L2	Low	High
	3.9 Air Quality	Dust emissions from earth moving activities and materials handling (stockpiles, waste dumps) have a significant impact on environment and occupational health.	C3	L4	High		Develop and implement Dust Management Plan including monitoring and dust suppression measures (e.g. water trucks, sprinklers).	C3	L2	Low	High
		Increased dust emissions from vehicle movements along unsealed roads have a significant impact on vegetation.	C2	L4	Medium		Water trucks / dust suppressants along unsealed roads.	C2	L3	Low	High
	3.10 Geochemistry	Acid or metalliferous drainage (AMD) from stockpiles.	C3	L3	Medium		Manage PAF materials to minimise the risk of oxidation and generation of AMD. Refer to 3.2. Develop and implement the Surface Water Management Plan.	C3	L2	Low	Reasonable
		Preliminary tests show initial high values for Arsenic during kinetic testing.	C3	L3	Medium		Capture potentially contaminated surface water runoff from stockpile areas for use in processing plant, or otherwise retained on site.	C3	L2	Low	Reasonable
		Risk of groundwater contamination from AMD in pit in Whale and East Whale deposits.	C3	L3	Medium		Manage PAF materials to minimise the risk of oxidation and AMD (e.g. backfill of susceptible areas of pit).	C3	L2	Low	Reasonable
	3.11 Greenhouse Gas Emissions	Rehandling of materials results in significant greenhouse gas emissions	C2	L2	Low		Undertake mine planning to minimise material handling. Maintain machinery and vehicles in good working order.	C2	L1	Very Low	Reasonable
	3.12 Noise and Vibration	Noise and vibration affect the amenity of the workforce staying in the Accommodation Village.	C2	L3	Low	Village is separated from Project by low hills. Nearest settlements are 80km - 113km.	Develop and implement a Noise Management Plan including mitigation of noise on vehicles and machinery if required.	C2	L2	Low	High
		Risk to significant or sensitive (e.g. breeding) fauna populations.	C3	L2	Low	Greater Bilby and Crest-tailed Mulgara occur in low numbers and are sparsely and patchily distributed throughout Project area.	Develop and implement a Noise Management Plan including mitigation of noise on vehicles and machinery if required.	C3	L2	Low	Low
	3.13 Indigenous Heritage	Refer to 1.11.					Refer to 1.11.				
	3.14 Public Amenity / Recreation	Visual impacts.	C2	L4	Medium		Undertake progressive rehabilitation in accordance with the Mine Closure and Rehabilitation Plan. Design final landforms to blend in with the natural landscape as far as practical.	C2	L3	Low	High
	3.15 Local Community	Restriction of the land from use by general public.	C2	L3	Low		Consult with relevant stakeholders on land access requirements and resources (e.g. Bores).	C2	L2	Low	Reasonable
	3.16 Occupational Health	Health hazard from fibrous minerals which may be present.	C5	L3	High		Develop and implement a Fibrous Minerals Management Plan. Check mined material and drill cores, through logging, by qualified geology staff to identify possible occurrences of fibrous minerals.	C3	L2	Low	Reasonable
4.0 Ore processing	4.1 Landforms / soils	Refer to 1.1.					Refer to 1.1.				
	4.2 Surface Water	Refer to 8.2.					Refer to 8.2.				

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			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
		Potential contamination of surface water from leaks and spills of process liquids.	C3	L3	Medium		Capture potentially contaminated surface water runoff from processing areas for use in processing plant, or otherwise retained on site. Design Project to withstand 1:100 yr 72 hr storm event	C3	L2	Low	High
	4.3 Groundwater	Potential contamination of groundwater aquifer source from leaks, spills and seepage from processing areas and process ponds.	C3	L3	Medium		Develop and implement a Chemical and Fuel Storage Management and Ground Water Management Plan. Bund process areas and capture runoff. Provide spill kits for clean up.	C3	L2	Low	Reasonable
	4.4 Flora and Vegetation	Spills of process materials could result in vegetation decline or death.	C3	L2	Low		Develop and implement the Surface Water Management Plan and Chemical and Fuel Storage Management Plans. Bund process areas and capture runoff. Provide spill kits for clean up.	C3	L2	Low	High
	4.5 Terrestrial Fauna	Refer to 1.4.					Refer to 1.4.				
		Attraction of fauna to process water ponds.	C3	L3	Medium		Fence process areas and provide netting over TMF and TWREP	C3	L2	Low	Reasonable
	4.6 Radiation	Airborne emissions of radioactive dust and radon leading to potential exposures to workers above the recognised limit	C4	L3	High		Develop and implement a Radiation Management Plan. Implement occupational and environmental monitoring of radionuclides in dust and radon/radon decay products	C4	L1	Low	High
		Airborne emissions of radioactive dust and radon leading to potential exposures to the public above the recognised limit	C4	L1	Low		No additional controls necessary - radiation impact assessment indicates doses to public are extremely low. Undertaken environmental monitoring to confirm modelling	C4	L1	Low	High
		Run off of contaminated water from processing area leading to changes in external surface water quality impacting on the environment	C3	L2	Low		Capture potentially contaminated surface water runoff from mining and materials handling areas for use in processing plant, or otherwise retain on site.	C3	L2	Low	High
	4.7 Air Quality	Dust generated from front end of processing plant	C3	L4	High		Develop and implement Dust Management Plan including monitoring and dust suppression measures (e.g. sprinklers, dust retardants).	C3	L2	Low	Reasonable
		Dust generated in the UOC production area, leading to emissions beyond compliance limits.	C3	L2	Low		Implement dust management systems and procedures for the UOC area in accordance with the Dust Management Plan	C3	L2	Low	Reasonable
	4.8 Geochemistry	Refer to 5.12					Refer to 5.12				
	4.9 Greenhouse Gas Emissions	Refer to 7.8					Refer to 7.8				
	4.10 Noise and Vibration	Refer to 3.12					Refer to 3.12				
	4.11 Indigenous Heritage	Refer to 1.11					Refer to 1.11				
	4.12 Public Amenity / Recreation	Refer to 3.14					Refer to 3.14				
	4.13 Local Community	Refer to 3.15					Refer to 3.15				
	4.14 Occupational Health	Refer to 3.16					Refer to 3.16				
	4.15 Public Health	Adverse impacts on public health as a result of operation of the process plant.	C4	L1	Low		Implement Dust Management Plan Implement Radiation Management Plan	C4	L1	Low	High
5.0 Waste management (WRL, TMF, Landfill, Radioactive waste, Sewage Plant, TWREP)	5.1 Landforms / soils	Contamination from inappropriate waste disposal or seepage from waste facilities.	C3	L3	Medium		Design waste management facilities to capture potentially contaminated surface water runoff and seepage.	C3	L2	Low	Reasonable
		Inefficient use of resources in the mining cycle generates excess waste such as more waste rock, worn out parts.	C1	L4	Low		Develop and implement a Waste Management Plan with the following waste management hierarchy: Avoid, Reduce, Reuse, Recycle; Recover; Treat; and Dispose.	C1	L3	Low	Reasonable
		Unplanned release of waste to environment (e.g. Overtopping).	C4	L2	Medium		Design waste management facilities to withstand 1:100 yr 72 hr storm event	C4	L1	Low	Reasonable
		Risk of flooding or overtopping of waste management facilities following heavy rainfall.	C5	L1	Medium		Design TMF to withstand 1:100 yr 72 hr storm event	C4	L1	Low	Reasonable
		Increased erosion from poorly managed or designed waste rock dump or landfill.	C2	L3	Low		Construct adequate erosion controls.	C2	L2	Low	Reasonable
		Windblown litter in landscape.	C1	L4	Low		Fence landfill and regularly cover waste in accordance with Environmental Protection (Rural Landfill) Regulations 2002. Design temporary waste storage areas with bunding and drainage controls to avoid contamination of soils, surface water and groundwater.	C2	L3	Low	High
		Contamination of soils on a geological timescale.	C3	L3	Medium		Construct and operate the waste management facilities using current best practice and comply with legislation including engineering design and post closure monitoring.	C3	L2	Low	Low
	5.2 Surface Water	Potential contamination of surface water runoff from waste management areas.	C3	L3	Medium		Develop and implement a Waste Management Plan and Surface Water Management Plan. Capture potentially contaminated surface water runoff from waste management areas for use in processing plant, or otherwise retained on site.	C3	L2	Low	Reasonable
		Potential contamination of surface water from spills, seepage or unplanned releases.	C4	L2	Medium		Design TMF for 1:100 72 hr. storm event.	C4	L1	Low	Reasonable
	5.3 Groundwater	Potential contamination of groundwater aquifer from seepage from TMF and other waste disposal sites	C3	L3	Medium		TMF will be double lined with leak detection and seepage recovery systems. Develop and implement a Chemical and Fuel Storage Management and Groundwater Management Plan.	C3	L2	Low	High

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			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
							Install and monitor leak detection equipment and groundwater monitoring network. Apply contingency measures if contamination detected.				
		Contaminated groundwater plume from waste disposal areas extends over large distances on a geologic timescale.	C3	L3	Medium		Construct and operate the waste management facilities using current best practice and comply with legislation.	C2	L2	Low	Low
							Continue operating TMF leak detection and seepage recovery systems until completion criteria achieved in accordance with the Mine Rehabilitation and Closure Plan				
	5.4 Flora and Vegetation	Seepage from TMF results in death of vegetation.	C3	L2	Low		TMF will be double lined with leak detection and seepage recovery systems.	C3	L2	Low	Reasonable
							Continue operating TMF leak detection and seepage recovery systems until completion criteria achieved in accordance with the Mine Rehabilitation and Closure Plan				
	5.5 Terrestrial Fauna	Attraction of fauna to landfill site.	C2	L4	Medium		Construct and operate landfill in accordance with Environmental Protection (Rural Landfill) Regulations 2002 including fencing.	C2	L2	Low	High
		Attraction of fauna to supernatant liquor on TMF surface water pond.	C3	L3	Medium		Fence TMF and process areas to prevent fauna access.	C2	L2	Low	High
							TMF and TWREP will be netted to prevent birds alighting on surface				
							Daily inspection of facilities for trapped or injured fauna.				
		Fauna contact with tailings or process waters.	C2	L3	Low		TMF and TWREP will be netted to prevent birds alighting on surface	C2	L2	Low	High
							Daily inspection of facilities for trapped or injured fauna.				
		Potential for bioaccumulation of radionuclides in living organisms.	C3	L2	Low		Refer to 5.9	C3	L2	Low	Reasonable
							Fence TMF and process areas to prevent fauna access.				
							TMF and TWREP will be netted to prevent birds alighting on surface				
	5.6 Aquatic Fauna	Potential contamination of surface water habitats from spills, seepage or unplanned releases from waste management areas.	C3	L2	Low	Semi-permanent pools are upstream from, or in a different catchment to Project.	Refer to 5.2.	C3	L1	Low	High
	5.7 Subterranean Fauna	Potential disturbance or contamination of subterranean fauna habitats from spills, seepage or unplanned releases from waste management areas.	C2	L2	Low		Refer to 5.3.	C2	L1	Very Low	Low
	5.8 Conservation Areas	Litter blows into National Park.	C1	L2	Very Low	Project is 3 km from boundary with National Park.	Construct and operate landfill in accordance with Environmental Protection (Rural Landfill) Regulations 2002 including fencing and regular site clean up.	C1	L1	Very Low	High
		Potential contamination of groundwater in the National Park from TMF, TWREP and other waste disposal sites.	C4	L1	Low	Natural groundwater flow is away from Park	Refer to 5.3.	C4	L1	Low	High
	5.9 Radiation	Radioactive dust and radon emissions from the TMF or any waste contaminated with radionuclides leading to worker, public or environmental exposure above the recognised limit	C4	L3	High		Develop and implement a Radiation Management Plan which includes radioactive waste management.	C4	L1	Low	Low
							Implement occupational and environmental monitoring of radionuclides in dust and radon/radon decay products				
		Run off of contaminated water from the TMF and stockpiles leading to changes in external surface water quality impacting on the environment	C3	L3	Medium		Capture potentially contaminated surface water runoff from mining and materials handling areas for use in processing plant, or otherwise retain on site.	C3	L2	Low	High
		Significant seepage from the TMF or stockpiles leading to radiological impacts on the environment	C3	L3	Medium		TMF will be double lined with leak detection and seepage recovery systems.	C4	L1	Low	High
							Install and monitor leak detection equipment and groundwater monitoring network to monitor seepage from TMF and other Project areas. Apply contingency measures if contamination detected.				
	5.10 Air Quality	Dust generated from WRL.	C3	L4	High		Develop and implement a Dust Management Plan including use of water sprays to suppress dust.	C3	L2	Low	Low
		Dust generated from TMF.	C3	L3	Medium		Tailings will be discharged in slurry form and the ponds will be managed to maintain a moist surface	C3	L2	Low	Reasonable
		Dust generated from landfill.	C1	L4	Low		Progressive covering of waste in landfill with use of water sprays for dust suppression.	C2	L3	Low	Reasonable
		Odour generated from operation of the landfill.	C1	L5	Low		Construct and operate landfill in accordance with Environmental Protection (Rural Landfill) Regulations 2002 including regular covering of waste.	C1	L2	Very Low	Low
	5.11 Greenhouse Gas Emissions	GHG generation from operation of the landfill.	C2	L4	Medium		Develop and implement Waste Management Plan which focusses on the principles of Avoid, Reduce, Reuse, Recycle, Recover, Treat and Dispose.	C2	L2	Low	Low
							Develop and implement a Greenhouse Gas Management Plan.	C2	L2	Low	
	5.12 Geochemistry	AMD from WRL.	C4	L3	High	Geochemical studies indicate low risk of AMD	Encapsulate any PAF material within WRL and/or co-dispose with carbonate rock types.	C3	L2	Low	Reasonable
							Develop and implement the Surface Water Management Plan.				

Aspect	Factor	Potential Impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
		AMD from TMF.	C4	L3	High	Geochemical studies indicate low risk of AMD	Manage potentially PAF materials to minimise the risk of oxidation and AMD Surface of TMF will be kept wet during operations which will reduce oxidation. TMF will be double lined with leak detection and seepage recovery systems.	C3	L2	Low	High
	5.13 Noise and Vibration	Noise from earthmoving machinery creates nuisance for workers staying in Accommodation Village.	C2	L3	Low	Village is separated from Project by low hills. Nearest settlements are 80km - 113km.	Develop and implement Noise Management Plan.	C2	L1	Very Low	Reasonable
	5.14 Indigenous Heritage	Refer to 1.11.					Refer to 1.11.				
	5.15 Public Amenity / Recreation	Refer to 3.14					Refer to 3.14				
	5.16 Local Community	Long term liability of waste disposal sites.	C4	L2	Medium		Design, operate and closure waste facilities in accordance with current best practice and legislative requirements. Implement the Radiation Management Plan incorporating the radioactive waste management and mineralised overburden management	C4	L1	Low	Reasonable
	5.17 Occupational Health	Health hazard to workers from fibrous minerals which may be present.	C4	L3	High		Develop and implement Fibrous Minerals Management Plan. Design, operate and close waste facilities in accordance with current best practice and legislative requirements.	C4	L1	Low	Low
	5.18 Public Health	Adverse impacts on public health as a result of operation and closure of waste facilities.	C4	L1	Low		Design, operate and close waste facilities in accordance with current best practice and legislative requirements.	C4	L1	Low	Reasonable
		Significant release of radioactive material causing contamination of bush tucker leading to potential exposures to local people above the recognised limit	C4	L2	Medium		Develop and implement a Radiation Management Plan which includes radioactive waste management.	C4	L1	Low	Low
6.0 Surface water management (diversion bunds, stormwater ponds)	6.1 Landforms / soils	Changes to natural erosion and deposition processes.	C2	L5	High		Develop and implement a Surface Water Management Plan. Account for natural erosion and deposition in design of surface water management structures.	C2	L3	Low	Reasonable
		Increased erosion or scouring.	C2	L4	Medium		Construct adequate erosion controls.	C2	L3	Low	
	6.2 Surface Water	Altered surface hydrology.	C2	L5	High		Develop and implement Surface Water Management Plan which includes monitoring of surface water volumes and water quality.	C2	L3	Low	Low
		Risk of flooding or overtopping of operational areas following heavy rainfall.	C4	L3	High		Project is protected from inundation by flood protection bund Project is designed for 1:100 year 72 hour event	C4	L1	Low	High
		Changes to surface water quality from run-off from operational areas.	C3	L3	Medium		Capture potentially contaminated surface water runoff from operational areas for use in processing plant, or otherwise retained on site. Remove sediment from runoff from disturbed areas through sediment traps.	C3	L2	Low	High
	6.3 Groundwater	Changes in hydrogeology as a result of altered surface hydrology.	C2	L3	Low		Develop and implement a Ground Water Management Plan.	C2	L2	Low	Reasonable
	6.4 Flora and Vegetation	Degradation of health and/or death of vegetation sensitive to inundation or reduction of surface flows.	C2	L4	Medium		Develop and implement a Flora and Vegetation Management Plan. Account for natural surface water flows in design of surface water management structures to minimise drainage 'shadows' or inundation of vegetation.	C2	L3	Low	Reasonable
	6.5 Terrestrial Fauna	Changes to fauna habitat as a result of altered surface hydrology.	C2	L3	Low		Develop and implement a Fauna Management Plan.	C2	L2	Low	Reasonable
	6.6 Aquatic Fauna	Impacts on aquatic fauna due to increased sediment or release of contaminants to surface water environment.	C3	L1	Low	Semi-permanent pools are upstream or in a different catchment from Project.	Develop and implement a Surface Water Management Plan including monitoring surface water quality.	C3	L1	Low	Low
	6.7 Radiation	Surface water runoff exiting the site boundary containing radionuclide concentrations above the recognised standard.	C3	L3	Medium		All potentially contaminated surface water will be collected for use in process plant or sent to the TWREP. Develop and implement Surface Water Management Plan which includes monitoring of surface water quality.	C3	L2	Low	High
	6.8 Indigenous Heritage	Altered surface hydrology affects Aboriginal heritage sites associated with surface water features.	C3	L2	Low	Project area represents only a small proportion of catchment	Consult with indigenous representatives to determine potential management / contingency measures. Refer to 6.2	C3	L2	Low	Reasonable
	6.9 Public Amenity / Recreation	Altered surface hydrology affects public amenity / recreational use of surface water features.	C3	L2	Low		Refer to 6.2.	C3	L1	Low	Reasonable
7.0 Power generation and fuel consumption	7.1 Landforms / soils	Refer to 1.1.					Refer to 1.1.				
		Refer to 8.1.					Refer to 8.1.				
	7.2 Surface Water	Refer to 8.2.					Refer to 8.2.				
	7.3 Groundwater	Refer to 8.3.					Refer to 8.3.				
	7.4 Flora and Vegetation	Refer to 8.4.					Refer to 8.4.				
	7.5 Terrestrial Fauna	Refer to 8.5.					Refer to 8.5.				
	7.6 Subterranean Fauna	Refer to 8.7					Refer to 8.7				
	7.7 Air Quality	Air emissions from power station do not comply with Ambient Air Quality guidelines	C4	L2	Medium	Nearest settlements are 80 km – 113 km.	Conduct air pollution modelling and refine power station design if required to ensure compliance (Tier 3).	C4	L1	Low	High

Aspect	Factor	Potential Impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
	7.8 Greenhouse Gas Emissions	Release of carbon emissions from power generation and fuel combustion will make a significant contribution to global emissions	C3	L2	Low		Develop and implement a Greenhouse Gas Management Plan which includes measures for maximising energy and fuel efficiency through engineering design and selection of equipment.	C3	L2	Low	High
	7.9 Noise and Vibration	Noise from power generation and vehicle use is a nuisance to workforce and accommodation village.	C2	L3	Low	Village is separated from Project by low hills.	Develop and implement a Noise Management Plan including mitigation of noise on vehicles if required.	C2	L2	Low	Reasonable
		Non compliance with the Noise Regulations off-site.	C4	L1	Low	Nearest settlements are 80 km – 113 km.	Develop and implement a Noise Management Plan including mitigation of noise on vehicles if required.	C4	L1	Low	High
		Risk to significant or sensitive (e.g. breeding) fauna populations.	C4	L2	Medium	Greater Bilby and Crest-tailed Mulgara occur in low numbers and are sparsely and patchily distributed throughout Project area.	Develop and implement a Fauna Management Plan which includes specific management of significant species.	C4	L1	Low	Reasonable
8.0 Chemical transport, storage and use	8.1 Landforms / soils	Potential contamination of soils from leaks and spills from chemical and fuel transfer and storage areas and along transport route.	C2	L4	Medium		Chemical and fuel storage will be designed in accordance with relevant Australian or International standards and a Chemical and Fuel Storage Management Plan will be implemented.	C2	L3	Low	High
							Spill kits will be made available and staff and contractors trained in the use of these kits.				
							Transport operators transporting fuel or chemicals to site are required to have a Transport Management Plan which includes emergency response procedures in case of accident or spill. Spill kits are to be carried in transport vehicles where appropriate.				
							Any contaminated soils recovered during remediation of a spill will be disposed of by a licensed waste contractor to an approved waste facility, to the TMF or bio remediated (small hydrocarbon spills only) in accordance with the Chemical and Fuel Storage Management Plan.				
	8.2 Surface Water	Potential contamination of surface water from leaks and spills from chemical and fuel transfer and storage areas and along transport route.	C3	L2	Low	Transport of fuels and chemicals may be restricted during flood conditions	Refer to 8.1.	C3	L2	Low	High
	8.3 Groundwater	Potential contamination of groundwater aquifer source from leaks and spills from chemical and fuel transfer and storage areas.	C3	L3	Medium		Refer to 8.1.	C2	L3	Low	Reasonable
							Any contaminated groundwater recovered during remediation will be used in the process plant or disposed of to the TWREP.				
	8.4 Flora and Vegetation	Death or deterioration of vegetation health from spills of chemicals or fuels.	C3	L2	Low		Refer to 8.1.	C3	L2	Low	Reasonable
							Any vegetation affected by chemical or fuel spill to be rehabilitated where natural regeneration may be hampered.				
	8.5 Terrestrial Fauna	Death or deterioration of fauna health from spills of chemicals or fuels.	C2	L2	Low		Refer to 8.1.	C2	L2	Low	Reasonable
		Contamination of habitat if spill occurs.	C2	L2	Low		Refer to 8.1.	C2	L2	Low	Reasonable
		Risk of fauna collision with vehicles transporting fuel or chemicals to site	C2	L4	Medium		Drivers will be required to comply with road rules.	C2	L4	Medium	Low
		Risk of significant fauna collision with vehicles transporting fuel or chemicals to site	C3	L3	Medium		Drivers will be required to comply with road rules.	C3	L1	Low	Low
	8.6 Aquatic Fauna	Refer to 8.1.					Refer to 8.1.				
	8.7 Subterranean Fauna	Refer to 8.1.					Refer to 8.1.				
	8.8 Air Quality	Fumes or odours potentially arising from spills.	C3	L3	Medium		Appropriate PPE and safety precautions to be taken during clean up in accordance with Chemical and Fuel Storage Management Plan.	C3	L2	Low	Reasonable
	8.9 Greenhouse Gas Emissions	Significant greenhouse gas emissions from transport of fuel or chemicals	C3	L2	Low		Transport company will be required to maintain vehicles and undertake driver training.	C3	L1	Low	Reasonable
							Chemicals and fuels will be obtained from the most suitable supplier (the selection of which will take into consideration transport distances)				
	8.10 Indigenous Heritage	Potential contamination of indigenous heritage site from leaks and spills from chemical and fuel transfer and storage areas or along transport route.	C3	L2	Low		Refer to 8.1.	C3	L2	Low	Reasonable
	8.11 European Heritage	Potential contamination of European heritage site from leaks and spills along transport route.	C3	L2	Low		Refer to 8.1.	C3	L2	Low	Reasonable
	8.12 Transport Route Community	Increased heavy commercial traffic on existing infrastructure will cause additional wear and tear on roads	C2	L3	Low		Refer to 8.1.	C2	L3	Low	Reasonable

Aspect	Factor	Potential impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
		Major transport accident where chemical / fuel is released to the environment and poses a health risk	C3	L2	Low		Refer to 8.1. Cameco and transport company personnel trained in emergency response.	C3	L1	Low	Reasonable
9.0 UOC transport (routine transport)	9.1 Flora and Vegetation	Introduction or spread of weeds via vehicles along transport route.	C2	L3	Low		Develop and implement Flora and Vegetation Management Plan which includes vehicle hygiene measures.	C2	L2	Low	High
	9.2 Terrestrial Fauna	Alien fauna introduced by vehicles along transport route.	C2	L3	Low		Drivers to check for pests (e.g. Cane toads) on vehicles.	C2	L2	Low	High
		Risk of fauna collision with vehicles transporting UOC from site	C2	L4	Medium		Drivers will be required to comply with road rules.	C2	L4	Medium	Low
		Risk of significant fauna collision with vehicles transporting UOC from site	C3	L3	Medium		Drivers will be required to comply with road rules.	C3	L1	Low	Low
	9.3 Radiation	Radiation exposures during transport greater than modelled	C3	L2	Low	There are no emissions of radioactivity during routine transport operations. Radiological impact assessment conducted and indicates negligible impact	Develop and implement a Radiation Management Plan and Transport Management Plan for transport of UOC which includes emergency response procedures in case of an accident or incident.	C3	L1	Low	High
	9.4 Air Quality	Refer to 10.6					Refer to 10.6				
		Radiation emissions to air during routine transport	C4	L1	Low		Refer to 9.3	C4	L1	Low	High
	9.5 Greenhouse Gas Emissions	Significant greenhouse gas emissions from transport of UOC	C3	L2	Low		Transport company will be required to maintain vehicles and undertake driver training.	C3	L1	Low	Reasonable
	9.6 Noise and Vibration	Increased traffic adding to noise in built up areas.	C2	L4	Medium	Already designated haulage route.	Transport company will be required to comply with the road rules and minimise engine braking in built up areas.	C2	L3	Low	Reasonable
	9.7 European Heritage	European heritage along the transport route which may be affected by vibration.	C2	L2	Low	Already designated haulage route.	Refer to 9.6	C2	L1	Very Low	Low
	9.8 Transport Route Community	Increased heavy commercial traffic on existing infrastructure will cause addition wear and tear on roads.	C2	L3	Low		Refer to 9.6	C2	L3	Low	High
	9.9 Occupational Health	Radiation exposures to truck drivers higher than expected.	C4	L2	Medium	Radiological impact assessment conducted and indicates doses less than member of public dose limit	Develop and implement Radiation Management Plan and Transport Radiation Management Plan	C4	L1	Low	High
	9.10 Public Health	Radiation exposures to the public along the transport route greater than modelled	C4	L1	Low	Radiological impact assessment conducted and indicates negligible impact to public during routine transport operations	Develop and implement Radiation Management Plan	C4	L1	Low	High
		Possible theft of UOC.	C4	L1	Low	Strict standards established and monitored by ASNO. Cameco standards for transport of UOC.	In addition to secure packaging, trucks would be fitted with a GPS which includes a duress alarm, out-of-zone back to base alarm and en route checking systems.	C4	L1	Low	Reasonable
9.0 UOC transport (accident resulting in loss of containment of UOC product)	9.11 Landforms / soils	Contamination of soils from release of UOC during transport accident	C4	L2	Medium	Well established standards for the transport of UOC	Cameco is required to comply with the standards established by the Australian government through ASNO. Implementation of the standards are audited by ASNO. UOC is required to be packed in sealed steel drums stored securely inside steel shipping containers which are then sealed. This minimises the potential for product release in the event of an accident. Cameco would develop and implement a Transport Management Plan for transport of UOC which would be approved by the appropriate authorities. The plan would include emergency response procedures to address any accident situation. Emergency response plans would be aimed at; first aid, containing the spread of spilt material, securing a perimeter, monitoring and cleanup.	C4	L1	Low	High
	9.12 Surface Water	Contamination of surface waters from release of UOC during transport accident	C4	L1	Low		Refer to 9.11	C4	L1	Low	High
	9.13 Flora and Vegetation	Contamination of vegetation from release of UOC during transport accident	C3	L2	Low		Refer to 9.11	C3	L1	Low	High
	9.14 Terrestrial Fauna	Contamination of fauna from release of UOC during transport accident	C3	L2	Low		Refer to 9.11	C3	L1	Low	High
	9.15 Aquatic Fauna	Contamination of aquatic fauna from release of UOC during transport accident	C4	L1	Low	No permanent water bodies along transport route	Refer to 9.11	C4	L1	Low	High
	9.16 Radiation	Radiation exposure to people and the environment resulting in doses above the accepted limit	C4	L1	Low		Refer to 9.11	C4	L1	Low	Reasonable

Aspect	Factor	Potential Impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
	9.17 Indigenous Heritage	Contamination of heritage site from release of UOC during transport accident	C3	L1	Low		Refer to 9.11	C3	L1	Low	Reasonable
	9.18 European Heritage	Contamination of heritage site from release of UOC during transport accident	C2	L2	Low		Refer to 9.11	C2	L1	Very Low	Reasonable
	9.19 Transport Route Community	Major transport accident where packaged material is exposed.	see separate Transport Risk Assessment								
	9.20 Occupational Health	Exposure to truck drivers as a result of transport accident	C4	L2	Medium		Refer to 9.11	C4	L1	Low	Reasonable
	9.21 Public Health	Exposure to the public and emergency response workers above recognised limit of 1 mSv/yr	C4	L2	Medium		Refer to 9.11	C4	L1	Low	Reasonable
10.0 Buildings and infrastructure	10.1 Landforms / soils	Refer to 1.1					Refer to 1.1				
	10.2 Surface Water	Refer to 1.2 and 6.2.					Refer to 1.2.				
		Sedimentation and disturbance of flow regimes around road creek crossings.	C3	L4	High		Drainage controls at creek crossings will be designed to current best practice.	C3	L2	Low	Reasonable
	10.3 Flora and Vegetation	Refer to 1.3 and 6.4.									
		Dust from dirt roads smothers vegetation affecting plant health.	C2	L4	Medium		Develop and implement Dust Management Plan as described in Section 3.10 and 10.7	C2	L3	Low	Reasonable
		Impact on vegetation due to saline overspray as part of dust control measures	C2	L4	Medium		Refer to 1.3	C2	L3	Low	Reasonable
		Increased risk of fire due to improved access (e.g. vehicles, cigarette butts, camp fires, deliberately lit fires).	C3	L3	Medium		Develop and implement Fire Prevention and Management Plan	C3	L2	Low	Reasonable
		Introduction or spread of weeds via vehicles along transport route.	C2	L3	Low		Develop and implement weed management measures from the Flora and Vegetation Management Plan which includes vehicle hygiene measures.	C2	L2	Low	High
	10.4 Terrestrial Fauna	Risk of fauna collision with vehicles transporting UOC from site	C2	L4	Medium		Drivers will be required to comply with road rules.	C2	L4	Medium	Reasonable
		Risk of significant fauna collision with vehicles transporting UOC from site	C3	L3	Medium		Drivers will be required to comply with road rules.	C3	L1	Low	Low
		Attraction of feral fauna which compete with, or prey on native species.	C2	L3	Low		Monitor the presence of feral animals and implement controls in consultation with Department of Environment and Conservation (DEC) and Department of Agriculture and Food (DAF) if required.	C2	L3	Low	Reasonable
							Monitor the presence of pests and undertake appropriate pest control in accordance with Health (Pesticides) Regulations 1956.				
		Fauna come into contact with litter	C1	L3	Low		Refer to 5.1	C1	L2	Very Low	Reasonable
							Ensure adequate waste receptacles provided around site as part of the Waste Management System				
		Impacts from hunting due to improved access.	C2	L3	Low		Consult with indigenous community regarding hunting requirements.	C2	L2	Low	Reasonable
		Light impacts on nocturnal species.	C2	L3	Low		Keep lighting to the minimum required for safe operating, and shielding of lights.	C2	L3	Low	Low
		Alien fauna introduced by vehicles along transport route.	C2	L3	Low		Drivers to check for pests (e.g. Cane toads) on vehicles.	C2	L2	Low	High
		Increased risk of fire and impacts on significant species	C3	L3	Medium		Cameco is participating in regional scale fire management programme with DEC. Undertake a wildfire threat analysis and implement fire management controls	C3	L2	Low	
	10.5 Conservation Areas	Increased uncontrolled pressure on natural resources such as water sources within National Park, by third parties, due to improved access.	C2	L3	Low			C2	L3	Low	Low
		Increased waste / litter present in National Park due to improved access.	C2	L3	Low			C2	L3	Low	Low
		Increased threat of wildfires due to improved access (e.g. from vehicles, cigarette butts, camp fires, deliberately lit).	C3	L3	Medium		Cameco is participating in regional scale fire management programme with DEC. Undertake a wildfire threat analysis and implement fire management controls	C3	L2	Low	Reasonable
	10.6 Air Quality	Dust generated from movement of vehicles along dirt roads.	C1	L5	Low		Develop and implement a Dust Management Plan including monitoring and dust suppression measures (e.g. water trucks).	C1	L4	Low	High
	10.7 Indigenous Heritage	Improved third party access to area resulting in disturbance to heritage sites.	C3	L2	Low	Third party access to sites outside the Project area beyond Cameco's control		C3	L2	Low	Reasonable
	10.8 Local Community	Impacts on local communities from improved access to area.	C3	L2	Low	Third party access to sites outside the Project area beyond Cameco's control		C3	L2	Low	Reasonable
11.0 Workforce	11.1 Flora and Vegetation	Employees driving off-road results in damage to vegetation.	C3	L3	Medium		Unauthorised off-road driving prohibited.	C3	L2	Low	High
		Employees picking native flora.	C2	L3	Low		Include protection of native vegetation and flora in site induction.	C2	L2	Low	High
	11.2 Terrestrial Fauna	Increased human interaction with wildlife or feral animals.	C2	L4	Medium		Undertake workforce training on wildlife awareness and protection.	C1	L1	Very Low	High
							Prevent workforce from having pets or firearms onsite.				

Aspect	Factor	Potential Impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
							Exclude fauna from human interaction and infrastructure where practical.				
		Employees driving off-road results in damage to fauna habitats.	C3	L3	Medium		Refer to 11.1.	C3	L2	Low	Reasonable
	11.3 Aquatic Fauna	Employees fishing or catching aquatic fauna.	C2	L2	Low		Employees prohibited from taking fauna without a licence.	C2	L2	Low	High
	11.4 Conservation Areas	Refer to 10.5.					Refer to 10.5.				
	11.5 Radiation	Worker radiation exposure exceeds statutory limits for radiation workers	C4	L2	Medium	Modelling undertaken using recognised methods	Development and implementation of a Radiation Management Plan, which includes regular monitoring to confirm modelling	C4	L1	Low	High
	11.6 Greenhouse Gas Emissions	FIFO workforce commute generates significant greenhouse gas emissions.	C2	L3	Low		Develop and implement Greenhouse Gas Management Plan.	C2	L2	Low	High
							The Project will have a hire local policy.				
							Workforce will have the option to offset greenhouse gas emissions for FIFO travel				
	11.7 Indigenous Heritage	Unauthorised access or damage to indigenous heritage sites.	C4	L3	High		Project will implement workforce inductions and cultural awareness training.	C4	L2	Medium	Reasonable
							Develop and implement Cultural Heritage Management Plan. Erect barriers and signage as required by Cultural Heritage Management Plan				
	11.8 Amenity / Recreation	Increased pressure on recreational areas.	C2	L3	Low		Recreational facilities will be provided in camp.	C2	L2	Low	Reasonable
		Increased litter.	C1	L5	Low		Workforce required to dispose of litter in bins provided.	C1	L3	Low	High
	11.9 Local Community	Increase risk of anti-social behaviour due to improved access to remote location.	C3	L2	Low		Workforce predominantly FIFO. Zero tolerance policy towards anti social behaviour with regards to the workforce.	C3	L2	Low	High
							Recreational facilities will be provided in camp.				
		Unauthorised interactions with local community.	C3	L2	Low		Develop and implement a Cultural Heritage Management Plan.	C3	L1	Low	Reasonable
							Proper training for all employees and visitors including inductions, safety awareness, and specific task training.				
		Pressure on existing infrastructure of surrounding areas (Telfer, Royal Flying Doctor).	C3	L3	Medium		Construction of self sufficient mine site complete with power generating capabilities and an air strip. Also personnel sourced from surrounding communities whenever possible, for drive in drive out arrangements.	C3	L2	Low	Reasonable
		Local indigenous workforce have greater financial capacity to purchase alcohol and illegal drugs.	C3	L3	Medium	The local indigenous communities are 'dry'	Implement employee health and well-being programme	C3	L2	Low	Reasonable
							Zero tolerance to illegal drugs.				
		Mining against Martu cultural values.	C2	L4	Medium		Cameco has undertaken consultation with Martu to obtain permission for the Project to proceed. Develop and implement a Cultural Heritage Management Plan.	C2	L3	Low	High
12.0 Rehabilitation and closure	12.1 Landforms / soils	Creation of unstable post-mining landforms.	C4	L3	High		Design and construct landforms to accepted industry standards.	C3	L2	Low	Reasonable
		Inadequate or inappropriate design or closure results in creation of polluting post-mining landforms.	C4	L3	High		Design and construct landforms to accepted industry standards.	C3	L2	Low	Reasonable
							Establish baseline data for topography prior to construction, to demonstrate post mining landforms will be compatible w/ pre-mining environment.				
							Complete geochemical and geotechnical studies to inform the closure plan.				
		Exposure of mineralised material over geologic timeframes.	C3	L4	High		The design for the final TMF (or in-pit tailings disposal site) will ensure long-term stability of the structure and ensure no exposure or release of material with elevated radiation levels.	C3	L2	Low	Low
							Assess the success of rehabilitation program. Identify successful and unsuccessful techniques.				
		Poor rehabilitation resulting in impacts on soils and its ability to support a functioning ecosystem.	C3	L3	Medium		Undertake rehabilitation in accordance with approved Mine Closure and Rehabilitation Plan.	C2	L2	Low	Reasonable
							Manage topsoil to retain structure and viability during clearing, handling, storage and rehabilitation.				
	12.2 Surface Water	Poor rehabilitation could result in poor surface water quality.	C2	L3	Low		Undertake rehabilitation in accordance with approved Mine Closure and Rehabilitation Plan.	C2	L2	Low	Reasonable
		Pit lake will result in poor water quality	C2	L4	Medium	Final pit lake will be terminal sink and will be saline	Partially backfill pit void with unmineralised overburden.	C2	L3	Low	Reasonable
		Creation of polluting post-mining landforms.	C3	L3	Medium		Final landforms and surfaces would be made physically stable by controlling drainage and slopes.	C3	L2	Low	Reasonable
							Partially backfill pit void with unmineralised overburden.				
							Identify drainage patterns for post closure drainage alignment.				
	12.3 Groundwater	Creation of polluting post-mining landforms.	C3	L3	Medium		Design construct operate and close structures in accordance with accepted industry standards	C3	L2	Low	Reasonable
							Assess groundwater flow in proximity to waste storages including evidence of effectiveness of perimeter barriers and evidence of integrity of tailings containment system.				
							TMF will be double lined with leak detection and seepage recovery systems which will continue to operate until completion criteria are achieved.				
							Mineralised material will be processed at the end of mine life or encapsulated within WRLs on an engineered pad to prevent contamination of groundwater				

Aspect	Factor	Potential Impact	Inherent Risk Rating (no controls)			Mitigating Factors	HAZARD CONTROL	Residual risk rating (with controls)			Confidence Level
			Consequence	Likelihood	Rating		ACTIVITY	Consequence	Likelihood	Rating	
		Contaminants in pit lake post mining affect water quality adjacent aquifers (refer to 3.10).	C3	L3	Medium	Pit lake void will remain a terminal groundwater sink.	Partially backfill pit void with unmineralised overburden.	C3	L2	Low	Reasonable
							Manage potentially acid-forming (PAF) materials to minimise the risk of oxidation and generation of AMD. Refer to 3.2.				
		Impact of final pit void on terrestrial environment (e.g. attraction of feral grazing species)	C3	L3	Medium	Waterbody will be saline	Provide suitable abandonment bund for pit	C3	L3	Medium	Reasonable
							Review and agree post closure management measures with regulators				
	12.4 Flora and Vegetation	Poor rehabilitation could result in non-functional ecosystems.	C3	L3	Medium		Undertake progressive rehabilitation in accordance with approved Mine Closure and Rehabilitation Plan.	C3	L2	Low	Reasonable
							Manage topsoil to retain structure and viability during clearing, handling, storage and rehabilitation.				
							Carry out revegetation using local species suited to final landforms.				
		Spread of introduced or problematic weeds throughout mine life.	C3	L3	Medium		Monitor weed infestation to assess health and minimise spread until completion criteria are achieved	C2	L2	Low	Reasonable
	12.5 Terrestrial Fauna	Poor rehabilitation could result in non-functional ecosystems.	C3	L3	Medium		Undertake rehabilitation in accordance with approved Mine Closure and Rehabilitation Plan.	C2	L2	Low	Reasonable
		Contaminants post closure affect terrestrial fauna	C3	L3	Medium		Mineralised material will be processed at the end of mine life or encapsulated within WRLs.	C2	L2	Low	Reasonable
							Monitor terrestrial fauna ecosystems and re-population of mine areas.				
	12.6 Subterranean Fauna	Impact on subterranean fauna if landforms are emitting pollution.	C3	L2	Low		Refer to Section 5.7				
	12.7 Conservation Areas	Refer to Section 5.8.	C3	L3	Medium		Refer to Section 5.8.				
	12.8 Radiation	Failure of long term control mechanisms leading to release of radioactivity from TMF or rehabilitated stockpiles leading to environmental exposures above the recognised standards	C4	L2	Medium	Design criteria for facilities	Design operate and close TMF and WRL in accordance with accepted standards	C4	L1	Low	High
							TMF will be double lined with leak detection and seepage collection system which will operate until completion criteria are met.				
	12.9 Air Quality	In adequate or inappropriate design or closure results in creation of dust from post-mining landforms	C3	L3	Medium		Ascertain climate conditions, patterns and trends to assist in rehabilitation planning. Wind speed and direction, rainfall and temperature all monitored.	C3	L2	Low	Reasonable
	12.10 Geochemistry	AMD resulting in polluting landforms over a geological timeframe.	C3	L3	Medium		Identify PAF prior to and during mining and encapsulate any PAF within the WRL and / or co-dispose with carbonate rock types. Monitor drainage from landforms until completion criteria are met	C2	L2	Low	Reasonable
	12.11 Greenhouse Gas Emissions	Poor mine closure planning results in greenhouse gas emissions from significant rehandling.	C3	L2	Low		Refer to Section 7.8				
	12.12 Indigenous Heritage	Unplanned disturbance to indigenous heritage sites during rehabilitation activities	C4	L2	Medium		Refer to Section 1.11				
	12.13 Public Amenity / Recreation	Restriction of the land from use by general public post-mining	C2	L3	Low		All plant and associated infrastructure (such as mine camp and airport) will be demolished and removed at the conclusion of operations, subject to negotiations by key stakeholders.	C2	L2	Low	Reasonable
		Poor rehabilitation could result in poor visual amenity	C2	L3	Low		Undertake rehabilitation in accordance with approved Mine Closure and Rehabilitation Plan.	C2	L2	Low	Reasonable
	12.14 Local Community	Poor rehabilitation could result in long-term financial liabilities	C4	L2	Medium		Undertake rehabilitation in accordance with approved Mine Closure and Rehabilitation Plan.	C4	L1	Low	Reasonable
	12.15 Public Health	Failure of long term control mechanisms leading to release of radioactivity from TMF or rehabilitated stockpiles leading to human exposures above the recognised limit of 1 mSv/y	C4	L1	Low	Design criteria for facilities	Development and implementation of the closure plan.	C4	L1	Low	High

			Likelihood				
			L1	L2	L3	L4	L5
			Rare	Unlikely	Possible	Likely	Almost Certain
Consequence		Environmental outcome	Extremely unlikely to occur during LOM	Has occured in different industries. Unlikely to occur during LOM.	Has occurred in similar projects. Possible during LOM	Known hazard. Likely to occur within the LOM.	Likely to occur at least annually
C5	Severe	Significant loss. Threatened closure of site.	Medium	High	High	Very High	Very High
C4	Major	Substantial loss. Regulator fine. Temporary closure of site.	Low	Medium	High	High	Very High
C3	Moderate	Moderate loss. Report to regulator or warning. Lost operation time	Low	Low	Medium	High	High
C2	Minor	Minor loss. Minor disruption to operations.	Very Low	Low	Low	Medium	High
C1	Insignificant	Very minor loss. No disruption to operations.	Very Low	Very Low	Low	Low	Low

Landforms / soils
Surface Water
Groundwater
Flora and Vegetation
Terrestrial Fauna
Aquatic Fauna
Subterranean Fauna
Conservation Areas
Radiation
Air Quality
Geochemistry
Greenhouse Gas Emissions
Noise and Vibration
Indigenous Heritage
European Heritage
Public Amenity / Recreation
Local Community
Transport Route Community
Occupational Health
Public Health