

Adopted Likelihood Rating

Description	Explanation
Not Credible	Cannot creditably occur; Not expected to occur.
Rare	May occur in exceptional circumstances (would be considered highly unusual); may occur in the next 20 years or more (<5% per year).
Unlikely	Not likely to occur, may occur within the next 10 - 20 years (5%-10% probability).
Possible	May occur within 5 - 10 years (10% - 50% probability).
Likely	Known to occur or has occurred in the past; is likely to occur in the next 1 - 5 years (50 - 80 % probability).
Almost Certain	Expected to occur in the next year (80 - 100% probability).

Adopted Consequence Definitions

		Insignificant	Minor	Moderate	Major	Extreme
Biodiversity/Flora/Fauna/Ecosystem	Flora and Vegetation	Localised and short-term decrease in health, abundance and structure of vegetation communities that are well represented in the region.	Localised and medium-term decrease in health, abundance and structure of vegetation communities that are well represented in the region.	Localised and long-term decrease in health, abundance and structure of vegetation communities that are not well represented in the region.	Widespread and medium-term decrease in health, abundance and structure of vegetation communities that are not well represented in the region.	Long term loss of vegetation communities that are not well represented in the region.
		No direct loss of conservation significant flora in disturbance envelope although increased stress incurred through indirect or induced processes.	Minor, localised loss of conservation significant flora either through direct, indirect or induced processes.	Regional loss of conservation significant flora with no impacts on species survival.	Project places significant pressure on continued survival of conservation significant species.	Project results in extinction of conservation significant species on a regional scale.
		Manageable, localised weed infestation that does not result in competition with native species.	Manageable, localised weed infestation that results in minor competition with native species.	Localised weed infestation that results in competition with native species requiring considerable management/control measures.	Regional weed infestation that results in competition with native species requiring extensive management/control measures.	Uncontrollable regional weed infestation that results in competition with native species.
	Terrestrial Fauna	Localised and short-term loss or fragmentation of habitat (including that of conservation significant species) that is well represented in the region.	Localised and medium-term loss or fragmentation of habitat (including that of conservation significant species) that is well represented in the region.	Localised and long-term loss or fragmentation of habitat (including that of conservation significant species) that is not well represented in the region.	Widespread and medium-term loss or fragmentation of habitat (including that of conservation significant species) that is not well represented in the region.	Long term loss fragmentation of habitat (including that of conservation significant species) that is not well represented in the region.
		Some displacement of fauna that has no lasting effects on population viability or abundance.	Some displacement of fauna that has short term effects on population viability or abundance.	Displacement of fauna that has medium term effects on population viability or abundance	Displacement of fauna that puts populations at risk of local extinction	Fauna displacement leads to extinction of species on a regional scale.
		Localised and short-term impacts to behaviour of fauna in local area.	Localised and medium-term impact to behaviour of fauna in local area.	Localised and long-term impact to behaviour of fauna in local area.	Widespread and medium-term impact to behaviour of fauna.	Long term change to behaviour of fauna in the regional area.
		Localised and short-term decrease in fauna abundance (including conservation significant fauna) occurring in the Disturbance Envelope.	Localised and medium term or widespread, and short-term decrease in fauna abundance (including conservation significant fauna) within the Disturbance Envelope.	Localised and long-term decrease in fauna abundance (including conservation significant fauna).	Widespread and medium-term decrease in fauna abundance (including conservation significant fauna).	Long term loss of a significant portion of fauna population (including conservation significant fauna).
		Minor increase in pest species numbers but does not result in impacts to the population viability or abundance of native species.	Minor increase in pest species numbers, resulting in localised impacts to the population viability or abundance of native species.	Major increase in pest species numbers, resulting in widespread impacts to the population viability or abundance of native species.	Pest species introduced and populations expand into the regional area resulting in long term exclusion of native species.	Pest species introduced and populations expand into the regional area resulting in permanent exclusion of native species.
	Subterranean Fauna	Localised and short-term loss to the representation, diversity, viability and ecological function of subterranean fauna species, populations or assemblages in the Disturbance Envelope.	Localised and medium-term loss to the representation, diversity, viability and ecological function of subterranean species, populations or fauna assemblages in the local area.	Localised and long-term loss to the representation, diversity, viability and ecological function of subterranean fauna species, populations or assemblages in the local area.	Widespread and medium-term loss to the representation, diversity, viability and ecological function of subterranean species, populations or fauna assemblages in the regional area.	Long term loss to the representation, diversity, viability and ecological function of subterranean species, populations or fauna assemblages in the regional area.

		Insignificant	Minor	Moderate	Major	Extreme
Hydrological Processes and Inland Waters Environmental Quality]	Surface Water	Minor change to surface water quality within the project area that does not change its ability to be used by livestock and fauna	Minor change to surface water quality within the project area and downstream watercourses that does not affect its use by livestock and fauna.	Moderate change to surface water quality within the project area and downstream watercourses that affects its use by livestock and fauna in the short term.	Decline in surface water quality in the project area and downstream watercourses that prevents medium to long term use by livestock and fauna.	Decline in surface water quality on a regional scale that prevents long term use by livestock and fauna.
		Short term changes to local water volumes that do not affect beneficial uses, including livestock and fauna.	Medium term changes to local water volumes that do not affect beneficial uses, including livestock and fauna.	Short term changes to regional water volumes that affect beneficial uses, including livestock and fauna.	Medium term changes to regional water volumes that affect beneficial uses, including livestock and fauna.	Project causes permanent loss of surface water resources that affects livelihoods and/or survival of communities.
	Groundwater	Minor, localised change to groundwater quality that does not change its ability to be used by beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.	Short term localised decline in groundwater quality that affects beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.	Medium term localised decline in groundwater quality that affects beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.	Short to medium term regional decline in water quality that prevents beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.	Long term regional decline in water quality that prevents beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.
		Minor changes to local groundwater levels/availability that do not affect beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.	Local changes to groundwater levels/availability that do not affect beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna.	Local changes to groundwater levels/availability that affect beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna in the short to medium-term.	Regional changes to groundwater levels/availability that affect beneficial uses including livestock, fauna, groundwater dependent ecosystems and subterranean fauna in the medium term.	Regional changes to groundwater levels/availability that affect beneficial uses, including livestock, fauna, groundwater dependent ecosystems and subterranean fauna in the long term.
	Landforms	Negligible impact to isolated area.	Contained low impact, not impacting on any environmental value.	Uncontained impact, able to be rectified in short term.	Extensive hazardous impact that will require long-term remedial works.	Uncontained hazardous impact with residual effects.
		Minimal to no land contamination within Disturbance Envelope, easily treatable in short term and does not result in adverse impacts on associated environmental values	Minimal land contamination localised and treatable in medium term. Does not result in adverse impacts on associated environmental values.	Localised, low level land contamination that result in adverse impacts on associated environmental values in the short to medium term.	Low level land contamination on a regional scale resulting in adverse impacts on associated environmental values requiring medium to long term management.	Mid-level land contamination on a regional scale resulting in permanent damage with severe environmental and socioeconomic disruption.
		Loss of soil resources has short term impact on associated environmental values within Disturbance Envelope.	Loss of soil resources has medium term impact on associated environmental values on a local scale.	Loss of soil resources has long term impact on associated environmental values on a local scale.	Loss of soil resources resulting in a short to medium term impact on associated environmental values on a regional scale.	Loss of soil resources that has a permanent impact on associated environmental values on a regional scale.

Adopted Risk Matrix

		Not Applicable (nil dust)	Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain		Low	Medium	High	Extreme	Extreme
	Likely		Low	Medium	High	Extreme	Extreme
	Possible		Low	Low	Medium	High	Extreme
	Unlikely		Low	Low	Medium	High	High
	Rare		Low	Low	Low	Medium	High
	Not credible	Not applicable (nil risk)					

Refinery Dust Environmental Risk Assessment

Item Number	Risk Description / Cause	Impact / Consequence	Likelihood	Consequence	Raw Risk (2)	Treatment	Likelihood	Consequence	Treated Risk (2)	Comments
Refinery Spodumene Concentrate (RSC)										
1	RSC - Dust emissions from receival / unloading	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter	Rare	Insignificant	Low	In transport and unloading product moisture will be ~3x DEM
2	RSC - Dust emissions from storage/blending	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter	Rare	Insignificant	Low	Damp product, within sheltered location
3	RSC - Dust emissions from reclaiming	Ambient dust emission	Possible	Insignificant	Low	Damp product, dedicated treatments to conveyors	Rare	Insignificant	Low	Damp product, within sheltered location
4	RSC - Dust emissions from conveying / transfer handling	Ambient dust emission	Possible	Insignificant	Low	Damp product, dedicated treatments to conveyors	Rare	Insignificant	Low	Damp product, conveyors with dedicated treatments to conveyors
5	RSC - Dust emissions from Pyrometallurgical system (Calcining/Milling/Mixing/Acid roast)	Ambient dust emission, Dedicated scrubbing of particulate matter	Rare	Insignificant	Low	Dedicated scrubber system	Rare	Insignificant	Low	Calcination with dedicated scrubber and stack
6	RSC - Dust emissions from Water Leaching	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA			NA	Wet Process / Not credible
Refinery filtered aluminosilicate (RFA)										
7	RFA - Dust emissions from filtration	Ambient dust emission, bleed air filtered	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Wet Process / Not credible
8	RFA - Dust emissions from filter cake transfer	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter	Rare	Insignificant	Low	Wet filter cake - unlikely to produce more than insignificant level of dust
9	RFA - Dust emissions from filter cake storage	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter	Rare	Insignificant	Low	Wet filter cake, within sheltered location
10	RFA - Dust emissions from filter cake loading	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter when loading	Rare	Insignificant	Low	Wet filter cake - unlikely to produce more than insignificant level of dust
11	RFA - Dust emissions from filter cake transport	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Closed container, wet material
Refinery dewatered cake (RDC) - including dewatered filter aid precoat, Ca and Mg precipitates, dewatered solids from water treatment.										
12	RDC - Dust emissions from filtration	Ambient dust emission, bleed air filtered	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Wet Process / Not credible
13	RDC - Dust emissions from filter cake transfer	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Wet Process / Not credible
14	RDC - Dust emissions from filter cake storage / blending	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter	Rare	Insignificant	Low	Wet filter cake, within sheltered location

Item Number	Risk Description / Cause	Impact / Consequence	Likelihood	Consequence	Raw Risk (2)	Treatment	Likelihood	Consequence	Treated Risk (2)	Comments
15	RDC - Dust emissions from filter cake loading	Ambient dust emission	Rare	Insignificant	Low	Damp product, dedicated undercover shelter when loading	Rare	Insignificant	Low	Wet filter cake - unlikely to produce more than insignificant level of dust
16	RDC - Dust emissions from filter cake transport	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Closed container, wet material
Refinery Sodium Sulphate (RSS)										
17	RSS - Dust emissions from crystallisation	Ambient dust emission, bleed air filtered	Rare	Insignificant	Low	Crystallisation occurs in wet system. Inherent design of system	Rare	Insignificant	Low	Wet process / system inherent design
18	RSS - Dust emissions from drying	Ambient dust emission, bleed air filtered	Rare	Insignificant	Low	Small scale. Dedicated scrubber system	Rare	Insignificant	Low	Small scale. Dedicated scrubber system
19	RSS - Dust emissions from packaging	Ambient dust emission, bleed air filtered	Rare	Insignificant	Low	Small scale, direct heating, low velocity air system, enclosed building. Inherent design of system includes scrubber	Rare	Insignificant	Low	Activity within an enclosed location, free of moisture
20	RSS - Dust emissions from storage	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Bags. Not credible
21	RSS - Dust emissions from loading	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Bags. Not credible
22	RSS - Dust emissions from transport	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Bags. Not credible
Refinery Lithium Hydroxide (RLH)										
23	RLH - Dust emissions from crystallisation	Ambient dust emission, bleed air filtered	Rare	Minor	Low	Crystallisation occurs in wet system. Inherent design of system	Rare	Minor	Low	Wet process / system inherent design
24	RLH - Dust emissions from drying	Ambient dust emission, bleed air filtered	Rare	Minor	Low	Small scale, indirect heating, low velocity dryer system. Inherent gas tightness system design	Rare	Minor	Low	Indirect drying, lithium hydroxide requires a CO ₂ (g) free / enclosed system
25	RLH - Dust emissions from packaging	Ambient dust emission, bleed air filtered	Rare	Minor	Low	Small scale, low velocity air system, enclosed building. Inherent design of system includes indirect form of heat transfer	Rare	Minor	Low	Activity within hermetically enclosed location
26	RLH - Dust emissions from storage	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Bags. Not credible
27	RLH - Dust emissions from loading	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Bags. Not credible
28	RLH - Dust emissions from transport	Ambient dust emission	Not credible	NA (nil dust)	NA (nil risk)	NA	Not credible	NA (nil dust)	NA	Bags. Not credible