

Treasury Metals Revised EIS Report Goliath Gold Project April 2018



APPENDIX HH

FAILTURE MODES AND EFFECTS ANALYSIS



Treasury Metals Revised EIS Report Goliath Gold Project April 2018



NOTE TO READER APPENDIX HH

In April 2015, Treasury Metals submitted an Environmental Impact Statement (EIS) for the proposed Goliath Gold Project (the Project) to the Canadian Environmental Assessment Agency (the Agency) for consideration under the Canadian Environmental Assessment Act (CEAA), 2012. The Agency reviewed the submission and informed Treasury Metals that the requirements of the EIS Guidelines for the Project were met and that the Agency would begin its technical review of the submission. In June 2015, the Agency issued a series of information requests to Treasury Metals regarding the EIS and supporting appendices (referred to herein as the Round 1 information requests). The Round 1 information requests included questions from the Agency, other federal and provincial reviewers, and members of Indigenous communities, as well as interested stakeholders. As part of the Round 1 information request process, the Agency requested that Treasury Metals consolidate the responses to the information requests into a revised EIS for the Project.

Appendix HH of the revised EIS (Failure Modes and Effects Analysis) presents an analysis of project risks in a tabular format. The information in this appendix was relied on for describing the accidents and malfunctions associated with the proposed Project (Section 4 in the revised EIS). No changes have been made to this appendix from the original EIS issued in April 2015.

As part of the process to revise the EIS, Treasury Metals has undertaken a review of the status for the various appendices. The status of each appendix to the revised EIS has been classified as one of the following:

- **Unchanged**: The appendix remains unchanged from the original EIS, and has been re-issued as part revised EIS.
- **Minor Changes:** The appendix remains relatively unchanged from the original EIS, and has been re-issued with relevant clarification.
- **Major Revisions**: The appendix has been substantially changed from the original EIS. A rewritten appendix has been issued as part of the revised EIS.
- **Superseded:** The appendix is no longer required to support the EIS. The information in the original appendix has been replaced by information provided in a new appendix prepared to support the revised EIS.
- **New**: This is a new appendix prepared to support the revised EIS.

The following table provides a listing of the appendices to the revised EIS, along with a listing of the status of each appendix and their description.



Treasury Metals Revised EIS Report Goliath Gold Project April 2018



	List of Appendices to	o the Revised EIS
Appendix	Status	Description
Appendix A	Major Revisions	Table of Concordance
Appendix B	Unchanged	Optimization Study
Appendix C	Unchanged	Mining Study
Appendix D	Major Revisions	Tailings Storage Facility
Appendix E	Minor Changes	Traffic Study
Appendix F	Major Revisions	Water Management Plan
Appendix G	Superseded	Environmental Baseline
Appendix H	Minor Changes	Acoustic Environment Study
Appendix I	Unchanged	Light Environment Study
Appendix J	Minor Changes	Air Quality Study
Appendix K	Minor Changes	Geochemistry
Appendix L	Superseded	Geochemical Modelling
Appendix M	Minor Changes	Hydrogeology
Appendix N	Unchanged	Surface Hydrology
Appendix O	Superseded	Hydrologic Modeling
Appendix P	Unchanged	Aquatics DST
Appendix Q	Major Revisions	Fisheries and Habitat
Appendix R	Major Revisions	Terrestrial
Appendix S	Major Revisions	Wetlands
Appendix T	Unchanged	Socio-Economic
Appendix U	Minor Changes	Heritage Resources
Appendix V	Major Revisions	Public Engagement
Appendix W	Unchanged	Screening Level Risk Assessment
Appendix X	Major Revisions	Alternatives Assessment Matrix
Appendix Y	Unchanged	EIS Guidelines
Appendix Z	Unchanged	TML Corporate Policies
Appendix AA	Major Revisions	List of Mineral Claims
Appendix BB	Unchanged	Preliminary Economic Assessment
Appendix CC	Unchanged	Mining, Dynamic And Dependable For Ontario's Future
Appendix DD	Major Revisions	Indigenous Engagement Report
Appendix EE	Unchanged	Country Foods Assessment
Appendix FF	Unchanged	Photo Record Of The Goliath Gold Project
Appendix GG	Minor Changes	TSF Failure Modelling
Appendix HH	Unchanged	Failure Modes And Effects Analysis
Appendix II	Major Revisions	Draft Fisheries Compensation Strategy and Plans
Appendix JJ	New	Water Report
Appendix KK	New	Conceptual Closure Plan
Appendix LL	New	Impact Footprints and Effects



Project Risk and Opportunities Register

Document No. 1593900100-RR-G0001-00 Project Name: Goliath Gold Project No. 734-1593900100 Client: Treasury Metals Risk Assessed: January 31 - February 2, 2015 Risk Rank of High (H1 - H9) Risk Rank of Medium (M11 - M17) Risk Rank of Low (L18 - L25)

1136 733	essed: January 31 - February 2, 2015			Resid	dual Risk					
ltem No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
	Dam breach / rupture / spill	Human injury, damage to property, spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, damage to property (reseury, personal, private and other industry), damaged to surrounding environment, reputation	Storage of Tailings	Standard Operating Procedures; Bast Management Practices, Engineering (Design/Cortrol/QA/QC), Third Party Roskow, Pan, Emergency Response Pan, Predictive Modelling, TSF SurveillanceMonitoring, Groundwater Monitoring,	Reputation	Level 5	Rare	E	5	H 9
	Clearing of 240 ha of vegetation involving heavy equipment	Accidents, collisions, spills, air emissions, human injury, contact with wildlife, removal of habitat (vegetation, wetlands), generation of deleterious substances (sitt and soil), fire, and waste management	General Development - Bulk Earthworks/ Site Preparation - Clearing of 240 ha of vegetation	Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Training, Spill Management Plan, Wildfie Management Plan	Environment		Almost Certain	А	2	M 11
	5 Civil earth works involving heavy equipment use	Accidents, collisions, spills, air emissions, human injury, contact with wildlife, removal of habitat (wetlands); generation of deleterious substances (silt and soil)	General Development - Bulk Earthworks/ Site Preparation - Civil Earth Work	Safe Work Procedures, Standard Operating Procedures, Training, Widdle Management Plan, Spill Management Plan	Environment		Almost Certain	А	2	M 11
	8 Road development works involving heavy equipment use , storage of road material	Accidents, collisions, spills, air emissions, human injury, contact with wildlife, removal of habitat (vegetation, wetlands), generation of deleterious substances (silt and soil)	General Development - Site Roads - Development of Roads	Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Training, Wildlife Management Plan	Environment		Almost Certain	A	2	M 11
	' Material release / spill / splash / fumes/ gas generation	Human injury, equipment damage, loss of production, release to environment	Process Reagents -Storage/Distribution	Emergency Response Plan, temparatic Operating Procedures; Best Management Practices, Engineering (Design), Engineering (Pan, PPE, Solill Management Plan	Safety and Health	Level 4	Unlikely	D	4	M 13
8	t Use of CN solution	Spill / spray / release (injury, damage, loss of production)		Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintennoe Procedures; Engineering (Design Spray Guards), Health and Safety Plan, PPE; Spill Management Plan	Safety and Health	Level 4	Unlikely	D	4	M 13
g) Equipment failure	Spill / spray / release (injury, damage, loss of production), fire, flying debris		Emergency Response Plan, Standard Operating Procedures, Best Management Practices, Maintennane Procedures, Engineering (Design Spray Guards), Health and Safety Plan, PPE, Spill Management Plan	Sallety and Health	Level 4	Unlikely	D	4	M 13
10) Structural failure	Human injury, inadequate ventilation, equipment damage, instable ground, loss of emergency egress, damage to reputation	Mining Underground - Lateral Development - Structure of Drift	Spill maralegement - all Engineering, Spill Management Plan, Standard Operating Procedures; Best Management Practices	Safety and Health	Level 4	Unlikely	D	4	M 13
11	Structural failure	Human injury, inadequate ventilation, equipment damage, Instable ground, loss of emergency egress, damage to reputation	Structure of Shaft	Engineering Construction of the agenetic function of the agenetic function of the agenetic of	Safety and Health	Level 4	Unlikely	D	4	M 13
12	Structural failure / inadequate capacity	Human injury, inadequate ventilation, equipment damage, Instable ground, loss of emergency egress, damage to reputation			Safety and Health	Level 4	Unlikely	D	4	M 13
13	9 Equipment / operator failure	Moten metal spill (human injury; equipment damage; loss of production), fire		Training Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE, Shut-down Procedures	Safety and Health	Level 4	Unlikely	D	4	M 13
14	Breakage of pipe / delivery system	Loss of fresh air supply to refuge stations (potential loss of life); loss of "power" to pneumatic equipment (loss of production); human injury (equipment or line failure)	U/G Mining Infrastructure - Air and Water - Compressed Air	Sinuardowi Proclaudiescodures; Best Management Practices, Standard Operating Rossie Engineering (Design), Engineering (Design), Engineering and Safety Plan, PPF	Safety and Health	Level 3	Unlikely	D	3	M 15
15	Disruption of electrical protection system	Electrocution (human injury)	Electronwinning/Gold Room - General electrowinning operation	FFE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (Design), PPF	Safety and Health	Level 3	Unlikely	D	3	M 15
16	Protection failures	Property damage, damage to equipment, human injury, electrocution	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Operation	Standard Operating Procedures; Best Management Practices, Engineering	Safety and Health	Level 3	Unlikely	D	3	M 15

ltem No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
e	Heavy equipment moving, spill from squipment failure (mobile), accidents and squipment damage, communication with haul rucks	Air emissions, dust, noise, accidents, collisions (vehicle, wildlife, livestock), fire, spills, human injury	Offsite Infrastructure - Offsite Access Road - Transportation - Heavy equipment	Traffic Management Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training, Wildlife Management Plan, Emergency Response Plan,	Environment	Level 3	Unlikely	D	3	M 15
18 (Collisions	Human injury, property damage	U/G Mining Infrastructure - Underground Electrical Substation and Distribution -Power	Spill Management Plan Standard Operating Procedures; Best Management Practices, Emergency Response, Training, PFE	Safety and Health	Level 3	Unlikely	D	3	M 15
19 (Contact / collisions	Fire, equipment damage, human injury, congestion	U/G Mining Infrastructure - Underground Explosive	BMPs and Plans	Safety and	Level 3	Unlikely	D	3	M 15
20 0	Contact / collisions / weather (i.e. lightning)	Fire, equipment damage, human injury	Magazine - Storage OP Mining Infrastructure - Explosive Magazine - Storage	Emergency Response Plan, Explosives Management Plan, Security System, Standard Operating Procedures; Best Management Practices,	Health Safety and Health	Level 3	Unlikely	D	3	M 15
	vlaterial release / spill / splash / fumes/ gas generation	Human injury, equipment damage, loss of production, release to environment	Process Reagents -Storage/Distribution	Regulatory Permits Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 3	Unlikely	D	3	M 15
22 (Jse of CN solution	Spill / spray / release (injury, damage, loss of production)	Acid Wash and Elution - Elution Operations	Spill Management Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures Engineering (Design Spray Guards), Health and Safety Plan, PPE,	Environment	Level 3	Unlikely	D	3	M 15
23 E	Equipment failure	Spill / spray / release (injury, damage, loss of production), fire; flying debris	Acid Wash and Elution - Elution Operations	Spill Management Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures; Engineering (Design Spray Guards), Health and Safey Plan, PFE	Environment	Level 3	Unlikely	D	3	M 15
26	mproper procedure; equipment failure	Production of HCN	Process Reagents -Preparation	Spill Management Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design), Health and Safety Plan, PPE,	Safety and Health	Level 4	Rare	E	4	M 16
27	mproper procedure; equipment failure	Production of HCN	Process Reagents -Preparation	Spill Management Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design), Health and Safety Plan, PPE,	Reputation	Level 4	Rare	E	4	M 16
28 M	Mechanical / instrumentation failure	Off-gassing of HCN, loss of production, fire (e.g., agitator motors)	CIL - CIL Operation	Spill Management Plan Emergency Response Plan, Standard Operating Procedures, Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (DA, PPE, Spill Management Plan	Safety and Health	Level 4	Rare	E	4	M 16
29 M	Mechanical / instrumentation failure	Off-gassing of HCN, loss of production, fire (e.g., agitator motors)	CIL - CIL Operation	Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures; Engineering (Design), Engineering QA, PPE, Suill Management Plan	Reputation	Level 4	Rare	E	4	M 16
30 F	Fire / explosion		Utilities - Fuel, Storage, & Distribution - Natural Gas - Natural Gas Use	Oper interligentein Fast Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Safety and Health	Level 4	Rare	E	4	M 16
31 5	Structural failure / inadequate capacity	Human Injury, Inadequate Ventilation, equipment damage, Instable ground, loss of emergency egress, damage to reputation	U/G Mining Infrastructure - Portal Infrastructure Structure of Portal	Design, Standard Operating Procedures; Best Management Practices, Engineering QA, Emergency Response Plan	Safety and Health	Level 4	Rare	E	4	M 16
32	mproper operation and maintenance	Human injury, equipment damage, loss of production	Primary Grinding -Overhead Crane	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Saley Plan, PPE, Noise Management Plan	Safety and Health	Level 4	Rare	E	4	M 16
33	mproper operation and maintenance		Overhead Crane	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE, Government Regulation and Log Book	Safety and Health	Level 4	Rare	E	4	M 16
	Contact with equipment (snow removal / rrading)		Utilities - Power & Electrical - HV Switchyard and Substation (General) - Maintenance	Softamina Regulation and a softamina and a sof	Safety and Health	Level 4	Rare	E	4	M 16
35 E	Back-feeding from emergency power	Property damage, damage to equipment, loss of production, human injury, electrocution	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Operation	Standard Operating Procedures; Best Management Practices, Engineering	Safety and Health	Level 4	Rare	E	4	M 16

Item No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
3	6 Access for public / staff, access to equipment, threat to security, safety	Unwanted access by unauthorized persons to site or areas of the plant, human injury, access to equipment /explosives, damage to equipment and sampling locations	General Development - Fencing/Gates (Site Control), Access to mine site and remote sampling	Engineering (CC-TV, Fence and Gates),	Safety and Health	Level 4	Rare	E	4	M 16
3	Peoplement, and a discurry, and		locations (on and off property)	Traffic Management Plan. Standard Operating Procedures; Best Management Practices, Training Bandard Operating Procedures; Best Management Practices, Bandard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering (Design/Control), Engineering OA, PE	Safety and Health	Level 4	Rare	E	4	M 16
3	8 Electracution	Contact with humans, human injury, property damage, inadequate training	U/G Mining Infrastructure - Underground Electrical Substation and Distribution - Power	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineening (Design/Control), Engineening OA, PPE	Reputation	Level 4	Rare	E	4	M 16
3	9 Electrocution		OP Mining Infrastructure - Electrical Substation and Distribution - Power	Emergency Response Plan, Engneering, Standard Operating Procedures; Best Management Practices, Training, PPE	Safety and Health	Level 4	Rare	E	4	M 16
4	0 Electrocution		OP Mining Infrastructure - Electrical Substation and Distribution - Power	Emergency Response Plan, Engineering, Standard Operating Procedures; Best Management Practices, Training, PPE	Reputation	Level 4	Rare	E	4	M 16
4	1 Electrocution		Utilities - Power & Electrical - HV Switchyard and Substation (General) - Power Operations	Design, Standard Operating Procedures; Best Management Practices, Training, PPE	Safety and Health	Level 4	Rare	E	4	M 16
4	2 Electrocution	Loss of production, loss of safety infrastructure, property damage, human injury	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Power Operations	Design, Standard Operating Procedures; Best Management Practices, Training, PPE	Reputation	Level 4	Rare	E	4	M 16
4	3 Electrocution	Loss of production, loss of safety infrastructure, property damage, human injury	Utilities - Power & Electrical - Power Distribution - Power Operations	Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training, PPE	Safety and Health	Level 4	Rare	E	4	M 16
4	4 Electrocution	Loss of production, loss of safety infrastructure, property damage, human injury	Utilities - Power & Electrical - Power Distribution - Power Operations	Polign, Design, Haardward and Safety Plan, Haardward Operating Procedures; Best Management Practices, Maintenance Procedures, Policies Policies	Reputation	Level 4	Rare	E	4	M 16
4	5 Electrocution	Loss of production, loss of safety infrastructure, property damage, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power Operations	PPE Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PPE	Safety and Health	Level 4	Rare	E	4	M 16
4	6 Electrocution		Utilities - Power & Electrical - Emergency Power - Emergency Power Operations	PPE Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Mantenance Procedures, PPF	Reputation	Level 4	Rare	E	4	M 16
4	7 Fire / explosion	Property damage, human injury, air pollution, release of fuel to air, or environment (-45 or less)	Utilities - Fuel, Storage, & Distribution - Propane - Propane Use	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Safety and Health	Level 3	Rare	E	3	M 17
	(mobile equipment, human)		Utilities - Fuel, Storage, & Distribution - Propane - Propane Fork Lifts	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maritemance Procedures	Safety and Health	Level 3	Rare	E	3	M 17
	equipment, human)		Utilities - Fuel, Storage, & Distribution - Natural Gas -Natural Gas	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safey Plan, Maintenance Procedures	Safety and Health	Level 3	Rare	E	3	M 17
	0 Falls		Mining Underground - Vertical Development - Development	Engineering, Engineering OA, Spill Management Plan, Standard Operating Procedures; Best Management Practices, Training	Safety and Health	Level 3	Rare	E	3	M 17
5	1 Falls	Human injury, equipment damage	U/G Mining Equipment - Fixed Equipment - Gates and Chutes	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering, Engineering OA, PPE, Air Monitors	Safety and Health	Level 3	Rare	E	3	M 17
5	2 Slips, trips, falling into equipment (sumps)	Human injury, drowning	U/G Mining Infrastructure - Pump Station (Dewatering) -Sumps	Spill Management Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Maritenance Procedures, PPE	Safety and Health	Level 3	Rare	E	3	M 17

ltem No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
53 Slips, trips	s, falling into equipment (sumps)	Human injury, drowning	U/G Mining Infrastructure - Pump Station (Dewatering) -Sumps	Spill Management Plan, Standard Operating Procedures; Best Management Practices,	Reputation	Level 3	Rare	E	3	M 17
54 Natural ga	na laak	Human injury, explosion, fire, and loss of production, damage of equipment		Earlinearing (Design/Control), Maintenance Procedures, PPE Standard Operating Procedures; Best Management Practices,	Safety and	Level 3	Boro	F	3	M 17
54 Naturai ga	Adda C	пипан пуну, офиски, те, аки исс и рисский, кападе и ецирнен	U/O withing infrastructure - withe reading - reading	Maintenance Procedures, Emergency Response Plan, Engineering, Engineering (A,	Health	Level 3	Raie	-	3	W 17
55 Burner ma	alfunction	Fire, explosion, human injury, equipment damage, loss of production	Carbon Regeneration - Operation of horizontal kiln	Maintenance Procedures, Entererance Procedures, Engineering (Design), Engineering (OA, Health and Safety Plan, PPE,	Safety and Health	Level 3	Rare	E	3	M 17
56 Dam bread	nch / rupture / spill	Human injury, damage to property, spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, damage to property (Treasury, personal, private and other industry), damaged to surrounding environment, reputation	Tailings - Tailing Storage Facility - Operations / Storage of Tailings	Spill Management Pian Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Third Party Review, Emergency Response Pian, Predictive Modeling, TSF Surveillacce Monitoring,	Safety and Health	Level 3	Rare	E	3	M 17
57 Dam bread	nch / rupture / spill	Human injury, damage to property, spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, damage to property (Treasury, personal, private and other industry), damaged to surrounding environment, reputation	Tailings - Tailing Storage Facility - Operations / Storage of Tailings	Groundwater Monitoring Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QAOC), Third Party Review, Emergency Response Plan, Predictive Modelling, TSF Surveillance/Monitoring, Groundwater Monitoring	Environment	Level 3	Rare	E	3	M 17
58 Equipment	nt / instrumentation failure	Process failure (insufficient CN destruction leading to higher CN in TSF), fire (e.g., agitator motors)	Cyanide Destruction - System Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering Obesign), Engineering Obesign), Stud-down Procedures	Environment	Level 3	Rare	E	3	M 17
59 Failure for	r dewatering equipment	Unable to dewater, flooding of work areas, human injury, damage to property and equipment, fire	OP Mining Infrastructure - Pump Station (Dewatering) - Pumping / Dewatering	Emergency Response Plan, Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training	Safety and Health	Level 3	Rare	E	3	M 17
60 Breach to	pipeline / blockage	Flooding, unable to remove water	OP Mining Infrastructure - Pump Station (Dewatering)- Pumping / Dewatering	Emergencing, Pesponse Plan, Emergencing, Standard Operating Procedures; Best Management Practices, Madard Operating Procedures, Training	Safety and Health	Level 3	Rare	E	3	M 17
63 Drowning		Human injury, reputation	Maintenance / Inspection	Standard Operating Procedures; Best Management Practices, PPE, Engineering (Design/Control/QA/QC)	Safety and Health	Level 3	Rare	E	3	M 17
64 Failure for	r dewatering equipment	Unable to dewater, flooding of work areas, human injury, damage to property and equipment, fire	U/G Mining Infrastructure - Pump Station (Dewatering) -Pumping / Dewatering	Standard Operating Procedures; Best Management Practices, Emergency Response, Maintenance Procedures	Safety and Health	Level 3	Rare	E	3	M 17
65 Breach to	pipeline / blockage	Flooding, unable to remove water	U/G Mining Infrastructure - Pump Station (Dewatering) - Pumping / Dewatering	Maintenance Procedures	Safety and Health	Level 3	Rare	E	3	M 17
66 Tank failur	rre (780 m³)	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	CIL - CIL Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Shut-down Procedures, Engineering (Design), Engineering OA, PPE,	Safety and Health	Level 3	Rare	E	3	M 17
67 Tank failur	ıre (780 m²)	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	CIL - CIL Operation	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Stul-down Procedures, Engineering (Design), Engineering (DA, PPE, Spill Management Plan	Environment	Level 3	Rare	E	3	M 17
68 Tank spilla	age / overflow	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	CIL Operation	Standard Operating Procedures; Best Management Practices, Mantenance Procedures, Engineering Obesign), Engineering QA, PPE,	Safety and Health	Level 3	Rare	E	3	M 17
69 Tank spilla	age / overflow	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	CIL Operation	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE, PPE, the secure of Plan	Environment	Level 3	Rare	E	3	M 17
70 Spill / spla	ash of electrolyte	Human injury, environmental release	General electrowinning operation	Spill Management Pian Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (Design), PPE	Safety and Health	Level 3	Rare	E	3	M 17
71 Spill / spla	ash of electrolyte	Human injury, environmental release	General electrowinning operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE	Environment	Level 3	Rare	E	3	M 17

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
72 Tank failure (250 m3)	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	Cyanide Destruction - System Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA,	Safety and Health	Level 3	Rare	E	3	M 17
73 Tank failure (250 m3)	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	Cyanide Destruction - System Operation	Engineering GA, Standown Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA,	Environment	Level 3	Rare	E	3	M 17
74 Equipment / instrumentation failure	Process failure (insufficient CN destruction leading to higher CN in TSF), fire (e.g., agitator motors)	Cyanide Destruction - System Operation	Shut-down Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Fonionering OA	Safety and Health	Level 3	Rare	E	3	M 17
75 Spill / splash / off gas	Human injury, environmental release (e.g., of SO2)	Cyanide Destruction - System Operation	Shut-down Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Engineering Obaign),	Safety and Health	Level 3	Rare	E	3	M 17
76 Spill / splash / off gas	Human injury, environmental release (e.g., of SO2)	Cyanide Destruction - System Operation	Shut-down Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Splil Management Plan, Engineering (Design), Engineering OA, Shut-down Procedures	Environment	Level 3	Rare	E	3	M 17
	Accidents, collisions, spills, human injury, generation of deleterious substances (silt and soil)		n Safe Work Procedures,	Environment	Level 2	Likely	С	2	L 19
site, spill from equipment failure (mobile), accidents and equipment damage	release of untreated 'Contact Water', mixing 'contact water' and non ' contact water'	of drainage system	Standard Operating Procedures; Best Management Practices, Training, Spill Management Plan,						
78 Mining involving heavy equipment use	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	U/G Mining Equipment - Mobile Equipment - Transportation - Heavy equipment (resources to Mine pad)	Widlife Management Plan Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training,	Environment	Level 2	Likely	С	2	L 19
79 Mining involving heavy equipment use	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	U/G Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles	Spill Management Plan Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training,	Environment	Level 2	Likely	С	2	L 19
80 Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, Heavy debris (resource rocks), communication with haul trucks	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	OP Mining Equipment - Mobile Equipment - Transportation - Heavy equipment (resources to Mine pad)	Spill Management Plan Standard Operating Procedures; Best Management Practices, Training, Emergency Response Plan, Traffic Management Plan,	Environment	Level 2	Likely	С	2	L 19
81 Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, heavy debris (resource rocks), poor communication with heavy	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	OP Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles	Spill Management Plan Standard Operating Procedures; Best Management Practices, Training, Emergency Response Plan, Traffic Management Plan,	Environment	Level 2	Likely	С	2	L 19
equipment 82 Congestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Temporary Facilities - Construction Laydown Area Operation of Laydown Area	Emergency Response Plan, Traffic Management Plan, Spill Management Plan,	Environment	Level 2	Likely	С	2	L 19
83 Removal of public road, increase in back country access(due to road closure)	Back country access increase, increase of traffic along hydro route, accidents	General Development - Site Roads - Road Closures because of Site Roads	Engineering (Design/Control/QA/QC) Traffic Management Plan, Engineering (Perimeter Fence), Standard Operating Procedures; Best Management Practices	Safety and Health	Level 1	Expected	в	1	L 20
84 Access to equipment, threat to security, safety	Unwanted access by unauthorized persons to sile or areas of the plant, human injury, access to equipment /explosives, damage to equipment and sampling locations; damage to sampling locations	General Development - Site Communication & Security System - Access to site; mine site and remote sampling locations	Engineering (CC-TV, Fence and Gates), Engineering (Radio System and Phones), Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Safety and Health	Level 1	Expected	В	1	L 20
85 Release of drilling water (contact)	Break of a line, human injury, flooding, increase in sediment in contact water (for treatment	Mining Underground - Lateral Development -	Training Engineering (Water Collection),	Environment	Level 1	Expected	в	1	L 20
86 Release of drilling water (contact)	Later) Break of a line, human injury, flooding, increase in sediment in contact water (for treatment Later)	Drilling Mining Underground - Vertical Development - Drilling	Standard Operating Procedures; Best Management Practices Engineering, Spill Management Plan,	Environment		Expected		1	L 20
87 Release of drilling water (contact)	Break of a line, human injury , flooding, increase in sediment in contact water (for treatment	Mining Underground - Lateral Development -	Standard Operating Procedures; Best Management Practices Engineering (water collection),	Safety and	Level 1	Expected	в	1	L 20
88 Release of drilling water (contact)	Later) Break of a line, human injury, flooding, increase in sediment in contact water (for treatment Later)	Drilling Mining Underground - Vertical Development - Drilling	Standard Operating Procedures; Best Management Practices, Engineering, Spill Management Plan,	Health Safety and Health	Level 1	Expected	в	1	L 20
89 Structural failure	Human injury, inadequate ventilation, equipment damage, Instable ground, loss of emergency egress, damage to reputation	Mining Underground - Vertical Development - Structure of Shaft	Standard Operating Procedures; Best Management Practices Engineering Engineering QA, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Training	Reputation	Level 2	Unlikely	D	2	L 21
90 Structural failure / inadequate capacity	Human injury, inadequate ventilation, equipment damage, Instable ground, loss of emergency egress, damage to reputation	Mining Underground - Ventilation Shafts - Structure of Shaft		Reputation	Level 2	Unlikely	D	2	L 21
91 Insufficient drainage, habitat alteration	Habitat damage, flooding, road washout	General Development - Site Roads - Development of Road Crossing (culverts)	Training Standard Operating Procedures; Best Management Practices, Training, Traffic Management Plan, Surface Water Management Plan, Engineering OA/OC	Environment	Level 2	Unlikely	D	2	L 21

Item No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	r Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
	Clearing of 240 ha of vegetation involving heavy equipment use	Accidents, collisions, spills, air emissions, human injury, contact with wildlife, removal of habitat (vegetation, wetlands), generation of deleterious substances (silt and soil), fire, and waste management	General Development - Bulk Earthworks/ Site Preparation - Clearing of 240 ha of vegetation	Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Training, Wildlife Management Plan,	Safety and Health	Level 2	Unlikely	D	2	L 21
	Civil earth works involving heavy equipment use	Accidents, collisions, spills, air emissions, human injury, contact with wildlife, removal of habitat (wetlands); generation of deleterious substances (silt and soil)	General Development - Bulk Earthworks/ Site Preparation - Civil Earth Work	Spill Management Plan Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Training, Wildlife Management Plan,	Safety and Health	Level 2	Unlikely	D	2	L 21
	Heavy equipment moving, more equipment on site, spill from equipment failure (mobile), Accidents and equipment damage	accidents, collisions, spills, human injury, generation of deleterious substances (silt and soil), release of untreated 'Contact Water', mixing 'contact water' and non ' contact water'	General Development -Site Drainage - Construction of drainage system	Standard Operating Procedures; Best Management Practices, Training, Spill Management Plan,	Safety and Health	Level 2	Unlikely	D	2	L 21
95 :	Spills from equipment	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	Mining Underground - Lateral Development - Drilling	Wildlife Management Plan Engineering, Spill Management Plan,	Safety and Health	Level 2	Unlikely	D	2	L 21
96 :	Structural failure	Human injury, inadequate ventilation, equipment damage, instable ground, loss of emergency egress, damage to reputation	Mining Underground - Lateral Development - Structure of Drift	Standard Operating Procedures; Best Management Practices Engineering, Spill Management Plan,	Reputation	Level 2	Unlikely	D	2	L 21
97 :	Spills from equipment	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	Mining Underground - Vertical Development - Drilling	Standard Operating Procedures; Best Management Practices Engineering, Spill Management Plan, Standard Operating Procedures; Best Management Practices,	Safety and Health	Level 2	Unlikely	D	2	L 21
98	Mining involving heavy equipment use	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	U/G Mining Equipment - Mobile Equipment - Transportation - Heavy equipment (resources to Mine pad)	Training Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training,	Safety and Health	Level 2	Unlikely	D	2	L 21
99	Mining involving heavy equipment use	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	U/G Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles	Spill Management Plan Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emregnory, Response, Training, Spill Management Plan	Safety and Health	Level 2	Unlikely	D	2	L 21
	Power failure (ventilation, dewatering and lighting)	Human injury, poor / no air quality, unable to dewater, flooding of open pit, loss of lighting	U/G Mining Infrastructure - Underground Electrical Substation and Distribution -Power		Safety and Health	Level 2	Unlikely	D	2	L 21
	Power failure (ventilation, dewatering and lighting)	Human injury, poor / no air quality, unable to dewater, flooding of open pit, loss of lighting	U/G Mining Infrastructure - Underground Electrical Substation and Distribution -Power	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering (Air Monitors), Engineering QA, PPE	Reputation	Level 2	Unlikely	D	2	L 21
102	Fire	Contact with humans, human injury, damage to property / equipment, air quality	U/G Mining Infrastructure - Underground Electrical Substation and Distribution -Power	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering (Design/Control),	Salety and Health	Level 2	Unlikely	D	2	L 21
103	Fire	Contact with humans, human injury, damage to property / equipment, air quality	U/G Mining Infrastructure - Underground Electrical Substation and Distribution -Power	Engineering GA, Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering (Design/Control), Engineering OA, PPE	Reputation	Level 2	Unlikely	D	2	L 21
	Vehicle accidents / collisions with other equipment / snow removal	Vehicle congestion / traffic, human injury, fire, spills, equipment damage, animal contact	U/G Mining Infrastructure - Portal Infrastructure Transportation	Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Training, Wildlife Management Plan	Safety and Health	Level 2	Unlikely	D	2	L 21
	Heavy equipment moving, more equipment on site, spill from equipment failure (mobile), accidents and equipment damage	Accidents, collisions, spills, air emissions, human injury, contact with wildlife, removal of habitat (vegetation, wetlands), generation of deleterious substances (silt and soil), fire, and waste management, dust generation	Mining - Infrastructure Development (Capital) - Pre stripping of Topsoil	Wildlife Management Plan, Standard Operating Procedures; Best Management Practices, Training,	Safety and Health	Level 2	Unlikely	D	2	L 21
	Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage	Dust, noise, accidents, collisions, spills, human injury, contact with wildlife, removal of habitat (vegetation, wetlands), generation of deleterious substances (silt, soil), fire, and waste management	Mining - Infrastructure Development (Capital) - Stripping of Overburden	Design Mine Plan, Wildlife Management Plan, Standard Operating Procedures; Best Management Practices, Training,	Safety and Health	Level 2	Unlikely	D	2	L 21
	heavy equipment moving, spill from equipment failure (mobile), Accidents and equipment damage, Heavy debris (resource rocks), Communication with Haul trucks	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	OP Mining Equipment - Mobile Equipment - Transportation - Heavy equipment (resources to Mine pad)	Design Standard Operating Procedures; Best Management Practices, Training. Emergency Response Plan, Traflic Management Plan,	Safety and Health	Level 2	Unlikely	D	2	L 21
	Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, heavy debris (resource rocks), poor communication with heavy equipment	Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	OP Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles	Spill Management Plan Standard Operating Procedures; Best Management Practices, Training, Emergency Response Plan, Traffic Management Plan, Spill Management Plan	Safety and Health	Level 2	Unlikely	D	2	L 21

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severit Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
109 Inadequate response to an emergency	Human injury, equipment damage, fire	OP Mining Equipment - Mine Rescue Team Equipment - Emergency Response	Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Training, PPE	Safety and Health	Level 2	Unlikely	D	2	L 21
110 Power failure (ventilation, dewatering and lighting)	Human injury, poor/no air quality, unable to dewater, flooding of open pit, loss of lighting	OP Mining Infrastructure - Electrical Substation and Distribution - Power	Emergency Response Plan, Engineering, Standard Operating Procedures; Best Management Practices, Training, PPE	Safety and Health	Level 2	Unlikely	D	2	L 21
111 Power failure (ventilation, dewatering and lighting)	Human injury, poor/no air quality, unable to dewater, flooding of open pit, loss of lighting	OP Mining Infrastructure - Electrical Substation and Distribution - Power	Emergency Response Plan, Engineering, Standard Operating Procedures; Best Management Practices, Training, PPE	Reputation	Level 2	Unlikely	D	2	L 21
112 Fire	Contact with humans, human injury, damage to property / equipment, air quality	OP Mining Infrastructure - Electrical Substation and Distribution - Power	Emergency Response Plan, Engineering, Standard Operating Procedures; Best Management Practices, Training, PPE	Safety and Health	Level 2	Unlikely	D	2	L 21
113 Fire	Contact with humans, human injury, damage to property / equipment, air quality	OP Mining Infrastructure - Electrical Substation and Distribution - Power	Emergency Response Plan, Engineering. Standard Operating Procedures; Best Management Practices, Training,	Reputation	Level 2	Unlikely	D	2	L 21
114 Fire	Loss of production, loss of safety infrastructure, property damage, human injury, impact to air quality	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Power Operations		Safety and Health	Level 2	Unlikely	D	2	L 21
115 Fire	Loss of production, loss of safety infrastructure, property damage, human injury, impact to air	Utilities - Power & Electrical - HV Switchyard and	Design,	Reputation	Level 2	Unlikely	D	2	L 21
116 Fire	quality Loss of production, loss of safety infrastructure, property damage,human injury, impact to air	Substation (General) - Power Operations Utilities - Power & Electrical - Power Distribution -	Standard Operating Procedures; Best Management Practices Design,	Safety and	Level 2	Unlikely	D	2	L 21
	quality	Power Operations	Health and Safety Plan,	Health			_		
117 Fire	Loss of production, loss of safety infrastructure, property damage, human injury, impact to air quality	Utilities - Power & Electrical - Power Distribution - Power Operations	Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training, Prope	Reputation	Level 2	Unlikely	D	2	L 21
118 Inadequate maintenance	property damage, Loss of production, loss of safety infrastructure, human injury	Utilities - Power & Electrical - Emergency Power - Maintenance of Emergency Power	Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PPE	Safety and Health	Level 2	Unlikely	D	2	L 21
119 Inadequate maintenance	property damage, Loss of production, loss of safety infrastructure, human injury	Utilities - Power & Electrical - Emergency Power - Maintenance of Emergency Power	Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PPE	Reputation	Level 2	Unlikely	D	2	L 21
120 Fire	Loss of production, loss of safety infrastructure, property damage, human injury, impact to air quality	Utilities - Power & Electrical - Emergency Power - Emergency Power Operations	Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PPF	Safety and Health	Level 2	Unlikely	D	2	L 21
121 Fire	Loss of production, loss of safety infrastructure, property damage, human injury, impact to air quality	Utilities - Power & Electrical - Emergency Power - Emergency Power Operations	Design, Health and Safety Plan, Stahn and Operating Procedures; Best Management Practices, Maintenance Procedures, PPF	Reputation	Level 2	Unlikely	D	2	L 21
122 Spills from equipment	Accidents, collisions, spills, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power operations	Design, Spill Management Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PPE	Safety and Health	Level 2	Unlikely	D	2	L 21
123 Congestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Ancillary Facilities - Warehouse - Operation	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Spill Management Plan, Emeroperov Ressonse Plan	Safety and Health	Level 2	Unlikely	D	2	L 21
124 Congestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Ancillary Facilities -Security / Scale House - Operation	Envirgency response Final Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Spill Management Plan	Safety and Health	Level 2	Unlikely	D	2	L 21
125 Congestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Operation of Laydown Area	- Standard Öperating Procedures; Best Management Practices, Emergency Response Plan, Traffic Management Plan, Spill Management Plan, Engineering (Design/Control/OA/QC)	Safety and Health		Unlikely	D	2	L 21
126 Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, communication with hav trucks		Transportation - Heavy equipment	Traffic Management Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training, Wildlife Management Plan, Emergency Response Plan, Spill Management Plan	Safety and Health		Unlikely	D	2	L 21
127 Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, poor communication with heavy equipment	Air emissions, dust, noise, accidents, collisions (vehicle, wildlife, livestock), fire, spills, humar injury h	Transportation - Movement of Staff and Maintenance vehicles	Standard Operating Procedures; Best Management Practices, Training, Wildlifk Management Plan, Emergency Response Plan, Spill Management Plan	Safety and Health	Level 2	Unlikely	D	2	L 21

Item No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
128 Co	ontact with wildlife, access for public, ccess to equipment, threat to security	Human injury, attraction of wildlife, theft, access to equipment /explosives	General Development - Fencing/Gates (Site Control) - Installing and Operation of fencing and	Engineering (Fence and Gates), Health and Safety Plan,	Environment	Level 2	Unlikely	D	2	L 21
129 Ac	ccess for public / staff, access to	Unwanted access by unauthorized persons to site or areas of the plant, human injury, access to equipment /explosives, damage to equipment and sampling locations	gate	Standard Operating Procedures; Best Management Practices, Training, Wildlife Management Plan Engineering (CC-TV, Fence and Gates),	Environment	Level 2	Unlikely	D	2	L 21
	ccess to equipment, threat to security, fety	Unwanted access by unauthorized persons to site or areas of the plant, human injury, access to equipment /explosives, damage to equipment and sampling locations; damage to sampling locations	General Development - Site Communication & Security System - Access to site; mine site and remote sampling locations	Training, Widlife Management Plan Engineering (RC-TV, Fence and Gates), Engineering (Radio System and Phones), Health and Safety Plan, Standard Operating Procedures, Best Management Practices,	Environment	Level 2	Unlikely	D	2	L 21
131 Us	se of HCI	Spill / spray / release (injury, damage, loss of production)	Acid Wash and Elution - Acid Washing Operations	Maintenance Procedures, Training Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design Spray Guards), Health and Safety Plan, PPF	Environment	Level 2	Unlikely	D	2	L 21
132 Eq	quipment failure	Spill / spray / release (injury, damage, loss of production)	Acid Wash and Elution - Acid Washing Operations	Spill Management Plan	Environment	Level 2	Unlikely	D	2	L 21
135 Co	ongestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Ancillary Facilities - Warehouse - Operation	Spill Management Plan Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Spill Management Plan,	Environment	Level 2	Unlikely	D	2	L 21
136 Co		Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Ancillary Facilities -Security / Scale House - Operation	Emergency Response Plan Standard Operating Procedures; Best Management Practices, Engineering (Design/Control),	Environment	Level 2	Unlikely	D	2	L 21
eq		Air emissions, dust, noise, accidents, collisions (vehicle, wildlife, livestock), fire, spills, human injury	Transportation - Movement of Staff and Maintenance vehicles	Spill Management Plan Standard Operating Procedures; Best Management Practices, Training, Wildlife Management Plan, Emergency Response Plan,	Environment	Level 2	Unlikely	D	2	L 21
138 Re acc	amoval of public road, increase in back country cess(due to road closure)	Back country access increase, increase of traffic along hydro route, accidents	General Development - Site Roads - Road Closures because of Site Roads	Spill Management Plan Traffic Management Plan, Engineering (Perimeter Fence),	Reputation	Level 2	Unlikely	D	2	L 21
139 Ac sal		Unwanted access by unauthorized persons to site or areas of the plant, human injury, access to equipment (explosives, damage to equipment and sampling locations; damage to sampling locations	General Development - Site Communication & Security System - Access to site; mine site and remote sampling locations	Standard Operating Procedures; Best Management Practices Engineering (CCT-V, Fence and Gates), Engineering (Radio System and Phones), Health and Safety Plan, Standard Operating Procedures, Best Management Practices, Maintenance Procedures,	Reputation	Level 2	Unlikely	D	2	L 21
the		Uncontrolled water release, release of deleterious substances (silt and soll), increase in volume; effect to down stream water quality / quantity; removal of habitat (FISH RELOCATION?)	General Development -Site Drainage - Dewatering of site (Surface water changes with ponds and General Arrangement area)	Engineering (Design), Standard Operating Procedures; Best Management Practices, Training, Spill Management Plan,	Environment	Level 2	Unlikely	D	2	L 21
			General Development - Site Roads -Development of Roads	Regulatory Permits Safe Work Procedures, Standard Operating Procedures, Training, Wildlife Management Plan,	Safety and Health	Level 2	Unlikely	D	2	L 21
142 Pre	ecipitation contact water		Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan,	Environment	Level 2	Unlikely	D	2	L 21
143 Co	ontact water		Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 2	Unlikely	D	2	L 21
146 Ex	posure of failings solids (Beach exposure)	Dust, potential acid generation, release to environment (dust), human injury	Operations / Storage of Tailings	Surface Water Management Plan Standard Operating Procedures; Best Management Practices, Engineering (Design/Contro/QACC), Third Party Review, Emergency Response Plan, Predictive Modeling, TSF Surveillance/Monitoring	Environment	Level 2	Unlikely	D	2	L 21
147 Ex	posure of tailings solids (Beach exposure)	Dust, potential acid generation, release to environment (dust), human injury	Operations / Storage of Tailings	15F SurveilanceMonitoring Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Third Party Review, Emergency Response Plan, Predictive Modeling, TSF Surveillance/Monitoring	Reputation	Level 2	Unlikely	D	2	L 21
148 Ina	adequate response to an emergency		U/G Mining Equipment - Mine Rescue Team Equipment - Emergency Response	TSF SurveillanceMonitoring Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering (Ground Monitors), Engineering QA, PPE	Safety and Health	Level 2	Unlikely	D	2	L 21

Bit of the support function Bit of the support function <t< th=""><th>Iten No.</th><th></th><th>Description/Consequence</th><th>Area of Impact</th><th>Controls</th><th>Impact Category</th><th>Severit Name</th><th>y Likeli- hood Name</th><th>Likeli- hood</th><th>Severity</th><th>Risk Matrix Priority Number</th></t<>	Iten No.		Description/Consequence	Area of Impact	Controls	Impact Category	Severit Name	y Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
INP: Note: Section 100, and 100, an	1	site, spill from equipment failure (mobile),	habitat (vegetation, wetlands), generation of deleterious substances (silt and soil), fire, and	Mining - Infrastructure Development (Capital) Pre- stripping of Topsoil	Wildlife Management Plan, Standard Operating Procedures; Best Management Practices, Training,	Environment	Level 2	Unlikely	D	2	L 21
11 Name Description Descripion Descripion <thdescripti< td=""><td>1</td><td>equipment failure (mobile), accidents and</td><td>(vegetation, wetlands), generation of deleterious substances (silt, soil), Fire, and waste</td><td>Mining - Infrastructure Development (Capital) - Stripping of Overburden</td><td>Mine Plan, Wildlife Management Plan, Standard Operating Procedures; Best Management Practices, Training,</td><td>Environment</td><td>Level 2</td><td>! Unlikely</td><td>D</td><td>2</td><td>L 21</td></thdescripti<>	1	equipment failure (mobile), accidents and	(vegetation, wetlands), generation of deleterious substances (silt, soil), Fire, and waste	Mining - Infrastructure Development (Capital) - Stripping of Overburden	Mine Plan, Wildlife Management Plan, Standard Operating Procedures; Best Management Practices, Training,	Environment	Level 2	! Unlikely	D	2	L 21
I-13 Sprin num Construction of matching sprin Construction of matching sprin Sprin Num	1	51 Failure of supply or delivery system	Loss of fresh air supply to refuge stations (potential loss of life); loss of "power" to pneumatic equipment (loss of production); human injury (equipment or line failure)		Standard Operating Procedures; Best Management Practices, Mainterance Procedures, Engineering (Design), Emergency Response Plan, Health and Safety Plan,		Level 1	Likely	с	1	L 22
Interprint (Hamming): Surgity 2000 (Surgity 20	1	52 Spills to water	Contaminants within contact water from spills	U/G Mining Infrastructure - Pump Station (Dewatering) -Pumping / Dewatering	Spill Management Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control),		Level 1	Likely	С	1	L 22
14 - Bath Loss of anticides, having suppring langes, solid afferded, having supp	1	53 Spills to water	Contaminants within contact water from spills	OP Mining Infrastructure - Pump Station (Dewatering) - Pumping / Dewatering	Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,		Level 1	Likely	С	1	L 22
15. Sph. Date of potential brain spectra mean spec	1	54 Spills			Standard Operating Procedures; Best Management Practices, Waste Management Plan, Engineering (Design/Control), Health and Safety Plan,		Level 1	Likely	С	1	L 22
15 Ball Count createring use, undersprunder, undersprunder, bander (bereing use), bereins undersprunder, bereins undersprundersprunder, bereins undersprunder, bereins un	1		Loss of production, human injury, property damage, spills of process fluids, regulatory non- compliance, release to environment (groundwater contamination, soil contamination)		Standard Öperating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan,		Level 1	Likely	С	1	L 22
151 Example spanning (Rate general contexp) Engeneral (Rate gener	1	56 Spill	Ground contamination, surface/ground water contamination, fire hazard	Primary Grinding - SAG Mill Operation	Standard operating Procedures; Best Management Practices, Maintenance Procedures, Splil Management Plan, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 1	Likely	С	1	L 22
19 Expansion Safe y and sequent money given (Sade System and Phone), sequent money given (Sade System and Phone), sequent money given (Sade System and Phone), metal safe System, sequent money given (Sade System and Sade System, metal safe System, metas	1	57 Loss communication, Access to areas, heavy equipment moving, more equipment on site	Loss communication, congestion, accidents, collisions, spills, human injury		Engineering (Radio System and Phones), Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Environment	Level 1	Likely	с	1	L 22
19 Bibblage of breach of len Pooling, damage of equipment, loss of production, human injury UM Ming if framiturus- Underground basis Bandard Operating Procedures, Bet Mangement Practices, Procedures, Bet Mange	1		Loss communication, congestion, accidents, collisions, spills, human injury		Engineering (Radio System and Phones), Health and Safety Plan, Standard Operating Procedures, Best Management Practices, Maintenance Procedures,		Level 1	Likely	с	1	L 22
Instrumentation Batcated Operating Procedures, Best Management Practices, Communication (detectical) Batcated Operating Procedures, Best Management Practices, Communication (detectical) Heath 151 Bockage / Intering (deterrapion) Splings, human injury (burst), equipment damage, loss of production (sed, editical) UG Mining Infratestructure - BackII Projeg and DeterMation (deterrapion) Mainternance Procedures, Heath Heath Level	1	59 Blockage or breach of line	Flooding, damage of equipment, loss of production, human injury	U/G Mining Infrastructure - Underground Backfill Distribution - Backfill piping	Maintenance Procedures, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control),		Level 1	Likely	С	1	L 22
161 Blockage / Intexing Splitsg, human injury (burst), explorment damage, loss of production (schedule, access) UC Mining Infrastructure - BackIII Pring and Enclusion (Underground) - BackIII Pring and Enclusion (Controls, Englance) Safety and Enclusion (Controls, Englance) Safety and Englance Level 1 Le	1	60 Failure / inadequate communication	Human injury, equipment damage, collisions, spills, fire, loss of production	Instrumentation and Communication -	Standard Operating Procedures; Best Management Practices, Engineering (Radio System and Phones), Training, Engineering QA,		Level 1	Likely	с	1	L 22
(interruption of supply) Maintenance Procedures, Engineering (Olegin), Emergency Response Plan, Health Health Health Level 1 Likely C 1 L2 163 Inadequate design / system Freezing of lines, loss of production, human injury, property damage, spills, regulatory non- compliance Uillities - Water System S- Water Olsthulion System (General) - System Distribution Starbard Operating Procedures, Best Management Practices, PPE Starbard Operating Procedures, Best Management Practices, Engineering (Oseign).Christophility Plan, PPE Level 1 Likely C 1 L2 164 System / equipment failure (freezing of lines, loss of production, human injury, property damage, spills mechanical, electrical Uillities - Water System S- Water Distribution System (General) - System Distribution Starbard Operating Procedures, Best Management Practices, Engineering (Design).Christophility Plan, Maintenance Procedures Starbard Operating Procedures, Best Management Practices, Engineering (Design).Christophility Plan, Maintenance Procedures Starbard Operating Procedures, Best Management Practices, Engineering (Design).Christophility Plan, Maintenance Procedures Starbard Operating Procedures, Engineering (Design).Christophility Plan, Maintenance Procedures Starbard Operating Procedures, Health Level 2 Rave E 2 L2			cleanup)	Distribution (Underground) - Backfill transport	Maintenance Procedures, Engineering Controls, Procedures/Training	Health				1	L 22
163 Inadequate design / system Freezing of lines, loss of production, human injury, property damage, spills, regulatory on compliance Utilities - Water Distribution Standard Operating Procedures, Best Management Practices, Seat Management Pra	1		Loss of fire water; loss of production (e.g., drilling)		Maintenance Procedures, Engineering (Design), Emergency Response Plan, Health and Safety Plan,		Level 1	Likely	С	1	L 22
164 System - dequipment failure (freezing, contact, Freezing of lines, loss of production, human injury, property damage, spills Uilities - Water Distribution System (General) - System Distribution Standard Operating Procedures; Best Management Practices, Health and Safety Plan, Water System Set Management Practices, equipment, human injury, property damage Level 1 Likely C 1 Likely <	1		Freezing of lines, loss of production, human injury, property damage, spills, regulatory non- compliance		Standard Operating Procedures; Best Management Practices, Waste Management Plan, Engineering (Design/Control),		Level 1	Likely	С	1	L 22
165 Contact with lines resulting in damage (mobile Spills, flooding, loss of production, human injury, property damage Uilities - Water Distribution Standard Operating Procedures, Best Management Pfactices, Engineering (Design/Control), Haintenance Standard Operating Procedures, Best Management Pfactices, Engineering (Design/Control), Haintenance New1 Lilities - Water System - Water Distribution Lew1 Lilities - Water Distribution Standard Operating Procedures, Best Management Pfactices, Engineering (Design/Control), Haintenance Lew1 Lilities - Water System - Water Distribution Lew1 Lilities - Water Distribution Standard Operating Procedures, Best Management Pfactices, Engineering (Design/Control), Haintenance Procedures Lew1 Lilities - Water System - Water Distribution Stanten Distribution	1	64 System / equipment failure (freezing, contact, mechanical, electrical)	Freezing of lines, loss of production, human injury, property damage, spills	System (General) - System Distribution	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures		Level 1	Likely	С	1	L 22
167 Inadequate design and/or maintenance Loss of production, property damage, human injury Utilities - Power & Electrical - Lighting Protocures; Best Management Practices, Partial Procedures; Best Ma	1	65 Contact with lines resulting in damage (mobile equipment, human)	Spills, flooding, loss of production, human injury, property damage	Utilities - Water Systems - Water Distribution System (General) - System Distribution	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Engineering (Design/Control), Health and Safety Plan,		Level 1	Likely	С	1	L 22
168 Inadequate design and/or maintenance Loss of production, property damage, human injury Utilities - Power & Electrical - Lightning Procedures; Best Management Practices, Design and Maintenance Reputation Level 2 Rare E 2 L2 177 Poor location Noise, air quality (outtake), public complaints from visibility, air quality (intake) Mining Underground - Ventilation Shafts - Design of Shaft Engineering (Oesgin/Control) Engineering OA, Engineering DA, Engineering, Engineering DA, Engineering DA, Engineerin	1	67 Inadequate design and/or maintenance	Loss of production, property damage, human injury	Utilities - Power & Electrical - Lightning Protection - Design and Maintenance	Standard Operating Procedures; Best Management Practices,	Safety and Health	Level 2	Rare	E	2	L 23
177 Poor location Noise, air quality (outake), public complaints from visibility, air quality (intake) Mining Underground - Ventilation Shafts - Design Engineering, of Shaft Engineering QA, Engineering QA, Engineering Plan, Engineering Charter Ch	1	68 Inadequate design and/or maintenance	Loss of production, property damage, human injury	Utilities - Power & Electrical - Lightning Protection -	Standard Operating Procedures; Best Management Practices,	Reputation	Level 2	Rare	E	2	L 23
Training, Maintenance Procedures	1	77 Poor location	Noise, air quality (outtake), public complaints from visibility, air quality (intake)	Mining Underground - Ventilation Shafts - Design	Engineering OA, Engineering OA, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Training,	Environment	Level 2	Rare	E	2	L 23

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matri Priority Number
183 Collision with lime silo	Equipment damage, loss of production, spill of lime	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Standard Operating Procodures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Safety Plan,	Environment	Level 2	Rare	E	2	L 23
184 Collision with bins / silos	Human injury: ground contamination, groundwater contamination, equipment damage	Paste Plant and Distribution - Plant Operation	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Daisign), Engineering Casilon, Shut-down Procedures,	Environment	Level 2	Rare	E	2	L 23
187 Natural gas leak	Human injury, explosion, fire, and loss of production, damage of equipment	U/G Mining Infrastructure - Mine Heating - Heating	Traffic Nanagement Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Emergency Response Plan, Engineering, Engineering QA, Training	Environment	Level 2	Rare	E	2	L 23
190 Failure / damage of equipment / insufficient warning of hazards	Human Injury, equipment damage, poor air quality, ground collapse	U/G Mining Equipment - Anciliary equipment (survey etc.) - Monitoring equipment (Ground control, Air Quality and Seismic)	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineening (Ground Monitors), Engineening QA, PPE, Spill Management Plan	Safety and Health	Level 2	Rare	E	2	L 23
191 Failure / damage of equipment / insufficient warning of hazards	Human injury, equipment damage, poor air quality, ground collapse	OP Mining Equipment - Ancillary equipment (survey etc.) - Failure of seismic Senor	Emergency Response Plan, Engineering (Ground Control Equipment)	Safety and Health	Level 2	Rare	E	2	L 23
192 Overflow of spillway	Human injury, damage to property, spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, damage to property (Treasury), damaged to surrounding environment, deputation	Operations / Storage of Tailings	Standard Operating Procedures: Best Management Practices, Engineering (Design/Control/QA/QC), Third Party Review, Emergency Response Plan, Predictive Modelling, TSF Surveillance/Monitoring, Groundwater Monitoring,	Environment	Level 2	Rare	E	2	L 23
193 Overflow of spillway	Human injury, damage to property, spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, damage to property (Treasury), damaged to surrounding environment, deputation	Operations / Storage of Tailings	Standard Denaing Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Third Party Review, Emergency Response Plan, Predictive Modelling, TSF Surveillance/Monitoring, Groundwater Monitoring	Reputation	Level 2	Rare	E	2	L 23
194 Drowning	Human injury, reputation	Maintenance / Inspection	Standard Operating Procedures; Best Management Practices, PPE,	Reputation	Level 2	Rare	E	2	L 23
195 Collision with conductors or towers	Structural damage, potential power interruption, human injury	Offsite Infrastructure - Offsite Power Transmission Construction/Operational Activity in proximity to line		Reputation	Level 2	Rare	E	2	L 23
196 Improper procedure; equipment failure	Production of HCN	Process Reagents -Preparation	Emergency Response Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 2	Rare	E	2	L 23
197 Mechanical / instrumentation failure	Off-gassing of HCN, loss of production, fire (e.g., agitator motors)	CIL - CIL Operation	Spill Management Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (Da, PPE,	Environment	Level 2	Rare	E	2	L 23
206 Collision with lime silo	Equipment damage, loss of production, split of lime	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Sately Plan,	Safety and Health	Level 2	Rare	E	2	L 23
207 Collisions (human, vehicle, infrastructure)	Human injury, equipment damage, loss of production, fire, spills	Mill Feed and Storage - SAG Mill Feed Stock Pile - Operation of Mobile Equipment at Dead Stock Pile	PPE Trafic Management Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Safety Plan, PPE	Safety and Health	Level 2	Rare	E	2	L 23
208 Contact with wildlife, access for public, access to equipment, threat to security	Human injury, attraction of wildlife, theft, access to equipment /explosives	General Development - Fencing/Gates (Site Control) - Installing and Operation of fencing and gate	Fre Engineering (Fence and Gates), Health and Safety Plan, Sandrad Operating Procedures; Best Management Practices, Training, Widtle Management Plan	Reputation	Level 1	Unlikely	D	1	L 24
209 Access for public / staff, access to equipment, threat to security, safety	Unwanted access by unauthorized persons to site or areas of the plant, human injury, access to equipment /explosives, damage to equipment and sampling locations	General Development - Fencing/Gates (Site Control), Access to mine site and remote sampling locations (on and off property)	Engineering (CC-TV, Fence and Gates), Health and Safety Plan, Traffic Management Plan, Standard Operating Procedures; Best Management Practices, Training,	Reputation	Level 1	Unlikely	D	1	L 24
210 Inadequate maintenance	Regulatory non-compliance, human injury, property damage, splits, fire	Utilities - Water Systems - Fire Water - Maintenance	Widtlife Management Plan Standard Openating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Safety and Health	Level 1	Unlikely	D	1	L 24

Item RISK No.	Description/Consequence	Area of impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
211 Failure of backfill barricade	Flooding, damage of equipment, loss of production, human injury	U/G Mining Infrastructure - Underground Backfill Distribution - Backfill	Maintenance Procedures, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Training, Engineering OA, PPE.	Safety and Health	Level 1	Unlikely	D	1	L 24
212 Equipment / operator failure	Moten metal spill (human injury; equipment damage; loss of production), fire	Smelting Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE, ShuHdown Procedures	Reputation	Level 1	Unlikely	D	1	L 24
213 Downed line (from contact or accident (weather event)	Loss of production, loss of safety infrastructure, property damage, human injury, electrocution	Utilities - Power & Electrical - Power Distribution - Power Operations	Snut-bown Procedures Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, ppF	Safety and Health	Level 1	Unlikely	D	1	L 24
214 Vehicle accidents / collisions with other equipment / snow removal	Vehicle Congestion / traffic, human injury, fire, spills, equipment damage, animal contact	U/G Mining Infrastructure - Portal Infrastructure Transportation	Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Training,	Environment	Level 1	Unlikely	D	1	L 24
215 Collision (vehicle)	Spilage, human injury (burst), equipment damage, loss of production (schedule, access, cleanup)	U/G Mining Infrastructure - Backfill Piping and Distribution (Underground) -Backfill transport	Wildlife Management Plan Standard Openating Procodures; Best Management Practices, Traffic Management Plan, Spill Management Plan, Health and Safety Plan, Engineering QA, Training	Safety and Health	Level 1	Unlikely	D	1	L 24
216 Spill from fueling heavy equipment (fueling of drills, loaders, trucks)	Spills when filling fuel truck, spills from filling equipment, spills from fuel truck (maintenance)	Fueling of set Heavy Equipment	Spill Management Plan, Standard Operating Procedures; Best Management Practices, Design	Environment	Level 1	Unlikely	D	1	L 24
217 Fire / explosion	Spills when filling fuel truck, human injury, fire, equipment damage	U/G Mining Infrastructure - U/G Fuel Distribution Fueling of set Heavy Equipment	Emergency Response Plan, Spill Management Plan, Standard Operating Procedures; Best Management Practices, Design	Environment	Level 1	Unlikely	D	1	L 24
218 Blasting, heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, Rock Fall	Flying debris, dust, noise, accidents, collisions, spills, human injury, generation of deleterious substances (silt, soil and nitrates and NH3, NH4), fire, and waste management, rock fall (from truck or wall)	Mining - Infrastructure Development (Capital) - Mining the Resource	Mine Plan, Standard Operating Procedures; Best Management Practices, Training,	Environment	Level 1	Unlikely	D	1	L 24
219 Spill from fueling heavy equipment (fueling of drills, loaders, trucks)	Spills when filling fuel truck, spills from filling equipment, spills from fuel truck (maintenance)	OP Mining Infrastructure - OP Fuel Storage and Distribution Fueling of Heavy Equipment	Design Engineering (Ground Movement Sensors) Spill Management Plan, Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training	Environment	Level 1	Unlikely	D	1	L 24
220 Fire / explosion	Spills when filling fuel truck, human injury, fire, equipment damage	OP Mining Infrastructure - OP Fuel Storage and Distribution Fueling of Heavy Equipment	Training Spill Management Plan, Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training	Environment	Level 1	Unlikely	D	1	L 24
221 Dust	Alteration of air quality (atmospheric and human effects), particulate deposition outside of mine area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design),	Safety and Health	Level 1	Unlikely	D	1	L 24
222 Dust	Alteration of air quality (atmospheric and human effects), particulate deposition outside of mine area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill (including Lime Silo)	Health and Safety Pian Standard Openating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Pian, PPE,	Safety and Health	Level 1	Unlikely	D	1	L 24
223 Dust	Alteration of air quality (atmospheric and human effects), particulate deposition outside of mine area	Paste Plant and Distribution - Plant Operation	Fuglixe Dust Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Separation, Spill Management Plan, Engineering Oesign), Engineering QA,	Safety and Health	Level 1	Unlikely	D	1	L 24
224 Power failure	Loss of production, loss of safety infrastructure, property damage, flooding (underground and open pit)	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Power operations	Shut-down Procedures Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maritenance Procedures, Spill Management Plan, Engineering (Design), Engineering QA	Safety and Health	Level 1	Unlikely	D	1	L 24
225 Spills	Discharge to environment, property damage	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Operation	Standard Operating Procedures; Best Management Practices, Spill Response Plan, Maintenance Procedures,	Environment	Level 1	Unlikely	D	1	L 24
226 Power failure	Loss of production, loss of safety infrastructure, property damage, flooding (underground and open pit)	Utilities - Power & Electrical - Power Distribution - Power operations	Engineering Design, Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training, PPE	Safety and Health	Level 1	Unlikely	D	1	L 24
229 Power failure	Loss of production, loss of safety infrastructure, property damage, flooding (underground and open pit)	Utilities - Power & Electrical - Emergency Power - Emergency Power operations	Design, Heath and Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Safety and Health	Level 1	Unlikely	D	1	L 24
230 Spill	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Fuel, Storage, & Distribution - Diesel - Fuel transfer, Storage, Fueling of Diesel	PPE Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Environment	Level 1	Unlikely	D	1	L 24

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matri Priority Number
231 Fire / explosion / spills / tank failure / hose failure / nozzle failure	Release to environment, human injury, property damage, human injury, air pollution, fire	Utilities - Fuel, Storage, & Distribution - Gasoline - Restocking, Storage, Fueling of Gasoline	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan,	Environment	Level 1	Unlikely	D	1	L 24
232 Spill	Release to environment, human injury, property damage, human injury, air pollution	Restocking, Storage, Fueling of Gasoline	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Environment	Level 1	Unlikely	D	1	L 24
233 Spills / tank failure / hose failure / nozzle failure	Spill human injury, property damage	Utilities - Fuel, Storage, & Distribution - Oil and Grease - Restocking, Storage, Use of Oil and Greases	Health and Safety Pian Standard Operating Procedures; Best Management Practices, Spill Management Pian, Engineering (Design/Control), Health and Safety Pian	Environment	Level 1	Unlikely	D	1	L 24
234 Fire	Release to environment, human injury, property damage, human injury, air pollution	Restocking, Storage, Use of Oil and Greases	Tream at 3 Safety Fian Sandard Operating Procedures; Best Management Practices, Splil Management Plan, Engineering (Design/Control), Health and Safety Plan	Environment	Level 1	Unlikely	D	1	L 24
235 Spills / tank failure / hose failure / nozzle failure	Spill human injury, property damage	Utilities - Fuel, Storage, & Distribution - Waste Oil Disposal - Temporary Storage of waste	Standard Operating Procedures; Best Management Practices, Split Management Plan, Engineering (Design/Control), Health and Safety Plan	Environment	Level 1	Unlikely	D	1	L 24
236 Fire	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Fuel, Storage, & Distribution - Waste Oil Disposal - Temporary Storage of waste	Sandard Operating Procedures; Best Management Practices, Splil Management Plan, Engineering (Design/Control), Health and Safety Plan	Environment	Level 1	Unlikely	D	1	L 24
237 Fire	Human injury, fire, property damage, regulatory non-compliance	Storage of Waste	Spill Management Plan, Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan	Environment	Level 1	Unlikely	D	1	L 24
238 Spill	Release to environment, human injury, property damage, human injury, air pollution	Hazardous waste	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Sately Plan, Spill Management Plan,	Environment	Level 1	Unlikely	D	1	L 24
239 Spills, splashes	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Waste Disposal - Sewage Storage - Operations / Storage / Handling	Design Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Spill Management Plan, Design, Regulatory Permits	Environment	Level 1	Unlikely	D	1	L 24
240 Process failure (CN destruction unit failure)	CN Release to environment, harm to animals (birds), regulatory non-compliance, loss of production, cost, reputation	Operations / Storage of Tailings	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Training, Emergency Response Plan, PPE	Reputation	Level 1	Unlikely	D	1	L 24
241 Loss of lighting, attraction of animals	Loss of yard lighting, light pollution, reduction of visibility, congestion, accidents, attraction of animals, human injury	General Development - Yard Lighting - Yard Lighting	Fegineering, Health and Safety Plan, Wildlife Management Plan, Standard Operating Procedures; Best Management Practices	Environment	Level 1	Unlikely	D	1	L 24
248 Dust	Alteration of air quality (atmospheric and human effects), particulate deposition outside of mine area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Sandard Operang Procedures; Des Waregennen Fractices Sandard Operang Procedures; Maintenance Procedures; Engineering (Design), Health and Sately Plan, Fuglikho bust Management Plan	Environment	Level 1	Unlikely	D	1	L 24
249 Dust	Alteration of air quality (atmospheric and human effects), particulate deposition outside of mine area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill (including Lime Silo)	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 1	Unlikely	D	1	L 24
250 Dust	Alteration of air quality (atmospheric and human effects), particulate deposition outside of mine area	Paste Plant and Distribution - Plant Operation	Fugitive Dust Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering Qbesign), Engineering Qbesign), Engineering Qbesign, Shut-down Procedures, Fugitive Dust Management Plan	Environment	Level 1	Unlikely	D	1	L 24
254 Inadequate design	Loss of light, safety, property damage, human injury	Utilities - Power & Electrical - Area Lighting - Emergency Lighting	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan	Environment			D	1	L 24
255 Inadequate maintenance	Loss of light, safety, property damage, human injury	Utilities - Power & Electrical - Area Lighting - Emergency Lighting	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan	Environment		Unlikely	D	1	L 24
256 Line breach / rupture / spill	Spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, frozen line, human injury, damage to property	Tailings - Tailing Delivery System / Reclaim Water Operations of Pipeline	- Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Design, Engineering QA	Safety and Health	Level 1	Unlikely	D		L 24
257 Line breach / rupture / spill	Spill, release to environment, contamination to groundwater and surface water, loss of production, cost, regulatory non-compliance, frozen line, human injury, damage to property	Tailings - Tailing Delivery System / Reclaim Water Operations of Pipeline	Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Design, Engineering QA	Environment	Level 1	Unlikely	D	1	L 24
260 Mechanical / electrical failure	Backflow of tailings, loss of production, cost, contained spill	Tailings - Tailing Delivery System / Reclaim Water Operation of Pipeline	- Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Emergency Response Plan, Engineering OA	Safety and Health	Level 1	Unlikely	D	1	L 24
261 Mechanical / electrical failure	Backflow of tailings, loss of production, cost, contained spill	Tailings - Tailing Delivery System / Reclaim Water Operation of Pipeline	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Emergency Reports Plan, Engineering QA	Environment	Level 1	Unlikely	D	1	L 24

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
264 Spills	Ground contamination, surface/ground water contamination, fire hazard	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPF	Safety and Health	Level 1	Unlikely	D	1	L 24
265 Spills	Ground contamination, surface/ground water contamination, fire hazard	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPer All Safety Plan, PPER	Environment	Level 1	Unlikely	D	1	L 24
266 Spills	Ground contamination, surface/ground water contamination, fire hazard, rock fail (human/equipment impacts)	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Safety Plan,	Safety and Health	Level 1	Unlikely	D	1	L 24
267 Spills	Ground contamination, surface/ground water contamination, fire hazard, rock fail (humar/equipment impacts)	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Pian, Engineering (Design), Health and Safety Pian, PPE	Environment	Level 1	Unlikely	D	1	L 24
268 Equipment failure (including power supply)	Damage, human injury, fire, spill, loss of production	Mill Feed and Storage - SAG Mill Feed Stock Pile - General equipment operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Safety Plan, PPE	Safety and Health	Level 1	Unlikely	D	1	L 24
269 Equipment failure (including power supply)	Damage, human injury, fire, spill, loss of production	Mill Feed and Storage - SAG Mill Feed Stock Pile - General equipment operation	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Safety Plan, PPE	Environment	Level 1	Unlikely	D	1	L 24
271 Improper procedures and general maintenance (e.g., during charging and relining)	Human injury, equipment damage, loss of production	Primary Grinding - SAG Mill Maintenance	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 1	Unlikely	D	1	L 24
273 Improper operation and maintenance	Human injury, equipment damage, loss of production	Primary Grinding -Overhead Crane	Noise Mknagement Plan Standard Operating Procedures; Best Management Practices, Martenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Environment	Level 1	Unlikely	D	1	L 24
276 Scrubber malfunction	Steam / chemical / particulate release (Cl, steam, etc.), human injury, damage, loss of production), ground contamination	Carbon Regeneration - Operation of horizontal kiln	Maintenance Procedures, Shur-down Procedures, Engineering (Design), Engineering OA, Health and Safety Plan, PPE,	Environment	Level 1	Unlikely	D	1	L 24
276 Burner malfunction	Fire, explosion, human injury, equipment damage, loss of production	Carbon Regeneration - Operation of horizontal kiln	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Emergency Response Plan, Engineering Obesign), Engineering OA, Health and Safety Plan, PPE,	Environment	Level 1	Unlikely	D	1	L 24
280 General equipment malfunction	Spills, steam release, ground contamination	Carbon Regeneration - Operation of horizontal kiln	Maintenance Procedures, Shut-down Procedures, Engineering (Design), Engineering QA, PPE,	Environment	Level 1	Unlikely	D	1	L 24
282 Improper operation and maintenance	Human injury, equipment damage, loss of production	Overhead Crane	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, Ppeering QA,	Environment	Level 1	Unlikely	D	1	L 24
284 Failure of scrubber	Gaseous release into environment (human injury, air quality)	Generation of gas by-products	Government Regulation and Log Book Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE, PPE,	Environment	Level 1	Unlikely	D	1	L 24
285 Failure of scrubber	Gaseous release into environment (human injury, air quality)	Generation of gas by-products	Shut-down Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA PPE, Engineering Destations	Reputation	Level 1	Unlikely	D	1	L 24
286 Failure of air quality control measures	Environmental release; human injury	Smelting Operation	Shut-down Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering Obesign), Engineering Obesign), PPE, Shut-down Procedures	Environment	Level 1	Unlikely	D	1	L 24

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
287 Failure of air quality control measures	Environmental release, human injury	Smelting Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (Dak, PPE,	Reputation	Level 1	Unlikely	D	1	L 24
288 Improper equipment maintenance and operation	Human injury, ground contamination, groundwater contamination, equipment damage, fire	Paste Plant and Distribution - Plant Operation	Shurdown Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures; Spill Management Plan, Engineering (Design), Engineering (DA	Environment	Level 1	Unlikely	D	1	L 24
292 Heavy equipment moving, spill from equipment failure (mobile), accidents and equipment damage, communication with haul trucks	Air emissions, dust, noise, accidents, collisions (vehicle, wildlife, livestock), fire, spills, human injury	Offsite Infrastructure - Offsite Access Road - Transportation - Heavy equipment	Engineering GA Traffic Management Plan, Standard Operating Procedures; Best Management Practices, Maintenarce Procedures, Training, Wildlife Management Plan, Emergency Response Plan, Soill Management Plan	Reputation	Level 1	Unlikely	D	1	L 24
294 Insufficient drainage, habitat alteration	Habitat damage, flooding, road washout	General Development - Site Roads - Development of Road Crossing (culverts)	Standard Öperating Procedures; Best Management Practices, Training, Traffic Management Plan, Surface Water Management Plan,	Safety and Health	Level 1	Unlikely	D	1	L 24
296 Failure / inadequate communication	Human injury, equipment damage, collisions, spills, fire, loss of production	U/G Mining Infrastructure - Controls, Instrumentation and Communication - Communication (electrical)	Engineering GA/QC Traffic Management Plan, Standard Operating Procedures; Best Management Practices, Engineering (Radio System and Phones), Training, Engineering GA, PPF	Environment	Level 1	Unlikely	D	1	L 24
298 Uncontrolled release of site water; increase o the volume of water down stream (temporary increase)	Uncontrolled water release, release of deleterious substances (sill and soll), increase in volume, effect to down stream water quality / quantity; removal of habitat (FISH RELOCATION?)	General Development -Site Drainage - Dewatering of site (Surface water changes with ponds and General Arrangement area)	Water Management Plan, Engineering (Design), Standard Operating Procedures; Best Management Practices, Training, Spill Management Plan, Resolutiony Permits	Safety and Health	Level 1	Unlikely	D	1	L 24
299 Spill	Ground contamination, surface/ground water contamination, fire hazard	Primary Grinding - SAG Mill Operation	Regulatory Feminas Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Stefey Plan, PPE, Noise Management Plan	Safety and Health	Level 1	Unlikely	D	1	L 24
300 Improper procedures and general maintenance (e.g., during charging and relining)	Human injury, equipment damage, loss of production	Primary Grinding - SAG Mill Maintenance	Note Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE, Note Management Plan	Safety and Health	Level 1	Unlikely	D	1	L 24
301 Use of HCI	Spill / spray / release (injury, damage, loss of production)	Acid Wash and Elution - Acid Washing Operations		Safety and Health	Level 1	Unlikely	D	1	L 24
302 Equipment failure	Spill / spray / release (injury, damage, loss of production)	Acid Wash and Elution - Acid Washing Operations	Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures Engineering (Design Spray Guards), Health and Safety Plan, PPE, PPE,	Safety and Health	Level 1	Unlikely	D	1	L 24
304 Scrubber malfunction	Steam / chemical / particulate release (Cl, steam, etc.), human injury, damage, loss of production), ground contamination	Carbon Regeneration - Operation of horizontal kiln	Spill Management Plan Standard Operating Procedures; Bastradard Operating Procedures, Stul-down Procedures, Engineering (Design), Engineering (OA, Health and Safety Plan, PPE,	Safety and Health	Level 1	Unlikely	D	1	L 24
305 General equipment malfunction	Spills, steam release, ground contamination	Carbon Regeneration - Operation of horizontal kiln	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Shur-down Procedures, Engineering (Design), Engineering (DA, PPE, Spill Management Plan	Safety and Health	Level 1	Unlikely	D	1	L 24
306 Failure of scrubber	Gaseous release into environment (human injury, air quality)	Generation of gas by-products	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (DA, PPE,	Safety and Health	Level 1	Unlikely	D	1	L 24
307 Failure of air quality control measures	Environmental release, human injury	Smelting Operation	Shut-down Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering QA, PPE, Shut-down Procedures	Safety and Health	Level 1	Unlikely	D	1	L 24
308 Improper equipment maintenance and operation	Human injury, ground contamination, groundwater contamination, equipment damage, fire	Paste Plant and Distribution - Plant Operation	Snut-Bown Procedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Engineering (DA	Safety and Health	Level 1	Unlikely	D	1	L 24

Item No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
309 Spills		Discharge to environment, property damage	Substation (General) - Operation	Standard Operating Procedures; Best Management Practices, Spill Response Plan, Maintenance Procedures,	Safety and Health	Level 1	Unlikely	D	1	L 24
310 Fire / explosion failure / nozzle f		Release to environment, human injury, property damage, human injury, air pollution, fire	Utilities - Fuel, Storage, & Distribution - Diesel - Fuel transfer, Storage, Fueling of Diesel	Engineering Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Environment	Level 1	Unlikely	D	1	L 24
311 Inadequate mai	intenance	Loss of water, freezing of lines, loss of production, human injury, property damage, spills	Utilities - Water Systems - Water Distribution System (General) -Maintenance	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Waste Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Safety and Health	Level 1	Unlikely	D	1	L 24
312 Inadequate des	sign /system	Freezing of lines, loss of production, human injury, property damage, spills, regulatory non- compliance	Utilities - Water Systems - General Water - System Distribution	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Engineering (Design/Control), Health and Safety Plan,	Safety and Health	Level 1	Unlikely	D	1	L 24
313 System / equipr mechanical, ele	ment failure (freezing, contact, ectrical)	Freezing of lines, loss of production, human injury, property damage, spills	Utilities - Water Systems - General Water - System Distribution	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Sately Plan, Maintenance Procedures	Safety and Health	Level 1	Unlikely	D	1	L 24
314 Contact with lin equipment, hum		e Spills, flooding, loss of production, human injury, property damage	Distribution	Standard Operating Procedures; Best Management Practices, Splil Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Safety and Health	Level 1	Unlikely	D	1	L 24
315 Inadequate mai	intenance	Loss of water, freezing of lines, loss of production, human injury, property damage, spills	Utilities - Water Systems - General Water - Maintenance	Standard Openation Froedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Sately Plan, Maintenance Procedures	Safety and Health	Level 1	Unlikely	D	1	L 24
316 Process failure	e (CN destruction unit failure)	CN Release to environment, harm to animals (birds), regulatory non-compliance, loss of production, cost, reputation	Operations / Storage of Tailings	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control(DA/QC), Training, Emergency Response Plan, PPE	Safety and Health	Level 1	Unlikely	D	1	L 24
317 Process failure	e (CN destruction unit failure)	CN Release to environment, harm to animals (birds), regulatory non-compliance, loss of production, cost, reputation	Operations / Storage of Tailings	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Training, Emergency Response Plan, PPE	Environment	Level 1	Unlikely	D	1	L 24
318 Exposure of tail	ilings solids (Beach exposure)	Dust, potential acid generation, release to environment (dust), human injury	Operations / Storage of Tailings	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Third Party Review, Emergency Response Plan, Predictive Modelling, TSF Surveillance/Monitoring	Safety and Health	Level 1	Unlikely	D	1	L 24
319 Alarm failure		Human injury, damage to property, air quality, threat to surrounding areas and properties	Systems - Evacuation Systems operation	Emergency Response Plan (Provincial Fire Protection), Emergency Shutdown Procedures, Engineering (Radio System and Phones), Health and Salety Plan, Emergency Response Plan, Standard Operating Procedures, Best Management Practices, Maintenance Procedures, Training	Reputation	Level 1	Rare	E	1	L 25
320 Slow reaction to	o evacuation	Human injury, damage to property, air quality, threat to surrounding areas and properties	Systems -Fire Systems operation	Emergency Response Plan (Provincial Fire Protection), Emergency Shutdown Procedures, Engineering (Radio System and Phones), Health and Safety Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Reputation	Level 1	Rare	E	1	L 25
321 Alarm failure		Human injury, damage to property, air quality, threat to surrounding areas and properties	Systems - Evacuation Systems operation	Training Emergency Response Plan (Provincial Fire Protection), Emergency Shutdown Procedures, Engineering (Radio System and Phones), Health and Sately Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintence Procedures,	Safety and Health	Level 1	Rare	E	1	L 25
322 Slow reaction to	o evacuation	Human injury, damage to property, air quality, threat to surrounding areas and properties	General Development - Site Evacuation Alarm Systems -Fire Systems operation	Training Emergency Response Plan (Provincial Fire Protection), Emergency Shutdown Procedures, Engineering (Radio System and Phones), Health and Salety Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training	Safety and Health	Level 1	Rare	E	1	L 25
323 Explosions, fire	9	Explosions, fire, human injury, collisions, accidents, damage to property	U/G Mining Equipment - Mobile Equipment - Explosive Mixing truck	Training Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Spill Management Plan,	Reputation	Level 1	Rare	E	1	L 25
324 Fire, spills, expl	olosions	Human injury, equipment damage, Fire, mine shut-down, spills, explosions		Regulatory Permits Explosives Management Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Maintenance Procedures, PPE	Reputation	Level 1	Rare	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Categor		y Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
325 Explosion / fire	Fire, damage, human injury, air quality, mine shut-down	U/G Mining Infrastructure - Underground Explosive Magazine - Storage / Handling	Emergency Response Plan, Regulatory Permits, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Maintenance Procedures,	Reputation	Level	1 Rare	E	1	L 25
326 Improper handling / storage / disposal	Equipment damage, human injury, spills	U/G Mining Infrastructure - Underground Explosive Magazine - Storage / Handling	Explosives Management Plan, Standard Operating Procedures; Best Management Practices, Engineering QA,	Reputation	Level	1 Rare	E	1	L 25
327 Uncontrolled blast	Human injury, equipment damage, spills, fire, loss of production	U/G Mining Infrastructure - Controls, Instrumentation and Communication -Blasting Control	Environmental Permits Explosives Management Plan, Emergency Response Plan, Standard Operating Proceedures; Best Management Practices, Engineering, Traning, Engineering OA, PEE	Reputation	Level	1 Rare	E	1	L 25
328 Failure of supply or delivery system	Loss of fresh air supply to refuge stations (potential loss of life); loss of "power" to pneumatic equipment (loss of production); human injury (equipment or line failure)	U/G Mining Infrastructure - Air and Water - Compressed Air	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Emergency Response Plan, Health and Safety Plan, PPE	Reputation	Level	1 Rare	E	1	L 25
329 Breakage of pipe / delivery system	Loss of fresh air supply to refuge stations (potential loss of life); loss of "power" to pneumatic equipment (loss of production); human injury (equipment of line failure)	U/G Mining Infrastructure - Air and Water - Compressed Air	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Emergency Response Plan, Health and Safety Plan, PEE	Reputation	Level	1 Rare	E	1	L 25
330 Explosions, fire	Explosions, fire, human injury, collisions, accidents, damage to property	OP Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles - Explosive Mixing truck	Explosives Management Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Training, Engineering OA, Regulatory Permits	Reputation	Level	1 Rare	E	1	L 25
331 Explosion / fire	Fire, damage, human injury, air quality, mine shut-down	OP Mining Infrastructure - Explosive Magazine - Storage / Handling	Emergency Response Plan, Explosives Management Plan, Socurity System, Standard Operating Procedures; Best Management Practices, Renulatory Permits	Reputation	Level	1 Rare	E	1	L 25
332 Improper handling / storage / disposal	Equipment damage, human injury, spills	OP Mining Infrastructure - Explosive Magazine - Storage / Handling	Regulatory Pennis Emergency Response Plan, Explosives Management Plan, Spill Management Plan, Sacurity System, Standard Operating Procedures; Best Management Practices, Reouldary Pennis	Reputation	Level	1 Rare	E	1	L 25
333 Expiry of equipment (wear or shell life)	Unfit equipment, use of damaged equipment, improper waste management	OP Mining Infrastructure - Safety Equipment, Lamps etc. and Storage -Safety Equipment	Health and Safety Plan, Maintenance Procedures, Standard Operating Procedures; Best Management Practices, PPE	Safety and Health	Level	1 Rare	E	1	L 25
334 Fire, spills, explosions	Human injury, equipment damage, Fire, mine shut-down, spills, explosions	Ancillary Facilities - Truck Shop and Maintenance Shop - Maintenance	Standard Operating Procedures; Best Management Practices, Mainterance Procedures, Emergency Response Plan, Explosives Management Plan, Engineering OA, Regulatory Permits	Reputation	Level	1 Rare	E	1	L 25
335 Fire	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Temporary Facilities - Construction Laydown Area - Operation of Laydown Area	- Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Trafic Management Plan, Splil Management Plan, Engineering (Design/Control/QA/QC)	Reputation	Level	1 Rare	E	1	L 25
336 Material release / spill / splash / fumes /gas generation	Human injury, equipment damage, loss of production, release to environment	Process Reagents -Storage/Distribution	Engineering (Design Control CoVCC) Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design), Health and Safety Plan, PPE, Spill Management Plan	Reputation	Level	1 Rare	E	1	L 25
337 Use of CN solution	Spill / spray / release (injury, damage, loss of production)	Acid Wash and Elution - Elution Operations	Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures Engineering (Design Spray Guards), Health and Safety Plan, PPE, PPE,	Reputation	Level	1 Rare	E	1	L 25
338 Equipment failure	Spill / spray / release (injury, damage, loss of production), fire, flying debris		Spill Management Plan Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design Spray Guards), Health and Safety Plan, PPE,	Reputation	Level	1 Rare	E	1	L 25
339 Falls	Human injury, reputation, equipment damage / loss of equipment	Mining Underground - Vertical Development - Development	Spill Management Plan Engineering OA, Spill Management Plan, Standard Operating Procedures; Best Management Practices,	Reputation	Level	1 Rare	E	1	L 25
340 Falls	Human injury, equipment damage	and Chutes	Training Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering OA, PPE, Air Monitors	Reputation	Level	1 Rare	E	1	L 25

ltem No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
341 Fa	ailure of backfill barricade	Flooding, damage of equipment, loss of production, human injury	U/G Mining Infrastructure - Underground Backfill Distribution - Backfill	Maintenance Procedures, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Training, Engineering QA, PPF	Reputation	Level 1	Rare	E	1	L 25
342 SI	tructural failure / inadequate capacity	Human Injury, Inadequate Ventilation, equipment damage, Instable ground, loss of emergency egress, damage to reputation	U/G Mining Infrastructure - Portal Infrastructure Structure of Portal	PPE Design, Standard Operating Procedures; Best Management Practices, Engineering QA,	Reputation	Level 1	Rare	E	1	L 25
343 N	atural gas leak	Human injury, explosion, fire, and loss of production, damage of equipment	U/G Mining Infrastructure - Mine Heating - Heating	Emergency Response Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Emergency Response Plan, Engineering GA,	Reputation	Level 1	Rare	E	1	L 25
344 Fi	ire / explosion	Spills when filling fuel truck, human injury, fire, equipment damage	U/G Mining Infrastructure - U/G Fuel Distribution Fueling of set Heavy Equipment	Training Emergency Response Plan, Spill Management Plan, Standard Operating Procedures; Best Management Practices, Design	Reputation	Level 1	Rare	E	1	L 25
ec	lasting, heavy equipment moving, spill from quipment failure (mobile), accidents and quipment damage, rock fall	Flying debris, dust, noise, accidents, collisions, spills, human injury, generation of deleterious substances (silt, soil and nitrates and NH3, NH4), fire, and waste management, rock fail (from truck or wall)	Mining - Infrastructure Development (Capital) - Mining the Resource	Mine Plan, Standard Operating Procedures; Best Management Practices, Training,	Reputation	Level 1	Rare	E	1	L 25
346 E	xpiry of equipment (wear or shelf life)	Unfit equipment, use of damaged equipment, improper waste management	OP Mining Infrastructure - Safety Equipment, Lamps etc. and Storage -Safety Equipment	Design Engineering (Ground Movement Sensors) Health and Safety Plan, Maintenance Procedures, Standard Operating Procedures; Best Management Practices,	Reputation	Level 1	Rare	E	1	L 25
347 Fi	ire / explosion		OP Mining Infrastructure - OP Fuel Storage and Distribution Fueling of Heavy Equipment	PPE Spill Management Plan, Engineoring, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Tratenance Proceedures, Tratenance Proceedures,	Reputation	Level 1	Rare	E	1	L 25
	ontact with equipment (snow removal / rading)	Property damage, human injury, electrocution	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Maintenance	Hailling Safety Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Engineering OA	Reputation	Level 1	Rare	E	1	L 25
	ack-feeding from emergency power		Utilities - Power & Electrical - HV Switchyard and Substation (General) - Operation	Standard Operating Procedures; Best Management Practices, Engineering, Maintenance Procedures	Reputation	Level 1		E	1	L 25
350 Pi	rotection failures	Property damage, damage to equipment, human injury, electrocution	Utilities - Power & Electrical - HV Switchyard and Substation (General) - Operation	Standard Operating Procedures; Best Management Practices, Engineering	Reputation	Level 1	Rare	E	1	L 25
351 Fi	ire / explosion	Property damage, human injury, air pollution, release of fuel to air, or environment (-45 or less)		Engineering Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
352 Fi	ire / explosion	Property damage, human injury, air pollution, release of fuel to air	Utilities - Fuel, Storage, & Distribution - Natural Gas - Natural Gas Use	Maintesinator Frücoures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health anance Procedures	Reputation	Level 1	Rare	E	1	L 25
	ontact with property resulting in damage nobile equipment, human)	Loss of production, human injury, damage to property, release to the air, fire, explosion	Utilities - Fuel, Storage, & Distribution - Propane - Propane Fork Lifts	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
354 C ec	ontact with lines resulting in damage (mobile quipment, human)		Utilities - Fuel, Storage, & Distribution - Natural Gas -Natural Gas	Maintenance Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
355 Fi fa	ire / explosion / spills / tank failure / hose illure / nozzle failure	Release to environment, human injury, property damage, human injury, air pollution, fire	Utilities - Fuel, Storage, & Distribution - Gasoline - Restocking, Storage, Fueling of Gasoline	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
	pills / tank failure / hose failure / nozzle ilure		Utilities - Fuel, Storage, & Distribution - Oil and Grease - Restocking, Storage, Use of Oil and Greases	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan	Reputation	Level 1	Rare	E	1	L 25
	pills / tank failure / hose failure / nozzle illure		Utilities - Fuel, Storage, & Distribution - Waste Oil Disposal - Temporary Storage of waste	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Selfvt Plan	Reputation	Level 1	Rare	E	1	L 25
358 In	adequate maintenance	Regulatory non-compliance, human injury, property damage, spills, fire	Utilities - Water Systems - Fire Water - Maintenance	Health and Sarely Plan Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
359 Lo	oss of power	Fire, spills, loss of power, equipment damage, damage to property, human injury	Utilities - Water Systems - Fire Water -Use of Fire water		Reputation	Level 1	Rare	E	1	L 25
364 E	xplosions, fire		U/G Mining Equipment - Mobile Equipment - Explosive Mixing truck	Maintenance Procedures Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Spill Management Plan, Regulatory Permits	Safety and Health	Level 1	Rare	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
365 Fire, spills, explosions	Human injury, equipment damage, Fire, mine shut-down, spills, explosions	U/G Mining Infrastructure - Underground Workshop (and/or Service Bay) - Maintenance	Explosives Management Plan, Emergency Response Plan, Standard Openang Processes: Best Management Practices, Elementing (Prolyn Control), Merri and Procedures, Merri and Procedures,	Safety and Health	Level 1	Rare	E	1	L 25
366 Improper handling / storage / disposal	Equipment damage, human injury, spills	U/G Mining Infrastructure - Underground Explosive Magazine - Storage / Handling		Safety and Health	Level 1	Rare	E	1	L 25
367 Inadequate location of emergency refuge chambers	Human injury, slow return to stations	U/G Mining Infrastructure - Mobile Refuge Chambers - Location of Refuge Chambers	Emorgency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), PPF	Safety and Health	Level 1	Rare	E	1	L 25
368 Inadequate location of emergency refuge chambers	Human injury, slow return to stations	U/G Mining Infrastructure - Mobile Refuge Chambers - Location of Refuge Chambers	Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), PDF	Reputation	Level 1	Rare	E	1	L 25
369 Inadequate design / supply emergency refuge chambers	Human injury, limited supplies for capacity	U/G Mining Infrastructure - Mobile Refuge Chambers - Capacity / Supplies of Refuge Chambers	Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), PPE	Safety and Health	Level 1	Rare	E	1	L 25
370 Inadequate design / supply emergency refuge chambers	Human injury, limited supplies for capacity	U/G Mining Infrastructure - Mobile Refuge Chambers - Capacity / Supplies of Refuge Chambers	PPE Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), PPE	Reputation	Level 1	Rare	E	1	L 25
371 Uncontrolled blast	Human injury, equipment damage. spills, fire, loss of production	U/G Mining Infrastructure - Controls, Instrumentation and Communication -Blasting Control	Explosives Management Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering, Training, Engineering QA,	Safety and Health	Level 1	Rare	E	1	L 25
372 Inadequate condition of safety equipment	Failure of safety equipment, human injury	U/G Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Maintenance of Safety Equipment	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures Health and Safety Plan, PPF	Safety and Health	Level 1	Rare	E	1	L 25
373 Expiry of equipment (wear or shelf life)	Unfit equipment, use of damaged equipment, improper waste management	U/G Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Safety Equipment	Standard Operating Procedures; Best Management Practices, Health and Safety Plan	Safety and Health	Level 1	Rare	Е	1	L 25
374 Inadequate safety equipment training	Human injury, cost, reputation	U/G Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Safety Equipment	Standard Operating Procedures; Best Management Practices, Health and Safety Plan	Safety and Health	Level 1	Rare	Е	1	L 25
375 Explosions, fire	Explosions, fire, human injury, collisions, accidents, damage to property	Camps etc. and Storage - Sarety Equipment OP Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles - Explosive Mixing truck	Heatin and Sation Faint Data, Explosites Managemen Pain, Standard Operating Procedures; Best Management Practices, Training, Engineering OA, Regulatory Permits	Safety and Safety and Health	Level 1	Rare	E	1	L 25
376 Explosion / fire	Fire, damage, human injury, air quality, mine shut-down	OP Mining Infrastructure - Explosive Magazine - Storage / Handling	Emergency Response Plan, Explosives Management Plan, Security System, Standard Operating Procedures; Best Management Practices,	Safety and Health	Level 1	Rare	E	1	L 25
377 Improper handling / storage / disposal	Equipment damage, human injury, spills	OP Mining Infrastructure - Explosive Magazine - Storage / Handling	Regulatory Permits Emergency Response Plan, Explosives Management Plan, Spill Management Plan, Security System, Standard Operating Procedures; Best Management Practices,	Safety and Health	Level 1	Rare	E	1	L 25
378 Inadequate condition of safety equipment	Failure of safety equipment, human injury	OP Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Maintenance of Safety Equipment	Regulatory Permits Health and Safety Plan, Maintenance Procedures, Standard Operating Procedures; Best Management Practices, PPF	Safety and Health	Level 1	Rare	E	1	L 25
379 Inadequate safety equipment training	Human injury, cost, reputation	OP Mining Infrastructure - Safety Equipment, Lamps etc. and Storage -Safety Equipment	Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Training, PPF	Safety and Health	Level 1	Rare	E	1	L 25
380 Fire, spills, explosions	Human injury, equipment damage, fire, mine shut-down, spills, explosions	Ancillary Facilities - Truck Shop and Maintenance Shop - Maintenance	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Emergency Response Plan, Engineering OA, Regulatory Permits	Safety and Health	Level 1	Rare	E	1	L 25
381 Explosion / fire	Fire, damage, human injury, air quality, mine shut-down	U/G Mining Infrastructure - Underground Explosive Magazine - Storage / Handling		Safety and Health	Level 1	Rare	E	1	L 25
382 Fire / explosion	Spills when filling fuel truck, human injury, fire, equipment damage	U/G Mining Infrastructure - U/G Fuel Distribution Fueling of set Heavy Equipment	Emergency Response Plan, Spill Management Plan, Standard Operating Procedures; Best Management Practices, Design	Safety and Health	Level 1	Rare	E	1	L 25
383 Blasting, heavy equipment moving, spill from equipment failure (mobile), Accidents and equipment damage, rock fall	Flying debris, dust, noise, accidents, collisions, spills, human injury, generation of deleterious substances (silt, soil and Nitrates and NH3, NH4), fire, and waste management, Rock Fall (from truck or wall)	Mining - Infrastructure Development (Capital) - Mining the Resource	Mine Plan, Standard Operating Procedures; Best Management Practices, Training, Design Engineering (Ground Movement Sensors)	Safety and Health	Level 1	Rare	E	1	L 25
384 Inadequate condition of safety equipment	Failure of safety equipment, human injury	OP Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Maintenance of Safety Equipment	Design Engineening (footal a novement sensors) Health and Safety Plan, Maintenance Procedures Standard Operating Procedures; Best Management Practices, PPE	Reputation	Level 1	Rare	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severi Name	y Likeli- hood Name	Likeli- hood	Severity	Risk Matri Priority Number
385 Fire / explosion	Spills when filling fuel truck, human injury, fire, equipment damage	OP Mining Infrastructure - OP Fuel Storage and Distribution Fueling of Heavy Equipment	Spill Management Plan, Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Safety and Health	Level	I Rare	E	1	L 25
386 Fire / explosion / spills / tank failure / hose failure / nozzle failure	Release to environment, human injury, Property damage, human injury, air pollution, Fire	Utilities - Fuel, Storage, & Distribution - Diesel - Fuel transfer, Storage, Fueling of Diesel	Training Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Cortro), Health and Staffy Plan,	Salfety and Health	Level	I Rare	E	1	L 25
387 Fire / explosion / spills / tank failure / hose failure / nozzle failure	Release to environment, human injury, property damage, human injury, air pollution, fire	Utilities - Fuel, Storage, & Distribution - Gasoline - Restocking, Storage, Fueling of Gasoline	Spill Management Plan, Engineering (Design/Control), Health and Safety Plan,	Safety and Health	Level	I Rare	E	1	L 25
388 Spills / tank failure / hose failure / nozzle failure	Spill human injury, property damage	Utilities - Fuel, Storage, & Distribution - Oil and Grease - Restocking, Storage, Use of Oil and Greases	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Sately Plan	Safety and Health	Level	I Rare	E	1	L 25
389 Spills / tank failure / hose failure / nozzle failure	Spill human injury, property damage	Utilities - Fuel, Storage, & Distribution - Waste Oil Disposal - Temporary Storage of waste	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Safety and Health	Level	l Rare	E	1	L 25
392 Loss of power	Fire, spills, loss of power, equipment damage, damage to property, human injury	Utilities - Water Systems - Fire Water -Use of Fire water	Health and Safety Pian Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Pian, Emergency Response Pian,	Safety and Health	Level	I Rare	E	1	L 25
395 Congestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Ancillary Facilities - Warehouse - Operation	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Spill Management Plan,	Reputation	Level	l Rare	E	1	L 25
396 Congestion, collisions	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Ancillary Facilities -Security / Scale House - Operation	Emergency Response Plan Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Spill Management Plan	Reputation	Level		E	1	L 25
397 Fire	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Temporary Facilities - Construction Laydown Area Operation of Laydown Area	Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Traffic Management Plan, Spill Management Plan,	Safety and Health	Level	l Rare	E	1	L 25
400 Structural failure / damage / fire	Damage to property, human Injury, mine shut-down, damage to reputation, fire	Ancillary Facilities - Mill and Mine Dry, First Aid - Structure	Engineering (Design/Control/QA/QC) Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Pian, Maintenance Procedures, Emergency Response Pian,	Safety and Health	Level	I Rare	E	1	L 25
401 Structural failure / damage / fire	Damage to property, human Injury, mine shut-down, damage to reputation, fire	Ancillary Facilities - Mill and Mine Dry, First Aid - Structure	Design Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures, Emergency Response Plan,	Reputation	Level	I Rare	E	1	L 25
402 Structural failure / damage / fire	Damage to property, human injury, mine shut-down, damage to reputation, fire	Ancillary Facilities - Warehouse - Structure	Design Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Emergency Response Plan,	Safety and Health	Level	I Rare	E	1	L 25
406 Loss of lighting, attraction of animals	Loss of yard lighting, light pollution, reduction of visibility, congestion, accidents, attraction of animals, human injury	General Development - Yard Lighting - Yard Lighting	Maintenance Procedures Engineering, Health and Safety Plan, Wildlifk Management Plan, Standard Operating Procedures; Best Management Practices	Salfety and Health	Level	I Rare	E	1	L 25
407 Emissions from equipment / poor maintenance	Damage of equipment, human injury, spills from equipment	U/G Mining Equipment - Mobile Equipment - Equipment Maintenance	Safe Work Procedures; Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Spill Management Plan, Regulatory Permits, PPE,	Safety and Health	Level	I Rare	E	1	L 25
408 Fire / spils	Poor air quality / ventilation, Spills	U/G Mining Equipment - Fixed Equipment - Gates and Chutes	Air Monitors Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering, Engineering OA, PPE, Spill Management Plan, Air Monitors	Safety and Health	Level	I Rare	E	1	L 25
409 Fire	Poor air quality / ventitation, human injury	U/G Mining Equipment - Fixed Equipment - Doors	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering, Engineering QA, PPE, Spill Management Plan, Air Monitos	Safety and Health	Level	l Rare	E	1	L 25
drills, loaders, trucks)	f Spills when filling fuel truck, spills from filling equipment, spills from fuel truck (maintenance)	Fueling of set Heavy Equipment	Spill Management Plan, Standard Operating Procedures; Best Management Practices, Design	Safety and Health		Rare	E	1	L 25
411 Release of soil and sediments	Release of deleterious substances, collapse of pile (make sure that the grade of the pile is ok)	Mining - Infrastructure Development (Capital) - Storage of Topsoil	Mine Flan, Hydro Seeding, Standard Operating Procedures; Best Management Practices, Training, Design Engineering (Water Collection Systems)	Environment	Level	I Rare	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
412 Release of soil and sediments	Release of deleterious substances, collapse of pile (make sure that the grade of the pile is ok) potential acid generation	, Mining - Infrastructure Development (Capital) - Storage of Overburden (Overburden)	Mine Plan, Standard Operating Procedures; Best Management Practices,	Environment	Level 1	Rare	E	1	L 25
413 Emissions from equipment / poor maintenance	Damage of equipment, human injury, spills from equipment	OP Mining Equipment - Mobile Equipment - Equipment Maintenance	Training. Design Engineering (Water Collection Systems) Spill Management Plan, Engineering (Alr Quality Monitors), Maintenance Procedures, Standard Operating Procedures; Best Management Practices,	Safety and Health	Level 1	Rare	E	1	L 25
414 Emissions from equipment / poor maintenance	Damage of equipment, human injury, spills from equipment	OP Mining Equipment - Mobile Equipment - Equipment Maintenance	Training. Engineering QA, Regulatory Permits Spill Management Plan, Engineering (Air Quality Monitors), Maintenance Procedures, Standard Operating Procedures; Best Management Practices, Training.	Environment	Level 1	Rare	E	1	L 25
415 Spills to water	Contaminants within contact water from spills	OP Mining Infrastructure - Pump Station (Dewatering) - Pumping / Dewatering	Engineering OA, Regreatery Permits Spill Management Plan, Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Environment	Level 1	Unlikely	D	1	L 24
416 Spill from fueling heavy equipment (fueling of drills, loaders, trucks)	Spills when filling fuel truck, spills from filling equipment, spills from fuel truck (maintenance)	OP Mining Infrastructure - OP Fuel Storage and Distribution Fueling of Heavy Equipment	Training Spill Management Plan, Engineering, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Safety and Health	Level 1	Rare	E	1	L 25
417 Noise	Proximate effects on worker health, noise "pollution" of surrounding area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Training Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE.	Environment	Level 1	Rare	E	1	L 25
418 Noise	Proximate effects on worker health, noise "pollution" of surrounding area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Noise Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan,	Environment	Level 1	Rare	E	1	L 25
419 Noise	Proximate effects on worker health, noise "pollution" of surrounding area	Primary Grinding - SAG Mill Operation	PPE, Noise Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Heatht and Safety Plan,	Environment	Level 1	Rare	E	1	L 25
420 Noise	Noise release, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power operations	PPE, Noise Management Plan Design (Inbuilding), Standard Operating Procedures; Best Management Practices, Noise Management Plan, Maintenance Procedures,	Environment	Level 1	Rare	E	1	L 25
421 Air emissions (NOx)	Increase in emissions, reduced air quality if attracted into vents, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power operations	PPE Design (Inbuilding), Standard Operating Procedures; Best Management Practices, Noise Management Plan, Maintenance Procedures, PPE	Environment	Level 1	Rare	E	1	L 25
422 Inadequate design	Loss of light, safety, property damage, human injury	Utilities - Power & Electrical - Area Lighting - Emergency Lighting	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control),	Safety and Health	Level 1	Rare	Е	1	L 25
423 Inadequate maintenance	Loss of light, safety, property damage, human injury	Utilities - Power & Electrical - Area Lighting - Emergency Lighting	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Engineering (Design/Control),	Safety and Health	Level 1	Rare	E	1	L 25
424 Spill	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Fuel, Storage, & Distribution - Diesel - Fuel transfer, Storage, Fueling of Diesel	Health and Safety Pian Standard Operating Procedures; Best Management Practices, Spill Management Pian, Engineering (Design/Control), Health and Safety Pian,	Safety and Health	Level 1	Rare	E	1	L 25
425 Spill	Release to environment, human injury, property damage, human injury, air pollution	Restocking, Storage, Fueling of Gasoline	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Safety and Health	Level 1	Rare	E	1	L 25
426 Fire	Release to environment, human injury, property damage, human injury, air pollution	Restocking, Storage, Use of Oil and Greases	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Safety and Health	Level 1	Rare	E	1	L 25
427 Fire	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Fuel, Storage, & Distribution - Waste Oil Disposal - Temporary Storage of waste	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Safety and Health	Level 1	Rare	E	1	L 25
428 Contamination / change in source water conditions	Human injury, cost, regulatory non-compliance, changes in source water	Utilities - Water Systems - General Water	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures, Use Orther Drinking Water	Safety and Health	Level 1	Rare	E	1	L 25
430 Nuisance animals / attraction of animals	Human - animal interactions, human injury, collisions with animals	Utilities - Waste Disposal - Solid Waste Disposal (General) - Storage of Waste (Domestic Refuse and Recycling)	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Sately Plan,	Safety and Health	Level 1	Rare	E	1	L 25
431 Nuisance animals / attraction of animals	Human - animal interactions, human injury, collisions with animals	Utilities - Waste Disposal - Solid Waste Disposal (General) - Storage of Waste (Domestic Refuse and Recycling)	Widlife Management Plan Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Widlife Management Plan	Environment	Level 1	Rare	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
432 Over generation of waste / lack of pick-up	Human - animal interactions, human injury, collisions with animals, regulatory non-compliance	Utilities - Waste Disposal - Solid Waste Disposal (General) - Storage of Waste (Domestic Refuse)	Health and Safety Plan,	Safety and Health	Level 1	Rare	E	1	L 25
433 Over generation of waste / lack of pick-up	Human - animal interactions, human injury, collisions with animals, regulatory non-compliance	Utilities - Waste Disposal - Solid Waste Disposal (General) - Storage of Waste (Domestic Refuse)	Wildlife Management Plan Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan,	Environment	Level 1	Rare	E	1	L 25
434 Inadequate diversion of waste	Regulatory non-compliance, cost, human injury, attraction of animals	Waste Diversion	Wildlife Management Plan Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan,	Safety and Health	Level 1	Rare	E	1	L 25
435 Inadequate diversion of waste	Regulatory non-compliance, cost, human injury, attraction of animals	Waste Diversion	Wildlife Management Plan Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan,	Environment	Level 1	Rare	E	1	L 25
436 Fire	Human injury, fire, property damage, regulatory non-compliance	Storage of Waste	Widtlife Management Plan Spill Management Plan, Standard Operating Procedures; Best Management Practices, Design, Waste Management Plan,	Safety and Health	Level 1	Rare	E	1	L 25
437 Improper storage of hazardous waste	Human injury, fire, property damage, explosion, regulatory non-compliance	Hazardous waste	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan	Safety and Health	Level 1	Rare	E	1	L 25
438 Improper storage of hazardous waste	Human injury, fire, property damage, explosion, regulatory non-compliance	Hazardous waste	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan	Environment	Level 1	Rare	E	1	L 25
439 Spill	Release to environment, human injury, property damage, human injury, air pollution	Hazardous waste	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Spill Management Plan, Desion	Safety and Health	Level 1	Rare	E	1	L 25
440 Spills, splashes	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Waste Disposal - Sewage Storage - Operations / Storage / Handling	Sandard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Spill Management Plan, Design, Regulatory Permits	Salfety and Health	Level 1	Rare	E	1	L 25
441 Mechanical failure / electrical failure	Spills, loss of "power" to pneumatic equipment (loss of production), human injury (equipment or line failure), equipment damage, spills, uncontrolled process	Utilities - Other - Plant and Instrument air - Compressed Air	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures, Emergency, Response Plan,	Safety and Health	Level 1	Rare	E	1	L 25
442 Breakage of pipe / delivery system	Loss of "power" to pneumatic equipment (loss of production); human injury (equipment or line failure), equipment damage, equipment damage, spills, uncontrolled process	Compressed Air	Design Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Stefay Plan, Maintenance Procedures, Emergency Response Plan,	Safety and Health	Level 1	Rare	E	1	L 25
443 Contact with biological hazards / sharps	Human injury, splits, improper disposal of biohazard materials	Ancillary Facilities - Mill and Mine Dry, First Aid - First Aid	Design Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safley Plan, Emergency Response Plan,	Environment	Level 1	Rare	E	1	L 25
444 Contact with biological hazards / sharps	Human injury, spills, improper disposal of biohazard materials	Ancillary Facilities - Mill and Mine Dry, First Aid - First Aid	Waste Management Plan (Hazardous Waste Management Plan) Standard Openating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Emergency Response Plan,	Reputation	Level 1	Rare	E	1	L 25
445 Improper storage	Cross contamination, human injury, fire, explosions, spills, loss of production, cost (loss of	Ancillary Facilities - Warehouse -Storage	Waste Management Plan (Hazardous Waste Management Plan) Standard Operating Procedures; Best Management Practices,	Environment	Level 1	Rare	Е	1	L 25
448 Inadequate training	inventory and material damage), nuisance animals Incorrect analysis, incorrect use of chemicals, incorrect calibration, explosion, fire, cost, production loss	Ancillary Facilities - Assay/Met/Environmental Lab - Chemical Use	Engineering (Design/Control) Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Waste Management Plan	Safety and Health	Level 1	Rare	E	1	L 25
449 Fire, spills, sxplosions	Human injury, equipment damage, fire, mine shut-down, spills, explosions	Ancillary Facilities - Truck Shop and Maintenance Shop - Maintenance	vraste marageriner, mar Standard Openating Procedures; Best Management Practices, Maintenance Procedures, Emergency Response Plan, Engineering QA, Resultatory Permits	Environment	Level 1	Rare	E	1	L 25
450 Spills, emissions from equipment	Release to environment, spills	Operation of Laydown Area	Kaguaany Permis Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Traffic Management Plan, Spill Management Plan, Engineering (Design/Control/QAOC), Engineering (Ary Quality Monitors)	Safety and Health	Level 1	Rare	E	1	L 25
451 Loss of power / power failure	Spills, releases from uncontrolled process (air and liquid), property damage, human injury	General Development - Fencing/Gates (Site Control) -Back-up Power (UPS)	Engineering (CC-TV, Ferce and Gates), Health and Safey Plan, Standard Opening Procedures; Best Management Practices, Maintenance Procedures, Transmission, Transmission, T	Safety and Health	Level 1	Rare	E	1	L 25
452 Blockage / inadequate design	Unplanned blockage, snow build-up, ice build-up, animal ingress	Mining Underground - Ventilation Shafts -Design of Shaft	Training Engineering OA Engineering OA Emergency Response Plan Standard Operating Procedures; Best Management Practices, Training, Maintenance Procedures, Widlife Management Plan	Environment	Level 1	Rare	E	1	L 25
453 Blockage / inadequate design	Unplanned blockage, snow build-up, ice build-up, animal ingress	U/G Mining Infrastructure - Portal Infrastructure Design of Portal	Design, Standard Operating Procedures; Best Management Practices, Engineering OA, Emergency Response Plan, Maintenance Procedures, Wildlife Management Plan	Environment	Level 1	Rare	E	1	L 25

Item No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
454 Sp	pillage of tailings	Human injury, ground contamination, groundwater contamination	Paste Plant and Distribution - Plant Operation	Standard Operating Procedures; Best Management Practices,	Environment	Level 1	Rare	E	1	L 25
				Maintenance Procedures, Separation, Spill Management Plan, Engineering (Design), Engineering (Design), Shut-down Procedures						
455 lm	proper ventilation	Fire; explosion, human injury, indoor air quality, regulatory non-compliance	Ancillary Facilities - Assay/Met/Environmental Lab Chemical / Laboratory Equipment Use	Standard Operating Procedures; Best Management Practices, Training, Engineering (Design)	Environment	Level 1	Rare	Е	1	L 25
456 Re	elease of deleterious substances	Release to environmental (chemical, oils, dirt)	Ancillary Facilities - Truck Shop and Maintenance Shop - Truck Wash	Engineering (Cesign) Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Design, Engineering QA	Environment	Level 1	Rare	E	1	L 25
457 Ov	verflow of spillway	Human injury, damage to property, spill, release to environment, contarnination to groundwater and surface water, loss of production, cost, regulatory non-compliance, damage to property (Treasury), damaged to surrounding environment, deputation	Operations / Storage of Tailings	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control/QA/QC), Third Party Review, Emergency Response Plan, Predictive Modelling, TSF Surveillance/Monitoring, Groundwater Monitoring	Safety and Health	Level 1	Rare	E	1	L 25
458 Co	ollision with conductors or towers	Structural damage, potential power interruption, human injury	Offsite Infrastructure - Offsite Power Transmission Construction/Operational Activity in proximity to line	-Standard Operating Procedures; Best Management Practices,	Safety and Health	Level 1	Rare	E	1	L 25
	nissions from equipment / poor aintenance	Damage of equipment, human injury, spills from equipment	U/G Mining Equipment - Mobile Equipment - Equipment Maintenance	Emergency Response Plan Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Spill Management Plan, Regulatory Permits, PPE, Air Munitors	Environment	Level 1	Rare	E	1	L 25
460 Fir	re / spills	Poor air quality / ventilation, Spills	U/G Mining Equipment - Fixed Equipment -Gates and Chutes	Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering OA, PPE, Spill Management Plan,	Environment	Level 1	Rare	E	1	L 25
461 Fir	re	Poor air quality / ventilation, human injury	U/G Mining Equipment - Fixed Equipment -Doors	Air Monitors Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering OA, PPE, Spill Management Plan,	Environment	Level 1	Rare	E	1	L 25
483 Sp	bills, emissions from equipment	Release to environment, spills	Operation of Laydown Area	Air Monitors Standard Operating Procedures; Best Management Practices, Emergency Response Plan, Traffic Management Plan, Spill Management Plan, Engineering (Design/Control/QA/QC),	Environment	Level 1	Rare	E	1	L 25
484 Ex	xplosions, fire	Explosions, fire, human injury, collisions, accidents, damage to property	U/G Mining Equipment - Mobile Equipment - Explosive Mixing truck	Engineering (Air Quality Monitors) Safe Work Procedures, Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Spill Management Plan, Regulatory Permits	Environment	Level 1	Rare	E	1	L 25
485 Fir	re, spills, explosions	Human injury, equipment damage, Fire, mine shut-down, spills, explosions	U/G Mining Infrastructure - Underground Workshop (and/or Service Bay) - Maintenance	Regulatory Permits Explosives Management Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Maintenance Procedures, PPF	Environment	Level 1	Rare	E	1	L 25
486 Ex	xplosion / fire	Fire, damage, human injury, air quality, mine shut-down	U/G Mining Infrastructure - Underground Explosive Magazine - Storage / Handling		Environment	Level 1	Rare	E	1	L 25
487 lm	nproper handling / storage / disposal	Equipment damage, human injury, spills	U/G Mining Infrastructure - Underground Explosive Magazine - Storage / Handling		Environment	Level 1	Rare	E	1	L 25
488 Ur	ncontrolled blast	Human injury, equipment damage, spills, fire, loss of production	U/G Mining Infrastructure - Controls, Instrumentation and Communication -Blasting Control	Environmental Hermits Explosives Management Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Engineering, Training, Engineering OA, PPE	Environment	Level 1	Rare	E	1	L 25
489 Ex	xplosions, fire	Explosions, fire, human injury, collisions, accidents, damage to property	OP Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles - Explosive Mixing truck	Fre Explosives Management Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Training, Engineering QA, Regulatory Permits	Environment	Level 1	Rare	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
490 Explosion / fire	Fire, damage, human injury, air quality, mine shut-down	OP Mining Infrastructure - Explosive Magazine -	Emergency Response Plan,	Environment	Level 1	Rare	E	1	L 25
491 Improper handling / storage / disposal	Equipment damage, human injury, spills	Storage / Handling OP Mining Infrastructure - Explosive Magazine - Storage / Handling	Explosives Management Plan, Scarufy System, Standard Operating Procedures; Best Management Practices, Regulatory Permits Emergency Response Plan, Explosives Management Plan, Spill Management Plan, Sacurity System, Standard Operating Procedures; Best Management Practices,	Environment	Level 1	Rare	E	1	L 25
492 Structural failure / damage / fire	Damage to property, human injury, mine shut-down, damage to reputation, fire	Ancillary Facilities - Warehouse - Structure	Regulatory Permits Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Emergency Response Plan,	Environment	Level 1	Rare	E	1	L 25
493 Fire	Human injury, fire, explosions, spills, loss of production, cost (loss of inventory and material damage)	Temporary Facilities - Construction Laydown Area Operation of Laydown Area	Maintenance Procedures Standard Openting Procedures: Best Management Practices, Emergency Response Plan, Traflic Management Plan, Spill Management Plan, Engineering (Design/Control/OA/OC)	Environment	Level 1	Rare	E	1	L 25
494 Collisions (human, vehicle, infrastructure)	Human injury, equipment damage, loss of production, fire, spills	Mill Feed and Storage - SAG Mill Feed Stock Pile - Operation of Mobile Equipment at Dead Stock Pile	Traffic Management Plan, Standard Openating Procedures, Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Health and Safety Plan,	Environment	Level 1	Rare	E	1	L 25
497 Inadequate heating / loss of fuel	Human injury, ice build-up and loss of production, damage of equipment (pipes, etc.)	U/G Mining Infrastructure - Mine Heating - Heating	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Emergency Response Plan, Health and Safety Plan, Engineering, Engineering OA, Traning	Safety and Health	Level 1	Rare	E	1	L 25
498 Precipitation contact water	Ground contamination (e.g., PAG), surface/ground water contamination	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, Surface Water Management Plan	Safety and Health	Level 1	Rare	E	1	L 25
499 Contact water	Ground contamination (e.g., PAG), surface/ground water contamination	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Safety and Health	Level 1	Rare	E	1	L 25
500 Nuisance animals (rats, mice)	Loss of production, loss of safety infrastructure, property damage, human injury	Utilities - Power & Electrical - Power Distribution - Power Operation	Surface Water Management Plan Design, Wildlife Management Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training, PPE	Safety and Health	Level 1	Rare	E	1	L 25
501 Nuisance animals (rats, mice)	Loss of production, loss of safety infrastructure, property damage, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power Operation	Pro- gnue Meiseith and Satety Plan. Wildlik Menagement Plan. Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PFF	Safety and Health	Level 1	Rare	E	1	L 25
505 Mechanical failure / electrical failure	Spills, loss of "power" to pneumatic equipment (loss of production); human injury (equipment or line failure), equipment damage, spills, uncontrolled process	Utilities - Other - Plant and Instrument air - Compressed Air	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Salety Plan, Maintenance Procedures, Emergency Response Plan,	Reputation	Level 1	Rare	E	1	L 25
506 Breakage of pipe / delivery system	Loss of "power" to pneumatic equipment (loss of production); human injury (equipment or line failure), equipment damage, equipment damage, spills, uncontrolled process	Compressed Air	Design Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures, Emergency Response Plan,	Reputation	Level 1	Rare	E	1	L 25
507 Structural failure / damage / fire	Damage to property, human Injury, mine shut-down, damage to reputation, fire	Ancillary Facilities - Mill and Mine Dry, First Aid - Structure	Design Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures, Emergency Response Plan,	Environment	Level 1	Rare	E	1	L 25
510 Loss of power / power failure	Spills, releases from uncontrolled process (air and liquid), property damage, human injury	General Development - Fencing/Gates (Site Control) -Back-up Power (UPS)	Design Engineering (CC-TV, Fence and Gates), Health and Safety Plan, Standard Openating Procedures; Best Management Practices, Maintenance Procedures, Training	Environment	Level 1	Rare	E	1	L 25
511 Alarm failure	Human injury, damage to property, air quality, threat to surrounding areas and properties	General Development - Site Evacuation Alarm Systems - Evacuation Systems operation	Training Emergency Response Plan (Provincial Fire Protection), Emergency Shutdown Procedures, Engineering (Radio System and Phones), Health and Safety Plan, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Training	Environment	Level 1	Rare	E	1	L 25

Item No.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category	Sever Nam		bd h	ikeli-	Severity	Risk Matrix Priority Number
512 Sk	ow reaction to evacuation	Human injury, damage to property, air quality, threat to surrounding areas and properties	General Development - Site Evacuation Alarm Systems -Fire Systems operation	Emergency Response Plan (Provincial Fire Protection), Emergency Shutdown Procedures, Engineering (Radio system and Phones), Health and Safey Plan. Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Environment	Level	1 Ra	re	E	1	L 25
513 Bi	ockage / inadequate design	Unplanned blockage, snow build-up, ice build-up, animal ingress	Mining Underground - Ventilation Shafts -Design of Shaft	Training Engineering. Engineering OA, Emergency Response Plan, Standard Operating Procedures; Best Management Practices, Training, Maintense Procedures, Widthef Management Plan	Safety and Health	Level	1 Ra	re	E	1	L 25
514 Pc	cor location	Noise, air quality (outtake), public complaints from visibility, air quality (intake)	Mining Underground - Ventilation Shafts - Design of Shaft	Virtues watergement France Engineering, Engineering OA, Emergency Response Plan, Standard Operating Procedures, Best Management Practices, Training, Maintenance Procedures	Safety and Health	Level	1 Ra	re	E	1	L 25
519 Bk	ockage / inadequate design	Unplanned blockage, snow build-up, ice build-up, animal ingress	U/G Mining Infrastructure - Portal Infrastructure Design of Portal	Maintenance Procedures Design, Standard Operating Procedures; Best Management Practices, Engineering OA. Emergency Response Plan, Maintenance Procedures, Widliffe Management Plan	Safety and Health	Level	1 Ra	re	E	1	L 25
	adequate condition of safety equipment	Failure of safety equipment, human injury	U/G Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Maintenance of Safety Equipment	Standard Operating Procedures; Best Management Practices, Health and Safety Plan, PPE	Reputation	Level	1 Ra	re	E	1	L 25
	xpiry of equipment (wear or shelf life) adequate safety equipment training	Unfit equipment, use of damaged equipment, improper waste management Human injury, cost, reputation	U/G Mining Infrastructure - Safety Equipment, Lamps etc. and Storage - Safety Equipment U/G Mining Infrastructure - Safety Equipment,	Standard Operating Procedures; Best Management Practices, Health and Safety Plan Standard Operating Procedures; Best Management Practices,	Reputation Reputation	Level			E	1	L 25 L 25
	elease of soil and sediments		Lamps etc. and Storage - Safety Equipment	Health and Safety Plan Mine Plan, Hydro Seeding, Standard Operating Procedures; Best Management Practices, Training,	Reputation	Level		re	E	1	L 25
524 Ina	adequate safety equipment training	Human injury, cost, reputation	OP Mining Infrastructure - Safety Equipment, Lamps etc. and Storage -Safety Equipment	Design Engineering (Water Collection Systems) Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Training, PFE	Reputation	Level	1 Ra	re	E	1	L 25
525 No	oise	Proximate effects on worker health, noise "pollution" of surrounding area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from ROM to Primary Crusher	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Safety and Health	Level	1 Ra	re	E	1	L 25
526 No	oise	Proximate effects on worker health, noise "pollution" of surrounding area	Mill Feed and Storage - SAG Mill Feed Stock Pile - Transportation/Storage of Ore from Primary Crusher to Mill	Noise Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Health and Safety Plan, PPE,	Safety and Health	Level	1 Ra	re	E	1	L 25
527 No	oise	Proximate effects on worker health, noise "pollution" of surrounding area	Primary Grinding - SAG Mill Operation	Noise Management Plan Standard Operatores, Best Management Practices, Maintenearce Procedures, Maintenearce Procedures, Health and Safety Plan, PEG. Berb,	Safety and Health	Level	1 Ra	re	E	1	L 25
528 Ta	ank failure (780 m³)	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	CIL - CIL Operation	Noise Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Shut-down Procedures, Engineering (Design), Engineering (Design), PPE,	Reputation	Level	1 Ra	re	E	1	L 25
530 Ta	ank spillage / overflow	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	CIL Operation	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering (DA, PPE,	Reputation	Level	1 Ra	re	E	1	L 25
533 Sp	bill / splash of electrolyte	Human injury, environmental release	General electrowinning operation	Spill Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering OA, PPE	Reputation	Level	1 Ra	re	E	1	L 25
534 Ta	ank failure (250 m3)	Ground contamination, ground / surface water contamination, human injury, equipment damage, loss of production	Cyanide Destruction - System Operation	PPE Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering OA, Shut-down Procedures	Reputation	Level	1 Ra	re	E	1	L 25
536 Ec	quipment / instrumentation failure	Process failure (insufficient CN destruction leading to higher CN in TSF), fire (e.g., agitator motors)	Cyanide Destruction - System Operation	Snuesown Proceedures Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Engineering (Design), Engineering OA, Shul-drawn Procedures	Reputation	Level	1 Ra	re	E	1	L 25
538 Sp	pill / splash / off gas	Human injury, environmental release (e.g., of SO2)	Cyanide Destruction - System Operation	Standard Operating Procedures, Standard Operating Procedures, Best Management Practices, Maintence Procedures, Spill Management Plan, Engineering (Design), Engineering QA, Shut-down Procedures	Reputation	Level	1 Ra	re	E	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severit Name	/ Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
540 Noise	Noise release, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power operations	Design (Inbuilding), Standard Operating Procedures; Best Management Practices, Maintenance Procedures, PPF	Safety and Health	Level 1	Rare	E	1	L 25
541 Air emissions (NOx)	Increase in emissions, reduced air quality il attracted into vents, human injury	Utilities - Power & Electrical - Emergency Power - Emergency Power operations	Design (Inbuilding), Standard Operating Procedures; Best Management Practices, Noise Management Plan, Maintenance Procedures,	Safety and Health	Level 1	Rare	E	1	L 25
542 Fire / explosion	Property damage, human injury, air pollution, release of fuel to air, or environment (-45 or less)	Utilities - Fuel, Storage, & Distribution - Propane - Propane Use	PPE Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Safety Plan,	Environmen	Level 1	Rare	E	1	L 25
543 Fire / explosion	Property damage, human injury, air pollution, release of fuel to air	Utilities - Fuel, Storage, & Distribution - Natural Gas - Natural Gas Use	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Environmen	Level 1	Rare	E	1	L 25
544 Contact with property resulting in damage (mobile equipment, human)	Loss of production, human injury, damage to property, release to the air, fire, explosion	Utilities - Fuel, Storage, & Distribution - Propane - Propane Fork Lifts	Maintenance Frocedures Best Management Practices, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Environmen	Level 1	Rare	E	1	L 25
545 Loss of supply (heat)	Loss of production, human injury, damage to property	Utilities - Fuel, Storage, & Distribution - Natural Gas -Natural Gas	Names and Procedures Standard Openating Procedures, Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Safety and Health	Level 1	Rare	E	1	L 25
546 Contact with lines resulting in damage (mobi equipment, human)	le Loss of production, human injury, damage to property, release to the air, fire, explosion	Utilities - Fuel, Storage, & Distribution - Natural Gas -Natural Gas	Standard Operating Procedures; Best Management Practices, Split Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Environmen	Level 1	Rare	E	1	L 25
547 Fire / explosion / spills / tank failure / hose failure / nozzle failure	Release to environment, human injury, property damage, human injury, air pollution, fire	Utilities - Fuel, Storage, & Distribution - Diesel - Fuel transfer, Storage, Fueling of Diesel	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
548 Inadequate disposal	Regulatory non-compliance	Disposal of Waste	Standard Operating Procedures; Best Management Practices, Waste Management Pfan, Engineering (Design/Control), Health and Safety Pfan, Regulatory Permits	Environmen	Level 1	Rare	E	1	L 25
549 Contamination / change in line water conditions (mixing of process fluids and potable)	Human injury, cost, regulatory non-compliance, contamination of source water, combination of potable with process	Utilities - Water Systems - General Water	Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan, Maintenance Procedures, Use Other Drinking Water,	Safety and Health	Level 1	Rare	E	1	L 25
550 Failure of treatment plant	Human injury, loss of production, cost, regulatory non-compliance	Treatment of Water	Operation and Testing Procedures Standard Operating Procedures; Best Management Practices, Spill Management Pian, Engineering (Design/Control), Health and Safety Pian, Maintenance Procedures, Use Other Dinking Water, Operation and Testing Procedures	Safety and Health	Level 1	Rare	E	1	L 25
551 Contamination / change in line water conditions (mixing of process fluids and glan water)	Combination of gland water with process, pump damage, loss of production d	Utilities - Water Systems - Gland Water	Standard Operating Procedures Best Management Practices, Engineering (Design/Control), Health and Safety Plan	Safety and Health	Level 1	Rare	E	1	L 25
552 Improper disposal of hazardous waste	Regulatory non-compliance, release to environment, human injury, fire	Hazardous waste	Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Spill Management Plan, Design,	Environmen	Level 1	Rare	E	1	L 25
553 Inadequate location of storage	Regulatory non-compliance, release to environment, human injury, fire	Operations / Storage / Handling	Regulatory Permits Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Spill Management Plan, Design,	Environmen	Level 1	Rare	E	1	L 25
554 Contact with biological hazards / sharps	Human injury, spills, improper disposal of biohazard materials	Ancillary Facilities - Mill and Mine Dry, First Aid - First Aid	Regulatory Permits Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Satety Plan, Emergency Response Plan,	Safety and Health	Level 1	Rare	E	1	L 25
555 Improper storage	Cross contamination, human injury, fire, explosions, spills, loss of production, cost (loss of	Ancillary Facilities - Warehouse -Storage	Waste Management Plan (Hazardous Waste Management Plan) Standard Operating Procedures; Best Management Practices,	Safety and	Level 1	Rare	Е	1	L 25
556 Improper chemical handling / disposal	inventory and material damage), nuisance animals Fire: explosion, human injury, indoor air quality, regulatory non-compliance, incorrect calibration	Ancillary Facilities - Assay/Met/Environmental Lab - Chemical Use	Engineering (Design/Control) Standard Operating Procedures; Best Management Practices, Maintenance Procedures,	Health Environmen	Level 1	Rare	Е	1	L 25
557 Improper chemical handling / disposal	Fire; explosion, human injury, indoor air quality, regulatory non-compliance, incorrect calibration	Ancillary Facilities - Assay/Met/Environmental Lab - Chemical Use	Waste Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, New Mark Management Plan	Safety and Health	Level 1	Rare	Е	1	L 25
558 Inadequate training	Incorrect analysis, incorrect use of chemicals, incorrect calibration, explosion, fire, cost, production loss	Ancillary Facilities - Assay/Met/Environmental Lab - Chemical Use	Waste Management Plan Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Waste Measurement Plan	Environmen	Level 1	Rare	E	1	L 25
559 Contact with wildlife, access for public, access to equipment, threat to security	Human injury, attraction of wildlife, theft, access to equipment /explosives	General Development - Fencing/Gates (Site Control) - Installing and Operation of fencing and gate	Waste Management Plan Engineering (Fence and Sates), Health and Safety Plan, Standard Operating Procedures; Best Management Practices, Training,	Safety and Health	Level 1	Rare	E	1	L 25
560 Unauthorized access	Theft, damage to property equipment	U/G Mining Infrastructure - Underground Explosive Magazine - Supply / Storage	Wildlife Management Plan Security System, Operating Procedures	Safety and Health	Level 1	Rare	Е	1	L 25

Item RISK No.	Description/Consequence	Area of Impact	Controls	Impact Category	Severity Name	Likeli- hood Name	Likeli- hood	Severity	Risk Matrix Priority Number
561 Unauthorized access	Theft, damage to property equipment	OP Mining Infrastructure - Explosive Magazine - Supply / Storage	Explosives Management Plan, Security System,	Safety and Health	Level 1	Rare	E	1	L 25
562 Spill	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Fuel, Storage, & Distribution - Diesel - Fuel transfer, Storage, Fueling of Diesel	Standard Operating Procedures; Best Management Practices Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control), Health and Safety Plan,	Reputation	Level 1	Rare	E	1	L 25
563 Spill	Release to environment, human injury, property damage, human injury, air pollution	Restocking, Storage, Fueling of Gasoline	Maintenance Procedures Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Reputation	Level 1	Rare	E	1	L 25
564 Fire	Release to environment, human injury, property damage, human injury, air pollution	Restocking, Storage, Use of Oil and Greases	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Reputation	Level 1	Rare	E	1	L 25
565 Fire	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Fuel, Storage, & Distribution - Waste Oil Disposal - Temporary Storage of waste	Health and Safety Plan Standard Operating Procedures; Best Management Practices, Spill Management Plan, Engineering (Design/Control),	Reputation	Level 1	Rare	E	1	L 25
566 Fire	Human injury, fire, property damage, regulatory non-compliance	Storage of Waste	Health and Safety Plan Spill Management Plan, Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan	Reputation	Level 1	Rare	E	1	L 25
567 Spill	Release to environment, human injury, property damage, human injury, air pollution	Hazardous waste	Tream an Salay Fian Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Safety Plan, Spill Management Plan,	Reputation	Level 1	Rare	E	1	L 25
568 Spills, splashes	Release to environment, human injury, property damage, human injury, air pollution	Utilities - Waste Disposal - Sewage Storage - Operations / Storage / Handling	Design Standard Operating Procedures; Best Management Practices, Waste Management Plan, Health and Staffey Plan, Spill Management Plan, Design,	Reputation	Level 1	Rare	E	1	L 25
569 Failure / damage of equipment / insuffic warning of hazards	ient Human Injury, equipment damage, poor air quality, ground collapse	U/G Mining Equipment - Anciliary equipment (survey etc.) - Monitoring equipment (Ground control, Air Quality and Seismic)	Regulatory Permits Standard Operating Procedures; Best Management Practices, Emergency Response, Training, Engineering (Ground Monitors), Engineering QA, PPE	Environment	Level 1	Rare	E	1	L 25
570 Inadequate ventilation	Unable to monitor air flow, human injury	U/G Mining Infrastructure - Controls, Instrumentation and Communication -Ventilation Control	Maintenance Procedures, Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Training, Engineering OA, PPE	Safety and Health	Level 1	Rare	E	1	L 25
571 Inadequate design	Air quality, noise, human injury	U/G Mining Infrastructure - Primary Ventilation Fans (Main Fans) - Design of System	Standard Operating Procedures; Best Management Practices, Engineering, Engineering QA, Training,	Safety and Health	Level 1	Rare	E	1	L 25
572 Loss of control / power failure of equipn	ent Unable to monitor air flow, human injury, mine shut-down	U/G Mining Infrastructure - Primary Ventilation Fans (Main Fans) -Ventilation Control	PPE Standard Operating Procedures; Best Management Practices, Engineering QA, Engineering QA, Training, PF	Safety and Health	Level 1	Rare	E	1	L 25
573 Inadequate design	Air quality, noise, human injury, inadequate training	U/G Mining Infrastructure - Secondary Ventilation Fans (Development Fans) -Design of System	Standard Operating Procedures; Best Management Practices, Engineering GA, Training, PPF	Safety and Health	Level 1	Rare	E	1	L 25
574 Loss of control / power failure of equipment failure	nent / Unable to monitor air flow, human injury, mine shut-down, inadequate training	U/G Mining Infrastructure - Secondary Ventilation Fans (Development Fans) - Ventilation Control	Standard Operating Procedures; Best Management Practices, Engineering Engineering QA, Training	Safety and Health	Level 1	Rare	E	1	L 25
575 Release of soil and sediments	Release of deleterious substances, collapse of pile (make sure that the grade of the pile is ok potential acid generation	, Mining - Infrastructure Development (Capital) - Storage of Overburden (Overburden)	Mine Plan, Standard Operating Procedures; Best Management Practices, Training,	Reputation	Level 1	Rare	E	1	L 25
576 Failure / damage of equipment / insuffic warning of hazards	ient Human injury, equipment damage, poor air quality, ground collapse	OP Mining Equipment - Ancillary equipment (survey etc.) - Failure of seismic Senor	Design Engineering (Water Collection Systems) Emergency Response Plan, Engineering (Ground Control Equipment)	Environment	Level 1	Rare	E	1	L 25
577 Spillage of tailings	Human injury, ground contamination, groundwater contamination	Paste Plant and Distribution - Plant Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Separation, Spill Management Plan, Engineering (Design), Engineering (Design), Engineering OA,	Safety and Health	Level 1	Rare	E	1	L 25
578 Collision with bins / silos	Human injury. ground contamination, groundwater contamination, equipment damage	Paste Plant and Distribution - Plant Operation	Standard Operating Procedures; Best Management Practices, Maintenance Procedures, Spill Management Plan, Engineering (Design), Engineering Octower, Shut-down Procedures, Traffic Management Plan	Safety and Health	Level 1	Rare	E	1	L 25
579 Improper ventilation	Fire; explosion, human injury, indoor air quality, regulatory non-compliance	Ancillary Facilities - Assay/Met/Environmental Lab Chemical / Laboratory Equipment Use	Standard Operating Procedures; Best Management Practices, Training, Engineering (Design)	Safety and Health	Level 1	Rare	E	1	L 25

em Io.	RISK	Description/Consequence	Area of Impact	Controls	Impact Category		Likeli- hood Name		Severity	Risk Matrix Priority Number
580	Disruption of electrical protection system	Electrocution (human injury)	Electronwinning/Gold Room - General electrowinning operation	Standard Operating Procedures; Best Management Practices, Mantenance Procedures, Engineering Obesign, Engineering QA, PPE	Reputation	Level 1	Rare	E	1	L 25
584 :	Structural failure / damage / fire	Damage to property, human lnjury, mine shut-down, damage to reputation, fire	Ancillary Facilities - Warehouse - Structure	Standard Operating Procedures; Best Management Practices, Engineering (Design/Control), Health and Satety Plan, Emergency Response Plan, Maintenance Procedures	Reputation	Level 1	Rare	E	1	L 25
		Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	OP Mining Equipment - Mobile Equipment - Transportation - Heavy equipment (resources to Mine pad)	Standard Operating Procedures; Best Management Practices, Training, Emergency Response Plan, Traffic Management Plan, Spill Management Plan	Reputation	Level 1	Rare	E	1	L 25
		Flying debris, air emissions, dust, noise, accidents, collisions, fire equipment, spills, human injury, and waste management	OP Mining Equipment - Mobile Equipment - Transportation - Movement of Staff and Maintenance vehicles	Standard Operating Procedures; Best Management Practices, Training, Emergency Response Plan, Traffic Management Plan, Spill Management Plan	Reputation	Level 1	Rare	E	1	L 25