

Colour	Significance Points	Explanation
	≤ 30	LOW environmental significance
	31 - 60	MODERATE environmental significance
	> 60	HIGH environmental significance

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	DESCRIPTION OF ENVIRONMENTAL RISK (Direct and indirect impact)	PHASE	Duration	Extent	Magnitude	Probability	SIGNIFICANC E (Pre-Mitigation)	MITIGATION CONSIDERATION S	Duration	Extent	Magnitude	Probability	SIGNIFICANCE (Post-Mitigation)	STANDARD TO BE ACHIEVED		TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
										Mitigation Type						Objective	Target		
Infrastructure development																			
1. Access and hauling along roads i.e. during the construction of roads	Dust generation	Air Quality	Direct Impact: Road construction involves the removal of rock and earth by grading or digging during construction. Vegetation is removed, grading and paving takes place using a range of road construction equipment. This often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5 from the dirt roads.	Construction & Operational	1	2	6	5	45	Control	1	1	4	3	18	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m³ /day averaged over 30 days in residential areas and 1200 mg/m³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	2	1	6	5	45		1	1	4	3	18				
		Topography and Visual Environment		Construction & Operational	1	1	6	5	40		1	1	4	3	18				
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Throughout the construction phase construction equipment are used. This poses a risk of hydrocarbon spills if equipment are not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	1	1	6	4	32	Control	1	1	6	3	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	1	2	6	3	27		1	2	6	2	18				
		Soil quality		Construction & Operational	2	1	6	4	36		1	1	6	3	24				
	Degradation of soil resources	Soil quality	Direct Impact: As part of the construction activity related to roads, valuable topsoil's will be removed. Improper management of topsoil or fertile soil may cause the loss of flora micro-ecosystems and cause the degradation of soil quality.	Construction & Operational	1	1	6	5	40	Remedy	1	1	6	3	24	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	1	1	6	3	24		1	1	6	3	24				
	Erosion	Loss of fertile soil	Indirect Impact: Improper management of storm water may lead to erosion along the access routes. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Construction & Operational	2	1	6	5	45	Control	1	1	6	3	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Construction & Operational	1	2	8	3	33		1	1	6	3	24				
	Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing the area to construct the access roads leads to the loss of vegetation and habitats of macro and micro organisms. Loss of vegetation, increase in runoff and erosion, possible distribution and increased establishment of alien invasive species, possible disturbance and reduction of habitat, injury or death to terrestrial fauna, possible change of natural runoff and drainage patterns causing accelerated erosion, possible loss of protected species, possible permanent loss of re-vegetation potential of soil surface, increase in dust levels, interference with fauna behavioural activities, possible exposure of fauna and flora to contaminants – especially hydrocarbons and increased dust levels	Construction & Operational	4	2	4	5	50	Remedy	4	1	2	4	28	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
		Fauna and Flora		Construction & Operational	3	2	8	5	65		2	1	6	4	36				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Constructing access roads through drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	2	1	6	5	45	Control	2	1	6	3	27	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water		Construction & Operational	2	2	8	5	60		2	1	6	4	36				

Noise generation	Surrounding noise quality	Direct Impact: Increased noise levels at potentially sensitive receptors exceeding criteria of the Noise Control Regulations legislation (NCR) and SANS guidelines; Changing ambient sound levels could change the acceptable land use capability; Changing ambient sound levels could increase annoyance and potential complaints; and Disturbing character of sound.	Construction & Operational	1	1	6	4	32	Control	1	1	4	3	18	Control potential noise pollution stemming from the construction of the project	(1) Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). (2) Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). (3) Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; (4) Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; (5) Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
Alteration of drainage patterns	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: The construction of access roads through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	2	2	6	5	50	Remedy	1	1	4	3	18	Remedy the possible affects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
	Surface Water quality		Construction & Operational	2	2	6	5	50		1	1	6	3	24				
Destruction of upstream tributaries and reduction in water in the catchment	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the upstream drainage lines may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: The destruction of tributaries may lead to a limited volume of water available to the downstream users. The reduction in water in the catchment may cause the degradation of surface water quality.	Construction & Operational	3	2	6	3	33	Remedy	1	1	6	3	24	Remedy the possible affects of destruction of upstream tributaries and reduction in the water catchment. Adherence with water quality requirements set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
	Downstream water users		Construction & Operational	3	2	6	4	44		1	1	6	3	24				
	Surface Water quality		Construction & Operational	2	2	6	4	40		1	1	6	3	24				
Water usage for dust suppression	Wastage of water resource	Direct Impact: Improper management of the water used during dust suppression may lead to the wastage of the available water resource.	Construction & Operational	1	2	4	5	35	Control	1	1	4	3	18	Storm water run-off from dirty areas is as far as possible recycled for reuse.	(1) Abstraction from natural watercourses is kept to a minimum and does not exceed the DWAS Water Use Licence provisions by more than 5% on an annual basis.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan including the monitoring and prevention programme. (2) Develop and implement a water usage record keeping procedure.
Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: Site clearing for roads, lay down areas, and mining area exposes the un-vegetated area to the influx of alien invasive vegetation causing Irreversible damage to the native fauna and flora species and loss of habitats.	Construction	3	2	6	5	55	Control	2	1	4	4	28	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.
CO ₂ emissions	Air Quality	Direct Impact: Contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	1	3	6	5	50	Control	1	1	2	3	12	The levels of greenhouse gas and CO ₂ emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
Fugitive dust generation	Air Quality	Direct Impact: Vegetation is removed, grading and paving to prepare the lay down areas takes place using a range of construction equipment. This often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5. The generation of dust during these activities will affect the visual environment negatively.	Construction	1	2	6	5	45	Control	1	1	6	4	32	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA). (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
	Visual Environment		Construction	3	2	6	5	55		1	1	6	4	32				

2. Site clearing and topsoil stripping for lay down area of approximately ? ha and all related mining infrastructure

Alteration of the visual environment and topography	Topography and Visual Environment	Direct Impact: Vegetation stripping during site clearing and topsoil removal activities will alter the visual environment and topography.	Construction	3	2	6	5	55	Remedy	1	2	6	4	36	Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	(1) No areas left un-vegetated. (2) No signs of alien or invasive species on site (3) Control of visual affects. (4)	Rehabilitation and Decommissioning	(1) Mine plan in accordance with the MPRDA Regulation 56 section (1) to (8). (2) Adherence to the finalised approved lay out plan. (3) Development and implementation of the phased mine rehabilitation management plan.
Degradation of soil resources	Soil quality	Direct Impact: If not managed properly, fertile soil will be lost during site clearance and topsoil stripping. Loss of fertile soil will cause the degradation of habitat for flora micro- and macro organisms.	Construction & Operational	2	1	6	5	45	Remedy	1	1	6	3	24	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3) (2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
	Flora micro-ecosystems		Construction & Operational	2	1	6	5	45		1	1	6	3	24				
Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing of site and stripping of topsoil leads to the loss of vegetation and habitats of macro and micro organisms. Loss of vegetation, increase in runoff and erosion, possible distribution and increased establishment of alien invasive species, possible disturbance and reduction of habitat, injury or death to terrestrial fauna, possible change of natural runoff and drainage patterns causing accelerated erosion, possible loss of protected species, possible permanent loss of re-vegetation potential of soil surface, increase in dust levels, interference with fauna behavioural activities, possible exposure of fauna and flora to contaminants – especially hydrocarbons and increased dust levels	Construction & Operational	3	1	10	5	70	Remedy	2	1	6	4	36	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3) (2) Apply for permits to remove protected species (provincial and national).	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
	Fauna and Flora		Construction & Operational	3	1	10	5	70		2	1	6	4	36				
Destruction of Wetlands	Wetlands and Aquatic Ecology	Direct Impact: Site clearing and topsoil stripping in Wetlands will cause the loss of micro and macro aquatic species.	Construction & Operational	3	2	8	5	65	Avoid	2	1	6	4	36	Avoid the destruction of wetlands.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2)Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include the conservation measures to be implemented in wetland areas. (2) Ensure compliance with the issued WUL requirements.
Hydrocarbon Contamination	Surface Water quality	Direct Impact: Throughout the construction phase construction equipment are used. This poses a risk of hydrocarbon spills if equipment is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	3	1	6	5	50	Control	1	1	6	4	32	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
	Groundwater quality		Construction & Operational	2	1	6	4	36		1	1	6	3	24				
	Wetlands and Aquatic Ecology		Construction & Operational	2	1	6	5	45		1	1	6	4	32				
Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Constructing access roads and lay down areas through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	3	1	6	5	50	Control	1	1	6	4	32	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2)Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
	Surface Water quality		Construction & Operational	3	2	6	5	55		1	1	6	4	32				
Water level reduction and contamination	Groundwater quality	Direct Impact: The reduction in water levels as well as contamination of the water resource that may be caused by alternating the topography during site clearing and topsoil stripping poses a risk to affecting the surface and sub-surface water quality as well as the downstream users.	Construction & Operational	2	1	6	5	45	Control	1	1	6	3	24	Control the potential water level reduction and contamination related to authorised activities.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2)Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages. (5) No signs of blockages to the natural flow of the associated river catchment.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include measures to be implemented to reduce the impact on surface and groundwater reduction. (2) Ensure compliance with the issued WUL requirements. (3) Develop and implement a storm water management plan and specifically address the diversion of "clean" water into the natural drainage lines.
	Downstream water users		Construction & Operational	2	2	6	5	50		1	1	6	3	24				
	Surface Water quality		Construction & Operational	2	1	6	5	45		1	1	6	3	24				
Noise generation	Surrounding noise quality	Direct Impact: The use of construction equipment during site clearing and topsoil stripping may cause noise during the construction phase. If equipment are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Construction & Operational	3	1	6	5	50	Control	1	1	4	3	18	Control potential noise pollution stemming from the construction of the project	* Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). * Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). * Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; * Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; * Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.

	Domestic water usage	Wastage of water resource	Direct Impact: The lack of water management and maintenance of taps, toilets, basins etc. poses a risk to wastage of water.	Operational	4	1	2	5	35	Avoid	4	1	2	3	21	Avoid wastage of water resources. Maintain all infrastructure associated to the management of domestic water.	(1) Abstraction from natural watercourses is kept to a minimum and does not exceed the DWAS Water Use Licence provisions by more than 5% on an annual basis. (2) No visible signs of leaks or damage to water storage infrastructures.	Entire Life cycle of project	(1) Develop and implement a water usage record keeping procedure. (2) Develop and implement a infrastructure maintenance programme to include frequent inspections of water pipes and taps.
5. Mining offices (construction and operation) i.e. operation of training centres, offices and kitchen facilities	Fugitive dust generation	Air Quality	Direct Impact: During the construction of infrastructures areas are to be cleared of vegetation. This often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5.	Construction	1	1	6	5	40	Control	1	1	6	3	24	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
	Topography and visual alteration	Topography and Visual Environment	Direct Impact: Construction of mining facilities will alter the topography and visual environment.	Construction	4	1	6	5	55	Remedy	2	1	4	3	21	Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	(1) No areas left un-vegetated. (2) No signs of alien or invasive species on site (3) Control of visual affects. (4)	Rehabilitation and Decommissioning	(1) Mine plan in accordance with the MPRDA Regulation 56 section (1) to (8). (2) Adherence to the finalised approved lay out plan. (3) Development and implementation of the phased mine rehabilitation management plan.
	Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: If areas remain un-vegetated, this poses the risk of alien and invasive species instating and spreading to the surrounded areas.	Construction & Operational	4	2	6	5	60	Control	2	1	4	3	21	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.
	Noise generation	Surrounding noise quality	Direct Impact: The use of construction equipment may cause noise during the construction phase. If equipment is not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Construction & Operational	1	1	4	5	30	Control	1	1	4	3	18	Control potential noise pollution stemming from the construction of the project	<ul style="list-style-type: none"> • Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered. 	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
	General waste generation & Littering	Visual Environment	Direct Impact: Littering throughout the construction and operational phase poses the risk of the visual environment to be affected negatively. The storing of waste onsite for an extended time may cause the formation of leachate that will affect the soil and water quality of the surrounding environment in a negative way. Indirect Impact: Exposure of leachate to the natural environment poses a health risk to the surrounding fauna and flora habitats as well as human health.	Construction & Operational	3	2	6	5	55	Control	4	1	4	4	36	Promoting the reduction, re-use, or recycle of waste where prevention is not possible. Disposal of waste to local waste disposal sites is limited.	(1) No littering (2) No unpleasant odours (3) Marked and sealable bins observed Evidence of waste disposal certificates (4)	Entire Life cycle of project	(1) Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.
		Soils quality due to leachates		Construction & Operational	3	1	6	5	50		4	1	2	4	28				
		Surface Water quality due to leachates		Construction & Operational	4	1	6	3	33		4	1	2	2	14				
	Electricity usage	CO ₂ emissions	Direct Impact: Contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Operational	3	1	4	5	40	Control	4	1	2	3	21	Control and monitor the carbon footprint of the Spitsvlei project.	(1) Annual reduction of the Carbon footprint.	Entire Life cycle of project	(1) Develop and implement a electricity usage monitoring programme. (2) Develop and implement a carbon footprint reporting policy.

	Domestic water usage	Wastage of water resource	Direct Impact: The lack of water management and maintenance of taps, toilets, basins etc. poses a risk to wastage of water.	Operational	4	1	4	5	45	Avoid	4	1	2	3	21	Avoid wastage of water resources. Maintain all infrastructure associated to the management of domestic water.	(1) Abstraction from natural watercourses is kept to a minimum and does not exceed the DWAS Water Use Licence provisions by more than 5% on an annual basis. (2) No visible signs of leaks or damage to water storage infrastructures.	Entire Life cycle of project	(1) Develop and implement a water usage record keeping procedure. (2) Develop and implement a infrastructure maintenance programme to include frequent inspections of water pipes and taps.
6. Storm water runoff management features	Erosion	Loss of fertile soil	Direct Impact: Improper management of storm water runoff poses a high risk to erosion. Un-vegetated or degraded areas exposed to weathering for an extended period of time are a contributing factor. Erosion prone areas has a high risk of loosing fertile soil caused by flash floods. The loss of fertile soil will result in the loss of important micro ecosystems.	Construction & Operational	4	2	6	5	60	Control	4	2	4	3	30	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Construction & Operational	4	2	6	5	60		4	2	4	3	30				
	Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing of site and stripping of topsoil during the construction of storm water runoff management features poses a risk to the loss of vegetation and habitats of macro and micro organisms. Loss of vegetation, increase in runoff and erosion, possible distribution and increased establishment of alien invasive species, possible disturbance and reduction of habitat, injury or death to terrestrial fauna, possible change of natural runoff and drainage patterns causing accelerated erosion, possible loss of protected species, possible permanent loss of re-vegetation potential of soil surface, increase in dust levels, interference with fauna behavioural activities, possible exposure of fauna and flora to contaminants – especially hydrocarbons and increased dust levels. Indirect Impact: If areas surrounding the storm water features are not rehabilitated properly or features installed are not constructed according to the storm water management model, these areas are prone to erosion.	Construction & Operational	4	2	6	5	60	Remedy	2	1	4	3	21	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
		Fauna and Flora		Construction & Operational	4	2	6	5	60		2	1	4	3	21				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Improper or ineffective storm water runoff management features poses a risk of contributing to the sedimentation and siltation of watercourses.	Construction & Operational	4	2	8	5	70	Control	4	2	6	3	36	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Storm water from dirty areas such as the mining area, lay down areas, workshops, stores, wash bays etc. poses a risk to hydrocarbon containing effluent to contaminate water resources. Depending on the level of contamination the risk may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	2	8	5	70	Control	2	1	6	2	18	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	2	8	4	56		2	1	4	2	14				
		Wetlands and Aquatic Ecology		Construction & Operational	4	2	8	5	70		2	1	6	2	18				
	Alteration of drainage patterns	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: Site clearing and topsoil stripping through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	4	2	8	5	70	Remedy	4	1	6	3	33	Remedy the possible affects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
		Surface Water quality		Construction & Operational	4	2	6	5	60		4	1	6	3	33				
7. Water storage facilities	Improper water storage management	Wastage of water resource	Direct Impact: Improper management of water storage facilities i.e. Not inspecting or regularly maintaining the storage tanks pose a risk of leaks and contamination.	Operational	4	1	6	4	44	Avoid	4	1	2	3	21	Avoid the wastage of water resources. Full compliance to the water abstraction limits provided by DWAS. Ensure maintenance of infrastructure related to water usage and storage.	(1) Abstraction from natural watercourses is kept to a minimum and does not exceed the DWAS Water Use Licence provisions by more than 5% on an annual basis. (2) No visible signs of leaks or damage to water storage infrastructures.	Entire Life cycle of project	(1) Develop and implement a water management plan specifically addressing the storage of water as well as the frequent inspections of storage facilities.
		Water contamination		Operational	4	1	8	4	52		1	1	6	2	16				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: In the event that PCD's are not constructed in a way to avoid seepage to the surrounding environment or if not maintained, it poses a risk of contaminating water resources within close proximity to the facility.	Operational	5	2	8	4	60	Avoid	1	1	6	2	16	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Ensure compliance with the WUL conditions. (4) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Operational	5	2	8	5	75		1	1	6	2	16				

8. Pollution Control Dams (PCD's) I.e. Construction and operation		Groundwater quality		Operational	5	2	8	5	75		1	1	6	2	16				
	Fugitive dust generation	Air Quality	Direct Impact: During the construction of infrastructures areas are to be cleared of vegetation. This often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5.	Construction	1	1	4	5	30	Control	1	1	2	3	12	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
	Hydrocarbon Contamination i.e. Usage of diesel operating pumps	Surface Water quality	Direct Impact: The lack of inspections or regular maintenance of facilities such as water pumps poses a risk to contaminating the surface and sub-surface water resource.	Construction & Operational	4	1	6	5	55	Control	4	1	2	3	21	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	1	6	3	33		4	1	6	1	11				
	Smell nuisance	Human health and safety environment	Direct Impact: Lack of maintenance and treatment may result in a smelling environment. May lead to a potential nuisance to local communities and land users in close proximity to the authorised site.	Construction & Operational	4	1	6	5	55	Avoid	1	2	6	3	27	Avoid the generation of unpleasant odours on site at all times.	(1) All toilets are serviced. (2) PCD's containing putrescible waste to be monitored and kept free of odour. (3) All putrescible waste removed and disposed off in a suitable manner.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management plan specifically addressing the management of sewage or chemical toilets. (2) Develop and implement a Infrastructure inspection programme to ensure no leaks or spillages of sewerage or waste. (3) Develop and implement a Waste Management plan.
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Throughout the construction & operation phase equipment and plant are used. This poses a risk of hydrocarbon spills if equipment/plant is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality. The improper management of oil separators/sumps may also lead to the contamination of the surrounding environment.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	2	22				
		Soil quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
	Degradation of soil resources	Soil quality	Direct Impact: The continuous spills of hydrocarbons and hazardous substances pose a environmental risk to the surrounding soil quality. The degradation of the soil quality will cause the loss of habitat or healthy environment for micro ecosystems.	Construction & Operational	4	1	6	5	55	Remedy	4	1	6	3	33	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Fauna & Flora micro-ecosystems		Construction & Operational	4	1	8	5	65		4	1	6	3	33				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Improper management of effluent from store, workshops, and wash bays poses a high risk to contaminating water resources. Indirect Impact: Over an extended period of time the exposure to contamination will cause the degradation of fauna and flora habitats as well as affect the surface and sub-surface water quality.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	2	22				

9.Stores, workshops &wash bays	CO ₂ emissions & Release of noxious gasses	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint. The storage of diesel poses a risk of releasing noxious gasses.	Construction & Operational	4	1	4	5	45	Control	4	1	4	3	27	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.	
	Chemical Fires	Human health and safety environment	Direct Impact: The improper storage of hazardous substances poses a risk of chemical fires. In the event of a chemical fire the impact to the surrounding environment is significant. Fires may lead to the loss of ecosystems, damage to properties and fatalities.	Construction & Operational	1	2	10	4	52	Avoid	1	1	10	2	24	Avoid and prevent chemical fires. Hazardous spills are prevented and no incidents to human health occurs.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) Immediate removal and remediation of all spills. (3) All staff trained. (4) All hazardous substances are documented. (5) No incidents recorded involving chemical fires.	Entire Life cycle of project	(1) Develop and implement a fire prevention plan that includes measures of prevention and response to chemical fires. (2) Develop a emergency preparedness procedure and include the process to be followed in case of a chemical fire. (3) Develop a Hazardous substances management plan. (4) Develop a frequent inspection programme to include inspections of hazardous substances storage facilities.	
		Loss of ecosystems		Construction & Operational	2	1	10	5	65		1	1	8	3	30					
		Damage to property		Construction & Operational	2	2	10	4	56		1	2	8	3	33					
	Noise generation	Surrounding noise quality	Direct Impact: The use of equipment may cause noise during the operation of workshops. If equipment is not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Construction & Operational	1	1	4	5	30	Control	1	1	4	3	18	Control potential noise pollution stemming from the construction of the project	• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.	
10. Ablutions & change house with sewage treatment plant	Degradation of soil resources	Soil quality	Direct Impact: Continuous leaking or lack of maintenance poses a risk to contaminating the surrounding soils and degrading the soil quality. This will affect the micro-ecosystems in a negative manner.	Construction & Operational	4	1	6	5	55	Remedy	4	1	6	3	33	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	(2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	4	1	6	5	55		4	1	6	3	33					
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Improper management of effluent from ablution facilities, change houses, and sewage treatment plant poses a high risk to contaminating water resources. Indirect Impact: Over an extended period of time the exposure to contamination will cause the degradation of fauna and flora habitats as well as affect the surface and sub-surface water quality.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.	
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33					
		Groundwater quality		Construction & Operational	4	2	8	4	56		4	1	6	2	22					

	Smell nuisance	Human health and safety environment	Direct Impact: Lack of maintenance and treatment may result in a smelling environment.	Construction & Operational	4	2	6	5	60	Avoid	1	1	4	4	24	Avoid the generation of unpleasant odours on site at all times.	(1) All toilets are serviced. (2) PCD's containing putrescible waste to be monitored and kept free of odour. (3) All putrescible waste removed and disposed off in a suitable manner.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management plan specifically addressing the management of sewage or chemical toilets. (2) Develop and implement a Infrastructure inspection programme to ensure no leaks or spillages of sewerage or waste. (3) Develop and implement a Waste Management plan.
11. Fuel operating power generators	Hydrocarbon Contamination	Surface Water quality	Direct Impact: The construction of improper generator facilities poses a risk of the surrounding environment to be exposes to continuous leaking of hydrocarbons leading possibly contaminating surface and sub-surface water sources as well as the soils surrounding the facility.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	2	22				
		Soil quality		Construction & Operational	4	1	6	5	55		4	1	6	3	33				
	Degradation of soil resources	Soil quality	Direct Impact: Continuous exposure to hydrocarbon leaks poses a risk to the degradation of the surrounding soil resources.	Construction & Operational	4	1	6	5	55	Remedy	4	1	6	3	33	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	4	1	8	5	65		4	1	6	3	33				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: The construction of improper generator facilities poses a risk of the surrounding environment to be exposes to continuous leaking of hydrocarbons leading possibly contaminating surface and sub-surface water sources as well as the soils surrounding the facility.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
		Groundwater quality		Construction & Operational	4	2	8	4	56		4	1	6	2	22				
	² CO ₂ emissions & Release of noxious gasses	Air Quality	Direct Impact: The use of diesel operated power generators will cause a contributing factor the BCR Minerals (Pt) Ltd carbon footprint. The storage of diesel poses a risk of releasing noxious gasses.	Construction & Operational	4	1	4	5	45	Control	4	1	4	3	27	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
	Chemical Fires	Human health and safety environment	Direct Impact: The improper storage of hazardous substances poses a risk of chemical fires. In the event of a chemical fire the impact to the surrounding environment is significant. Fires may lead to the loss of ecosystems, damage to properties and fatalities.	Construction & Operational	1	2	10	5	65	Avoid	1	1	10	2	24	Avoid and prevent chemical fires. Hazardous spills are prevented and no incidents to human health occurs.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) Immediate removal and remediation of all spills. (3) All staff trained. (4) All hazardous substances are documented. (5) No incidents recorded involving chemical fires.	Entire Life cycle of project	(1) Develop and implement a fire prevention plan that includes measures of prevention and response to chemical fires. (2) Develop a emergency preparedness procedure and include the process to be followed in case of a chemical fire. (3) Develop a Hazardous substances management plan. (4) Develop a frequent inspection programme to include inspections of hazardous substances storage facilities.
		Loss of ecosystems		Construction & Operational	1	2	10	5	65		1	1	8	2	20				
		Damage to property		Construction & Operational	2	2	10	5	70		1	1	10	2	24				

	Noise generation	Surrounding noise quality	Direct Impact: The use of generators to produce electricity may result in noise generation if equipment is not maintained.	Construction & Operational	1	1	4	5	30	Control	1	1	4	3	18	Control potential noise pollution stemming from the construction of the project	<ul style="list-style-type: none">• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime)• Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time)• Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR;• Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA;• Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
12. Lighting	Electricity usage	² CO ₂ emissions	Direct Impact: Contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	1	4	5	45	Control	4	1	2	3	21	Control and monitor the carbon footprint of the Spitsvlei project.	(1) Annual reduction of the Carbon footprint.	Entire Life cycle of project	(1) Develop and implement a electricity usage monitoring programme. (2) Develop and implement a carbon footprint reporting policy.
	Light pollution	Disruption in ecosystem especially nocturnal fauna species	Direct Impact: The use of bright and excessive lighting during the proposed night shift period poses a risk of disrupting nocturnal fauna species.	Construction & Operational	4	1	4	3	27	Control	4	1	2	1	7	Limit the possible contribution to light pollution as far as reasonably possible.	(1) No signs of usage of light during night times, if not essential for the safety of operation or humans.	Entire Life cycle of project	(1) Bi-Annual (every second year) investigation of the impact of Light pollution to nocturnal species.
13. Fuel storage	Emission of noxious fumes	Air Quality	Direct Impact: Evaporation of diesel fuel and heavy fuel from temporary tanks and possible spills during loading of fuel from tanks on site that are used for re-fuelling of heavy machinery and trucks poses a risk of releasing of noxious gasses. Indirect Impact: Over exposure of employees to the noxious gasses may lead to the development of respiratory problems and irritation to eyes.	Construction & Operational	4	1	8	5	65	Avoid	4	1	6	3	33	Avoid the release of emissions of noxious fumes from fuel storage facilities.	(1) No leaks from bulk fuel storage facilities. (2) No incidents relating to damage to lungs and eyes of employees or sub-contractors.	Entire Life cycle of project	(1) Develop and implement a Hazardous substance management plan addressing adherence to applicable SANS standards for the storage of fuel. (2) Develop and implement a infrastructure inspection schedule and programme and include the inspections of fuel storage facilities. (3) Develop and implement a Health and Safety Management plan . (4) Develop an Emergency preparedness plan addressing prevention and mitigation of incidents.
		Human Health		1	1	8	5	50	1		1	6	3	24					
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: The construction of improper storage facilities poses a risk of the surrounding environment to be exposes to continuous leaking of hydrocarbons leading possibly contaminating surface and sub-surface water sources as well as the soils surrounding the facility.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	2	22				
		Soil quality		Construction & Operational	4	2	6	5	60		4	1	6	3	33				
	Degradation of soil resources	Soil quality	Direct Impact: Continuous exposure to hydrocarbon leaks poses a risk to the degradation of the surrounding soil resources.	Construction & Operational	4	1	6	5	55	Remedy	4	1	6	3	33	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	4	1	8	5	65		4	1	6	2	22				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: The construction of improper storage facilities poses a risk of the surrounding environment to be exposes to continuous leaking of hydrocarbons leading possibly contaminating surface and sub-surface water sources as well as the soils surrounding the facility.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				

		Groundwater quality		Construction & Operational	4	2	8	4	56		4	1	6	2	22				
	Chemical Fires	Human health and safety environment		Construction & Operational	1	2	10	5	65	Avoid	1	1	10	2	24	Avoid and prevent chemical fires. Hazardous spills are prevented and no incidents to human health occurs.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) Immediate removal and remediation of all spills. (3) All staff trained. (4) All hazardous substances are documented. (5) No incidents recorded involving chemical fires.	Entire Life cycle of project	(1) Develop and implement a fire prevention plan that includes measures of prevention and response to chemical fires. (2) Develop a emergency preparedness procedure and include the process to be followed in case of a chemical fire. (3) Develop a Hazardous substances management plan. (4) Develop a frequent inspection programme to include inspections of hazardous substances storage facilities.
		Loss of ecosystems		Construction & Operational	1	2	10	5	65		1	1	8	2	20				
		Damage to property		Construction & Operational	2	2	10	5	70		1	1	10	2	24				
14. Employment of workers and procurement of construction materials.	Loss of farm labour	Socio-economic	Direct Impact: Increased demand of labour force poses a risk of the local farmers losing farm labour due to competing financial income.	Construction & Operational	4	2	4	5	50	Control	4	2	2	4	32	Promoting open public communication in terms of required labour.	(1) No complaints from local landowners regarding loss of farm labour. (2) Peaceful negotiations regarding employment opportunities.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.
	Population Influx – Pressure on Resources	Socio-economic	Direct Impact: Increased demand for labour force poses a risk of a population influx in the local district municipality. The increasing population will put pressure on the local municipality to provide services such as sewage, drinking water, waste management, electricity etc.	Construction & Operational	4	2	4	5	50	Control	4	2	2	4	32	Promoting the management of population influx associated to the mining operations in a sustainable manner.	(1) Provision of existing housing infrastructures.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.
	Population Influx – Social Pathologies	Socio-economic	Direct Impact: Increased demand for labour force poses a risk of a population influx. The increased population influx may lead to conflicting social pathologies in the surrounding local community.	Construction & Operational	4	2	4	5	50	Control	4	2	2	4	32	Control convicting social pathologies.	(1) Continuous awareness training on HIV/AIDS/STD in collaboration with local health service providers.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.
	Population Influx – Community Conflict	Socio-economic	Direct Impact: Increased demand for labour force poses a risk of a population influx. The increased population influx may lead to community conflicts in the surrounding local community.	Construction & Operational	4	3	6	5	65	Control	4	2	2	4	32	Promoting peaceful negotiations with the surrounding communities and local business owners.	(1) Peaceful negotiations regarding employment, skills development, and financial provisions for social development projects.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.
	Health and Safety of employees	Human health and safety environment	Direct Impact: Increased demand for labour and employees from different cultures may pose the risk to the lack of knowledge and skills on health and safety in the work place. Different human behaviours deals with different situations and if there is not a simplified system of managing health and safety risk, situations resulting loss or injury of human life may be a end result.	Construction & Operational	4	1	6	5	55	Control	4	1	6	3	33	Ensuring the health and safety of all personnel on site.	(1) Low incidents of injured on duty (IOD's) on site. (2) Low incidents of reported pedestrian accidents. (3) Records kept of health and safety training conducted for all staff on site. (4) Visible evidence and use of PPE. (5) Visible health and safety signs of high risk areas.	Entire Life cycle of project	(1) Develop and implement a Health and Safety Management plan.
	Job Creation and Skills Training	Socio-economic	Direct Impact: As positive, local employed labour force will form part of a skills and training development programme. The proposed mining operation will create a job opportunity for at least a total of 60 people.	Construction & Operational	4	2	0	4	24	Control	4	2	0	4	24	Promote job creation and skills development of local employment.	(1) Peaceful negotiations regarding employment, skills development, and financial provisions for social development projects.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.
	Job Creation (Multiplier effect) and Population Influx	Socio-economic	Indirect Impact: Social projects forming part of the proposed mining project will create additional job opportunities for the local communities.	Construction & Operational	4	3	0	5	35	Control	4	2	0	4	24	Promote job creation and skills development of local employment.	(1) Peaceful negotiations regarding employment, skills development, and financial provisions for social development projects.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Throughout the construction phase construction equipment are used. This poses a risk of hydrocarbon spills if equipment are not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	1	1	8	5	50	Control	1	1	4	3	18	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	1	1	8	5	50		1	1	4	2	12				
		Soil quality		Construction & Operational	1	1	8	5	50		1	1	4	3	18				

15. Transport of construction material, mobile plant and equipment to the site	Dust generation	Air Quality	Direct Impact: Continuous use of haul road often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5 from the dirt roads. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	1	1	6	5	40	Control	1	1	6	3	24	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	1	1	8	5	50		1	1	6	3	24				
		Topography and Visual Environment		Construction & Operational	3	1	6	5	50		1	1	6	3	24				
	Erosion	Loss of fertile soil	Indirect Impact: Improper management of storm water may lead to erosion along the access routes. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Construction & Operational	2	1	6	5	45	Control	1	1	6	3	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Construction & Operational	2	1	8	5	55		1	1	6	3	24				
	CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	1	1	4	5	30	Control	1	1	2	5	20	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Constructing access roads through drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	2	2	8	5	60	Control	1	1	6	3	24	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water		Construction & Operational	2	2	8	5	60		1	1	6	3	24				

16. Use of existing drilled / new boreholes	Hydrocarbon Contamination	Surface Water quality	Direct Impact: The lack of inspections or regular maintenance of facilities such as water pumps poses a risk to contaminating the surface and sub-surface water resource.	Construction & Operational	1	2	6	5	45	Control	4	1	4	3	27	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	1	2	6	5	45		4	1	4	2	18				
		Soil quality		Construction & Operational	1	2	6	5	45		4	1	4	2	18				
	Water level reduction and contamination	Groundwater quality	Direct Impact: Improper management of boreholes i.e. Pumping rates exceeding yield thresholds poses a risk to boreholes being pumped dry. Indirect Impact: Exposed boreholes may result in both sub-surface and surface water quality to be affected. Over exposing for an extended time may lead to water shortages and poses a negative effect to the downstream users.	Construction & Operational	4	2	6	5	60	Control	4	1	4	3	27	Control the potential water level reduction and contamination related to authorised activities.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages. (5) No signs of blockages to the natural flow of the associated river catchment.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include measures to be implemented to reduce the impact on surface and groundwater reduction. (2) Ensure compliance with the issued WUL requirements. (3) Develop and implement a storm water management plan and specifically address the diversion of "clean" water into the natural drainage lines.
		Downstream water users		Construction & Operational	4	2	6	5	60		4	2	2	3	24				
		Surface Water quality		Construction & Operational	4	2	6	5	60		4	1	4	3	27				

Mining Operations																				
17. Employment of workers	Loss of farm labour	Socio-economic	Direct Impact: Increased demand of labour force poses a risk of the local farmers losing farm labour due to competing financial income.	Construction & Operational	4	3	4	5	55	Control	4	2	0	4	24	Promoting open public communication in terms of required labour.	(1) No complaints from local landowners regarding loss of farm labour. (2) Peaceful negotiations regarding employment opportunities.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.	
	Population Influx – Pressure on Resources	Socio-economic	Direct Impact: Increased demand for labour force poses a risk of a population influx in the local district municipality. The increasing population will put pressure on the local municipality to provide services such as sewage, drinking water, waste management, electricity etc.	Construction & Operational	4	2	4	5	50	Control	4	2	0	5	30	Promoting the management of population influx associated to the mining operations in a sustainable manner.	(1) Provision of existing housing infrastructures.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.	
	Population Influx – Social Pathologies	Socio-economic	Direct Impact: Increased demand for labour force poses a risk of a population influx. The increased population influx may lead to conflicting social pathologies in the surrounding local community.	Construction & Operational	4	2	4	4	40	Control	4	2	0	4	24	Control convicting social pathologies.	(1) Continuous awareness training on HIV/AIDS/STD in collaboration with local health service providers.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.	
	Population Influx – Community Conflict	Socio-economic	Direct Impact: Increased demand for labour force poses a risk of a population influx. The increased population influx may lead to community conflicts in the surrounding local community.	Construction & Operational	4	3	6	5	65	Control	4	2	0	4	24	Promoting peaceful negotiations with the surrounding communities and local business owners.	(1) Peaceful negotiations regarding employment, skills development, and financial provisions for social development projects.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.	
	Health and Safety of employees	Human health and safety environment	Direct Impact: Increased demand for labour and employees from different cultures may pose the risk to the lack of knowledge and skills on health and safety in the work place. Different human behaviours deals with different situations and if there is not a simplified system of managing health and safety risk, situations resulting loss or injury of human life may be a end result.	Construction & Operational	4	1	6	5	55	Control	4	1	6	3	33	Ensuring the health and safety of all personnel on site.	(1) Low incidents of injured on duty (IOD's) on site. (2) Low incidents of reported pedestrian accidents. (3) Records kept of health and safety training conducted for all staff on site. (4) Visible evidence and use of PPE. (5) Visible health and safety signs of high risk areas.	Entire Life cycle of project	(1) Develop and implement a Health and Safety Management plan.	
	Job Creation and Skills Training	Socio-economic	Direct Impact: As positive, local employed labour force will form part of a skills and training development programme. The proposed mining operation will create a job opportunity for at least a total of 60 people.	Construction & Operational	4	1	0	5	25	Control	4	1	0	5	25	Promote job creation and skills development of local employment.	(1) Peaceful negotiations regarding employment, skills development, and financial provisions for social development projects.	Entire Life cycle of project	(1) Develop and implement a Social Labour plan as defined by the MRPDA. (2) Develop and implement a grievance lodging procedure.	
	Dust generation	Air Quality	Direct Impact: Clearing of vegetation for topsoil and subsoil stripping exposes the mining operation area to dust generation. High levels of dust fallout will affect the overall air quality. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction	4	2	6	5	60	Control	2	1	6	3	27	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ² /day averaged over 30 days in residential areas and 1200 mg/m ² /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)	
		Visual Environment		Construction	4	2	4	5	50		2	1	4	3	21					
	Alteration of the visual environment and topography	Topography and Visual Environment	Direct Impact: Topsoil and subsoil stripping will alter the topography and visual environment throughout the mining operation.	Construction	4	2	4	5	50	Remedy	4	1	4	4	36	Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	(1) No areas left un-vegetated. (2) No signs of alien or invasive species on site (3) Control of visual affects. (4)	Rehabilitation and Decommissioning	(1) Mine plan in accordance with the MPRDA Regulation 56 section (1) to (8). (2) Adherence to the finalised approved lay out plan. (3) Development and implementation of the phased mine rehabilitation management plan.	
	Degradation of soil resources	Soil quality	Direct Impact: If not managed properly, fertile soil will be lost during site clearance, topsoil stripping and stockpiling. Loss of fertile soil will cause the degradation of habitat for flora micro- and macro organisms.	Construction & Operational	3	1	6	5	50	Remedy	3	1	4	3	24	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	(2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	3	1	6	5	50		3	1	6	3	30					
	Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing of site and stripping of topsoil leads to the loss of vegetation and habitats of macro and micro organisms. The loss of vegetation also affects the habitat of surrounding Fauna and Flora.	Construction & Operational	5	2	10	5	85	Remedy	4	1	6	5	55	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).	
		Fauna and Flora		Construction & Operational	5	2	10	5	85		4	1	6	5	55					
	Destruction of Wetlands	Wetlands and Aquatic Ecology	Direct Impact: Site clearing and topsoil stripping in Wetlands will cause the loss of micro and macro aquatic species.	Construction & Operational	5	2	8	5	75	Avoid	3	1	6	4	40	Avoid the destruction of wetlands.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include the conservation measures to be implemented in wetland areas. (2) Ensure compliance with the issued WUL requirements.	
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	2	6	3	36				(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas"	

18.Topsoil and subsoil stripping & stockpiling for mining operation area	Hydrocarbon Contamination	Groundwater quality	Direct Impact: Throughout the operational phase construction equipment are used. This poses a risk of hydrocarbon spills if equipment is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	2	8	5	70	Control	4	2	6	2	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Wetlands and Aquatic Ecology		Construction & Operational	4	2	8	5	70		4	2	6	3	36				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Stripping topsoil and subsoil or stockpiling material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	6	5	60	Control	4	2	4	3	30	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	2	6	3	36				
	Water level reduction and contamination	Groundwater quality	Direct Impact: The reduction in water levels as well as contamination of the water resource that may be caused by alternating the topography during site clearing and topsoil stripping poses a risk to affecting the surface and sub-surface water quality as well as the downstream users.	Construction & Operational	4	2	6	5	60	Control	4	1	4	3	27	Control the potential water level reduction and contamination related to authorised activities.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages. (5) No signs of blockages to the natural flow of the associated river catchment.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include measures to be implemented to reduce the impact on surface and groundwater reduction. (2) Ensure compliance with the issued WUL requirements. (3) Develop and implement a storm water management plan and specifically address the diversion of "clean" water into the natural drainage lines.
		Downstream water users		Construction & Operational	4	2	6	5	60		4	1	4	2	18				
		Surface Water quality		Construction & Operational	4	3	6	5	65		4	1	4	4	36				
	Noise generation	Surrounding noise quality	Direct Impact: The use of construction equipment during site clearing and topsoil stripping may cause noise during the construction phase. If equipment are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Construction & Operational	4	1	6	5	55	Control	4	1	4	3	27	Control potential noise pollution stemming from the operational of the project	* Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). * Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). * Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; * Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; * Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
	Destruction of graves	Loss of heritage resources	Direct Impact: Proposed activities in close proximity to identified graves poses the risk of destructing graves of great cultural and heritage importance. Indirect Impact: Loss of heritage and history for the future generation of the affected community.	Construction & Operational	5	2	6	5	65	Avoid	5	2	2	4	36	Identification of all possible sites of archaeological value and graves have been identified prior to the commencement of authorised work.	(1) All sites clearly demarcated as no-go areas. (2) Evidence of records should further discoveries be identified during construction. (3) Full compliance to all mitigation measures.	Entire Life cycle of project	(1) Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999. (2) Ensure compliance with the Human Tissue Act, 1983 (Act no. 65 of 1983).
	Degradation of cultural significance heritage sites	Loss of heritage resources	Direct Impact: Proposed mining activities in close proximity to cultural significant heritage sites poses the risk of degrading or loss of these sites. Indirect Impact: Loss of heritage and history for the future generation of the affected community.	Construction & Operational	5	2	6	5	65	Avoid	5	2	2	4	36	Identification of all possible sites of archaeological value and graves have been identified prior to the commencement of authorised work.	(1) All sites clearly demarcated as no-go areas. (2) Evidence of records should further discoveries be identified during construction. (3) Full compliance to all mitigation measures.	Entire Life cycle of project	(1) Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999. (2) Ensure compliance with the Human Tissue Act, 1983 (Act no. 65 of 1983).

Erosion	Loss of fertile soil	Direct Impact: Un-vegetated areas exposed to weathering for an extended period of time will lead to erosion. Erosion prone areas has a high risk of losing fertile soil caused by flash floods. The loss of fertile soil will result in the loss of important micro ecosystems.	Construction & Operational	4	1	6	5	55	Control	4	1	6	3	33	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
	Micro-ecosystems		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	1	4	5	45	Control	4	1	2	4	28	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
Alteration of drainage patterns	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: Site clearing and topsoil stripping through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	5	2	8	5	75	Remedy	4	1	6	3	33	Remedy the possible affects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
	Surface Water quality		Construction & Operational	5	3	8	5	80		4	2	6	4	48				
Destruction of upstream tributaries and reduction in water in the catchment	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the upstream drainage lines may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: The destruction of tributaries may lead to a limited volume of water available to the downstream users. The reduction in water in the catchment may cause the degradation of surface water quality.	Construction & Operational	5	2	6	5	65	Remedy	4	1	4	3	27	Remedy the possible affects of destruction of upstream tributaries and reduction in the water catchment. Adherence with water quality requirements set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
	Downstream water users		Construction & Operational	5	2	6	5	65		4	1	4	2	18				
	Surface Water quality		Construction & Operational	5	3	6	5	70		4	1	4	4	36				
Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: Site clearing for roads, lay down areas, and mining area exposes the un-vegetated area to the influx of alien invasive vegetation causing Irreversible damage to the native fauna and flora species and loss of habitats.	Construction & Operational	4	2	6	5	60	Control	4	1	4	4	36	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.
Hydrocarbon Contamination	Surface Water quality	Direct Impact: Throughout the operational phase construction equipment are used. This poses a risk of hydrocarbon spills if equipment is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	2	8	5	70	Control	4	1	4	3	27	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
	Groundwater quality		Construction & Operational	4	2	8	5	70		4	2	6	3	36				
	Soil quality		Construction & Operational	4	1	8	5	65		4	1	4	3	27				
Dust generation	Air Quality	Direct Impact: Exposed un-vegetated mining areas may lead to high levels of dust fallout and will affect the overall air quality. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	4	2	6	5	60	Control	4	2	4	4	40	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ² /day averaged over 30 days in residential areas and 1200 mg/m ² /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
	Human Health		Construction & Operational	4	1	6	5	55		4	1	4	4	36				
	Topography and Visual Environment		Construction & Operational	4	2	6	5	60		4	2	4	4	40				

Degradation of soil resources	Soil quality	Direct Impact: If not managed properly, fertile soil will be lost during site clearance, topsoil stripping and stockpiling. Loss of fertile soil will cause the degradation of habitat for flora micro- and macro organisms.	Construction & Operational	5	1	6	5	60	Remedy	4	1	4	3	27	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	(2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
	Flora micro-ecosystems		Construction & Operational	5	1	8	5	70		4	1	6	5	55					
Erosion	Loss of fertile soil	Direct Impact: Un-vegetated areas exposed to weathering for an extended period of time will lead to erosion. Erosion prone areas has a high risk of losing fertile soil caused by flash floods. The loss of fertile soil will result in the loss of important micro ecosystems.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.		Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
	Micro-ecosystems		Construction & Operational	4	1	8	5	65		4	1	6	4	44					
Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing of site and stripping of topsoil leads to the loss of vegetation and habitats of macro and micro organisms. The loss of vegetation also affects the habitat of surrounding Fauna and Flora.	Construction & Operational	5	2	10	5	85	Remedy	4	1	6	5	55	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)		Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
	Fauna and Flora		Construction & Operational	5	2	10	5	85		4	1	6	5	55					
Noise generation	Surrounding noise quality	Direct Impact: The use of construction equipment during site clearing and topsoil stripping may cause noise during the construction phase. If equipment are not maintained and serviced regularly high levels of noise may result throughout the operational phase.	Construction & Operational	4	2	6	5	60	Control	4	1	4	3	27	Control potential noise pollution stemming from the operational of the project	• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.		(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	2	4	5	50	Control	4	1	2	4	28	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.	
Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Throughout the operational phase of the mining operations, potential pollutants are used such as high levels of nitrates. Improper management of potential pollutants may lead to the degradation of water quality (both surface and sub-surface). Polluted water resources may affect the aquatic environment in a detrimental manner.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.		Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
	Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33					
	Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33					
Sedimentation and siltation of	Wetland and Aquatic Ecology	Direct Impact: Stockpiling excavated material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly.	Construction & Operational	4	2	8	5	70		4	1	6	3	33	Avoid or minimise the degradation of water quality of	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within		(1) Develop a storm water management plan. (2) Develop an implement a water management plan	

	watercourses	Surface Water quality	Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	3	8	5	75	Control	4	2	6	4	48	watercourses due to sedimentation and siltation.	the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	and specifically include water monitoring and pollution prevention strategies.
	Alteration of drainage patterns	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: Site clearing and topsoil stripping through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	5	2	8	5	75	Remedy	4	1	6	3	33	Remedy the possible affects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
		Surface Water quality		Construction & Operational	5	3	8	5	80		4	2	6	5	60				
	Destruction of upstream tributaries and reduction in water in the catchment	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the upstream drainage lines may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: The destruction of tributaries may lead to a limited volume of water available to the downstream users. The reduction in water in the catchment may cause the degradation of surface water quality.	Construction & Operational	4	2	6	5	60	Remedy	4	1	4	3	27	Remedy the possible affects of destruction of upstream tributaries and reduction in the water catchment. Adherence with water quality requirements set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
		Downstream water users		Construction & Operational	4	3	6	5	65		4	1	4	2	18				
		Surface Water quality		Construction & Operational	4	3	6	5	65		4	1	6	4	44				
	Alteration of the visual environment and topography	Topography and Visual Environment	Direct Impact: Open cast mining will alter the topography and visual environment throughout the mining operation in a significant way.	Construction	4	2	10	5	80	Remedy	4	1	6	5	55	Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	(1) No areas left un-vegetated. (2) No signs of alien or invasive species on site (3) Control of visual affects. (4)	Rehabilitation and Decommissioning	(1) Mine plan in accordance with the MPRDA Regulation 56 section (1) to (8). (2) Adherence to the finalised approved lay out plan. (3) Development and implementation of the phased mine rehabilitation management plan.
	Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: Site clearing for roads, lay down areas, and mining area exposes the un-vegetated area to the influx of alien invasive vegetation causing Irreversible damage to the native fauna and flora species and loss of habitats.	Construction & Operational	4	2	6	5	60	Control	4	1	4	4	36	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.
	Dust generation	Air Quality	Direct Impact: Dust being generated form drilling and blasting activities poses the risk of affecting the ambient air quality. This also affects the visual environment. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	3	2	6	5	55	Control	3	1	4	4	32	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA). (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	3	2	6	5	55		4	1	4	4	36				
		Topography and Visual Environment		Construction & Operational	3	2	4	5	45		3	1	4	4	32				
	Degradation of soil resources	Soil quality	Direct Impact: Improper management of blasting activities poses the risk of contaminating soil resources with pollutants such as a high content of Nitrates. The presence of pollutant in the soils results in the degradation of the quality. Indirect Impact: The degradation of soil quality poses the risk of degrading the conditions for flora and fauna micro ecosystems.	Construction & Operational	4	1	8	5	65	Remedy	4	1	4	3	27	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3) (2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	5	1	8	5	70		4	1	6	5	55				

20.Drilling & Blasting

20.Drilling & Blasting	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Improper management of blasting activities poses the risk of contaminating water resources with pollutants such as high content of Nitrates. The presence of pollutants in the water resources poses a risk of degrading the conditions for the aquatic ecology to thrive.	Construction & Operational	4	2	8	5	70	Avoid	4	1	4	3	27	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	3	8	5	75		4	1	6	3	33				
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: The use of drill Riggs poses a high risk of hydrocarbon spills. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	2	8	5	70	Control	4	1	6	4	44	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
		Soil quality		Construction & Operational	4	1	8	5	65		4	1	4	3	27				
	Noise generation	Surrounding noise quality	Direct Impact: The use of drill Riggs and blasting activities itself will result in the generation of noise. If equipment is not maintained and serviced regularly high levels of noise may result throughout the operational phase.	Construction & Operational	4	2	6	5	60	Control	4	2	4	3	30	Control potential noise pollution stemming from the operational of the project	• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
	Damage to surrounding landowner properties	Socio-economic	Direct Impact: Blasting outside the safe zones or in areas within close proximity to properties of landowners poses a risk of damaging properties. Fly rock poses a human health and safety risk.	Construction & Operational	5	2	6	5	65	Avoid	4	2	6	3	36	Avoid damage to any surrounding landowner properties, infrastructures or mining equipment. Avoid any injuries caused by blasting activities.	(1) No signs of damage to surrounding landowner property, infrastructure, or mining equipment. (2) No injuries caused by blasting activities.	Entire Life cycle of project	(1) Health and safety act, act 29 of 1996. (2) Explosives Act, act 15 of 2003.
		Human health and safety environment		Construction & Operational	4	2	6	5	60		4	2	6	3	36				

21. RoM & product stockpiling	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Throughout the operational phase equipment and plant are used to transport and stockpile RoM and product. This poses a risk of hydrocarbon spills if equipment are not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	1	8	5	65	Control	4	1	6	3	33	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	1	8	5	65		4	1	6	3	33				
		Soil quality		Construction & Operational	4	1	8	5	65		4	1	4	3	27				
	Dust generation	Air Quality	Direct Impact: Continuous use of haul road often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5 from the dirt roads. Stockpiled RoM and product are continuously exposed to weathering leading the generation of fine dust particles. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	4	2	6	5	60	Control	4	1	4	4	36	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA). (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	4	2	8	5	70		4	1	6	4	44				
		Topography and Visual Environment		Construction & Operational	4	2	6	5	60		4	1	4	4	36				
	Degradation of soil resources	Soil quality	Direct Impact: If not managed properly, fertile soil will be lost during site clearance, topsoil stripping and stockpiling. Loss of fertile soil will cause the degradation of habitat for flora micro- and macro organisms.	Construction & Operational	5	1	6	5	60	Remedy	4	1	4	3	27	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	5	1	6	5	60		4	1	6	5	55				
	Erosion	Loss of fertile soil	Direct Impact: Un-vegetated areas exposed to weathering for an extended period of time will lead to erosion. Erosion prone areas has a high risk of losing fertile soil caused by flash floods. The loss of fertile soil will result in the loss of important micro ecosystems.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Construction & Operational	4	1	8	5	65		4	1	6	4	44				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Throughout the operational phase of the mining operations, potential pollutants are used such as high levels of nitrates. Improper management of potential pollutants may lead to the degradation of water quality (both surface and sub-surface). Polluted water resources may affect the aquatic environment in a detrimental manner. Indirect Impact: Sub-surface material and ore exposed to weathering may release pollutants to the water resources.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
	Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing of site and stripping of topsoil leads to the loss of vegetation and habitats of macro and micro organisms. The loss of vegetation also affects the habitat of surrounding Fauna and Flora.	Construction & Operational	5	1	8	5	70	Remedy	4	1	6	5	55	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
		Fauna and Flora		Construction & Operational	5	1	8	5	70		4	1	6	5	55				

Noise generation	Surrounding noise quality	Direct Impact: The use of construction equipment during the hauling and stockpiling of RoM and product may cause noise during the operational phase. If equipment are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Construction & Operational	4	2	4	5	50	Control	4	1	2	3	21	Control potential noise pollution stemming from the operational of the project	<ul style="list-style-type: none"> • Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR. • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered. 	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	2	4	5	50	Control	4	1	2	4	28	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Stockpiling RoM and product material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
	Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: Site clearing for roads, lay down areas, and mining area exposes the un-vegetated area to the influx of alien invasive vegetation causing irreversible damage to the native fauna and flora species and loss of habitats.	Construction & Operational	4	2	6	5	60	Control	4	1	4	4	36	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.
Alteration of the visual environment and topography	Topography and Visual Environment	Direct Impact: Open cast mining will alter the topography and visual environment throughout the mining operation in a significant way.	Construction	4	2	10	5	80	Remedy	4	1	6	5	55	Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	(1) No areas left un-vegetated. (2) No signs of alien or invasive species on site (3) Control of visual affects. (4)	Rehabilitation and Decommissioning	(1) Mine plan in accordance with the MPRDA Regulation 56 section (1) to (8). (2) Adherence to the finalised approved lay out plan. (3) Development and implementation of the phased mine rehabilitation management plan.
Dust generation	Air Quality	Direct Impact: Continuous use of haul roads often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5 from the dirt roads. Stockpiled residue is continuously exposed to weathering leading the generation of fine dust particles. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	4	2	6	5	60	Control	4	1	4	4	36	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
	Human Health		Construction & Operational	4	2	8	5	70		4	1	4	4	36				
	Topography and Visual Environment		Construction & Operational	4	2	6	5	60		4	1	4	4	36				

22. Residue stockpiles

Degradation of soil resources	Soil quality	Direct Impact: If not managed properly, fertile soil will be lost during site clearance, topsoil stripping and stockpiling. Loss of fertile soil will cause the degradation of habitat for flora micro- and macro organisms.	Construction & Operational	5	1	8	5	70	Remedy	4	1	4	3	27	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	(2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
	Flora micro-ecosystems		Construction & Operational	5	1	8	5	70		4	1	6	5	55					
Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Stockpiling residue material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.		Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
	Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33					
Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Throughout the operational phase of the mining operations, potential pollutants are used such as high levels of nitrates. Improper management of potential pollutants may lead to the degradation of water quality (both surface and sub-surface). Polluted water resources may affect the aquatic environment in a detrimental manner. Indirect Impact: Sub-surface material and ore exposed to weathering may release pollutants to the water resources.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.		Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
	Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33					
	Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33					
Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Clearing of site and stripping of topsoil leads to the loss of vegetation and habitats of macro and micro organisms. The loss of vegetation also affects the habitat of surrounding Fauna and Flora.	Construction & Operational	5	1	8	5	70	Remedy	4	1	6	5	55	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)		Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
	Fauna and Flora		Construction & Operational	5	1	8	5	70		4	1	6	5	55					
Alteration of the visual environment and topography	Topography and Visual Environment	Direct Impact: Stockpiles of residue material over an extended time potentially alters the topography and visual environment.	Construction & Operational	5	2	4	5	55	Remedy	4	1	4	4	36	Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	(1) No areas left un-vegetated. (2) No signs of alien or invasive species on site (3) Control of visual affects. (4)	Rehabilitation and Decommissioning	(1) Mine plan in accordance with the MPRDA Regulation 56 section (1) to (8). (2) Adherence to the finalised approved lay out plan. (3) Development and implementation of the phased mine rehabilitation management plan.	
Alteration of drainage patterns	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: Site clearing and topsoil stripping through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	5	2	8	5	75	Remedy	4	1	6	3	33	Remedy the possible effects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.		Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
	Surface Water quality		Construction & Operational	5	3	8	5	80		4	1	6	4	44					
Hazardous Leachate	Groundwater quality	Direct Impact: Potential pollutant in the residue material resulting from mining operation may lead to the formation of leachate. The leachate may contain toxins that are hazardous to the aquatic ecology and water resources.	Operational	5	2	8	5	75	Control	4	1	6	3	33	Ensure that hazardous leachates are not released into the natural environment.	(1) Exceedance in water quality are limited to 5% of the baseline thresholds. (2) No contamination of water resources.		Entire Life cycle of project	(1) Develop and implement a Waste Management plan. (2) Develop and implement an Integrated Waste Water Management plan.
	Aquatic ecology		Operational	5	2	8	5	75		4	1	4	3	27					

23. Screening Operations	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Hydrocarbon spills can occur where heavy machinery such as the screening plant and hauling vehicles are parked because they contain large volumes of lubricating oils, hydraulic oils, and diesel to run. This poses a risk of hydrocarbon spills if equipment is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	1	8	5	65	Control	4	1	2	3	21	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	1	8	5	65		4	1	2	3	21				
		Soil quality		Construction & Operational	4	1	8	5	65		4	1	2	3	21				
	Dust generation	Air Quality	Direct Impact: Screening operations poses a high risk to the generation of fugitive dust comprising TSP, PM10 and PM2.5. The generation of dust during these activities affects the visual environment negatively.	Construction & Operational	4	2	6	5	60	Control	4	1	6	4	44	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	4	2	8	5	70		4	1	4	4	36				
		Topography and Visual Environment		Construction & Operational	4	2	6	5	60		4	1	4	4	36				
	Degradation of soil resources	Soil quality	Direct Impact: Improper management of stockpile area i.e. mixing of topsoil and fertile soils with subsoil or RoM product poses a risk of degrading of soil quality. Indirect Impact: The degradation of soil quality poses the risk of degrading the conditions for flora micro organism to thrive.	Construction & Operational	5	1	8	5	70	Remedy	4	1	4	3	27	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	5	1	8	5	70		4	1	6	3	33				
	CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	2	4	5	50	Control	4	1	2	4	28	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Water seeping from stockpiles poses a risk of leading to elevated concentrations of heavy metals and other elements in the groundwater environment, and can potentially be acidic. When this water reaches surface water bodies or the groundwater it can negatively affect the water quality. Indirect Impact: Alteration to the conditions of the water resources may negatively affect the aquatic ecology.	Construction & Operational	4	2	8	5	70	Avoid	4	1	6	3	33	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	3	8	5	75		4	1	6	3	33				
		Groundwater quality		Construction & Operational	4	3	8	5	75		4	1	6	2	22				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Stockpiling screened material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				

	Noise generation	Surrounding noise quality	Direct Impact: Operation of the screening plant poses a risk of increasing the ambient noise levels at surrounding sensitive receptors.	Construction & Operational	4	1	6	5	55	Control	4	1	4	3	27	Control potential noise pollution stemming from the operational of the project	<ul style="list-style-type: none">• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime).• Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time).• Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR;• Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA;• Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
24. Discard disposal (backfilling of mining area)	Hydrocarbon Contamination	Surface Water quality	Direct Impact: During backfilling activities equipment and plant are used. This poses a risk of hydrocarbon spills if equipment is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality. Indirect Impact: The degradation of water quality and soil quality poses a risk of negatively affecting the conditions for micro and macro organisms to thrive.	Construction & Operational	4	2	8	5	70	Control	2	1	6	3	27	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	2	6	5	60		3	1	4	2	16				
		Soil quality		Construction & Operational	5	2	6	5	65		3	1	4	3	24				
	Dust generation	Air Quality	Direct Impact: Continuous use of haul roads and backfilling of material often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5 from the dirt roads. Un-vegetated areas are continuously exposed to weathering leading the generation of fine dust particles. Backfilling of material in windy conditions also contribute to dust generation. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	2	2	6	5	50	Control	1	1	6	5	40	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ² /day averaged over 30 days in residential areas and 1200 mg/m ² /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	3	2	8	5	65		1	1	4	4	24				
		Topography and Visual Environment		Construction & Operational	5	2	6	5	65		1	1	4	4	24				
	Degradation of soil resources	Soil quality	Direct Impact: Backfilling of soil layers will impact on the land capability by restoring the land capability to some extent because vegetation will be supported and therefore returned to the planned post mining land capability such as arable and or grazing. However if not done incorrectly, the conditions for fauna and flora to reinstate the area will be negatively affected.	Construction & Operational	5	1	8	5	70	Remedy	4	1	6	3	33	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (2) (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	5	1	8	5	70		4	1	6	4	44				
	Erosion	Loss of fertile soil	Direct Impact: Un-vegetated areas exposed to weathering for an extended period of time will lead to erosion. Erosion prone areas has a high risk of losing fertile soil caused by flash floods. The loss of fertile soil will result in the loss of important micro ecosystems.	Construction & Operational	5	1	8	5	70	Control	4	1	6	3	33	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Construction & Operational	5	1	8	5	70		4	1	4	4	36				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Throughout the operational phase of the mining operations, potential pollutants are used such as high levels of nitrates. Improper management of potential pollutants may lead to the degradation of water quality (both surface and sub-surface). Polluted water resources may affect the aquatic environment in a detrimental manner.	Construction & Operational	4	2	8	5	70	Avoid	4	1	4	3	27	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				

25. Waste generation, storage and disposal		Groundwater quality	Indirect Impact: Sub-surface material and ore exposed to weathering may release pollutants to the water resources.	Construction & Operational	4	2	8	5	70		4	1	4	2	18	are developed and maintained.	leaks or spills caused by inadequate waste water management facilities.		(3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Backfilling material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
	Noise generation	Surrounding noise quality	Direct Impact: The use of construction equipment during backfilling may cause noise during the construction phase. If equipment are not maintained and serviced regularly high levels of noise may result throughout the operational phase.	Construction & Operational	3	2	6	5	55	Control	1	1	4	3	18	Control potential noise pollution stemming from the operational of the project	<ul style="list-style-type: none">• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime).• Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time).• Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR;• Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA;• Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
	Degradation of soil resources	Soil quality	Direct Impact: The storage of large amounts of waste over an extended time in a area not lined or bunded poses a risk of forming potentially hazardous leachates.	Construction & Operational	4	1	6	5	55	Remedy	4	1	2	3	21			(1) Development of a soil conservation management plan. (2) Development of a storm water management plan.	
		Flora micro-ecosystems	Indirect Impact: The hazardous leachate potentially poses a risk in contaminating the soil causing the degradation of conditions for flora micro organisms to thrive.	Construction & Operational	4	1	6	5	55		4	1	4	3	27			(3) Development and implementation of vehicle/plant/equipment management plan with specific	
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: The storage of large amounts of waste over an extended time in a area not lined or bunded poses a risk of forming potentially hazardous leachates. Indirect Impact: The hazardous leachate from the waste storage facilities poses a risk of contaminating both surface and sub-surface water resources. This may lead to the degradation of conditions for the aquatic ecology to thrive.	Construction & Operational	4	1	8	5	65	Avoid	4	1	4	3	27	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	4	1	8	5	65		4	1	4	3	27				
		Groundwater quality		Construction & Operational	4	1	8	5	65		4	1	4	2	18				

	Illegal dumping	Surface water contamination	<p>Direct Impact: Dumping of generated water in areas other than is approved by the authorisation or EMP poses a high risk of polluting numerous sources i.e. Water and soil. The dumping of general waste poses a choking risk to grazing animals. Hazardous Leachates from illegal dumps also poses a risk to the health of surrounding communities.</p> <p>Indirect Impact: The hazardous leachate from the waste storage facilities poses a risk of contaminating both surface and sub-surface water as well as soil resources. This may lead to the degradation of conditions for the aquatic ecology to thrive.</p>	Construction & Operational	4	2	8	5	70	Avoid	4	1	4	3	27	Promoting the reduction, re-use, or recycle of waste where prevention is not possible. Disposal of waste to local waste disposal sites is limited.	(1) No littering (2) No unpleasant odours (3) Marked and sealable bins observed Evidence of waste disposal certificates (4)	Entire Life cycle of project	(1) Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.
		Human health and safety environment		Construction & Operational	4	2	8	5	70		4	1	4	3	27				
		Soil Contamination		Construction & Operational	5	2	8	5	75		4	1	4	3	27				
	Hazardous Leachate	Groundwater quality	<p>Direct Impact: The hazardous leachate from the waste storage facilities poses a risk of contaminating both surface and sub-surface water as well as soil resources. This may lead to the degradation of conditions for the aquatic ecology to thrive.</p>	Operational	4	2	8	5	70	Control	4	1	4	3	27	Ensure that hazardous leachates are not released into the natural environment.	(1) Exceedance in water quality are limited to 5% of the baseline thresholds. (2) No contamination of water resources.	Entire Life cycle of project	(1) Develop and implement a Waste Management plan. (2) Develop and implement an Integrated Waste Water Management plan.
		Aquatic ecology		Operational	5	2	8	5	75		4	1	4	2	18				
26. Chemical Toilets	Degradation of soil resources	Soil quality	<p>Direct Impact: Continuous leaking, spills or lack of maintenance poses a risk to contaminating the surrounding soils and degrading the soil quality. This will affect the micro-ecosystems in a negative manner.</p>	Construction & Operational	1	1	6	5	40	Remedy	1	1	4	3	18	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Construction & Operational	1	1	6	5	40		1	1	4	3	18				
	Contamination of water resources	Wetlands and Aquatic Ecology	<p>Direct Impact: Improper management of effluent from chemical toilets poses a high risk to contaminating water resources. Indirect Impact: Over an extended period of time the exposure to contamination will cause the degradation of fauna and flora habitats as well as affect the surface and sub-surface water quality.</p>	Construction & Operational	1	1	6	5	40	Avoid	1	1	4	2	12	<p>Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.</p>	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWMMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Construction & Operational	1	1	6	5	40		1	1	6	3	24				
		Groundwater quality		Construction & Operational	1	1	6	5	40		1	1	4	2	12				
	Smell nuisance	Human health and safety environment	<p>Direct Impact: Lack of maintenance and treatment may result in a smelling environment.</p>	Construction & Operational	1	1	6	5	40	Avoid	1	1	4	4	24	<p>Avoid the generation of unpleasant odours on site at all times.</p>	(1) All toilets are serviced. (2) PCD's containing putrescible waste to be monitored and kept free of odour. (3) All putrescible waste removed and disposed off in a suitable manner.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management plan specifically addressing the management of sewage or chemical toilets. (2) Develop and implement a Infrastructure inspection programme to ensure no leaks or spillages of sewerage or waste. (3) Develop and implement a Waste Management plan.
	Hydrocarbon Contamination	Surface Water quality	<p>Direct Impact: Throughout the construction and operational phase construction equipment are used. This poses a risk of hydrocarbon spills if equipment are not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.</p>	Construction & Operational	3	2	6	5	55	Control	4	1	4	3	27	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. Immediate removal and remediation of all spills. (3)	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Construction & Operational	4	1	6	5	55		4	1	4	3	27				
		Soil quality		Construction & Operational	3	2	8	5	65		2	1	6	3	27				

27. River crossings	Erosion	Loss of fertile soil		Construction & Operational	4	1	8	5	65	Control	4	1	4	4	36	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems	Direct Impact: Improper installation of river crossing infrastructure poses the risk of contributing to the conditions causing erosion i.e. Un-vegetated and exposed river/watercourse banks. Indirect Impact: Erosion poses a risk of contributing to sedimentation and siltation of rivers/watercourses. Pollutants may affect the conditions for the aquatic ecology to thrive.	Construction & Operational	4	1	8	5	65		4	1	4	4	36				
	Water level reduction and contamination	Groundwater quality		Construction & Operational	4	2	6	5	60	Control	4	1	2	3	21	Control the potential water level reduction and contamination related to authorised activities.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages. (5) No signs of blockages to the natural flow of the associated river catchment.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include measures to be implemented to reduce the impact on surface and groundwater reduction. (2) Ensure compliance with the issued WUL requirements. (3) Develop and implement a storm water management plan and specifically address the diversion of "clean" water into the natural drainage lines.
		Downstream water users	Direct Impact: Improper installation of river crossing infrastructures poses a risk in water level reduction and contamination of downstream water users i.e. through blocking of the natural flow of streams/rivers. Indirect Impact: The reduction of water levels of rivers/watercourses poses a risk of affecting both surface and sub-surface water resources.	Construction & Operational	4	2	6	5	60		4	1	2	2	14				
		Surface Water quality		Construction & Operational	4	2	6	5	60		4	1	2	3	21				
	Contamination of water resources	Wetlands and Aquatic Ecology		Construction & Operational	4	2	6	5	60	Avoid	4	1	4	3	27	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality	Direct Impact: Storm water run-off from river crossing structures containing pollutants poses a risk in contaminating the surrounding water resources. Indirect Impact: Pollutants poses a risk in altering the conditions of the aquatic ecology to thrive.	Construction & Operational	4	2	6	5	60		4	1	4	3	27				
		Groundwater quality		Construction & Operational	4	2	6	5	60		4	1	4	3	27				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology		Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality	Direct Impact: Excavating, stockpiling and transport of material through or in close proximity to drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads and un-vegetated areas may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	8	5	70		4	1	6	4	44				
	Alteration of drainage patterns	Wetland and Aquatic Ecology		Construction & Operational	5	2	8	5	75	Remedy	4	1	6	3	33	Remedy the possible affects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
		Surface Water quality	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: Site clearing and topsoil stripping through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	5	2	8	5	75		4	1	4	3	27				
28. Water supply (potable & process)	CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated plant used to transport water will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	1	6	5	55	Control	4	1	4	5	45	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.
	Water level reduction and contamination	Groundwater quality		Construction & Operational	4	2	6	5	60	Control	4	1	2	3	21	Control the potential water level reduction and contamination related to authorised activities.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages. (5) No signs of blockages to the natural flow of the associated river catchment.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include measures to be implemented to reduce the impact on surface and groundwater reduction. (2) Ensure compliance with the issued WUL requirements. (3) Develop and implement a storm water management plan and specifically address the diversion of "clean" water into the natural drainage lines.
		Downstream water users	Direct Impact: Water wastage and over exploitation of water resources poses a risk in water level reduction. Indirect Impact: The reduction of water levels of rivers/watercourses/underground water tables poses a risk of affecting both surface and sub-surface water resources.	Construction & Operational	4	2	6	5	60		4	1	2	2	14				
		Surface Water quality		Construction & Operational	4	2	6	5	60		4	1	2	3	21				
	Improper water storage management	Wastage of water resource		Construction & Operational	4	2	6	5	60	Avoid	4	1	4	3	27	Avoid wastage of water resources. Maintain all infrastructure associated to the management of domestic water.	(1) Abstraction from natural watercourses is kept to a minimum and does not exceed the DWAS Water Use Licence provisions by more than 5% on an annual basis. (2) No visible signs of leaks or damage to water storage infrastructures.	Entire Life cycle of project	(1) Develop and implement a water management plan specifically addressing the storage of water as well as the frequent inspections of storage facilities.
Water contamination		Direct Impact: Improper management of water storage facilities i.e. Not inspecting or regularly maintaining the storage tanks poses a risk of leaks and contamination.	Construction & Operational	4	2	8	5	70	4		1	4	2	18					

Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Leaks and breaks of water supply infrastructure poses a risk of contaminating water resources. Indirect Impact: Pollutants poses a risk in altering the conditions of the aquatic ecology to thrive.	Construction & Operational	4	2	8	5	70	Avoid	4	1	2	2	14	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (3) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
	Surface Water quality		Construction & Operational	4	2	6	5	60		4	1	2	2	14				
	Groundwater quality		Construction & Operational	4	2	6	4	48		4	1	4	1	9				
29. Storage of fuel and lubricants in temporary facilities	Hydrocarbon Contamination	Surface Water quality	Construction & Operational	2	2	8	5	60	Control	1	1	6	3	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality	Construction & Operational	2	1	8	5	55		1	1	6	3	24				
		Soil quality	Construction & Operational	5	1	8	5	70		1	1	6	3	24				
	Degradation of soil resources	Soil quality	Construction & Operational	2	1	8	5	55	Remedy	1	1	6	3	24	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems	Construction & Operational	2	1	8	5	55		1	1	6	3	24				
	Contamination of water resources	Wetlands and Aquatic Ecology	Construction & Operational	2	1	8	5	55	Avoid	1	1	6	2	16	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality	Construction & Operational	2	1	8	5	55		1	1	6	3	24				
		Groundwater quality	Construction & Operational	2	1	8	5	55		1	1	4	3	18				

			Human health and safety environment		Construction & Operational	1	1	10	5	60		1	1	10	2	24					(1) Develop and implement a fire prevention plan that includes measures of prevention and response to chemical fires. (2) Develop a emergency preparedness procedure and include the process to be followed in case of a chemical fire. (3) Develop a Hazardous substances management plan. (4) Develop a frequent inspection programme to include inspections of hazardous substances storage facilities.
		Chemical Fires	Loss of ecosystems	Direct Impact: The improper storage of hazardous substances poses a risk of chemical fires. In the event of a chemical fire the impact to the surrounding environment is significant. Fires may lead to the loss of ecosystems, damage to properties and fatalities.	Construction & Operational	5	1	10	5	80	Avoid	1	1	6	2	16	Avoid and prevent chemical fires. Hazardous spills are prevented and no incidents to human health occurs.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) Immediate removal and remediation of all spills. (3) All staff trained. (4) All hazardous substances are documented. (5) No incidents recorded involving chemical fires.	Entire Life cycle of project		
			Damage to property		Construction & Operational	4	2	10	5	80		1	1	6	2	16					
30. Vehicular activity on haul roads; and operation of mining equipment	Hydrocarbon Contamination	Surface Water quality			Construction & Operational	4	1	8	5	65	Control	1	1	4	4	24		(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.	
		Groundwater quality	Direct Impact: The use of vehicles on haul roads throughout the operational phase poses a risk of hydrocarbon spills if equipment is not maintained. Depending on the size of the spill the level of contamination may vary from insignificant to significant and may affect the surrounding water quality (both surface and sub-surface) as well as the soil quality.	Construction & Operational	4	1	8	5	65		4	1	4	3	27	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.					
		Soil quality		Construction & Operational	5	1	8	5	70		4	1	4	3	27						
	Dust generation	Air Quality			Construction & Operational	4	2	6	5	60	Control	4	1	4	4	36		(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA). (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)	
		Human Health	Direct Impact: Continuous use of haul road often leads to the generation of fugitive dust comprising TSP, PM10 and PM2.5 from the dirt roads. The generation of dust during these activities will affect the visual environment negatively. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	4	2	6	5	60		4	1	4	4	36	Control dust fallout throughout the life cycle of the mining activity.					
		Topography and Visual Environment		Construction & Operational	4	2	6	5	60		4	1	4	5	45						
	Degradation of soil resources	Soil quality			Construction & Operational	5	1	8	5	70	Remedy	4	1	6	3	33	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.	
		Flora micro-ecosystems	Direct Impact: As part of the maintenance related to roads, valuable topsoil's may be removed. Improper management of topsoil or fertile soil may cause the loss of flora micro-ecosystems and cause the degradation of soil quality.	Construction & Operational	5	1	8	5	70		4	1	6	2	22						
	Erosion	Loss of fertile soil			Construction & Operational	4	1	8	5	65	Control	4	1	6	3	33	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.	
		Micro-ecosystems	Indirect Impact: Improper management of storm water may lead to erosion along the access routes. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Construction & Operational	4	1	8	5	65		4	1	6	3	33						
		CO ₂ emissions	Air Quality	Direct Impact: Haul vehicles will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	2	4	5	50	Control	4	1	2	4	28	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.	
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology			Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.	
		Surface Water quality	Direct Impact: Constructing access roads through drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads may cause sedimentation and siltation of nearby watercourses.	Construction & Operational	4	2	8	5	70		1	1	4	4	24						

	Noise generation	Surrounding noise quality	Direct Impact: If vehicles are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Construction & Operational	4	2	6	5	60	Control	4	1	4	3	27	Control potential noise pollution stemming from the operational of the project	<ul style="list-style-type: none">• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime).• Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time).• Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR;• Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA;• Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
31. Bulk transporting of Ore to market on Public roads	Dust generation	Air Quality	Direct Impact: The use of public roads without covering loads with tarpaulin may result in fly rock generating dust and causing damages to other road users. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Construction & Operational	4	3	4	5	55	Control	4	1	4	3	27	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ² /day averaged over 30 days in residential areas and 1200 mg/m ² /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Construction & Operational	4	3	8	5	75		4	1	4	3	27				
		Topography and Visual Environment		Construction & Operational	4	3	4	5	55		4	1	4	3	27				
		CO ₂ emissions	Air Quality	Direct Impact: Haul vehicles will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Construction & Operational	4	3	4	5	55	Control	4	1	2	4	28	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project
	Pressure on public transport infrastructure	Socio-economic	Direct Impact: Influx of bulk transporting vehicles puts pressure on the public transport infrastructures. During the life cycle of the proposed activity an increase in vehicle movement in the area will be expected. This poses a potential increase in vehicle, pedestrian, and livestock accidents.	Construction & Operational	4	3	6	5	65	Control	4	2	4	5	50	Accidents are kept to a minimum. The surface quality of the road is not negatively impacted resulting from haulage of ROM product. The presence of heavy vehicles turning are clearly indicated thereby minimising potential accidents. Sections of existing road surfaces which have been impacted on by the haulage of ROM product are remediated.	(1) No incidents reported of vehicle, pedestrian, and livestock accidents. (2) Condition of road surface maintained. (3) No complaints from surrounding landowners or road users. (4) Clearly visibility of warning signage. (5) Existing road surfaces are utilised and maintained within baseline levels.	Entire Life cycle of project	(1) Develop and implement a traffic management plan. (2) Develop and implement a Public Complaints procedure.
	Erosion	Loss of fertile soil	Direct Impact: Poor management of storm water throughout the construction, operational, and decommissioning phase poses a high risk for erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Construction & Operational	4	1	8	5	65	Control	4	1	4	3	27	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Construction & Operational	4	1	8	5	65		4	1	4	4	36				
	Improper water storage management	Wastage of water resource	Direct Impact: Improper management of water storage facilities i.e. Not inspecting or regularly maintaining the storage tanks poses a risk of leaks and contamination.	Construction & Operational	4	1	6	5	55	Avoid	4	1	4	3	27	Avoid wastage of water resources. Maintain all infrastructure associated to the management of domestic water.	(1) Abstraction from natural watercourses is kept to a minimum and does not exceed the DWAS Water Use Licence provisions by more than 5% on an annual basis. (2) No visible signs of leaks or damage to water storage infrastructures.	Entire Life cycle of project	(1) Develop and implement a water management plan specifically addressing the storage of water as well as the frequent inspections of storage facilities.
		Water contamination		Construction & Operational	4	1	8	5	65		4	1	4	3	27				
		Wetlands and Aquatic Ecology		Construction & Operational	4	2	8	5	70		4	1	6	3	33				

32. Water Management	Contamination of water resources	Surface Water quality	Direct Impact: The poor management of onsite water i.e. Storm water, process water, effluent, potable water etc. may lead to the contamination of water resources.	Construction & Operational	4	3	8	5	75	Avoid	4	1	4	3	27	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Groundwater quality		Construction & Operational	4	2	8	5	70		4	1	6	3	33				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Runoff from lay down areas, construction areas, mining areas, stockpile areas, roads etc. potentially contains sediment and silt that poses a risk of affecting surrounding water courses and drainage lines.	Construction & Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	4	3	27				
	Alteration of drainage patterns	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the drainage patterns may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: Site clearing and topsoil stripping through drainage lines may lead to the siltation of streams as well as lead to erosion along the river banks that will affect the surface water quality negatively.	Construction & Operational	5	2	8	5	75	Remedy	4	1	6	3	33	Remedy the possible affects of alteration to natural drainage lines. Adherence with water quality requirements as set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
		Surface Water quality		Construction & Operational	5	2	8	5	75		4	1	4	4	36				
	Water level reduction and contamination	Groundwater quality	Direct Impact: Improper management of water usage and installation of improper storm water features and infrastructure poses a risk of reducing the water levels for downstream users. Indirect Impact: The reduction of water levels of rivers/watercourses/underground water tables poses a risk of affecting both surface and sub-surface water resources.	Construction & Operational	4	2	8	5	70	Control	4	1	4	3	27	Control the potential water level reduction and contamination related to authorised activities.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages. (5) No signs of blockages to the natural flow of the associated river catchment.	Entire Life cycle of project	(1) Develop and implement a water management plan and specifically include measures to be implemented to reduce the impact on surface and groundwater reduction. (2) Ensure compliance with the issued WUL requirements. (3) Develop and implement a storm water management plan and specifically address the diversion of "clean" water into the natural drainage lines.
		Downstream water users		Construction & Operational	4	2	8	5	70		4	1	4	3	27				
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	2	3	21				
	Destruction of upstream tributaries and reduction in water in the catchment	Wetland and Aquatic Ecology	Indirect Impact: Alteration of the upstream drainage lines may lead to the degradation of downstream or surrounding Wetlands which in its turn may affect the aquatic micro and macro ecology. Direct Impact: The destruction of tributaries may lead to a limited volume of water available to the downstream users. The reduction in water in the catchment may cause the degradation of surface water quality.	Construction & Operational	4	2	8	5	70	Remedy	4	1	4	3	27	Remedy the possible affects of destruction of upstream tributaries and reduction in the water catchment. Adherence with water quality requirements set by the Water Use Licence Conditions.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas. (4) No signs of degradation of diversion channels or drainage systems.	Entire Life cycle of project	(1) Develop and implement a storm water management plan. (2) Develop and implement a water management plan specifically including a strategy for the management of alterations to drainage patterns.
		Downstream water users		Construction & Operational	4	2	8	5	70		4	1	4	3	27				
		Surface Water quality		Construction & Operational	4	2	8	5	70		4	1	4	3	27				
	Erosion	Loss of fertile soil	Direct Impact: Exposed un-vegetated rehabilitated areas poses a high risk of erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Operational	5	1	8	5	70	Control	4	1	4	3	27	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Operational	5	1	8	5	70		4	1	4	4	36				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Runoff from exposed un-vegetated areas poses a risk in contaminating nearby streams, rivers, and drainage lines.	Operational	4	2	8	5	70	Control	4	1	6	3	33	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Operational	4	2	8	5	70		4	1	4	4	36				

33. Rehabilitation of mining areas	Noise generation	Surrounding noise quality	Direct Impact: The use of unmaintained equipment and plant throughout the rehabilitation phase poses a risk of generating noise.	Operational	2	2	6	5	50	Control	1	1	4	3	18	Control potential noise pollution stemming from the operational of the project	<ul style="list-style-type: none">• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime).• Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time).• Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR;• Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA;• Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.	
	Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: Site clearing for roads, lay down areas, and mining area exposes the un-vegetated area to the influx of alien invasive vegetation causing irreversible damage to the native fauna and flora species and loss of habitats.	Operational	4	2	6	5	60	Control	1	1	4	4	24	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.	
	Degradation of soil resources	Soil quality	Direct Impact: Poor management of topsoil and subsoil poses a risk to degradation of soil resources.	Operational	5	1	10	5	80	Remedy	1	1	6	3	24	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	(2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Operational	5	1	10	5	80		1	1	6	3	24					
	Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Improper rehabilitation measures implemented poses a risk of vegetation and habitat loss. The conditions for macro and micro organisms needs to be suitable for reinstatement of the ecosystem.	Operational	5	1	10	5	80	Remedy	1	1	4	5	30	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).	
Fauna and Flora		Operational		5	1	10	5	80	1		1	6	4	32						
Decommissioning																				
Hydrocarbon Contamination	Surface Water quality	Direct Impact: The potential impact will arise during demolition of infrastructure, where mobilisation of contaminants such as fuels containing hydrocarbons, waste, explosives, PCD material to the surface water resources resulting in the contamination of those resources.	Decommissioning	2	2	8	5	60	Control	1	1	6	3	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.		
	Groundwater quality		Decommissioning	2	2	8	5	60		1	1	6	1	8						
	Soil quality		Decommissioning	2	2	8	5	60		1	1	6	3	24						
Dust generation	Air Quality	Direct Impact: Dismantling and demolition of existing infrastructure, transporting and handling of topsoil on unpaved roads in order to bring the site to state suitable for alternative land uses poses potential impacts on the atmospheric environment. Demolition and removal of all infrastructures will cause fugitive dust emissions. Any implication this activity will have on ambient air quality will be short-term and localised. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Decommissioning	1	2	6	5	45	Control	1	1	4	4	24	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ² /day averaged over 30 days in residential areas and 1200 mg/m ² /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)		
	Human Health		Decommissioning	1	2	6	5	45		1	1	4	4	24						
	Topography and Visual Environment		Decommissioning	1	2	6	5	45		1	1	4	3	18						
Degradation of soil resources	Soil quality	Direct Impact: Poor management of topsoil and subsoil poses a risk to degradation of soil resources. Indirect Impact: Degradation of soil resources poses a risk in altering the conditions for micro organisms to thrive in.	Decommissioning	5	1	6	5	60	Remedy	1	1	4	3	18	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. No mixing of topsoil or fertile soils with infertile soils. (3)	(2)	Entire Life cycle of project	(1) Development of a soil conservation management plan. Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.	
	Flora micro-ecosystems		Decommissioning	5	1	6	5	60		1	1	4	3	18						

35. Demolition / removal of portable and related infrastructure	Erosion	Loss of fertile soil		Decommissioning	5	2	8	5	75	Control	1	1	4	4	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.	
		Micro-ecosystems	Direct Impact: Exposed un-vegetated rehabilitated areas poses a high risk of erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Decommissioning	5	1	8	5	70		1	1	4	4	24					
	Noise generation	Surrounding noise quality	Direct Impact: The use of unmaintained equipment and plant throughout the decommissioning phase poses a risk of generating noise.	Decommissioning	1	2	6	5	45	Control	1	1	4	3	18	Control potential noise pollution stemming from the decommissioning phase of the project	• Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA. • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered.	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.	
	General waste generation & Littering	Soils quality due to leachates	Direct Impact: Throughout the decommissioning phase of the project large amounts of waste (general and hazardous waste) will be generated putting strain on local landfill sites. The storage of large amounts of waste over an extended time in a area not lined or bunded poses a risk of forming potentially hazardous leachates.	Decommissioning	3	2	8	5	65	Control	1	1	6	3	24					
Surface Water quality due to leachates		Indirect Impact: The hazardous leachate from the waste storage facilities poses a risk of contaminating both surface and sub-surface water resources. This may lead to the degradation of conditions for the aquatic ecology to thrive.	Decommissioning	3	2	8	5	65	1		1	6	3	24						
36. Vehicular activity: removal of mobile plant / equipment and vehicles	Hydrocarbon Contamination	Surface Water quality		Decommissioning	2	1	8	5	55	Control	1	1	6	3	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.	
		Groundwater quality	Direct Impact: Heavy vehicle activity used during the decommissioning phase is poses a risk of leaking or spilling contaminants such as fuels containing hydrocarbons, waste, explosives, PCD material to the surface water resources resulting in the contamination of those resources.	Decommissioning	2	1	8	5	55		1	1	6	1	8					
		Soil quality		Decommissioning	2	1	8	5	55		1	1	6	3	24					
	Dust generation	Air Quality		Decommissioning	1	2	6	5	45	Control	1	1	4	4	24	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)	
		Human Health	Direct Impact: Transportation of mobile plants / equipment and other materials from site can lead to the generation of fugitive dust comprising TSP, PM10 and PM2.5. This activity will be short-term, localised, and will have low impacts on the atmospheric environment once the demolition ceases. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Decommissioning	1	2	6	5	45		1	1	4	4	24					
		Topography and Visual Environment		Decommissioning	1	2	6	5	45		1	1	4	4	24					
	Erosion	Loss of fertile soil		Decommissioning	1	1	8	5	50	Control	1	1	4	4	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.	
		Micro-ecosystems	Direct Impact: Exposed un-vegetated rehabilitated areas poses a high risk of erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Decommissioning	1	1	8	5	50		1	1	4	4	24					
		CO ₂ emissions	Air Quality	Direct Impact: The use of diesel operated construction equipment will cause a contributing factor the BCR Minerals (Pty) Ltd carbon footprint.	Decommissioning	1	1	6	5	40	Control	1	1	2	3	12	The levels of greenhouse gas and CO2 emissions emanating from the use of plant and vehicles as well as the use of generators for power on site, is kept to a minimum.	(1) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. (2) Record keeping of service records of all vehicles, plant, and equipment. (3) No evidence of plant, equipment or vehicles in bad condition.	Entire Life cycle of project	(1) Develop and maintain a Carbon footprint reporting policy.

	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: Constructing and the use of access roads through drainage lines may cause sedimentation and siltation of watercourses if not managed properly. Indirect Impact: Storm water runoff of dirt roads may cause sedimentation and siltation of nearby watercourses.	Decommissioning	1	1	8	5	50	Control	1	1	4	2	12	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Decommissioning	1	1	8	5	50		1	1	4	3	18				
	Noise generation	Surrounding noise quality	Direct Impact: If vehicles are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Decommissioning	1	1	6	5	40	Control	1	1	4	3	18	Control potential noise pollution stemming from the decommissioning phase of the project	<ul style="list-style-type: none"> • Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered. 	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
37. Rehabilitation of the lay down areas	Dust generation	Air Quality	Direct Impact: Re-vegetation of the remaining footprint of the mine must be done after the reclamation. The impacts on the atmospheric environment during rehabilitation will be limited to the vehicular activity, spreading of soil and profiling/contouring. The impact will be medium-term, very limited on spatial scale, with limited implication on ambient air quality.	Decommissioning	1	2	6	5	45	Control	1	1	4	4	24	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ² /day averaged over 30 days in residential areas and 1200 mg/m ² /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Decommissioning	2	2	6	5	50		1	1	4	4	24				
		Topography and Visual Environment		Decommissioning	2	2	4	5	40		1	1	4	4	24				
	Erosion	Loss of fertile soil	Direct Impact: Exposed un-vegetated rehabilitated areas poses a high risk of erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Decommissioning	3	2	8	5	65	Control	1	1	4	4	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Decommissioning	3	1	8	5	60		1	1	4	3	18				
	Sedimentation and siltation of watercourses	Wetland and Aquatic Ecology	Direct Impact: If areas remain un-vegetated and exposed run-off from these areas may contain sediment and silt posing the risk of contaminating watercourses/ivers in close proximity.	Decommissioning	3	2	8	5	65	Control	1	1	4	2	12	Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation.	(1) Ensure water quality results do not exceed the pre-determined baseline results with more than 10%. (2) Water quality of streams and rivers are maintained within the pre-determined seasonally baseline levels. (3) No incidents related to the pollution of rivers and streams. (4) No visible signs of erosion damages.	Entire Life cycle of project	(1) Develop a storm water management plan. (2) Develop an implement a water management plan and specifically include water monitoring and pollution prevention strategies.
		Surface Water quality		Decommissioning	5	2	8	5	75		1	1	4	3	18				
	Influx of alien invasive vegetation	Fauna and Flora micro and macro ecosystems	Direct Impact: Site clearing for roads, lay down areas, and mining area exposes the un-vegetated area to the influx of alien invasive vegetation causing Irreversible damage to the native fauna and flora species and loss of habitats.	Decommissioning	3	2	8	5	65	Control	1	1	4	3	18	Prevent the spreading of alien plants/seeds on site and to the surrounding areas. Eradication and removal of alien and invasive plants.	(1) No visible presence of alien vegetation on site.	Entire Life cycle of project	(1) Develop and implement an alien eradication and control management plan.
	Degradation of soil resources	Soil quality	Direct Impact: Poor management of topsoil and subsoil poses a risk to degradation of soil resources. Indirect Impact: Degradation of soil resources poses a risk in altering the conditions for micro organisms to thrive in.	Decommissioning	5	1	8	5	70	Remedy	1	1	4	3	18	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Decommissioning	5	1	8	5	70		1	1	4	3	18				

38. Demolition of PCD's	Vegetation and habitat loss	Macro and Micro organisms	Direct Impact: Improper rehabilitation measures implemented poses a risk of vegetation and habitat loss. The conditions for macro and micro organisms needs to be suitable for reinstatement of the ecosystem.	Decommissioning	5	2	10	5	85	Remedy	1	1	6	4	32	Avoid unnecessary loss of vegetation and habitats. Rehabilitation of all affected habitats and mining related areas.	(1) Limiting site clearance to areas as per the approved site layout plan. (2) All sensitive or protected flora identified to be rescued and relocated. (3)	Entire Life cycle of project	(1) Develop a plant specie search and rescue management plan. (2) Develop and implement a phased rehabilitation management plan. (3) Develop and implement a soil conservation management plan. (4) Apply for permits to remove protected species (provincial and national).
		Fauna and Flora		Decommissioning	4	1	10	5	75		1	1	4	4	24				
	Hydrocarbon Contamination	Surface Water quality	Direct Impact: Heavy vehicle activity used during the decommissioning phase is poses a risk of leaking or spilling contaminants such as fuels containing hydrocarbons, waste, explosives, PCD material to the surface water resources resulting in the contamination of those resources. If the contend of the PCD's are not treated or disposed off at a registered facility, the leakage or spillage of the contaminated water may lead to the degradation of water and soil resources.	Decommissioning	1	2	8	5	55	Control	1	1	6	3	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
		Groundwater quality		Decommissioning	1	2	8	5	55		1	1	6	1	8				
		Soil quality		Decommissioning	2	2	8	5	60		1	1	6	3	24				
	Dust generation	Air Quality	Direct Impact: Dismantling and demolition of existing infrastructure, transporting and handling of topsoil on unpaved roads in order to bring the site to state suitable for alternative land uses poses potential impacts on the atmospheric environment. Demolition and removal of all infrastructures will cause fugitive dust emissions. Any implication this activity will have on ambient air quality will be short-term and localised. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Decommissioning	1	1	6	5	40	Control	1	1	2	3	12	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
		Human Health		Decommissioning	1	1	6	5	40		1	1	2	4	16				
		Topography and Visual Environment		Decommissioning	1	1	6	5	40		1	1	2	4	16				
	Degradation of soil resources	Soil quality	Direct Impact: Poor management of topsoil and subsoil poses a risk to degradation of soil resources. Spills or leaks of effluent may contain possible pollutants that poses a risk of further degradation of soil resources. Indirect Impact: Degradation of soil resources poses a risk in altering the conditions for micro organisms to thrive in.	Decommissioning	5	1	8	5	70	Remedy	1	1	4	3	18	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
		Flora micro-ecosystems		Decommissioning	5	1	8	5	70		1	1	6	3	24				
	Erosion	Loss of fertile soil	Direct Impact: Exposed un-vegetated rehabilitated areas poses a high risk of erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Decommissioning	3	2	8	5	65	Control	1	1	4	4	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
		Micro-ecosystems		Decommissioning	3	1	8	5	60		1	1	4	3	18				
	Contamination of water resources	Wetlands and Aquatic Ecology	Direct Impact: Discharge, spills and leakage of effluent containing pollutants poses a risk of contaminating water resources within close proximity. Indirect Impact: Pollutants poses a risk in altering the conditions of the aquatic ecology to thrive.	Decommissioning	2	2	8	5	60	Avoid	1	1	6	3	24	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality		Decommissioning	2	2	8	5	60		1	1	6	3	24				
		Groundwater quality		Decommissioning	2	2	8	5	60		1	1	6	2	16				

Noise generation	Surrounding noise quality	Direct Impact: If vehicles used to demolish the PCD's are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Decommissioning	1	1	4	5	30	Control	1	1	4	3	18	Control potential noise pollution stemming from the decommissioning phase of the project	<ul style="list-style-type: none"> • Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR. • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA. • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered. 	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
General waste generation & Littering	Topography and Visual Environment	Direct Impact: Throughout the decommissioning phase of the project large amounts of waste (general and hazardous waste) will be generated putting strain on local landfill sites. The storage of large amounts of waste over an extended time in a area not lined or bunded poses a risk of forming potentially hazardous leachates. Indirect Impact: The hazardous leachate from the waste storage facilities poses a risk of contaminating both surface and sub-surface water resources. This may lead to the degradation of conditions for the aquatic ecology to thrive. Pressure on the local or national landfills poses the risk of land degradation and requires more space in terms of the IDP of the local municipality.	Decommissioning	1	1	6	5	40	Control	1	1	4	3	18	Promoting the reduction, re-use, or recycle of waste where prevention is not possible. Disposal of waste to local waste disposal sites is limited.	(1) No littering (2) No unpleasant odours (3) Marked and sealable bins observed (4) Evidence of waste disposal certificates	Entire Life cycle of project	(1) Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.
	Soils quality due to leachates		Decommissioning	3	1	8	5	60		1	1	4	3	18				
	Surface Water quality due to leachates		Decommissioning	3	1	8	5	60		1	1	4	3	18				
Hydrocarbon Contamination	Surface Water quality	Direct Impact: Heavy vehicle activity used during the decommissioning phase is poses a risk of leaking or spilling contaminants such as fuels containing hydrocarbons, waste, explosives, to the surface water resources resulting in the contamination of those resources. If the effluent are not treated or disposed off at a registered facility, the leakage or spillage of the contaminated water may lead to the degradation of water and soil resources. Workshop floors, waste storage facilities and fuel storage facilities are exposed to hydrocarbons throughout construction, operation, and decommissioning. Improper disposal method or remediation poses a risk of polluting the surrounding water and soil resources.	Decommissioning	2	1	8	5	55	Control	1	1	6	3	24	Adequate protection of soil and water resources. Active remediation in case of spill is ensured.	(1) No evidence of hydrocarbon and hazardous spills. (2) No release of contaminated water into the natural environment. (3) Immediate removal and remediation of all spills.	Entire Life cycle of project	(1) Development of water management plan addressing monitoring and management requirements. (2) Development of a storm water management plan addressing the separation of "dirty" and clean "areas" (3) Development of emergency response plan with specific reference to spill prevention and remediation. (4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. (5) Development and implementation of a Hazardous substances management plan.
	Groundwater quality		Decommissioning	2	1	8	5	55		1	1	6	2	16				
	Soil quality		Decommissioning	5	1	8	5	70		1	1	6	3	24				
Dust generation	Air Quality	Direct Impact: Dismantling and demolition of existing infrastructure, transporting and handling of topsoil on unpaved roads in order to bring the site to state suitable for alternative land uses poses potential impacts on the atmospheric environment. Demolition and removal of all infrastructures will cause fugitive dust emissions. Any implication this activity will have on ambient air quality will be short-term and localised. Indirect Impact: Continuous exposure to high levels of dust fallout may lead to unhealthy environment for employees and surrounding communities.	Decommissioning	1	1	6	5	40	Control	1	1	2	3	12	Control dust fallout throughout the life cycle of the mining activity.	(1) Dust fallout levels at active operational sites do not exceed the pre-determined baseline levels by more than 10%. (2) Zero number of complaints from site staff, surrounding landowners and communities. (3) Adherence with legal required dust fallout levels. (4) Adherence with 600 mg/m ³ /day averaged over 30 days in residential areas and 1200 mg/m ³ /day averaged over 30 days in non-residential areas. (5) No more than two within a year, no two sequential months per dust fallout monitoring site. (6) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Entire Life cycle of project	(1) Development and implementation of a Dust management plan as part of a Air quality management plan to including the monitoring and prevention programme. (2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. (3) Ensure activities remain under the thresholds stipulated in GNR 893 (in terms of section 21 of NEMAQA. (4) Register online to the National Atmospheric Emissions Inventory System (NAEIS) in terms of the National Reporting Regulations (GNR 283) as Group C emitters. (5) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) (6) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013)
	Human Health		Decommissioning	1	1	6	5	40		1	1	4	4	24				
	Topography and Visual Environment		Decommissioning	1	1	6	5	40		1	1	2	4	16				
Degradation of soil resources	Soil quality	Direct Impact: Poor management of topsoil and subsoil poses a risk to degradation of soil resources. Spills or leaks of effluent may contain possible pollutants that poses a risk of further degradation of soil resources. Workshop floors, waste storage facilities and fuel storage facilities are exposed to hydrocarbons throughout construction, operation, and decommissioning. Improper disposal method or remediation poses a risk of polluting the surrounding water and soil resources.	Decommissioning	5	1	8	5	70	Remedy	1	1	4	3	18	Adequate protection of soil resources and remediation if degradation cannot be avoided.	(1) No evidence of erosion. (2) No mixing of topsoil or fertile soils with infertile soils. (3)	Entire Life cycle of project	(1) Development of a soil conservation management plan. (2) Development of a storm water management plan. (3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.
	Flora micro-ecosystems	Indirect Impact: Degradation of soil resources poses a risk in altering the conditions for micro organisms to thrive in.	Decommissioning	5	2	8	5	75		1	1	4	3	18				
Erosion	Loss of fertile soil	Direct Impact: Exposed un-vegetated rehabilitated areas poses a high risk of erosion. This may lead to the loss of fertile soil and in its turn affect the micro-ecosystems of the surrounding environment.	Decommissioning	3	2	8	5	65	Control	1	1	4	4	24	To prevent any erosion and to provide adequate erosion control measures where required.	(1) No visible signs of erosion formations such as dongas or rills. (2) Sedimentation loads of streams and rivers not to exceed the baseline levels by more than 10%. (3) Erosion control measures implemented in high risk areas.	Entire Life cycle of project	(1) Development and implementation of a storm water management plan. (2) Development of a soil conservation management plan. (3) Development and implementation of mine rehabilitation plan.
	Micro-ecosystems		Decommissioning	3	1	8	5	60		1	1	4	3	18				

39. Demolition of workshops, waste storage facilities, fuel storage facilities etc.	Contamination of water resources	Wetlands and Aquatic Ecology		Decommissioning	2	2	8	5	60	Avoid	1	1	6	3	24	Avoid the release of pollutants into the aquatic environment. Waste water is appropriately managed. Erosion is prevented. Suitable water management facilities and treatment works are developed and maintained.	(1) Water quality of streams and rivers are maintained within the predetermined seasonally baseline levels. (2) No evidence of pollutants released into streams and rivers. (3) No formation of erosion gullies or rills. (4) No leaks or spills caused by inadequate waste water management facilities.	Entire Life cycle of project	(1) Develop and implement an Integrated Waste Water Management Plan (IWWMP). (2) Develop and implement a water monitoring schedule according to the water management plan. (2) Ensure compliance with the WUL conditions. (3) Develop an emergency preparedness plan addressing the prevention and management of incidents related to water contamination.
		Surface Water quality	Direct Impact: Discharge, spills and leakage of effluent containing pollutants poses a risk of contaminating water resources within close proximity. Indirect Impact: Pollutants poses a risk in altering the conditions of the aquatic ecology to thrive.	Decommissioning	2	2	8	5	60		1	1	6	2	16				
		Groundwater quality		Decommissioning	3	2	8	5	65		1	1	6	2	16				
	Noise generation	Surrounding noise quality	Direct Impact: If vehicles used to demolish these areas are not maintained and serviced regularly high levels of noise may result throughout the construction and operational phase.	Decommissioning	1	1	6	5	40	Control	1	1	4	3	18	Control potential noise pollution stemming from the operational of the project	<ul style="list-style-type: none"> • Ensure equivalent A-weighted noise levels below 55 dBA at potentially noise-sensitive receptors (daytime). • Ensure equivalent A-weighted noise levels below 45 dBA at potentially noise-sensitive receptors (night-time). • Define the noisy areas with a set boundary ensuring that equivalent A-weighted noise levels at this boundary does not exceed 61 dB LAeq,24hr. It should be noted that the area would have to be demarcated as a "controlled zone" in terms of the NCR; • Ensure that the change in ambient sound levels as experienced by Potentially Sensitive Receptors is less than 5 - 7 dBA; • Ensuring compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. The referencing of the International Finance Corporation (World Bank) guidelines for an acceptable sound level in a residential area was also considered. 	Before and during all phases on a quarterly basis.	(1) Develop and implement a noise monitoring programme to ensure compliance with the National Noise Control Regulations and SANS10103:2008 guidelines. (2) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
	General waste generation & Littering	Soils quality due to leachates	Direct Impact: Throughout the decommissioning phase of the project large amounts of waste (general and hazardous waste) will be generated putting strain on local landfill sites. The storage of large amounts of waste over an extended time in a area not lined or bunded poses a risk of forming potentially hazardous leachates.	Decommissioning	5	1	8	5	70	Control	1	1	6	3	24				
		Surface Water quality due to leachates	Indirect Impact: The hazardous leachate from the waste storage facilities poses a risk of contaminating both surface and sub-surface water resources. This may lead to the degradation of conditions for the aquatic ecology to thrive. Pressure on the local or national landfills poses the risk of land degradation and requires more space in terms of the IDP of the local municipality.	Decommissioning	3	2	8	5	65		1	1	6	3	24				