

SUPPORTING ENVIRONMENTAL IMPACT ASSESSMENT

A “significant impact” is defined as it is defined in the EIA Regulations (2014): “an impact that may have a notable effect on one or more aspects of the environment or may result non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as by its duration, magnitude, intensity or probability of occurrence”. The objective of this EIA methodology is to serve as framework for accurately evaluating impacts associated with current or proposed activities in the biophysical, social and socio-economical spheres. It aims to ensure that all legal requirements and environmental considerations are met in order to have a complete and integrated environmental framework for impact evaluations.

1. IMPACT ASSESSMENT METHODOLOGY

The process of determining impacts to be assessed is one of the most important parts of the environmental impact assessment process. It is of such high importance because the environmental impacts identified can and are often linked to the same impact stream.

In this method all impacts on the biophysical environment are assessed in terms of the overall integrity of ecosystems, habitats, populations and individuals affected. The Environmental Impact Assessment (EIA) 2014 Regulations promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) [as amended] requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social and economic environments.

The criteria identified in the EIA Regulations (2014) include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact;
- Frequency of the Impact;
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

Greenmined Environmental has developed an impact assessment methodology (as defined below) whereby the significance of a potential impact is determined through the assessment of the relevant temporal and spatial scales determined of the extent, magnitude and duration criteria associated with a particular impact.

This method does not explicitly define each of the criteria but rather combines them and results in an indication of the overall significance.

DEFINITIONS AND CONCEPTS:

Environmental significance:

The concept of significance is at the core of impact identification, evaluation and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- Environmental significance is a value judgement;
- The degree of environmental significance depends on the nature of the impact;
- The importance is rated in terms of both biophysical and socio-economic values; and
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

1.1. Nature of the impact

The nature of an impact can be defined as “a brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact”.

1.2. Extent of the impact

The extent of an impact can be defined as “a brief description of the spatial influence of the impact or the area that will be affected by the impact”.

Table 1: Determining the extent of an impact

EXTENT Extent or spatial influence of impact	Footprint	Only as far as the activity, such as footprint occurring within the total site area
	Site	Only the site and/or 500m radius from the site will be affected
	Local	Local area / district (neighbouring properties, transport routes and adjacent towns) is affected
	Region	Entire region / province is affected
	National	Country is affected

1.3. Severity of the impact

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 2: Rating of Severity

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

1.4. Duration of the impact

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

Table 3: Rating of Duration

Rating	Description
1	Very Short Term Up to three months (quarter) after construction
2	Short Term Three months to one year after construction
3	Medium Term One year to six years after construction
4	Long Term Six to ten years after construction
5	Permanent Beyond ten years after construction

1.5. Probability of the impact occurring

The probability of an impact can be defined as “the estimated chance of the impact happening”. Probability refers to how often the activity or aspect has an impact on the environment.

Table 4: Determining the probability of an impact

PROBABILITY	1	Description
	1	Almost never / almost impossible <i>Impossible</i> to occur (0 – 20% probability of occurring)

	2	Very seldom / highly unlikely	<i>Unlikely</i> to occur (20 -40% probability of occurring)
	3	Infrequent / unlikely / seldom	<i>May</i> occur (40-60% chance of occurring)
	4	Often / regularly / likely / possible	<i>Likely</i> to occur (60-80% chance of occurring)
	5	Daily / highly likely / definitely	Will <i>certainly</i> occur (80-100% chance of occurring)

1.6. Degree to which impact can be reversed

The reversibility of an impact can be defined as “the ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects”.

Table 5: Determining the reversibility of an impact

REVERSIBILITY	Reversible	Impacts can be reversed through the implementation of mitigation measures
	Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures

1.7. Determination of Likelihood:

The irreplaceability (likelihood) of an impact can be defined as “the amount of resources that can/can't be replaced”. The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 6 and 7.

1.8. Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

Example of calculating Overall Likelihood

Consequence	Rating
Duration	Example 4
Probability	Example 2
SUBTOTAL	6
TOTAL LIKELIHOOD (Subtotal divided by 2)	3

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

Rating of Frequency:

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 Months
3	Once/more a Month
4	Once/more a Week
5	Daily

1.9. Determination of Overall Environmental Significance:

The environmental significance assessment methodology is based on the following determination:

Environmental Significance = Overall Consequence X Overall Likelihood

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW, LOW-MEDIUM, MEDIUM, MEDIUM-HIGH** or **HIGH**, as shown in the table below.

Significance or Risk	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

Based on the above, the significance rating scale has been determined as follows:

- High** Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.
- Medium-High** Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
- Medium** Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, in case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.
- Low-Medium** Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
- Low** Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit
- Insignificant** There would be a no impact at all – not even a very low impact on the system or any of its parts.

1.10. Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: **Severity/Intensity, Duration and Extent/Spatial Scale**. Each factor is assigned a rating of 1 to 5, as described in the tables above.

1.11. Degree to which the impact can be mitigated

The degree to which an impact can be mitigated can be defined as “the effect of mitigation measures on the impact and its degree of effectiveness”.

Table 6: Determining the mitigation rating of an impact

MITIGATION RATING	MITIGATED Degree impact can be mitigated	High	<i>Impact 100% mitigated</i>
		Medium	<i>Impact >50% mitigated</i>
		Low	<i>Impact <50% mitigated</i>

1.12. Cumulative Impacts

The effect of cumulative impacts can be described as “the effect the combination of past, present and “reasonably foreseeable” future actions have on aspects”.

Table 7: Determining the confidence rating of an impact

CUMULATIVE RATING	CUMULATIVE EFFECTS	Low	<i>Minor cumulative effects</i>
		Medium	<i>Moderate cumulative effects</i>
		High	<i>Significant cumulative effects</i>

2. The positive and negative impacts that the proposed activity will have on the environment and the community that may be affected.

Two alternative sites were investigated for the application. Site Alternative 1 is preferred based on the following;

Site Alternative 1 (S1) (Preferred Alternative):

Positive Impacts:

- The mining site offers the mineral sought after;
- The mineral to be mined is already in aggregate form and will not need for hard blasting in order to loosen the material;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to R56. No new road infrastructure need to be constructed;

East Cape Farms – Geluk Quarry

- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. As maintenance and servicing of the equipment will be done at an off-site workshop the amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

Negative Impacts:

- Due to the remote location of the mining area very little negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document is not implemented and managed on-site; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

Site Alternative 2 was not considered the preferred site due to the following;

Site Alternative 2 (S2)

Positive Impacts:

- The site is near the mineral sought after;
- The alternative area will not have to compete with other land uses as all the activities can be contained within the boundaries of the site. Upon closure of the mining area, the land will revert back to agriculture; and
- The aggregate to be mined will be used for the upgrading of the roads in the vicinity of the activity. The alternative mining area will therefore contribute to the upgrading/maintenance of infrastructure in and around Elliot-Ugie area and indirectly contribute to the economy of the area.

Negative Impacts:

- The site alternative will counteract the visual aesthetic value of the area by being closer to the road;
- The site has not been previously disturbed before; thus the natural area needs to be cleared and is not preferred with regards to sustainable development;
- In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it;
- The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding land users if the mitigation measures proposed in this document is not implemented and managed on-site; and

East Cape Farms – Geluk Quarry

- ❏ Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

The remaining extent of the farm Geluk 104, Elliot, Eastern Cape Province is situated in an agricultural and mining setting to the east of the R56. The land use of the property comprises of the following:

- ❏ Agriculture – Mainly grazing
- ❏ Mining – Signs of previous mining activities for aggregate is evident on the farm.

The land use of the surrounding properties comprises of the following:

- ❏ Industrial – NONE
- ❏ Residents – Residents are situated 1.2km west and 800m north of the mining site
- ❏ Transport – Farm road is located 1.2 km from the proposed quarry, that is connecting to the R56 (adjacent to the site 780 m away)
- ❏ Agriculture – Grazing

Table 8: Impact Assessment of Driefonteinen Quarry MP

ature of Impact	Impact	Positive/Negative/Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
CONSTRUCTION / SITE ESTABLISHMENT PHASE																					
ACTIVITY:	DEMARCATON OF SITE WITH VISIBLE BEACONS.																				
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neu																			
ACTIVITY:	ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.																				
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neu																			
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	1	1	4	2	3	5	3	6	Low-Med	1	1	4	2	2	5	3	6	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High	1	2	5	3	5	5	5	13.3	Med-High
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighboring areas. Alien invasive encroachment	Neg	Reversible	1	4	4	3	5	5	5	15	Low-Med	1	4	4	3	5	5	5	15	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9.33	Low-Med	1	1	5	2	1	5	3	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med	1	1	2	1	2	3	3	3.33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	1	1	3.67	Low	1	5	5	4	1	1	1	3.67	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behavior of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4.67	Low	1	2	4	2	2	1	2	3.5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low

SUB ACTIVITY: ABLUTION FACILITIES																					
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
SUB ACTIVITY: ACCESS ROADS																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: SITE OFFICES																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: VEHICLE SERVICE AREA																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med

Environmental Impact Assessment

Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: WASH BAY																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: WORKSHOP																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighboring areas. Alien invasive encroachment	Neg	Reversible	1	4	4	3	5	5	5	15	Med-High	1	4	4	3	2	1	2	4.5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: SALVAGE YARD																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med

Environmental Impact Assessment

Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES																					
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: GENERATOR AREA (BUNDED)																					
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
SUB ACTIVITY: WEIGH BRIDGE																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low

Environmental Impact Assessment

SUB ACTIVITY: PARKING AREA																					
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
SUB ACTIVITY: WASTE AREA																					
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High	4	4	4	4	5	5	5	20	High
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrances to nocturnal animals and change in behavior of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4.67	Low	1	2	4	2	2	1	2	3.5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
ACTIVITY: STRIPPING AND STOCKPILING OF TOPSOIL																					
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High	1	2	5	3	5	5	5	13.3	Med-High
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighboring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13.3	Med-High	1	3	2	2	2	2	2	4	Low
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9.33	Low-Med	1	1	5	2	1	5	3	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med	1	1	2	1	2	3	3	3.33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	5	3	11	Med	1	5	5	4	1	3	2	7.33	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low

Environmental Impact Assessment

Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrances to nocturnal animals and change in behavior of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4.67	Low	1	2	4	2	2	1	2	3.5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
OPERATIONAL PHASE																					
ACTIVITY:	DRILLING AND BLASTING																				
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighboring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13.3	Med-High	1	3	2	2	2	2	2	4	Low
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9.33	Low-Med	1	1	5	2	1	5	3	7	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High	1	2	5	3	5	5	5	13.3	Med-High
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med	1	1	2	1	2	3	3	3.33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	5	3	11	Med	1	5	5	4	1	3	2	7.33	Low-Med
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med

Environmental Impact Assessment

Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behavior of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4.67	Low	1	2	4	2	2	1	2	3.5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Social & Safety	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	Neg	Reversible	1	4	4	3	3	3	3	9	Low-Med	1	4	1	2	2	1	2	3	Low
ACTIVITY:	EXCAVATION																				
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighboring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13.3	Med-High	1	3	2	2	2	2	2	4	Low
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High	1	2	5	3	5	5	5	13.3	Med-High
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9.33	Low-Med	1	1	5	2	1	5	3	7	Low-Med
Hazardous Waste	Dust nuisance due to loading and transportation of the material	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med	1	1	2	1	2	3	3	3.33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	5	3	11	Med	1	5	5	4	1	3	2	7.33	Low-Med
Noise	Noise nuisance generated by excavation equipment	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behavior of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4.67	Low	1	2	4	2	2	1	2	3.5	Low
Social & Safety	Unsafe working conditions for employees	Neg	Reversible	1	4	4	3	3	3	3	9	Low-Med	1	4	1	2	2	1	2	3	Low

Environmental Impact Assessment

Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
ACTIVITY:	CRUSHING AND SCREENING OF AGGREGATES																				
Noise	Noise nuisance caused by crushing plant.	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behavior of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4.67	Low	1	2	4	2	2	1	2	3.5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
ACTIVITY:	TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS																				
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med

Environmental Impact Assessment

Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	2	2	4	3	3	2	3	6.67	Low-Med	2	1	4	2	2	2	2	4.67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
DECOMMISSIONING PHASE																					
ACTIVITY:	SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)																				
Soils	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med	1	3	5	3	2	1	2	4.5	Low
Soils	Soils replaced and ameliorated	Pos	Reversible	1	3	4	3	3	5	4	10.7	Med	1	3	4	3	2	3	3	6.67	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighboring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13.3	Med-High	1	3	2	2	2	2	2	4	Low
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9.33	Low-Med	1	1	5	2	1	5	3	7	Low-Med
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	1	2	5	3	2	5	4	9.33	Low-Med	1	2	5	3	2	3	3	6.67	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med	1	1	2	1	2	3	3	3.33	Low
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	2	1	3	2	2	5	4	7	Low-Med	2	1	3	2	2	3	3	5	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	1	1	2	1	1	5	3	4	Low	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med	2	2	2	2	3	2	3	5	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	2	4	3	3	5	4	10.7	Med	2	2	4	3	2	5	4	9.33	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	1	3	2	1	5	3	6	Low-Med	2	1	3	2	1	3	2	4	Low
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	1	4	4	3	3	3	3	9	Low-Med	1	4	1	2	2	1	2	3	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	2	3	5	3	4	2	3	10	Med	1	3	1	2	2	2	2	3.33	Low
ACTIVITY: Application for Closure Certificate																					

Cumulative Impacts

Table 9: Cumulative Impact Assessment of Driefonteinen Quarry

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating	Mitigation
CONSTRUCTION AND OPERATIONAL PHASES													
ACTIVITY: Utilization of haul and access roads within the mining right area													
SUB ACTIVITY: Truck and heavy machinery operations													
Traffic & Safety	Increased potential for road incidences	Neg	Reversible	2	3	1	2	3	1	2	4	Low	All intersections with main tarred roads will be clearly signposted. Drivers will be enforced to keep to set speed limits. Trucks will be in road-worthy condition with reflective strips.
Traffic & Safety	Road degradation	Neg	Reversible	1	3	1	1.666667	2	1	1.5	2.5	Low	A fund will be set aside (with the two similar mines in close vicinity of the Driefonteinen) to maintain the serviceability of the road verge where the trucks approach or depart from the main road.