

IMPACTS OF THE AQUIFER RECHARGE PROJECT PROJECT

| No. | ENVIRONMENTAL IMPACT | IMPACT SOURCE/DESCRIPTION | Intensity | Duration | Severity | Extent | Consequence | Probability | Impact Significance | | | MITIGATION |
|--|---------------------------|--|-----------|----------|----------|--------|-------------|-------------|---------------------|-----------------------|-----------------|--|
| | | | | | | | | | Without Mitigation | Mitigation Confidence | With Mitigation | Mitigation Measure |
| 1.2. OPERATIONAL PHASE | | | | | | | | | | | | |
| 1.2.1. DIRECT OPERATIONAL IMPACTS | | | | | | | | | | | | |
| PHYSICAL ENVIRONMENT | | | | | | | | | | | | |
| 1.1.2.1 | Soils and land capability | <p>The removal of natural vegetation and topsoil might lead to the erosion of the cleared area. Storm water runoff is likely during heavy rainfall episodes.</p> <p>Soil compaction resulting from movement of heavy machinery along access roads and at drill sites. Soil contamination from drilling mud, oil and diesel spills.</p> <p>The proposed aquifer recharging will occur within the property boundary and mining rights area of the Kolomela Mine. The impacts of the proposed project on the land capability, land use, soils and agricultural potential concluded that there should be no discernible impacts on the aforementioned sites as a result of the aquifer recharging.</p> | 3 | 2 | 2.5 | 1 | 1.8 | 0.8 | 1.4 | High | Low | <ul style="list-style-type: none"> Monitoring to ensure that post-construction rehabilitation has been successful and implement measure if required. Erosion must be managed through adequate control and mitigation. Early identification of erosion-prone areas is essential. Ensure that soil is rehabilitated around the installed infrastructures, as well re-vegetated with indigenous seed mix where applicable. |
| 1.1.2.2 | Groundwater Quantity | <p>There are two aspects to this potential impact. The first being that an increase in the water table can change the hydrological gradient/pressure of the larger area. The second being that an increase in water table will give plant communities access to more available water source and may cause local vegetation to flourish in the area. However without appropriate monitoring of the vegetation invasive species can also become a significant problem of the entire area.</p> | 4 | 4 | 4.0 | 4 | 4.0 | 0.8 | 3.2 | High | Low | <ul style="list-style-type: none"> Initiate studies on soil: The identification and distribution of soil types in the immediate vicinity; soil classification and Soil mapping. Initiate soil water balance studies: Transpiration coefficient of different tree species and the dominant species in the herbaceous layer; Influence of rise and fall of the water level on sedges in the riverbed. Incorporate into mines groundwater studies. Incorporate into mines vegetation studies. Integration of the above. Identify risks to the environment associated with the recharge activities. Erosion sensitive areas must be identified and regular monitoring undertaken to ensure once the impact occurs it is stabilised and rehabilitated immediately. |

| No. | ENVIRONMENTAL IMPACT | IMPACT SOURCE/DESCRIPTION | Intensity | Duration | Severity | Extent | Consequence | Probability | Impact Significance | | | MITIGATION |
|-------------------------------|---|---|-----------|----------|----------|--------|-------------|-------------|---------------------|-----------------------|-----------------|---|
| | | | | | | | | | Without Mitigation | Mitigation Confidence | With Mitigation | Mitigation Measure |
| 1.1.2.3 | Groundwater quality | Groenwaterspruit boreholes results indicate them to be slightly alkaline, slightly saline and has elevated magnesium values, which gives it a fairly high total hardness. The differences between the inject waters and the receiving groundwater indicated the inject water is of a better quality than the Groenwaterspruit groundwater. It is therefor not expected that the aquifer recharging will have water quality problems. The injected water is expected to improve the groundwater quality of the Groenwaterspruit Groundwater. | 3 | 4 | 3.5 | 4 | 3.8 | 0.8 | 3.0 | | High + | <ul style="list-style-type: none"> • Geochemist must be approached to assess the stability of the injectant and the in situ compatibility of these waters. • Water quality monitoring should be incorporated into the mines monitoring networks. |
| Biological Environment | | | | | | | | | | | | |
| 1.1.2.4 | Increased invasion by exotic plant species following vegetation disturbance | Various exotic/invasive plants were observed on site. Soil and indigenous vegetation disturbances during construction may lead to proliferation of alien vegetation; where such aliens would compete for space and available resources; | 2 | 3 | 2.5 | 4 | 3.3 | 1 | 3.3 | High | Low | <ul style="list-style-type: none"> • In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998, landowners are legally responsible for the control of invasive alien plants on their properties and it is therefore recommended that declared weed and invader species be removed from the subject property; • This action must be followed up regularly to prevent regrowth or seedling growth. • It must be continuously monitored. |
| 1.1.2.5 | Pedestrian and vehicle traffic will disturb vegetation, create tracks and pathways on the site. | Regular maintenance and monitoring at the site will require workers and vehicles to access the area. This would result in vehicle and pedestrian tracks to be created on site. | 2 | 3 | 2.5 | 3 | 2.8 | 1 | 2.8 | High | Low | <ul style="list-style-type: none"> • Operational area should be demarcated. • No traffic or movement of people should be allowed outside the demarcated areas. |

| No. | ENVIRONMENTAL IMPACT | IMPACT SOURCE/DESCRIPTION | Intensity | Duration | Severity | Extent | Consequence | Probability | Impact Significance | | | MITIGATION |
|--|-----------------------------------|---|-----------|----------|----------|--------|-------------|-------------|---------------------|-----------------------|--------------------|--|
| | | | | | | | | | Without Mitigation | Mitigation Confidence | With Mitigation | Mitigation Measure |
| 1.1.2.6 | Collecting of medicinal plants. | The site has been categorised with the presence of protected medicinal plants and harvesting of these protect species is area of concern. | 2 | 3 | 2.5 | 4 | 3.3 | 1 | 3.3 | High | Low | <ul style="list-style-type: none"> Pre-construction the staff should receive environmental education to ensure that no harvesting of medicinal plants occurs. This should form the standard procedure for all employees working on the site during the operational life of the facility. |
| 1.1.2.7 | Loss of animal life | Poaching, disturbance of habitats, noise. | 2 | 3 | 2.5 | 3 | 2.8 | 0.8 | 2.2 | High | Low | <ul style="list-style-type: none"> Minimise footprint areas of disturbance Impose strict penalties for poaching. Environmental awareness training of staff. |
| SOCIAL AND ECONOMIC ENVIRONMENT | | | | | | | | | | | | |
| 1.1.2.8 | Roads, Traffic and Infrastructure | The proposed operational activities will results in a slight increase in movement of heavy motor vehicles and vehicles which will increase traffic and place additional pressure on the road infrastructure. This is not expected to be very limited. | 2 | 2 | 2.0 | 2 | 2.0 | 0.8 | 1.6 | Medium | Low | <ul style="list-style-type: none"> Control measures will be applied at the mining area such as dust suppression using water and chemicals. Appropriate speed limits for all vehicles must be strictly enforced to reduce the dust nuisance for the surrounding communities. (These are mitigation measures more for air quality and visibility than for roads and infrastructure). |
| 1.1.2.9 | Society in general | Aquifer recharging will maximise local natural storage, improve water quality, restore groundwater levels, improv well field production, maintain the reserve, have minor environmental imprint, require minimal land use and store large quantities of water for future use. | 3 | 4 | 3.5 | 4 | 3.8 | 0.8 | 3.0 | | Positive High | <ul style="list-style-type: none"> The aquifer recharge should aim to efficiently maximise the disposal rate into the aquifer. The aquifer recharging should be expanded to areas surrounding the entire mine (if feasible). |
| 1.1.2.10 | Economic Impact | Kolomela Mine is a large contributor to the economy of the Northern Cape. The purpose of the project is to enable Kolomela Mine to mange their water resource more efficiently and sustainably as to continue producing iron ore at the grades demanded by its clients and the world market. The majority of the economic activities in the area are linked to the mines in some way. The project is necessary because of the continued progression of the opencast mine pits and the mines responsibility to ensure that the operations is done in a suitable manner as far as possible. | 4 | 4 | 4.0 | 5 | 4.5 | 1 | 4.5 | N/A | Positive Very High | <ul style="list-style-type: none"> No mitigation measures required. |