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MILNEX CC

ENVIRONMENTAL CONSULTANTS

053 963 1081
072 998 6008

4 Botha Street
SCHWEIZER-RENEKE

018 011 1925
072 998 6008

Waterberry Street, Waterberry
Square, 1st floor, Office 7
POTCHEFSTROOM

073 792 0081
072 998 6008

c/o Welgevonden Street &
Memorial Road, Royleglen Office Park
KIMBERLEY

072 039 3439
072 998 6008

BLOEMFONTEIN

✉ info@milnex-sa.co.za www.milnex-sa.co.za

Rehabilitation Plan and Closure Plan

THE PROPOSED PROSPECTING RIGHT APPLICATION WITHOUT BULK SAMPLING FOR THE PROSPECTING OF DIAMONDS ALLUVIAL (DA), DIAMONDS GENERAL (D), DIAMONDS IN KIMBERLITE (DK) & DIAMONDS (DIA) ON PORTION 3 OF THE FARM DEELFONTEIN 237, REGISTRATION DIVISION: HOPETOWN RD, NORTHERN CAPE

NAME OF APPLICANT	Mr Petrus Van Der Walt Vermeulen
PREPARED BY	Milnex CC
REFERENCE NUMBER:	NC30/5/1/1/3/2/13048PR

Prepared by

Milnex CC

PO Box 1086, Schweizer-Reneke, 2780. Tel: (018) 011 1925, Fax 087 231 7021

E-mail: info@milnex-sa.co.za

INTRODUCTION

Milnex CC was contracted by **Mr Petrus Van Der Walt Vermeulen** as the independent environmental consultant to undertake the Rehabilitation Plan & Closure Plan for the proposed Prospecting Right application without bulk sampling for the prospecting of Diamond (Alluvial), Diamond (General), Diamonds (Kimberlite) & Diamonds (DIA) including associated infrastructure on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

REHABILITATION AND CLOSURE PLAN

In order to obtain a self-sustainable and stable closure plan, the following will be done where natural vegetation had been disturbed during the prospecting process.

AIMS AND OBJECTIVES OF REHABILITATION AND ALIEN INVASIVE SPECIES CONTROL

The objectives of the alien invasive control and rehabilitation are to provide:

Measures to restore riparian ecosystem functioning by:

- 1) identifying the setting and functioning of the riparian zone prior to impacts and then
- 2) recommend measures that would address the ecological integrity (ecosystem functioning and hydrology) of the ecosystems at the site.

At the impacted wetland areas and terrestrial ecosystems the clearing of footprint around the impact should take place as far as possible. Management of machinery and waste (movement, storage, handling) and management of sanitation and waste (movement, storage) should be done in such a way that the least possible impacts on the riparian zone occur. Overall all existing sources of negative impacts that also threaten the goals and successful outcome of the rehabilitation processes should be avoided or limited as far as possible. To identify and address the sources of unwanted impacts is one of the vital first steps in the rehabilitation process to avoid further damage and subsequently also avoid unnecessary costs of damage control and of rehabilitation.

(a) Rehabilitation and Closure

The clearing of soil surface areas would be restricted to what is really necessary for prospecting or the construction of infrastructure. During the closure of these sites, or where vegetation is lacking or compacted, the areas would be ripped or ploughed and levelled in order to re-establish a growth medium and if necessary appropriately fertilized to ensure the regrowth of vegetation and the soil ameliorated based on a fertilizer recommendation (soil sample analyzed).

As the project progresses there will be an increase in the topsoil surface area disturbed initially but also at the same time concurrent rehabilitation will take place which involves the replacement of topsoil on backfilled pit/trench areas.

(i) Rehabilitation of wetlands (should the applicant prospect in any water bodies, a Water Use Licence will have to be applied for)

- Rehabilitation of wetlands within the mining landscape requires an ecosystem (as opposed to a species) approach because of the inter-connectedness of wetlands in landscapes.
- All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material.
- All rehabilitation activities should occur in the dry season.
- Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat.
- Rehabilitation should limit fragmentation and isolation of sections of the non-perennial drainage line systems.
- The riparian structure and function must be reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at pre-mining levels.

(ii) Rehabilitation of access roads (if any)

- Whenever a prospecting right is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.
- Any gate or fence erected by the holder which is not required by the landowner / tenant, shall be removed and the situation restored to the pre prospecting situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilized (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the prospecting operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

(iii) Rehabilitation of the surface pitting site

On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), which states:

- (1) *When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -
(A & B) which may not be demolished in terms of any other law;
(C) which has been identified in writing by the Minister for purposes of this section; or
(D) which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.*
- (2) *The provision of subsection (1) does not apply to bona fide mining equipment which may be removed*

After all the foreign matter has been removed from the sites, the excavations shall be backfilled with subsoil, compacted and levelled with previously stored topsoil. No foreign matter such as cement or other rubble shall be introduced into such backfilling.

All rescued indigenous plants should be bagged and kept on a designated on-site nursery, and should be returned to site once all prospecting is completed and rehabilitation of disturbed areas is required. Replanting should only occur in springs or early summer (September to November), once the first rains have fallen, in order to facilitate establishment

Seed should be collected from plants earmarked for removal prior to disturbance, in order to reduce the impact on plants. If seeds are collected from nearby seedbanks, it may indirectly affect the availability of seed as a source of food for a variety of animals and birds.

On completion of the prospecting operation, the above areas shall be cleared of any contaminated soil. The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilized if necessary (based on a soil analysis). The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. Where the site has been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.

Photographs of the camp and office sites, before and during the prospecting operation and after rehabilitation and closure, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

Photographs of the different drill and pitting sites, before and during the prospecting, after rehabilitation and closure, shall be taken at selected fixed points and kept on record for the regional manager's information.

Rehabilitation of the new topographical landscape in such a way that it would blend in with the surrounding landscape and allow normal (controlled) surface drainage to continue.

Implement water control systems in order to prevent erosion.

Visual impact would be addressed by means of;

- Re-vegetation (grasses);
- Removal of any building, scrap, domestic waste, etc. that would otherwise contribute to a negative visual impact.

(iv) Borehole Decommissioning

Generally the decommissioning process involves:

Define the objectives: This objectives of decommissioning a borehole usually take into account removing trip/fall hazards, preventing the borehole acting as a conduit, stopping the mixing of water from different aquifers and to stop the wastage of borehole water from the overflow from artesian boreholes.

Remove the headworks and casing: This process ensures the well is free from an obstructions that could interfere with the sealing of the borehole itself.

Backfilling: This is where the borehole is filled to restore to its pre drilled condition. This requires a wide range of materials and must be carried out by a well drilling contractor who knows the area. Certain materials may change under the environmental / pH conditions they are subject to specific to the area. Artesian boreholes must also be treated differently

Sealing of the borehole: The backfilled borehole should then be capped and sealed (with an impermeable plug) to prevent entry of any foreign objects or contaminated water.

Recording of details: Any firm carrying out the decommissioning of a borehole should keep accurate records of the job in question. This is both for their own internal record keeping and to inform others that there is a decommissioned borehole within a specific area.

On completion of the prospecting operation, the above areas shall be cleared of any contaminated soil. The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilized if necessary (based on a soil analysis). The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. Where the site has been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.

Photographs of the camp and office sites, before and during the prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

Photographs of the different drill and pitting sites, before and during prospecting and after rehabilitation, shall be taken at selected fixed points and kept on record for the regional manager's information.

Photographs of the different boreholes, before and during prospecting and after decommissioning, shall be taken at selected fixed points and kept on record for the regional manager's information.

Rehabilitation of the new topographical landscape in such a way that it would blend in with the surrounding landscape and allow normal (controlled) surface drainage to continue.

Implement water control systems in order to prevent erosion. Seed the area (see C. (below) for recommended seed mixture).

Visual impact would be addressed by means of;

- Re-vegetation (indigenous grass);
- Removal of any building, scrap, domestic waste, etc. that would
- otherwise contribute to a negative visual impact.

(iv) Fertilizing of areas to be rehabilitated

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

(v) Seeding of Indigenous Seed Mixture and planting of Indigenous Species

The eventual seed mixture takes into account the availability of seed, different soil situations and the prevailing climatic conditions of the area. Seed mixtures of indigenous species for that area needs to be used.

(vi) Demolition of infrastructure/buildings

On completion of operations, all buildings, structures or other on the prospecting terrain shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act,2002 (Act No. 28 of 2002).

(vii) Invasive and alien control programme

Develop and implement an invasive and alien control programme to control the spread of weeds and other invasive species. Eradicate exotic weeds and invader species if it invades the terrain. All illegal invader plants and weeds shall be eradicated as required in terms of Regulation 15 & 16 of the Act on Conservation of Agricultural Resources, 1983 (Act no. 43 of 1983) which list the plants.

Monitor re-vegetation progress and administer alien plant control

- Recovery of disturbed areas should be assessed by the ECO after prospecting has ceased to assess the success of rehabilitation actions.
- Any areas that are not progressing satisfactorily must be identified (e.g. on a map) and action must be taken to actively re-vegetate these areas. If natural recovery is progressing well, no further intervention may be required.
- Alien plants need to be actively managed and eradicated from the site, with adequate monitoring and follow-up measures.

Remove any waste products

- All waste products (spoil, hazardous substances and general litter) need to be removed and disposed of in proper local waste facilities.
- Minimize additional disturbance by limiting the use of heavy vehicles and personnel during clean-up operations.

INTEGRATED ECOLOGICAL MANAGEMENT: ALIEN INVASIVE CONTROL AND REHABILITATION PLAN

Very basic principles that should accompany all rehabilitation actions are that these rehabilitation interventions should be safe, low-risk to human well-being and that the methods should be adaptive in relation to continuous monitoring and where necessary updating of methods.

The principle that the rehabilitation plan should be adaptive includes that monitoring of i) the consequences of rehabilitation interventions and/or ii) knock-on effects of the original impacts and/or iii) continuous effects of past and present impacts should take place and appropriate actions then continuously updated.

Overall these principles on which rehabilitation are based means that less drastic interventions that work with nature are to be favoured rather than more drastic interventions. More drastic and/ or artificial methods are only chosen where these are the only options left and the necessary infrastructure is available to implement and operate such drastic interventions. Project design should enhance the natural recovery of the system by working with natural processes and dynamics (Kotze *et. al.* 2009). The scale of disturbance and resources available are overall important to consider in the rehabilitation process.

CLOSURE OBJECTIVES AND THEIR EXTENT

The main closure objective for the prospecting site is to rehabilitate the whole prospecting site in such a way to ensure that the new man-made topographical landscape would blend in with the surrounding landscape, not pose a safety hazard to humans and animals, while at the same time allow for alternative land uses. Establish a self-sustaining and stable vegetation cover in order to mitigate the visual impact, to control erosion and to create some habitat for animals. The rehabilitated environment also needs to be aesthetically acceptable according to the principle of BPEO. Another main objective is to manage the surface water in such way that an acceptable water standard is achieved when a closure certificate is issued.

Mr Petrus Van Der Walt Vermeulen will ensure that the prospecting Operation/Sites are:

- Neither a danger to public health and safety nor to animal health and safety;
- Not a source of any pollution;
- Stable (ecological and geophysical);

- Rehabilitated to the state that is suitable for the predetermined and agreed land use;
- Compatible with the surrounding biophysical environment;
- A sustainable environment;
- Aesthetically acceptable;
- Not an economic, social or environmental liability to the local community or the state now or in the future.

Mr Petrus Van Der Walt Vermeulen will furthermore:

- ensure that the physical and chemical stability of the rehabilitated and closed prospecting site will be such that risk to the environment is not increased by naturally occurring forces to the extent that such increased risk cannot be contended with by the installed measures;
- subscribe to the optimal exploitation and utilization of South Africa's mineral resources (Diamonds);
- ensure that the prospecting site is closed efficiently and cost effectively.
- ensure that the operation is not abandoned but closed in accordance with the relevant requirements;
- ensure that the interest of all interested and affected parties will be considered;
- ensure that the all-relevant legislation regarding prospecting closure will be adhered to, and all relevant application procedures followed.

DECOMMISSIONING PHASE

- During the decommissioning Phase, the applicant will be responsible for the maintenance of the rehabilitation plan and management thereof. This is particularly pertinent with reference to the two years monitoring of alien vegetation, as well as erosion and incision control for the operational life of the development as defined in this rehabilitation plan.
- During this Phase, the applicant should consider that the land should be rehabilitated back to its original use which is agriculture.

Table 2 below gives Post- Rehabilitation Phase Mitigation and Rehabilitation Measures

Table 2: Post- rehabilitation Phase Mitigation and Rehabilitation Measures

Impact	Activities resulting in impact	Objective requirement or	Mitigation and Rehabilitation measures
Impact on riparian and wetland habitat and ecological structure	<ul style="list-style-type: none"> Impacts on riparian and wetland habitat due to alien plant species proliferation; Contamination of soils due to a lack of infrastructure maintenance; Ineffective monitoring leading to continued erosion and increased siltation of riparian and wetland areas. 	Clearing of alien vegetation in the vicinity of the wetland and watercourse.	<ul style="list-style-type: none"> Removal of alien and invasive species must continue for a two years' on the prospected areas; and After the two year period, an annual eradication exercise using non-mechanised methods is deemed suitable for management of alien species on the prospected areas.
		Monitoring of rehabilitation works	<ul style="list-style-type: none"> Upon completion of rehabilitation works on site, the ECO or a suitably qualified specialist should continue to monitor the rehabilitation works for three months on a monthly basis. Thereafter, one monitoring site visit is recommended after 6 months from completion of rehabilitation works and final sign-off of rehabilitation works should take place after one year.
		Revegetation	<ul style="list-style-type: none"> All bare and exposed soils noted during a two year maintenance period, including areas where alien vegetation is periodically removed, must be re-seeded using the specified indigenous veld grass mixture.
Impact on riparian and wetland hydrological function and sediment balance	<ul style="list-style-type: none"> Inefficient aftercare and maintenance leading to continued latent impacts on riparian and wetland areas; and Ineffective monitoring leading to continued erosion and increased siltation of riparian and wetland areas. 	Ensure that the hydraulic connectivity of the watercourse is maintained	<ul style="list-style-type: none"> Loss of stream continuity should be prevented through ensuring that no obstructions of natural stream flow patterns occurs; Upon completion of rehabilitation works on site, the ECO or a suitably qualified specialist should continue to monitor the rehabilitation works for three months on a monthly basis. Thereafter, one monitoring site visit is recommended after 6 months from completion of rehabilitation works and final sign-off of rehabilitation works should take place after one year.