

**SAXON HEAVY MINERALS (Pty) Ltd - HEAVY MINERAL PROSPECTING,
HONDEKLIPBAAI, NORTHERN CAPE**

REHABILITATION

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REHABILITATION PLAN

A number of studies concerning rehabilitation have been carried out in the Namaqualand Region. These projects have reflected variable success with the outcome of interventions to enhance restoration of disturbed and / or degraded sites.

One of the most important principles identified by the author is that **maximum retention of natural vegetation is fundamental in any rehabilitation programme. In this case hand drilling will take place in highly sensitive ecological areas , within 2 km radius of the Spoegrivier caves, 300 m from the HWM of the sea. No new tracks or veld driving will be allowed in highly sensitive ecological areas and 100 m from the HWM of the sea. No drilling will be allowed 600 m from the Spoegrivier riparian zone and estuary and no drilling within 1.5 km from the Spoefrivier caves. This avoidance approach will reduce disturbance in sensitive areas and the need for rehabilitation.**

Owing to the highly arid environment in which the prospecting project would take place, any disturbance (removal or trampling of vegetation) would take a long time to remedy. This is the principle reason for a precautionary approach whereby the habitat is disturbed as little as possible while still permitting the necessary activities for successful prospecting.

Apart from possible (probable) removal of vegetation at the drilling sites the other major anticipated negative impact would be unavoidable compaction of the soil. Taking this and other impacts into account, it is proposed that the following basic restorative steps should be taken at each site:

- (i) Once drilling has been completed at any site, the equipment and samples should be removed.
- (ii) The site should be decontaminated of any oil or chemical spills.
- (iii) The site should be de-compacted by hand using picks, shovels, forks and hoes to break up the topsoil which should then be raked by hand. (The reason for this to be done by hand is to prevent any further compaction by vehicles or machinery).

- (iv) An appropriate seed-mix (determined from the composition of the surrounding undisturbed vegetation) should be obtained and broadcast over the disturbed drilling site. The seed should then be lightly raked into the soil.
- (v) No watering of the site should take place; the seed should be allowed to germinate under the natural climatic regime to prevent die-off if germination occurs after an artificial regime caused by watering.
- (vi) The sites should be monitored over a two-year period for success or otherwise of revegetation. If initially unsuccessful, a second attempt should be carried out.
- (vii) All restoration interventions should be carried out under the supervision of a qualified restoration ecologist or landscape practitioner.

Aspect/Impact	Rehabilitation Measure	Monitoring Frequency and Responsibility
Vegetation	Considering that intact vegetation will be avoided by moving the drill site to an adjacent impacted area (micro-sitting) very little vegetation will be disturbed. A large portion of the area has been intensively disturbed by mining. If vegetation is in conflict with a drill site, it will not be uprooted but rather cut back, to allow continued root growth. Due to the harsh environment no re-vegetation will take place.	Once-off, after site is completed, checked by on site Geologist
Backfill of drill hole	Drill holes will automatically fall in due to sandy nature of the area and it will be backfilled with left over drill material (Excess residue will be used first and topsoil used last) until level with natural ground. Three months after drilling the rehabilitation team will visit each hole and do further backfilling where required avoiding open dangerous holes.	Immediately after backfilling and 3 months later checked by on site Geologist and rehabilitation team
Soil compaction	The drill rig will be at a drill hole for 2-3 hours. Compaction is therefore limited. After the hole is Backfilled the site will be raked by two workers to allow for the complete exposure of the substrate soil. Care should be taken not to damage vegetation during raking. Seed-mix applied over the disturbed drilling site need to be lightly raked into the	Immediately after drill rig leave the site, checked by on site Geologist

	soil.	
New off-road tracks	No driving is allowed on the beach and within 100 m from the hwm of the sea. When a new off-road track was used to access a drill site, two workers will close and rake the tracks after use, to avoid other vehicles using the same route. Place obstructive stones or natural debris where new tracks turn of existing tracks to discourage new routes. Track closure needs to be substantial to block 4x4 vehicles from entering new areas.	Immediately when new track is no longer used, when drill rig don't need to use the same tracks to exist the site. Checked by on site Geologist. During 3 month follow-up check, closed new tracks need to be checked.
Erosion protection	Protect all areas susceptible to erosion within the drill site or on the off-road tracks and ensure that there is no undue soil erosion resultant from activities within and adjacent to the site. Retain shrubbery and vegetation wherever possible. Perform regular monitoring and maintenance of erosion control measures.	While working in the area, check by on site Geologist. Check 3 months later during follow-up.
Waste Removal	Clear the site of all inert waste. Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site.	Immediately once-off, check by on site Geologist. Check 3 months later during follow-up.
Monitoring	Visit site 3 months after rehabilitation. Continue monitoring over a two-year period for success if not a second attempt should be carried out.	Geologist and landscape practitioner.