

PLANT REMOVAL AND RELOCATION PROJECT OF NAMWASTE MANAGEMENT FACILITY

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PREPARED BY:

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1. BACK GROUND

The Plant Removal Project of the Namwaste Management Facility (NMF) is situated west of Arandis, accessed via the main security gate of Orano Trekkopje Mine.

The NMF development area is characteristic of the Namib Dessert and falls within a semi-arid savanna environment, marked by low and irregular rainfall. The landscape predominantly comprises rocky plains, sandy soils, and areas of gravel dessert with sparse vegetation that is typically drought-resistant and well adapted to harsh conditions.

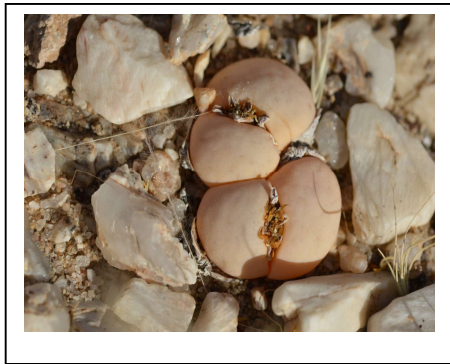


2. AIM

The aim of this project was specifically focused on locating *Lithops* plants within the NMF development area, relocating these rare specimens approximately 100 meters outside the designated zone, and develop a strategy to ensure their successful survival.

3. SITE INSPECTION

The site was inspected on 16 June 2025. During the inspection, about 70 ***Lithops ruschiorum*** were found on a small hill located near the center of the area, just within the DF03 – DF04 boundary. A second small hill was also identified approximately 70 meters outside the boundary, directly opposite the first hill about 100 ***Lithops ruschiorum*** plants were also found on this second hill, which appeared to be well suited for the relocation of these rare plants.



This distinctly Namib Desert specie was first collected by Ernst Rusch in 1923 and named in honour of the Rusch family. Each plant consists of a single root system (known as the merry stem) and one or more “head” each bearing two leaves. The top of the head is referred to as the “face” of the plant. These plants are easily recognizable by its typically humped heads, which range in colour from whitish-grey to pinkish-yellow. In younger plants the “heads” are mostly round, whereas older specimens may become oval or slightly kidney-shaped. The two leaves of a “head”

are usually unequal in size. Individual plants may possess twenty and more “heads”. This variety occurs along the Namib Desert – from just North of Swakopmund, extending north-east along the coast and reaching about 90 km inland. Populations vary from small to very large; one known stand near Swakopmund comprises over one thousand plants.

4. BOTANICAL FINDINGS

The following plants species have been recorded within the development zone:

Tetraena stapfii (dollar shrub) grows predominate in the development zone. It is a hardy endemic desert shrub that thrives in the Namib Desert mist zones and is resilient on coastal sand and gravel plains. It stabilizes soils in extreme conditions, provides forage and shelter for native wildlife, and its antioxidant and antibacterial effects holds untapped potential in traditional medicine that warrant further pharmacological research.



Arthraerua leubnitziae (pencil shrub). Endemic to Namibia. Previous studies shown that small rodents, Springbok and Hares have all been feeding on this shrub. Desert mice often build their nests within it, where the structure provides protection from extreme temperatures. Desert snakes and small lizards commonly use these shrubs and associated rodent burrows as sheltered refuges

Tripteris micocarpa is a perennial multi-stemmed plant, typically ranging from 30 – 150 cm in height. Found on rocky outcrops and gravel plains in the Namib dessert. It thrives in its native Namib desert habitat favouring rocky outcrops and gravel plains. As an endemic species, it is well adapted to harsh, arid conditions, forming succulent leaf rosettes that help conserve moisture and endure intense heat. Its bright yellow, daisy-like flower heads are nectar-rich and attract a variety of pollinating insects. Following pollination, the plant produces three-winged achenes-seeds that can be consumed by small rodents, while also dispersing by wind. The woody stems and fallen leaf litter create shelter and microclimates that support diverse small fauna and invertebrates, contributing to nutrient cycling and soil health. Furthermore, the extensive root system stabilizes the soil on rocky slopes, helping to prevent erosion and maintain structural integrity of its environment.





Euphorbia phylloclade is a small tuberous succulent herb native to the gravel plains and rocky slopes around Arandis. Growing up to 15m tall, it forms low clumps with fleshy, opposite leaves and produces tiny cyathia nestled among its leaf clusters during the summer rainfall season. Adapted to arid conditions, it plays a role in ground-level vegetation cover and may support small insect populations, although it is generally avoided by large herbivores due to its latex

content. Like many *Euphorbia* species, it contains a milky sap that can be irritant or toxic, suggesting possible traditional medicinal or protective uses, though direct ethnobotanical records for this species are limited.



Geigeria ornativa is a drought-tolerant herbaceous plant found near Arandis in central-western Namibia, thriving in arid habitats such as gravel plains, rocky slopes, and sandy soils within the Namib Desert transition zone. While well adapted to extreme heat and low rainfall, the plant has limited food value due to its toxicity, particularly to livestock, as it can cause vomiting disease (**vermeersiekte**) when consumed in quantity. Although specific medicinal uses of this

species are not well documented, related *Geigeria* species are occasionally used in traditional remedies, though caution is advised due to their toxic compounds.

Tetraena simplex is a small, drought-adapted plant that grows in sandy and gravelly soils near Arandis, Namibia, often appearing after seasonal rains in desert plains and ephemeral drainage lines. It plays a role in early ground cover and soil stabilization but has limited forage value, mainly offering occasional grazing to small livestock during brief growth periods. While specific medicinal uses are not well documented, related species are traditionally used for inflammation and digestive issues, suggesting potential ethnobotanical interest.



Opophytum cryptanthum is a low-growing, fleshy annual plant found on sandy and gravel plains near Arandis in western Namibia, thriving in the fog-fed, hyper-arid conditions of the Namib Desert. It appears briefly after rainfall or heavy fog, forming part of the early desert flora. The plant produces succulent, salty leaves that are sometimes grazed by small herbivores and may be foraged by people as a seasonal wild edible. While specific medicinal uses are not well

recorded, its juicy, mucilaginous tissues suggest potential traditional value for hydration or skin relief in arid environments.

Asparagus pearsonii is a tough, spiny desert shrub found near Arandis in western Namibia, growing in rocky and sandy soils under hot, dry conditions typical of the Namib Desert. It forms low, tangled thickets that are resistant to drought and erosion. While it offers minimal grazing value due to its spiny nature, it may be browsed lightly in extreme dry periods. Although its specific medicinal uses are not well recorded, related species in the genus are known in traditional medicine, suggesting possible ethnobotanical value worthy of further study.



Commiphora saxicola is a small, drought-hardy shrub found on rocky outcrops and gravel plains near Arandis in the Namib Desert. Adapted to extreme arid conditions, it features papery bark and sparse foliage, shedding leaves in dry seasons. While it offers limited forage value to wildlife, its resin is highly valued in traditional Herero and Damara medicine for treating respiratory ailments, skin conditions, and wounds, and is also used as a natural fragrance or ceremonial incense, highlighting its cultural and medicinal significance.

Larryleachia marlothii is a rare, drought-adapted succulent found on rocky slopes and gravel plains near Arandis in western Namibia, thriving in the hyper-arid conditions of the Namib Desert. Its rounded, tubercled, leafless stems allow it to survive extreme heat and scarce rainfall. The plant offers no food value due to its toxic and unpalatable nature, and there are no well-documented traditional medicinal uses. Its significance lies mainly in its ecological adaptation and value to botanical research and succulent collectors.



Ipomoea adenioides is a trailing or scrambling perennial plant found near Arandis in western Namibia, typically growing in sandy or gravelly soils of dry riverbeds, rocky plains, and open desert shrublands. It is well adapted to arid conditions, featuring longish green leaves and a woody or semi-woody stem, especially at the base in mature plants. The plant uses deep roots and hairy foliage to conserve moisture and endure high heat. While it offers limited seasonal grazing

value when young and green, its specific medicinal uses are not well documented. However, related *Ipomoea* species are known in traditional medicine, suggesting possible but unverified ethnobotanical potential.

Kleinia longiflora is a drought-adapted succulent shrub found on rocky slopes and gravel plains near Arandis in western Namibia. It grows in harsh, arid conditions with minimal rainfall, featuring pencil-like green stems and small yellow tubular flowers. The plant offers little to no forage value due to its bitter, unpalatable tissues, and while specific medicinal uses are not well documented, related species in the same family are known in traditional healing for skin and inflammatory conditions. Its primary significance lies in its ecological role as a hardy, erosion-resistant desert plant.



Galenia africana, or kraalbos, is a tough, drought-resistant shrub found in dry, sandy or gravelly soils across arid parts of Namibia. It thrives in disturbed and open areas, helping stabilize soils and resist erosion. Although it has limited food value and is typically avoided by livestock due to its strong smell and bitter taste, it holds significant importance in traditional medicine. Its leaves and extracts are used for treating wounds, skin infections, and inflammation, making it a culturally and

medically valuable plant in arid land communities.

Avonia albissima is a small succulent native to the arid gravelly soils near Arandis, Namibia, characterized by long, slender stems lined with silver, fleshy leaves arranged like fish scales. This silvery coloration helps reflect sunlight and conserve moisture, enabling the plant to thrive in harsh desert conditions. It provides minimal forage value due to its size and taste. While specific medicinal uses are not well documented, related species are traditionally used for skin ailments and wound healing, suggesting potential ethnobotanical importance worthy of further study.



5. Plant Removal and Relocation Procedure for *Lithops ruschiorum*



A number of 55 *Lithops ruschiorum* plants within the development area were first carefully relocated and marked with blue markers to ensure identification. The rocks surrounding the plants were gently loosened, and the plants were removed as carefully as possible to avoid damage to the root system. Removal was conducted during the cool morning hours to minimize plant stress, as replanting during hot afternoon conditions is detrimental to their survival. After

removal, the plants were securely stored overnight outside the development zone at the security offices.

The team reconvened the following morning, 17 June 2025, to proceed with replanting. A 3m x 3m site was selected on the second hill noted during the initial site inspection. The corners of this area were marked with four black plastic poles, each topped with a red-painted point for clear delimitation.



Before planting, the roots of the *Lithops* were carefully cleaned following best practices learned from previous replanting efforts, which showed improved survival rates when roots are properly prepared. Planting holes were made to a depth matching the roots, with minimal disturbance to the surrounding soil.

Each plant was replanted using the excavated soil and positioned carefully and marked with colorful markers. To provide additional protection from the intense afternoon sun, grass clippings were placed over the “heads” of the plants to create shade. The team successfully replanted a total of 55 *Lithops* plants. The remaining 15 young plants, which were not replanted due to their fragile condition and low likelihood of survival through the relocation process, were approved by NMF for removal and transfer to the Lithops hothouse at Alte Kalkofen Lodge. At this controlled environment, their chances of survival and growth are significantly higher. These plants will be maintained in the hothouse for approximately one to one-and-a-half years, after which they will be reintroduced alongside the replanted population on site.





Interestingly, a healthy population of approximately 100 *Lithops* plants was discovered adjacent to the designated replanting zone. These naturally occurring plants were also marked with blue markers to assist with counting and to define the area for future monitoring. Special care must be taken to avoid disturbing or damaging these plants when accessing the relocated specimens. Encouragingly, additional *Lithops ruschiorum* species were observed in the

same area, offering valuable potential for future ecological reference and conservation efforts.

6. ANIMALS.

Although the identification of animals or other living species was not the primary objective of the survey in the NMF development area, a hare was observed and identified as *Lepus linnaeus*, more accurately referred to as *Lepus capensis* (Cape hare). This species is commonly found in the arid and semi-arid regions of Namibia, including the gravel plains and dry bushland surrounding Arandis. The Cape hare is primarily nocturnal, emerging at dusk to forage on grasses, herbs, and succulent desert plants, often relying on dew and plant moisture for hydration. During the day, it shelters in shallow scrapes or beneath low shrubs, using its camouflaged fur to evade predators such as jackals, raptors, and snakes. Despite facing extreme heat, limited water, and sparse vegetation, this species persists through its efficient metabolism, specialized diet, and cautious, solitary behaviour that conserves energy and reduces risk in the harsh desert environment.



No further tracks of animals were observed in the NMF development zone.

7. RECOMMENDATIONS

It is recommended that the relocated *Lithops* plants be watered for the first time on Friday, 27 June 2025, using no more than half a cup of water per plant. This watering schedule should be repeated on the following two Fridays, applying the same amount of water each time. Care must be taken not to pour water directly onto the plants; instead, water should be applied slowly onto the inner sides of rocks near each plant, allowing it to flow gently toward the roots. No further watering will be required thereafter, as the plants will store sufficient moisture in their leaves to support long-term survival. It is also important to emphasize that movement within the replanted area must be done with extreme caution to avoid damaging the plants.

8. CONCLUSION



Monitoring of the relocated *Lithops* plants should be conducted after six months to assess their survival success. A follow-up assessment will also be required when the young plants currently housed at Alte Kalkofen Lodge are ready to be reintroduced into the area. We extend our sincere thanks for the opportunity to be involved in this important project. In addition to the *Lithops* relocation, we have included observations of other plant species in this report to highlight the ecological sensitivity of the site. Special consideration must be given to the NMF

development plan to ensure minimal impact on this fragile environment, which supports a range of desert-adapted plants, animals, reptiles, and insects.

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