

PROTECTED PLANT SEARCH AND RESCUE PLAN:

GAS TO POWER PLANT WITHIN RICHARDS BAY INDUSTRIAL ZONE



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Executive Summary

This document provides findings of the recent walk-through and a management plan for the rescue and relocation of protected and red listed plants for the proposed 400MW Gas to Power Plant situated in the Phase 1F within the Richards Bay Industrial Zone (RBIZ) (DEA Ref: 4/12/16/3/3/2/867). The first section provides an introduction to the Plant Rescue and Recovery Plan, including responsible persons for different parts of the process, and legal requirements related to protected plant species removal. The next section provides principles for the handling of plant species of conservation concern. This provides a framework for the actions required for the proposed plant rescue and recovery plan. The next section provides a list of all the species of concern that have been recorded to date on the proposed Gas to Power Plant site situated on 3 vacant erven. The penultimate section provides detailed steps for the rescue and handling of listed plants. Responsible parties are also identified for each step. The final section gives an outline of monitoring requirements for determining the success of the plant rescue and recovery operation. Evidence of one red listed 'Declining' *Crinum cf. delagoense* and nine *Ledebouria cf. ovatifolia* were observed during the current walk-through conducted on the 24th of June 2020.

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Introduction

This document presents the Plant Rescue and Recovery Plan for the authorized 400MW Gas to Power plant (DEA Ref: 4/12/16/3/3/2/867) situated within the Richards Bay Industrial Development Zone, Kwazulu-Natal. The Environmental Impact Assessment (EIA) process for the authorization of the gas to power was undertaken by Savanna Environmental Pty (Ltd). Post-authorization aspects are being handled by Savanna Environmental Pty (Ltd) currently, including conducting the required biodiversity walk-through and permitting applications as per conditions of the Environmental Authorisation. A walk-through of the site was undertaken by the consultant on the 24th of June 2020.

Purpose of the Plant Rescue Plan

The purpose of the Plant Rescue and Recovery Plan is:

- To provide practical guidance on search and rescue of threatened or protected plant species (TOPS), as specified in the Environmental Authorisation (EA) issued for the project.

The objective is to identify, remove and, where possible, rescue or relocate species of concern, as required by the conditions attached to the EA. The Plant Rescue and Recovery Plan will form part of the broader Environmental Management Programme, and measures for inclusion have been provided in this report.

Responsible persons

Rescue of threatened or protected plant species (TOPS) during the construction phase of the project will be dependent on a number of project personnel. These are listed below:

The Developer

This refers to the project proponent, Independent Power Producer 'Richards Bay Gas Power 2 Pty (Ltd)'. It will be responsible for the following:

1. Ensure that the requirements set out in this Plan are adhered to and implemented;
2. Allocate the responsibilities assigned to the Environmental Officer (EO) or an independent suitably qualified individual prior to the start of construction activities on site; and
3. Commission a suitably qualified independent service provider (ecologist/botanist) to undertake the required Search and Rescue plan.

The Project Environmental Manager

The Project Environmental Manager of the proposed development is responsible for the overall implementation of the Plan during the construction phase of the project. To effectively implement the plant rescue plan, the Project Environmental Manager must be aware of the findings, mitigation measures and conclusions of the Final EIA report, the requirements of the EA, the EMPr, and this Plan.

The Environmental Control Officer (ECO)

The ECO role and responsibilities include:

- Review of project documentation and compilation of a compliance checklist against all environmental specifications;
- Undertaking external compliance audits against all environmental specifications, including producing audit reports for submission to the authorities where relevant;
- Compile independent, comprehensive compliance reports which will include details of any transgressions and actions taken to rectify such transgressions, as well as the compliance checklist and incident register including details of any Non-Conformance Reports (NCRs) issued, as well as the complaints register updated by the contractor.

The ECO is therefore responsible for monitoring and verifying the implementation of the Plan during the construction phase of the project against the conditions of the environmental permits. To effectively monitor the Plan, the ECO must be aware of the findings, mitigation measures and conclusions of the Final EIA Report, the EA, and this Protected Plant Rescue and Recovery Plan.

Environmental Officer (EO)

The Environmental Officer (EO) acts as an internal environmental manager to the construction team, proponent and on-site staff. It is important to note that the EO role may be combined with existing construction staff roles as appropriate, and therefore does not necessarily represent a separate role. Duties of the EO could include, inter alia:

- Undertake daily monitoring of construction activities and ensure compliance with the provisions of the Environmental Authorisation, Environmental Management Programme (EMPr), environmental permits and relevant environmental legislation.
- Conduct inductions for new staff members.
- Conduct internal inspections and audits as required.
- Conduct workshops with line manager/departments on how to handle incidents.
- Develop and monitor an incident register.
- Develop environmental Standard Operating Procedures (SOPs) for common procedures required on site.
- Directing corrective actions where standard operating procedure improvements are required.
- Implement and maintain environmental education awareness programmes;
- Maintain a system of reporting environmental incidents and review of recommendations to rectify deviations;
- Maintaining a filing system for all environmental documentation, including waste manifests, incident and complaints registers, toolbox talks, training material and registers, and EMPr & EA documentation.

- Providing ad-hoc guidance to construction workers as and when environmental concerns arise
- Providing pragmatic advice in terms of actions required to rectify any non-compliances and/or address incidents recorded on the site.
- Provision of environmental inductions and awareness training;
- Using a matrix of permits compiled during the gap analysis as a tool to ensure that all required permits are in place for the construction of the facility throughout the construction phase.
- Assist in addressing and closing out non-conformances where these may be noted by the ECO;
- Assist with the management of environmental rehabilitation projects and contractor management

The EO is therefore responsible for the internal construction staff implementation, management and compliance of this Plan against the requirements contained herein, and must be suitably empowered to oversee and direct the activities required within this plan.

The Contractor

The contractor, being any directly appointed company or individual undertaking the implementation of the plant rescue and relocation, is responsible for complying with the Plan at all times during the construction phase. **An independent ecologist Mr C.L. Cook has been appointed to undertake the Search and Rescue plan.**

Legal Requirements

- National Environmental Management: Biodiversity Act (Act 10 of 2004), including Threatened or Protected Species Regulations;
- National Environmental Management Act (Act 107 of 1998);
- National Forests Act (Act 30 of 1998); .
- Natal Nature Conservation Ordinance (1974).

Ecological principles for plant rescue

Plant rescue is considered to be a last resort to conserve individual plants, when authorization for development has been obtained and construction is imminent. The ecosystem within the footprint of the development (hygrophilous grassland), with all its species diversity, genetic variation and ecological interrelationships will be lost and the objective is to salvage some measure of ecological function and important taxaprior to the destruction. Some considerations are as follows:

1. Plant rescue can usually only salvage a small proportion of the plants on site (Threatened or Protected Species). This is due to two main factors, firstly, the fact that different species appear at different times and some species will almost certainly be dormant at the time that

- the Search and Rescue is undertaken (June), and secondly, there may be practical limitations in terms of how much plant material can be salvaged.
2. Globally, it has been recognised that the selection of plants to rescue is based on criteria that may have little to do with conservation, for example, ease of access, horticultural value and probability of survival. However, in the case of the current project, it has been specified in the ecological report (Eco-Pulse 2016) which species are to be targeted for Search and Rescue. Two provincially protected species were previously recorded namely (~15-20) *Crinum delagoense* and (~5-8) *Ledebouria ovatifolia*.
 3. Plants chosen for rescue may not thrive or even survive. It is highly unlikely that all rescued plants will survive. This is based on the fact that it is virtually impossible to predict without experimentation and research exactly what artificial conditions will be required for the management of each species in order to ensure survival. It must be stressed that the proposed rescued and relocated plants on the site are relatively hardy and easy to cultivate. *Crinums* are popular ornamental garden plants and *Ledebouria* are relatively hardy and should transplant easily if planted in suitable habitat.
 4. Various agencies globally (e.g IUCN) and nationally (e.g. SANBI) have expressed concern regarding the concept of plant rescue. The concern is that the implementation of a plant Search and Rescue can weaken support for habitat conservation by fostering the perception that rescuing selected plants can compensate for destruction of an entire habitat, or that landscape plantings can substitute for natural areas. The majority of adjacent Maputaland Wooded grasslands are proposed for future industrial development with little conservation use planned.
 5. Plant rescue can divert time, energy, resources and leadership from tasks that may be more effective in protecting natural habitats.
 6. Plants can be used for rehabilitation of affected areas, thereby restoring something resembling the natural vegetation. The rescued plants can be used for landscaping or rehabilitating areas adjacent to the seasonally inundated seepage wetland outside the south-eastern boundary of the Gas to Power site.
 7. It can also make a long-term contribution to public education by providing indigenous plants for public gardens and nature centres. No public gardens or nature centres adjacent to the site. The adjacent areas are characterised by industrial developments.

Principles

- *In situ* conservation is preferable to *ex situ* conservation. Removing a population from its natural habitat and placing it under artificial conditions results in the erosion of the inherent genetic diversity and characteristics of that species. This principle is very strongly emphasized on the SANBI websites "Guidelines for Environmental Impact Assessments" (www.redlist.sanbi.org/eiaguidelines.php) where the following is stated:

- *"In situ conservation is vital and should be recommended as the only option for conserving species of conservation concern. Ex situ conservation, i.e. the removal of a subpopulation from its natural habitat to an artificial environment, a practice often termed 'search and rescue', will result in the erosion of the inherent genetic diversity and characteristics of that species and increase its extinction risk in the wild. Similarly, translocation of subpopulations is an unacceptable conservation measure."*
- In order to ensure the persistence of a population, it is imperative that the ecological processes maintaining that population persist. This requires that natural habitats are maintained in an ecologically functional condition.
- Translocation of Red List species is an unacceptable conservation measure since the translocated species may have undesirable ecological effects, as follows: Alterations to habitat by translocated species may be harmful to other species,

The implications of these principles are as follows:

- It is highly preferable **not to replant rescued plants into other natural habitats**. Based on scientific evidence and concerns directly from SANBI, translocation to an existing conservation area cannot be supported as a management measure.
- Rescued plants, if re-planted back in the wild, should be placed as close as possible to where they were originally removed. As stated in the previous paragraph, re-planting into natural areas is not supported as a management measure. The rescued plants could be relocated into the grassland buffer zones of the lower-lying seasonal wetland to the south-east. The frequent cutting of the adjacent grasslands as well as future industrial development reduces the viability of relocating in the adjacent grassland areas.
- Re-planting into the wild must cause as little disturbance and harm as possible to existing natural ecosystems. As stated in the previous paragraph, re-planting into natural areas is not supported as a management measure.
- Rescue must be limited to only those areas where plants will be destroyed by the development. No plants must be removed from areas that will otherwise not be disturbed.
- Rescue must not be undertaken from any site where there is a significant risk that well-established invasive alien plants or other pests will be spread by the relocation of indigenous plants.

Planning considerations

The following factors affect planning of plant rescue:

- Adequate time must be allowed to obtain the necessary information about the site and its flora. This is usually achieved during the EIA stage and/or follow-up surveys. A reliable inventory of the plants found on a site is a key factor in determining whether a

rescue is appropriate and, if it is, how the plants will be used. In general, a rescue should not be undertaken if an appropriate use of the rescued plants is not ready at hand or easily found. Where invasive alien species are present, the numbers and concentrations must be known. If there are large concentrations of alien invasive species, this may rule out any rescue and limits the choice of relocation sites or eventual use of the rescued plants.

- There must be adequately qualified and equipped personnel to undertake a plant rescue. Personnel undertaking the rescue must have the knowledge and skills to ensure that the rescue operation is a success. A trained and qualified ecologist/botanist is required to identify the species to be rescued, but horticultural skills are required for nursery establishment and for the actual planning and management of a nursery.
- In principle, rescued plants must be utilized for public benefit, not private gain. Acceptable uses are therefore replanting in rehabilitated areas, providing stock for propagation and providing plant material for a scientific project. Problematic uses are selling rescued plants to the public and providing plants for private gardens. This is because additional permits would be required for transport and trade of protected species. An incentive is also created to remove plants from the wild, which is not supported.
- Rescuing plants that are listed as protected under National or Provincial legislation is subject to requirements that cover the collection and use of whole plants, their progeny and plant parts, including seeds. **A permit is required to possess, transport or propagate such species. The general permit for removal of Threatened or Protected Species (TOPS) as defined in the NEM:BA listing from the permit office of Ezemvelo KZN Wildlife (EKZN) will cover these components. No permit is required from Department of Agriculture, Forestry and Fisheries (DAFF) as no protected tree or nationally protected plant species occur on the site.**
- A priority for replanting is to maintain the ecological integrity of the target habitat. Inappropriate target sites are natural habitats in which ecological integrity is currently uncompromised. Extremely limited natural habitats remain in the immediate area of the site except for the lower-lying wetland and grassland buffer outside the southern boundary of the site. The grasslands are transformed and degraded and are ideally suited for the relocation of remaining *Crinum cf. delagoense* and *Ledebouria cf. ovatifolia*.

Based on the limitations, the following activities must be undertaken to address the conditions that can be met:

1. All Threatened or Protected Species TOPS that can be located within the footprint of the development zone, as identified by an ecologist/botanist, must be rescued. This includes the single *Crinum cf. delagoense* and (9) *Ledebouria cf. ovatifolia*. More *Crinum cf. delagoense* could still remain on the site but could not be confirmed during the current walk-through due to lack of above-ground leaves and flowers. *Ledebouria*

cf. *ovatifolia* may have been overlooked due to limited above-ground leaves as well as a thick grass mulch layer from recent cutting of the site.

2. A rescue operation must be undertaken by the ecologist to remove these prior to the clearance of the vegetation on the site. Translocation should ideally occur during one of the cooler months in order to promote survival, with the optimal period at the site likely to be late August to early September (after the first spring rains). This will give the translocated plants sufficient time to establish and recover before the hot summer season (November-March). If the plants are removed during the wet summer months (October-March) it is important that they are watered on a weekly basis to avoid desiccation.
3. Although species such as geophytes are best translocated when they are dormant, they can be hard to locate at this time and therefore, any time would be acceptable for such species. The *Crinum* and *Ledebouria* are deciduous geophytes (bulbous plants).
4. No translocation to adjacent natural areas must take place. **The removed plants should be translocated within the lower-lying seasonally inundated seepage wetland's grassland buffer zone or alternatively along the outer edges of the artificial stormwater trench on the north-western boundary.**

Species of conservation concern that occur on site

This section provides an outline of the existing status of the study area with respect to the occurrence of any species of conservation concern (SCC) or any other plant species that are deemed worthy of rescue prior to construction. The purpose is to provide an indication of the identity of such species. The species included here have been identified from previous field surveys for the project, including ecological studies for the EIA (Eco-Pulse 2018) and the recent walk-through undertaken by the consultant on the 24th of June 2020. This list provides recorded plant species that occur on site in terms of TOPS. There is a possibility that additional TOPS could occur on site, but the process followed to arrive at the current list was comprehensive and it is not expected that there would be any major omissions.

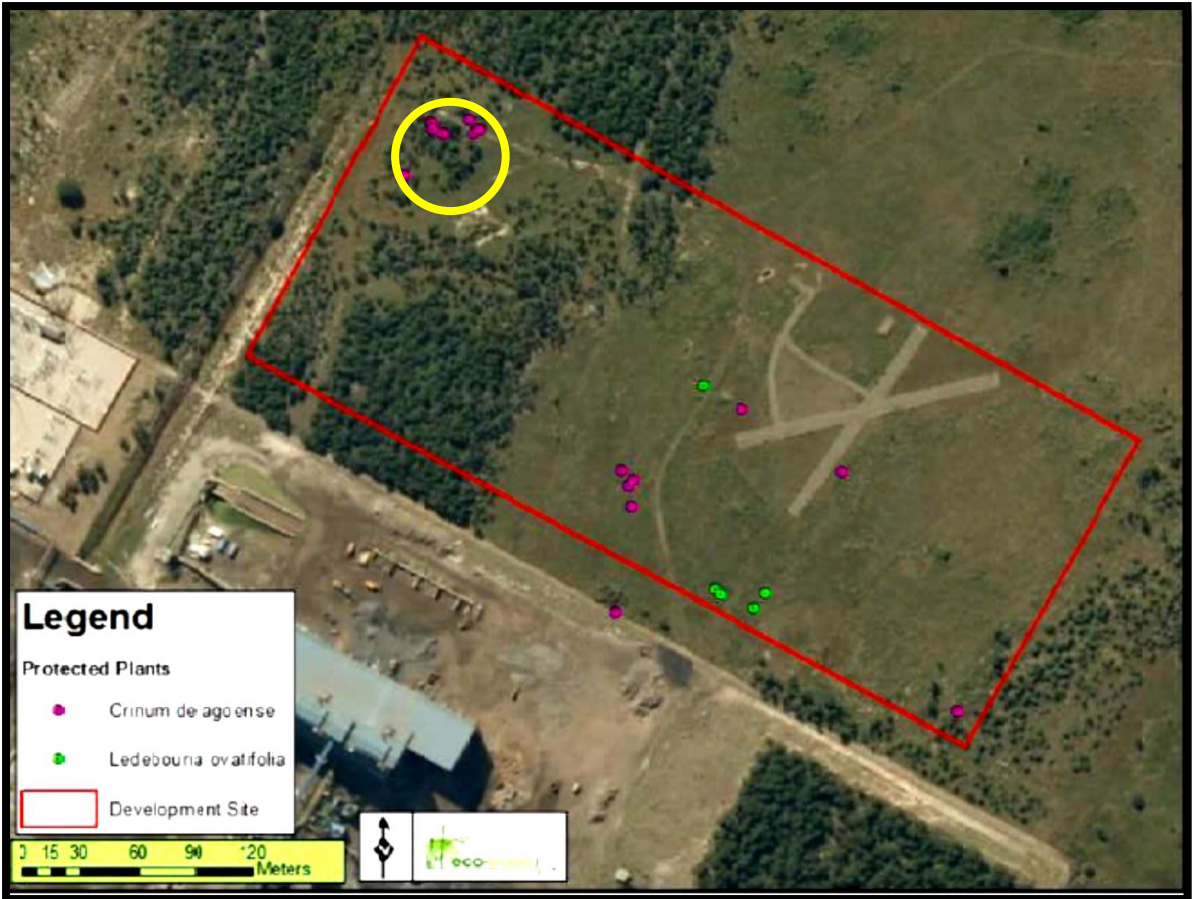


Figure1. Map showing the location of the protected plants recorded by Eco-pulse 2018. The population of *Crinum delagoense* on the north-western boundary (yellow circle) are most-likely destroyed due to the recent linear developments (access road and bulk pipeline).

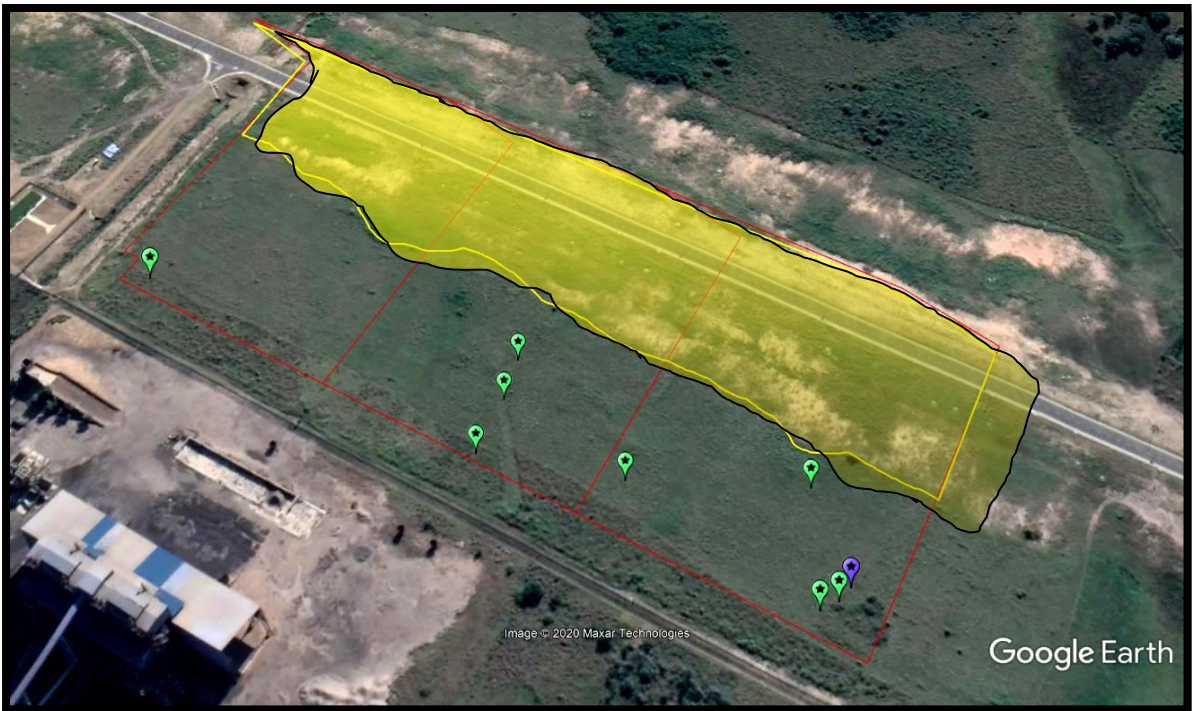


Figure2. A satellite image of the protected plants observed during current walk-through (June 2020). The green markers indicate the locality of the nine *Ledebouria cf.ovatifolia* and the

purple marker a single leaf of *Crinum cf. delagoense*. The yellow shaded area has been recently transformed due to the construction of access road and bulk pipeline. The *Crinum* population on the north-western portion of the site has most-likely been destroyed. This is highly condemned by the consultant and the responsible parties should replace the destroyed plants.

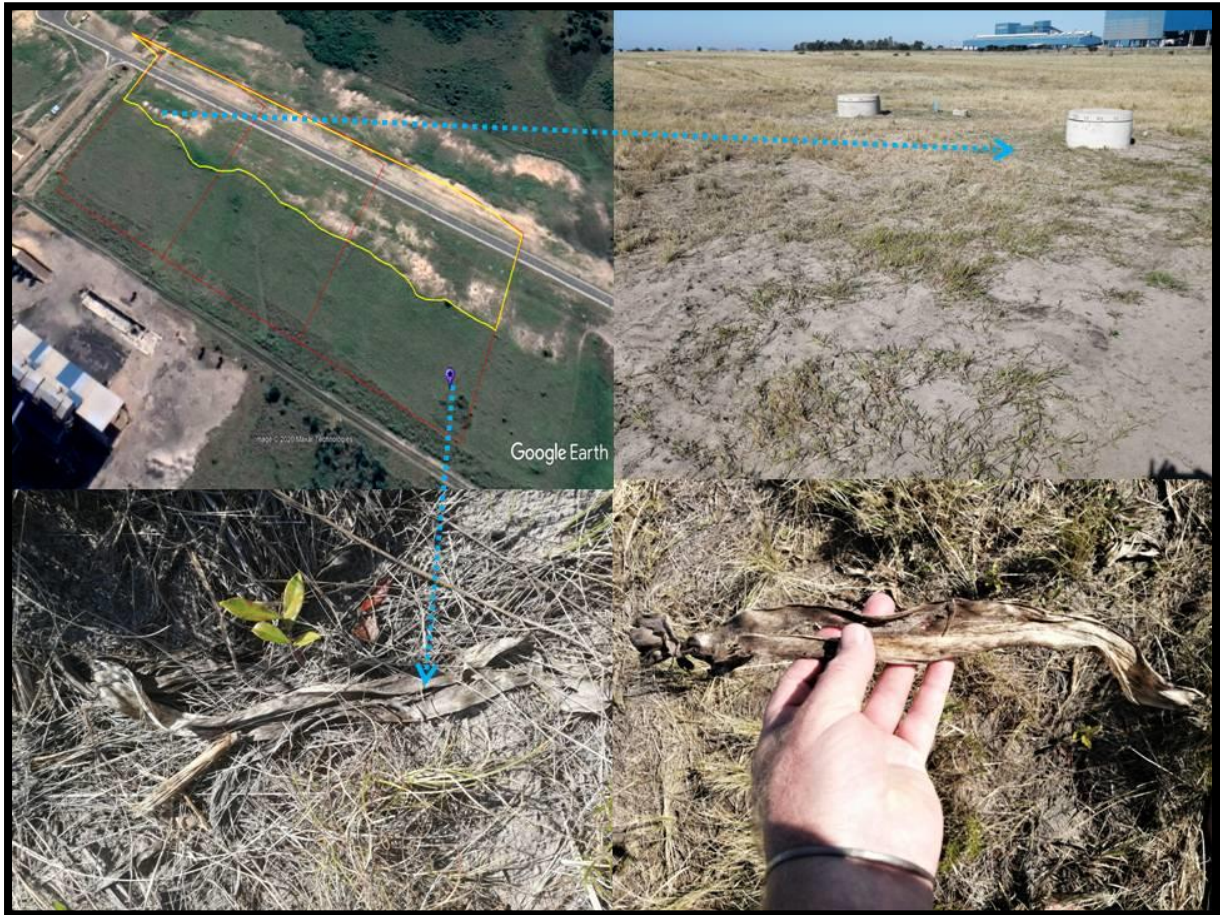


Figure3. A collage of photographs displaying the transformation of the north-western portion and population of *Crinum* the bulk pipeline construction. The purple marker indicates where the old leaf of a *Crinum cf. delagoense* was observed during current walk-through in June 2020. No further evidence was noted due to lack of any above-ground leaves, flowers or seed pods.



Figure4. A collage of photographs displaying the locations (green markers) of the *Ledebouria cf. ovatifolia* observed during the current walk-through. The leaves ranged from flat-growing to more prostrate with little or no purple spots. This may be due to the shadowing effect of the dense grasslands which have not been burned for several years (moribund).

Table 1. Protected plants observed during current walk-through of the site.

Protected Plant	GPS Locality	Comments
<i>Crinum cf. delagoense</i>	28°44'30.63"S; 32° 01'41.57"E	Desiccated leaf (possibly blown from elsewhere). No visible above-ground vegetative parts during June walk-through.
<i>Ledebouria cf. ovatifolia</i>	28°44'29.08"S; 32° 01'41.11"E	Single plant with two above-ground leaves. No mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'30.83"S; 32° 1'41.35"E	Single plant with single leaf at base of grass tussock. No mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'30.96"S; 32° 1'41.03"E	Single plant with three prostrate leaves. No mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'28.95"S; 32° 1'37.96"E	Single plant with three flattish leaves. No mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'26.84"S; 32° 1'36.04"E	Single plant with three prostrate leaves growing in small trench. No mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'27.56"S; 32° 1'35.82"E	Single plant with three flat leaves growing in small trench. Slight green mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'28.50"S; 32° 1'35.38"E	Two plants with two prostrate leaves. No mottling on leaves.
<i>Ledebouria cf. ovatifolia</i>	28°44'25.21"S; 32° 1'28.92"E	Single plant with three prostrate leaves. .No mottling on leaves.

Listing of Red and Orange List plant species

Species listed as threatened on the Red List change with time as new information becomes available and as threats to different species are re-evaluated over time. The list is therefore not static. One Orange listed 'Declining' species, namely Candy-Striped Crinum *Crinum delalandii*, were recorded from the site. Fourteen plants were recorded during the 2018 survey and one plant outside the Tata Steel boundary fence. Evidence (old leaf) of one *Crinum cf delagoense* was observed during the current walk-through. It is highly likely that the small population (~7 plants) were destroyed during the recent construction of the access road and bulk pipeline.

Nationally protected species

These are species listed in the Appendices of the National Environmental Management: Biodiversity Act (Act 10 of 2004, as updated in R. 1187, 14 December 2007). **No nationally protected plant species occur on the site.**

Provincially protected species

This Ordinance shall be known as the Nature Conservation Ordinance, 1974 contains lists of specially protected indigenous plant species within Kwazulu-Natal and for which permits for removal are required [Schedule 12 substituted by Schedule 38 of Ordinance 27 of 1975.]

Taxon	Protection Status	Conservation Status	Endemnicity
<i>Crinum cf. delagoense</i>	Natal Nature Conservation Ordinance (15 of 1974)	Declining	Not Endemic to SA
<i>Ledebouria cf. ovatifolia</i>	Natal Nature Conservation Ordinance (15 of 1974)	Least Concern	Endemic to SA

Six *Ledebouria ovatifolia* were observed during the Eco-pulse survey in 2016. Nine were observed during the current walk-through. The positive identification could not be confirmed due to lack of fresh leaves and flowers.

Plant rescue plan

This section provides details on the actions that are required to rescue any TOPS and/or listed plant species from the path of development. Translocation should ideally occur during one of the cooler months in order to promote survival, with the optimal period at the site likely to be late August to early September (after the first spring rains). This will give the translocated plants sufficient time to establish and recover before the hot summer season (November-March). If the plants are removed during the wet summer months (October-March) it is important that they are watered on a weekly basis to avoid desiccation. No on-site nursery will be required. The plants must be carefully excavated by the ecologist using a garden fork and spade. Care must be taken not to damage the underground bulbs or roots during the removal of the plants. The plants must be relocated to suitable habitat within the transformed grasslands adjacent to the seasonally inundated seepage wetland. The relocated plants must be positioned in a similar orientation to the sun and adequately spaced. After planting, the plant should be watered weekly and fertilised using an organic slow release fertiliser (Atlantic's Bounce Back). Rescued plants must be monitored to determine the success of the relocation programme for at least one year after the plants have been relocated.

Plant rescue activities required

Before construction commences at the site, the following actions must be taken:

Action	Responsible person
<p>Collate information on potential species of concern <i>Initial identification of all listed species that may occur within the project area. This is covered in this report and other survey reports related to this project. The action is therefore complete.</i></p>	Ecologist
<p>Species search (walk-through) <i>Location of all plants to be rescued within footprint of proposed Gas to Power development site. A walk-through of the site was conducted on the 24th of June 2020. The action is therefore complete.</i></p>	Ecologist
<p>Obtain Necessary Permits <i>Permits to collect, relocate and propagate plant material must be obtained from the relevant authorities. This should be a single permit application that covers all components of the project. Permits will be required from permit office of Ezemvelo KZN Wildlife (EKZN) for the removal of the (~9-15) <i>Ledebouria cf. ovatifolia</i> and (~1-15) <i>Crinum cfdelagoense</i>.</i></p>	Savanna Environmental Pty (Ltd)
<p>Plant rescue & relocation <i>Appoint an experienced ecologist or botanist to undertake the rescue operation, manage the rescued plant material (<i>Ledebouriacf. ovatifolia</i>. and <i>Crinum cfdelagoense</i>) and relocate in suitable habitat adjacent to the conserved seasonal seepage wetland and grassland buffer zone. For all plants that are rescued, relevant information must be collected, as is determined by the ecologist as being adequate for reporting and monitoring. This information could include the number of individuals/clumps and date collected, photographs of plants removed as well as GPS locality of relocated plants.</i></p>	Ecologist
<p>Control of impacts on adjacent areas</p> <ul style="list-style-type: none"> • <i>The collecting of plants by unauthorized persons should be prevented.</i> • <i>EO or suitably authorised representative to monitor that vegetation clearing only happens once all search and rescue operations have been completed.</i> • <i>The EO or suitably authorised representative should monitor construction activities in sensitive habitats (wetlands and buffer zones) to ensure that impacts within these areas are kept to a minimum.</i> 	EO or suitably authorised representative

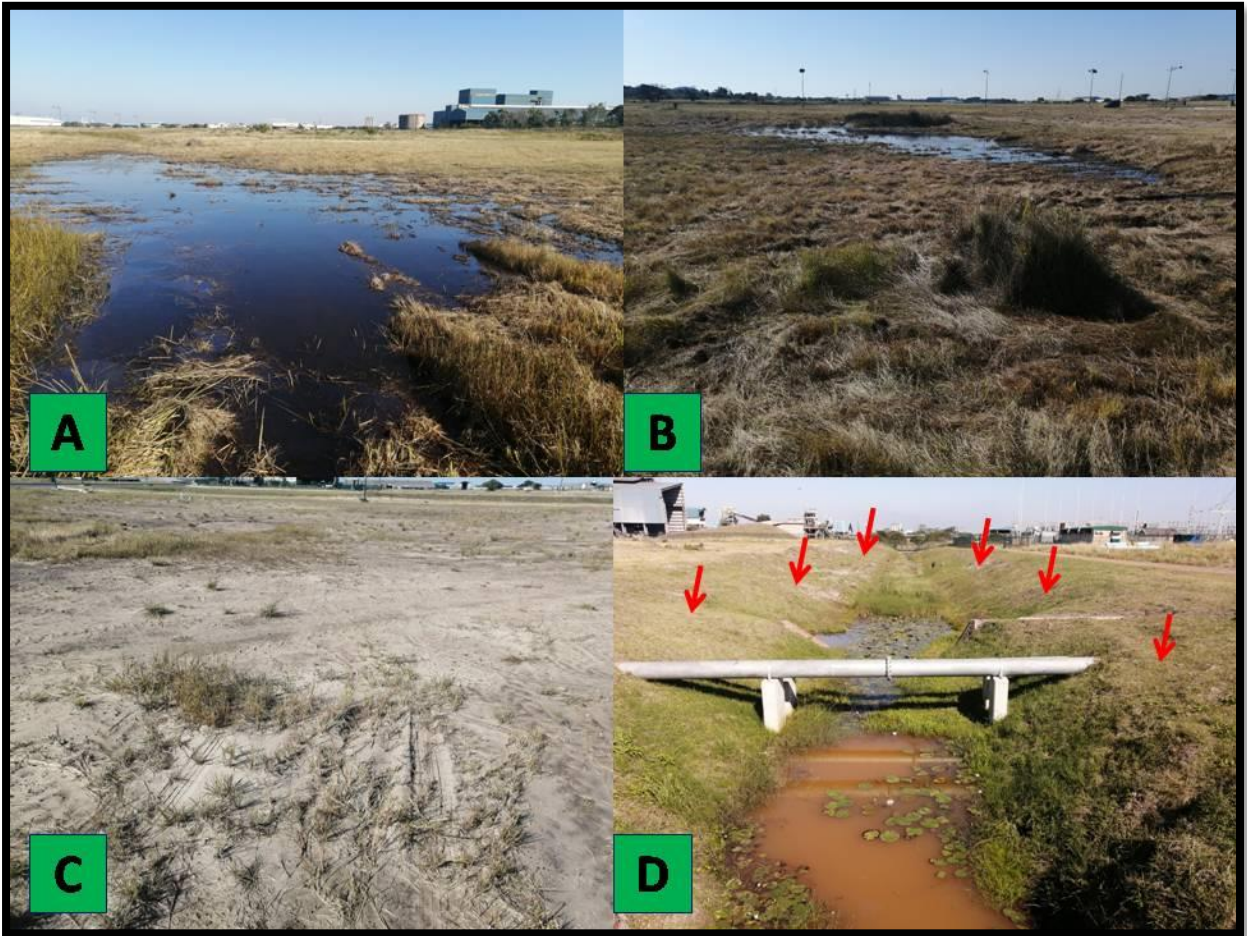


Figure 5. **A & B:** The rescued plants should be relocated to the south-east of the site within the transformed and degraded grasslands bordering the seasonally inundated seepage wetland. **C:** The soils adjacent to the wetland are sandy with limited grass cover and are suitable for the translocation of the *Crinum cf. delagoense* and *Ledebouria cf. ovatifolia*. **D:** An alternative site for the relocation could be the macro-channel embankments of an artificial stormwater trench on the north-western boundary of the site.

Monitoring requirements

The following monitoring activities are recommended as part of the plant rescue plan:

- Post-relocation monitoring of plants relocated during search and rescue to evaluate whether the intervention was successful or not. This must be undertaken on a three-monthly basis over a period of one year from the date of transplanting in order to evaluate the success thereof.
- Provision of a detailed record, including photographs, that indicates the success of the plant rescue operation.

Indicators and Targets

Indicator	Target
Written and photographic records from all search and rescue operations.	All species of conservation concern identified or removed prior to earth-clearing activities.
Survival rate of translocated plants	50-80% (based on probable survival rate of grassland geophytic plant species)

If less than 50% of plants survive the developer should replace the dead plants with suitable indigenous to the area geophytes such as *Eucomis autumnalis*, *Hypoxis hemerocallidea*, *Boophone disticha*, *Crinum macowanii*. Plants must be sourced from a local nursery (within 50km of the site) to prevent possible genetic contamination.

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