

REHABILITATION PLAN

FOR

VENETIA MINE

GNR1147 APPENDIX 3

&

ANGLO AMERICAN MINE CLOSURE TOOLBOX VERSION 3



FINAL

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NAME	EXPERIENCE / PROFESSIONAL REGISTRATION
	<p>Landscape (2012). Since then, he has been consulting as an applied ecologist focusing on the sustainable rehabilitation and restoration of farming land, mining areas and conservation areas. Michael also plays a role in the eradication of Alien and Invasive Plants (AIPs) in the private and mining sectors as well as the National Department Fisheries, Forestry and the Environment, where more than 100 000 ha of land has been cleared from AIPs under his management. Michael also actively conducts ecological monitoring, Biodiversity assessments and Management and Implementation Plans. He is a registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP) as well as a registered Pest Control Officer (PCA) with the Department of Agriculture. He is also a member of the Grassland Society of South Africa.</p>

REFERENCES TO CONTENT IN THIS DOCUMENT

CONTENT OF AN ANNUAL REHABILITATION PLAN (GN R1147, APPENDIX 3)	SECTIONS (§) IN THIS ANNUAL REHABILITATION PLAN
<p>(a) Details of-</p> <ol style="list-style-type: none"> i. The person or persons that prepared the plan; ii. The professional registrations and experience of the preparers; iii. Timeframes of implementation of the current, and review of the previous rehabilitation activities 	<ul style="list-style-type: none"> • Page i • Page ii and iii • Section 5
<p>(b) The pertinent environmental and project context relating directly to the planned annual rehabilitation and remediation activity;</p>	<p>Sections 1 and 2</p>
<p>(c) Results of monitoring of risks identified in the Final Rehabilitation and Decommissioning Mine Closure Plan with a view to informing rehabilitation and remediation activities;</p>	<p>Section 4</p>
<p>(d) Identification of shortcomings experienced in the preceding 12 months;</p>	<p>Section 4</p>
<p>(e) Details of the planned annual rehabilitation and remediation activities or measures for the forthcoming 12 months, including those which will address the shortcomings contemplated in (d) above or which were identified from monitoring in the preceding 12 months, and including:</p>	<ul style="list-style-type: none"> • Section 5.1
<ol style="list-style-type: none"> i. if no areas are available for annual rehabilitation and remediation concurrent with mining, an indication to that effect and motivation why no annual rehabilitation or remediation can be undertaken; 	<ul style="list-style-type: none"> • N/A • Concurrent rehabilitation will be done.

CONTENT OF AN ANNUAL REHABILITATION PLAN (GN R1147, APPENDIX 3)	SECTIONS (§) IN THIS ANNUAL REHABILITATION PLAN
<p>Where areas are available for annual rehabilitation and remediation concurrent with mining, annual rehabilitation and remediation activities related to previous disturbance or expected planned impacts and disturbance, as per the mine works programme, in the period under consideration, which should be tabulated and must indicate, but not necessarily be limited to:</p> <p>(aa) nature or type of activity and associated infrastructure;</p> <p>(bb) planned remaining life of the activity under consideration;</p> <p>(cc) area already disturbed or planned to be disturbed in the period of review;</p> <p>(dd) percentage of the already disturbed or planned to be disturbed area available for concurrent rehabilitation and remediation activities;</p> <p>(ee) percentage of the already disturbed or planned to be disturbed area available as per (dd) and on which concurrent rehabilitation and remediation can be undertaken;</p> <p>ff) notes to indicate why total available or planned to be available area differs from the area already disturbed or planned to be disturbed;</p> <p>(gg) notes to indicate why concurrent rehabilitation will not be undertaken on the full available or planned to be available area;</p> <p>(hh) details of rehabilitation activity planned on this area for the period of review;</p>	<ul style="list-style-type: none"> • • Table 10: Details of the planned annual rehabilitation - forthcoming 12 months
<p>(ii) the pertinent closure objectives and performance targets that will be addressed in the forthcoming year, which objectives and targets are aligned to the Final Rehabilitation, Decommissioning and Mine Closure Plan</p>	<p>Section 2.3</p>

CONTENT OF AN ANNUAL REHABILITATION PLAN (GN R1147, APPENDIX 3)	SECTIONS (§) IN THIS ANNUAL REHABILITATION PLAN
(jj) description of the relevant closure design criteria adopted in the annual rehabilitation and remediation activities and the expected Future / Next land use once all rehabilitation and remediation activities are complete for the activity or aspect; and	<ul style="list-style-type: none"> • Section 5.1 • Section 2.3.3
a site plan indicating at least the total area disturbed, area available for rehabilitation and remediation and the area to be rehabilitated or remediated per aspect or activity;	<ul style="list-style-type: none"> • Section 6 & APPENDIX C
(f) A review of the previous year's annual rehabilitation and remediation activities, indicating a comparison between activities planned in the previous year's annual rehabilitation and remediation plan and actual rehabilitation and remediation implemented, which should be tabulated and as a minimum contain— aa) area planned to be rehabilitated and remediated during the plan under review; (bb) actual area rehabilitation or remediated; and (cc) if the variance between planned and actual exceeds 15%, motivation indicating reasons for the inability to rehabilitate or remediate the full area.	This document, for FY2021 is the first Annual Rehabilitation Plan as no rehabilitation was executed in the previous year (FY 2020)
(g) Costing, including- i. an explanation of the closure cost methodology; ii. auditable calculations of costs per activity or infrastructure; iii. cost assumptions; and iv. monitoring and maintenance costs likely to be incurred both during the period of the annual rehabilitation plan and those that will extend past the period of the REHABILITATION, DECOMMISSIONING AND MINE CLOSURE	<ul style="list-style-type: none"> • Section 9

CONTENT OF AN ANNUAL REHABILITATION PLAN (GN R1147, APPENDIX 3)	SECTIONS (§) IN THIS ANNUAL REHABILITATION PLAN
<p>PLAN, on condition that the monitoring and maintenance costs included in previous annual rehabilitation plans must be accumulated into subsequent versions of the annual rehabilitation plan until such time as the monitoring and maintenance obligation is discharged.</p>	

CONTENT OF THE ANGLOAMERICAN MINE CLOSURE TOOLBOX VERSION 3 TOOL 5 REHABILITATION PLAN	SECTIONS (§) IN THIS REHABILITATION PLAN
<p>5.1.1: Develop an overarching rehabilitation strategy that aligns with the closure vision and land-use plan.</p>	<p>Section 5 <i>Overarching rehabilitation strategy to be refined with the update of the Closure Plan in 2022.</i></p>
<p>5.1.2: Develop a 5-year rolling rehabilitation plan that aligns with the rehabilitation strategy, and the baseline environmental conditions and legal commitments.</p>	<p>Section 7 <i>This entire plan comprises of sections dealing with this requirement and should be read in conjunction with the Closure Plan that should be updated in 2022.</i></p>
<p>5.1.3: Develop the success criteria for the rehabilitation plan in consultation with internal and external parties.</p>	<p>Section 3 <i>Success criteria to be refined with the update of the Closure Plan in 2022.</i></p>
<p>5.1.4: Implement rehabilitation trials to test assumptions and ensure cost-effective rehabilitation prescriptions.</p>	<p>Section 10 <i>Rehabilitation trials to be refined with the update of the Closure Plan in 2022.</i></p>
<p>5.1.5: Develop a detailed monitoring programme to track and record the rehabilitation plan execution.</p>	<p>Section 8 <i>Monitoring programme to be refined with the update of the Closure Plan in 2022.</i></p>
<p>5.1.6: Develop a maintenance and management plan and associated procedure to address gaps in the</p>	<p>Section 8</p>

CONTENT OF THE ANGLOAMERICAN MINE CLOSURE TOOLBOX VERSION 3 TOOL 5 REHABILITATION PLAN	SECTIONS (§) IN THIS REHABILITATION PLAN
rehabilitation plan (e.g. unsuccessful rehabilitation) as required to ensure a continuous improvement loop.	<i>Closure Maintenance and Management Plan (CMMP) to be refined with the update of the Closure Plan in 2022.</i>
5.1.7: Integrate the rehabilitation plan into the LoAP to ensure that operational budgets and resources are in place and progress is measured.	Section 9 <i>Life of Asset Plans (LOAPs) to consider the Rehabilitation plan and ensure that budgets and resources are planned as part of the update of the Closure Plan in 2022.</i>

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TERMS AND ABBREVIATIONS

TERMS AND ABBREVIATIONS	DESCRIPTION
AA MCT v3	Anglo American Mine Closure Toolbox, Version 3
AIA	Archaeological Impact Assessment
Amelioration	The act of making something better; improvement (such as fertiliser, ripping, etc.)
Care and maintenance	This involves the maintaining and corrective action as required as well as conducting the required inspection and monitoring to demonstrate achievement of success of the implemented measures
Closure	This involves the application for closure certificate and initiation of transfer of on-going care and maintenance to third parties
Contingencies	This allows for making reasonable allowance for possible oversights/omissions and possible work not foreseen at the time of compilation of the closure costs.
CRD	Coarse Residue Dump
DBCM	De Beers Group of Companies
Decommissioning	This relates to the situation after cessation of operations involving the deconstruction/removal and/or transfer of surface infrastructure and the initiation of general site reclamation
DMR	Department of Mineral resources
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMV	Earth Moving Vehicle
ERA	Environmental Risk Assessment
E-TEK	E-TEK Consulting (Pty) Ltd
ESP	Exchangeable Sodium Potential
FRD	Fine Residue Deposit
Ha	Hectare
I&APs	Interested and Affected Parties
ICPS	Integrated Closure planning System
IWWMP	Integrated Water and Waste Management Plan
KBA	Key Biodiversity Areas
Km	Kilometres
KPIs	Key Performance Indicators

TERMS AND ABBREVIATIONS	DESCRIPTION
LoM	Life of Mine or Scheduled closure that happens at the planned date and/or time horizon
MRF	Mine Reside Facilities (combined name for waste rock dump, slimes dams and tailings dumps)
NGL	Natural ground level
Preliminary and Generals (P&Gs)	This is a key cost item which is directly related to whether third-party contractors have applied for site reclamation. This cost item comprises both fixed and time-related charges. The former makes allowance for establishment (and dis-establishment) of contractors on site, as well as covering their operational requirements for their offices (electricity /water /communications), latrines, etc. Time-related items make allowance for the running costs of the fixed charge items for the contract period.
PM	Particulate Matter
PMS	Plant Moisture Stress
Post-closure	The period after mine closure
Premature or Un-scheduled closure	Immediate closure of a site, representing decommissioning and reclamation of the site in its present state
Rehabilitation	To restore to the approved sustainable end state of land. Land rehabilitation is the process of returning the land in each area to some degree of its former state or an approved end state with a beneficial/sustainable land use.
SBP	Strategic Business Plan
SEA	Strategic Environmental Assessment
Site relinquishment	Receipt of closure certificate and handover to third parties for on-going care and maintenance, if required
Slimes dams	A slime/tailings dam is typically an earth-fill embankment dam used to store by-products of mining operations after separating the ore from the waste (rock).
SO₂	Sulphur Dioxide
SPCP	Strategic Preliminary Closure Plan
TFCA	Transfrontier Conservation Area
VLNR	Venetia Limpopo Nature Reserve
VOP	Venetia Open-pit Operation
VUP	Venetia Underground Project
WHS	UNESCO World Heritage Site
WRD	Waste Rock Dump

EXECUTIVE SUMMARY

Venetia Mine (Venetia) is located 80 km west of Musina and 40 km east of Alldays in the Limpopo Province. The province shares its border with North-West, Gauteng and Mpumalanga, all being provinces of South Africa to the south of Limpopo province and neighbouring countries Botswana, Zimbabwe and Mozambique to the north.

The mines' ore processing plant has a capacity of six million tonnes per annum and recovers in the order of 3 to 4 million carats of diamonds per annum, making it South Africa's largest diamond producer.

The construction of the Venetia open pit mine started in January 1990 and was in full operation by 1993. The planned life of mine (LoM) for the open pit operations is Quarter 4 2022 whereafter the mining method will transition to the underground mining operation, currently under construction. The predicted LoM for the underground operation is 2045.

Venetia's closure vision is the following:

Develop and implement a cost-effective closure plan in collaboration with stakeholders and integrated with regional development plans which will ensure a safe and responsible transition from mining within the constraints and opportunities of the environment.

Emphasis will be on leaving behind a sustainable environment, through minimising the residual socio-economic and biophysical impacts.

"Leaving a positive legacy."

As per the current legal commitment and requirement in Appendix 13 of the 2012 Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP), the post-mining land use will be **CONSERVATION AND ECO-TOURISM**.

The 2022 annual rehabilitation plan focusses on the rehabilitation of selected available areas on the waste rock dump (WRD). The closure criteria, which was developed and updated during 2021 for the Venetia WRD, needs to be taken into consideration throughout the planning, budgeting and implementation phases to ensure that the agreed post-mining land use is achieved by mine-closure.

Project Description and Purpose:

During 2021, Venetia appointed E-TEK Consulting (Pty) Ltd to review and update the Annual Rehabilitation Plan (ARP) as well as inclusion and alignment of the plan with the Anglo American Mine Closure Toolbox, Version 3 (AAMCTV3). Previously the ARP was the only required document in terms of rehabilitation planning and implementation but as from 2021 Anglo American requires the alignment of the rehabilitation plan to the AAMCTV3.

Since the ARP only refers to the annual rehabilitation that is planned and the AAMCTV3 requires a 5-year rehabilitation plan, it is not relevant any more to refer to this document as the Annual Rehabilitation Plan but rather just the Rehabilitation Plan (RP) which includes a 5-year implementation plan. The main deliverable therefore would be the following:

- Updated Annual Rehabilitation Plan (ARP) referred to as Appendix 3 of GN R1147 as well as Version 3 of the Anglo-American Mine Closure Toolbox.

The processes followed, during the compilation of the above, facilitate the identification of the most appropriate post-mining land uses and closure-related performance objectives to guide the transition from operations within the expanded mining areas to closure as seamlessly as possible while ensuring compliance with the applicable legislation.

The RP is **the 4th update and** does not address routine environmental matters and considerations arising from operations, as these are covered in the EMP and are implemented through the mine's Environmental Management Systems (EMS) and supporting standards and procedures as well as the newly developed Biodiversity Management Plan.

The timeline for this RP is from 1 January 2022 to 31 December 2026.

Rehabilitation Plan Overview:

The operational RP should be reviewed and updated annually consistent with the progress, site requirements and the financial provision made.

The primary focus of the operational RP is to identify and address aspects that require attention and interventions, during the mine's operational life, which could contribute to achieving the mines' closure vision and closure objectives and success criteria, as stipulated in the closure plan, as soon as possible.

The objectives of the RP are summarised as follows:

- Review of concurrent rehabilitation and remediation activities already implemented and ascertain the success thereof;
- Establish rehabilitation and remediation goals and outcomes for the forthcoming 12

months (as per GN R1147) as well as a 5-year plan (as per Version 3 of the Anglo-American Rehabilitation Toolbox), which contribute to the gradual achievement of the following:

- Post-mining land use;
- Closure vision; and
- Objectives identified in the Rehabilitation, Decommissioning and Mine Closure Plan;
- Establish the following relating to the implementation of rehabilitation actions for the forthcoming 12 months (as per GN R1147) as well as a 5-year plan (as per Version 3 of the Anglo-American Rehabilitation Toolbox):
 - Rehabilitation plan;
 - Schedule; and
 - Budget
- Identify and address shortcomings experienced in the preceding 12 months of rehabilitation, if any implementation was conducted;
- Evaluate and update the cost of rehabilitation for the forthcoming 12-month and 5-year period for purposes of supplementing the financial provision guarantee or other financial provision instruments.

Concurrent rehabilitation actions completed before FY2021

Venetia Mine has successfully completed the following rehabilitation to date:

- Waste Rock Dump rehabilitation: 191 ha;
- Bulk profiling of WRD: 96.1 ha during 2021 and 88 ha is the planned section to be profiled by year end 2022;
- Continuous construction of the waste rock wall impoundment around the Fine residue deposit (FRD) complex (FRD-WRW):
 - Ensuring FRD stability;
 - Deposition creating a rehabilitation profile as part of cost-effective concurrent rehabilitation actions;
- Extensive site-wide environmental monitoring.

Planned concurrent rehabilitation actions for FY2022

Venetia is adopting an owner-based rehabilitation implementation approach where they will be acquiring their own rehabilitation fleet and implement all rehabilitation activities inhouse.

Venetia plans to implement the following concurrent rehabilitation projects from January 2022 to December 2022:

- Acquisition of own rehabilitation fleet;
- Appointment of dedicated rehabilitation lead;
- Appointment and training of dedicated rehabilitation fleet operators,
- Bulk reshaping and profiling of selected sections of the WRD (refer to APPENDIX E);
- Site-wide environmental monitoring.

The MRD rehabilitation strategy and subsequent designs focus on creating non-water-shedding rehabilitated facilities to support sustainable vegetation growth on these hot and dry facilities due to low rainfall and high evaporation. (Refer to section 6.1) This strategy facilitates reducing the risk of possible flooding of the underground operation below the pit. The current designs of the stormwater retaining infrastructure allow for a 1:200-year 24 hr storm event. The capacity can be increased if required by implementing minor changes to the construction and alignment criteria of the stormwater management infrastructure.

It is thus vitally important to rehabilitate the catchment on the WRD which drains towards the pit **before** commencing with other areas of the WRD or other facilities. The catchment covers 221 ha which will be rehabilitated over two years during 2022 and 2023 and the balance of the WRD by year end 2026. Refer to APPENDIX E.

The following budgets up to Y2026 have been provided for utilising owner fleet unit rates:

- Y2022: R3 635 642.44
- Y2023: R1 430 112.65
- Y2024: R3 774 715.00
- Y2025: R3 764 752.79
- Y2026: R0.00

The actions include the following:

- Bulk profiling of the nominated areas on the WRDs (APPENDIX E).
- The delineated area where the profiling and surface rehabilitation should be done amounts to approximately 88 ha during which 489 934m³ of material requires bulk reshaping for the 2022 period.
- The total flat surface area comprises of 19ha of the total 88ha that will require final

profiling.

- Bulk reshaping is to be conducted by D10 dozers already established on-site.
- Monitoring and biophysical closure aspects have been included in the annual rehabilitation budget as the outcomes have a direct impact on the closure liability of the mine which needs to be proactively managed to curb an unforeseen increase in the closure liability.

Closure liabilities for the Venetia Mine Mining Right

The closure liability of Venetia has been updated on an annual basis over the past years. There has been a steady reduction of the liability of the FRDs and WRDs, despite ongoing deposition on the facilities, due to smart planning and execution focussing on closure liability management.

The Venetia Underground Project's (VUP) liability has been increasing annually due to infrastructure development. Closure management has been kept in mind throughout the VUP planning phase.

The budget required for the annual rehabilitation plan for FY2022 amounts to **R15 403 136.74 (excluding VAT)**. It includes the cost of physical rehabilitation (profiling of WRD benches within the given boundary) together with surface rehabilitation, maintenance of rehabilitated areas and biophysical monitoring which has been annually in the past. The WRD costs are included under "Mining Aspects." The total cost for FY2022 is made up out of the following:

- Mining aspects amount to:
R3 635 642.44 (excl. VAT)
- Bio-physical aspects amount to:
R9 348 623.00 (excl. VAT)
- General aspects (care and maintenance of rehabilitated areas):
R2 418 871.31 (excl. VAT)

1. INTRODUCTION

During 2021, Venetia appointed E-TEK Consulting (Pty) Ltd (E-TEK) to review and update the Annual Rehabilitation Plan (ARP) as well as inclusion and alignment of the plan with the Anglo American Mine Closure Toolbox, Version 3 (AAMCTV3). Previously the ARP was the only required document in terms of rehabilitation planning and implementation, but as from 2021 Anglo American requires the alignment of the rehabilitation plan to the AAMCTV3. Since the ARP only refers to the annual rehabilitation that is planned and the AAMCTV3 requires a 5-year rehabilitation plan it is not relevant any more to refer to this document as the Annual Rehabilitation Plan but rather just the Rehabilitation Plan (RP) which includes a 5-year implementation plan. The main deliverable therefore would be the following:

- Updated Annual Rehabilitation Plan (ARP) referred to as Appendix 3 of GN R1147 as well as Version 3 of the Anglo-American Mine Closure Toolbox.

The processes followed during the compilation of the abovementioned document facilitate the identification of the most appropriate post-mining land uses and closure-related performance objectives to guide the transition from operations within the expanded mining areas to closure as seamlessly as possible while ensuring compliance with the applicable legislation.

The focus and content of the RP is aimed at identifying and addressing aspects that require attention and possible immediate interventions, during the mine's operational life (such as concurrent rehabilitation), that would contribute to achieving the closure vision and closure objectives, as stipulated in the Rehabilitation, Decommissioning and Mine Closure Plan, as soon as possible after mine closure.

The RP does not address routine environmental matters and considerations arising from operations, as these are covered in the EMP and are implemented through the mine's EMS and supporting standards and procedures.

The RP should be reviewed and updated annually to ensure that all closure criteria are met in accordance with the financial provision calculated.

2.2. LOCALITY AND UTILITIES

2.2.1. Locality

Venetia is located approximately 80 km west of Musina and 40 km east of Alldays in the Limpopo Province. The province shares its border with North-West, Gauteng and Mpumalanga, all being provinces of South Africa to the south of Limpopo province and neighbouring countries Botswana, Zimbabwe and Mozambique to the north (Figure 3, APPENDIX A).

The Venetia mining right is located on the farm Venetia 103-MS. The mine lease area, which includes the mining right area, extends over portions of the farms Drumsheugh, Elesger, Krone and Rugen (Figure 4).

The following farms form part of the surface area of Venetia:

- Portions 1, 2, 3, 4, 5 and remainder of the farm Venetia 103 MS;
- Portion 1 and remainder of the farm Krone 104 MS;
- Remainder of the farm Rugen 105 MS;
- The farm Drumsheugh 99 MS; and
- The farm Elesger 98 MS.

The mine lease, mining right and cadastral boundaries are indicated in Figure 4. The mine lease area falls within the Mapungubwe world heritage sites' buffer zone.

Bordering the mine lease boundary to the north, east and west is the Venetia Limpopo Nature Reserve (VLNR), a private reserve owned by DBCM. South of the mine is the farm Gotha 102 MS, a livestock and game farm and where a private guesthouse is operated.

Mining infrastructure, specifically relating to water supply and outside the mining right, is situated on the following two farms:

- Schroda farm 46MS; and
- Greefswald farm 37MS.

Access to the main entrance of the mine by road is via the regional R2692. A private airstrip, which was constructed within the mine lease area, is used for mine-related activities.

2.2.2. Primary Utilities

2.2.2.1. Electricity supply

The main Eskom power supply line originates from the south with a grid connection along the R2692. Eskom holds the servitude rights for the electricity supply line over the De Beers property.

2.2.2.2. Water supply

Potable water is extracted from the Limpopo River (wellfields in the Greefswald and Schroda aquifers) and pumped to the mine. Strict pumping protocols are enforced to prevent over utilisation and stressing of the water resource. These protocols are based on plant moisture stress (PMS) assessments that are conducted monthly.

During flood conditions, water is pumped to the Schroda off-channel storage dam. (OCS dam) This stored water is used to supplement the demand from the mine during dry periods to prevent the Greefswald aquifer from becoming stressed (Figure 2).

A reticulation network connects the wellfields, Schroda OCS dam, Greefswald reservoir/pump station and Venetia on-mine water storage dams (OMWSD). A water pipeline servitude, in favour of De Beers, is aligned from the Greefswald reservoir to the OMWSD.

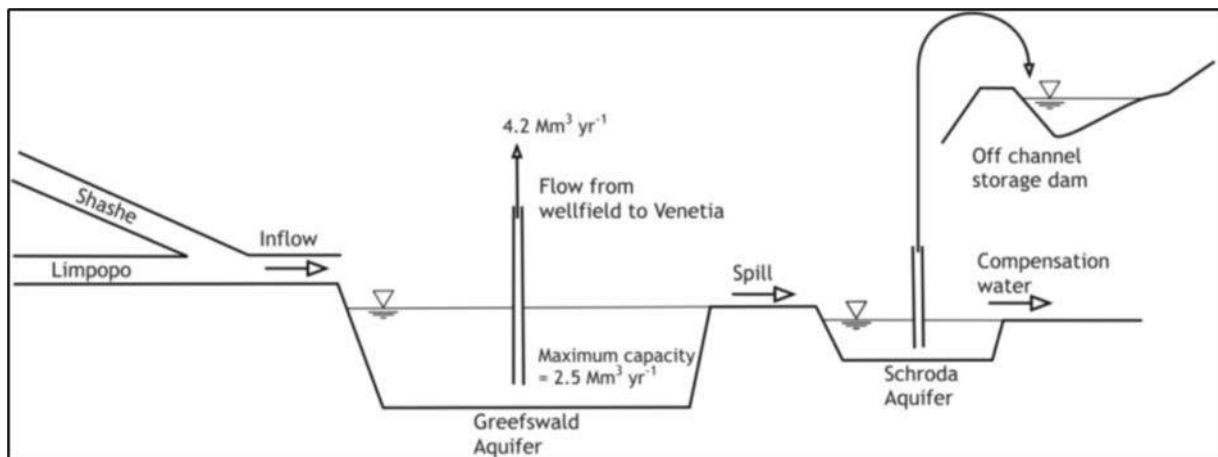


Figure 2: Conceptual model of water abstraction for Venetia Mine (Parke and Richards, 1992).

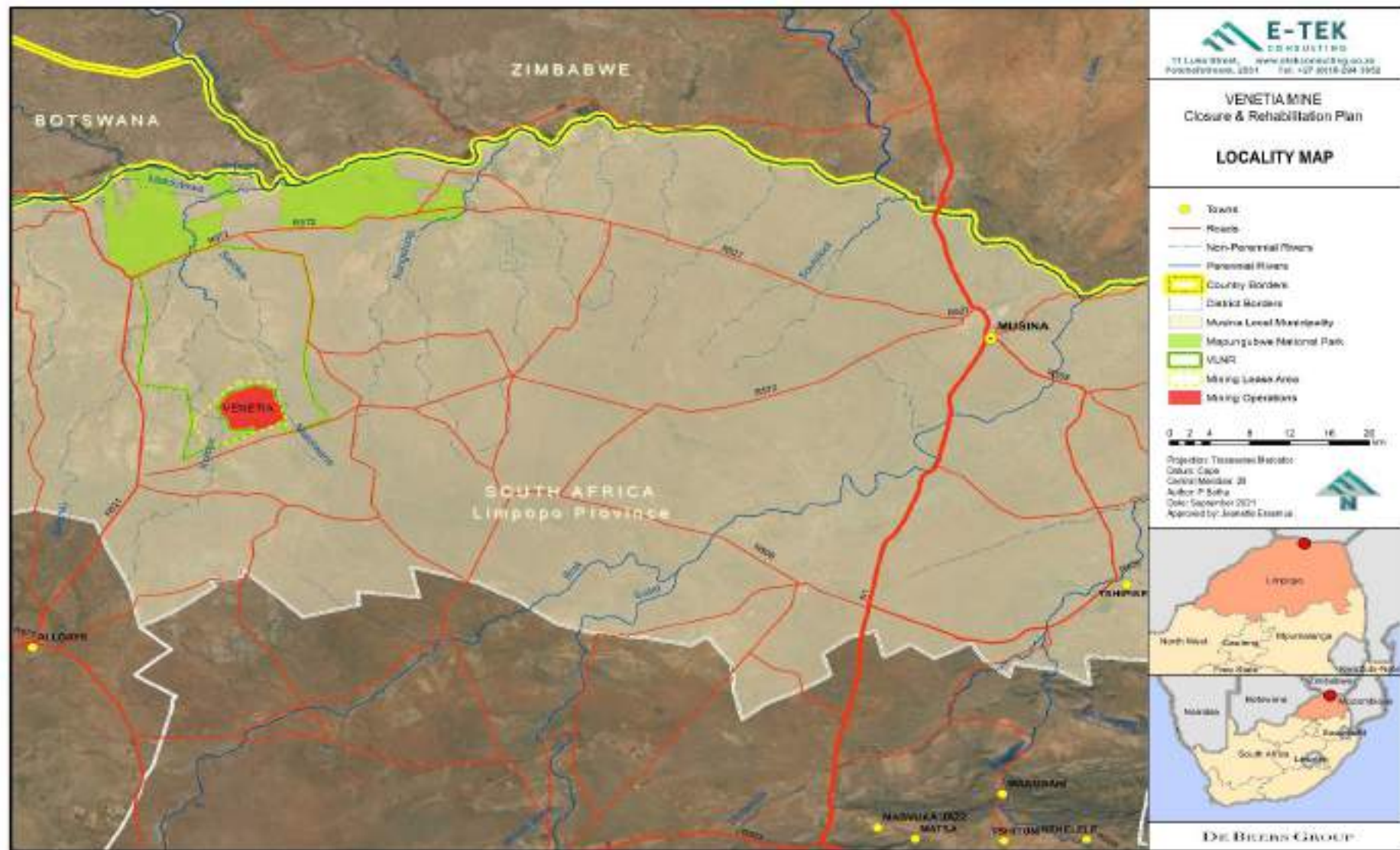


Figure 3: Locality Map for Venetia Mine

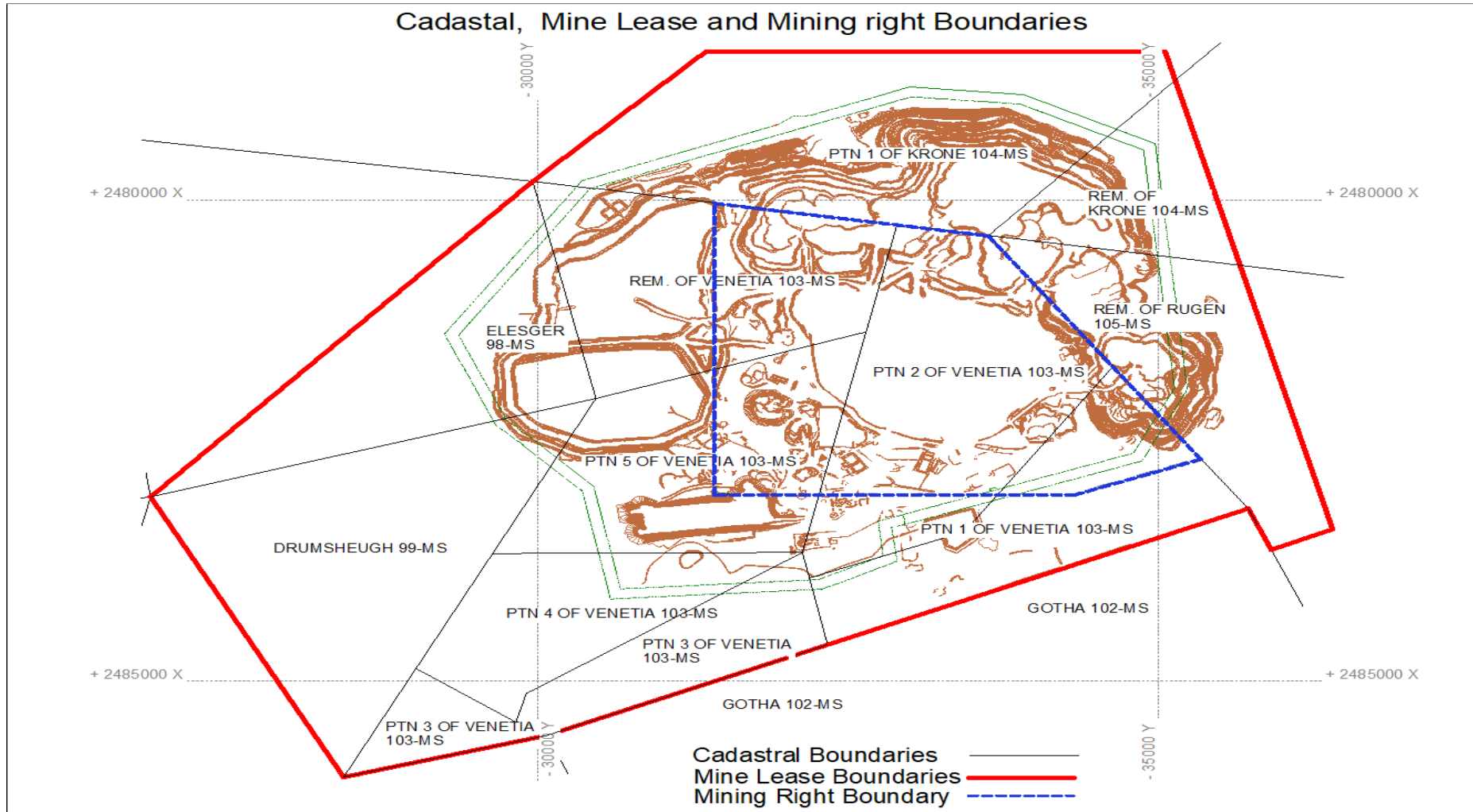


Figure 4: Cadastral-, Venetia Mine lease-, Security- and Mining Right Boundaries

2.3. CLOSURE VISION, OBJECTIVES & LAND USE

The overall closure vision is underpinned by the more specific objectives listed below.

2.3.1. Closure Vision

The closure vision for Venetia has been described as follows:

Develop and implement a cost-effective closure plan in collaboration with stakeholders and integrated with regional development plans which will ensure a safe and responsible transition from mining within the constraints and opportunities of the environment.

Emphasis will be on leaving behind a sustainable environment, through minimising the residual socio-economic and biophysical impacts.

“Leaving a positive legacy”

2.3.2. Closure Objectives

The following closure objectives guide the process and underline the drivers for the closure vision and post-mining land use.

Table 1: Closure objectives

CLOSURE ASPECT	DESCRIPTION
Physical stability:	To remove and /or stabilise all redundant surface infrastructure, roads and general surface areas; To stabilise all top surfaces and outer slopes of MRD’s remaining post-closure; To recognise the existence of the modelled break back zone/zone of relaxation of the pit rim ensuring future development to be outside this zone.
Environmental quality:	To ensure that the environmental quality is not adversely affected by: physical effects (e.g. erosion, dust) chemical contamination arising from the mine site. reduction in catchment-yield after closure.
Biodiversity:	To encourage re-establishment of sustainable indigenous vegetation on the disturbed mine areas. To ensure no nett loss of significant biodiversity.
Land capability/land use:	To ensure that the surrounding environment/adjacent land uses are the drivers for the proposed post-mining land use. To re-instate suitable land capabilities over the various portions of the mine site

CLOSURE ASPECT	DESCRIPTION
Health and safety:	To ensure that the post-mining site remains within a controlled area. To limit the possible health and safety threats to humans and animals, accessing the rehabilitated mine site, as it becomes available for the desired future land use.
Aesthetic quality:	To leave behind a rehabilitated mine site that is: neat and tidy, while giving an acceptable overall aesthetic appearance that does not compromise the planned post-mining land use. emulating the surrounding landscape where practically possible.
Social:	To ensure that the envisaged infrastructure transfers, and/or contributions, made by the mine, towards the long-term socio-economic benefit of the local communities, are sustainable. Timeously communicating with local communities, stakeholders and government departments on the closure of the mine. Training and awareness to effectively manage the financial and /or commercial resources transferred from the mine post-mining

2.3.3. Land Capability and Land Use/S

Refer to APPENDIX D: POST-MINING LAND-USE.

2.3.3.1. Pre-mining land capability and Land-use

The mine lease area was mostly undisturbed prior to mining activities and the area was classified as extensive grazing, however, due to the area being relatively dry and the unpredictable rainfall, the area is most suited to conservation. If the area is not managed correctly, it can lead to the loss of soil resources as well as an impact on the land capability of the area. Soils in the area have intermediate suitability for arable land, forestry and grazing. the latter of which is found mostly along the Limpopo and Sand River areas with the areas neighbouring the Limpopo River being set aside for intensive agricultural activities (Golder & E-TEK Consulting, 2011).

Venetia farm was first occupied in 1871 and for approximately 100 years the area was used extensively for grazing and occasionally for dryland cropping. The grazing capability of the Venetia farm declined prior to 1980 due to the farm being divided into 5 portions which led to overgrazing. The Venetia, Krone and Rugen farms were acquired by DBCM in 1980 and by 1989, a wildlife conservation policy was initiated. The area is maintained as a game reserve

with all domestic livestock being excluded with the assistance of a game fence (Golder & E-TEK Consulting, 2011).

Areas neighbouring Venetia which are also owned by DBCM and have been set aside for nature conservation include the following: (Refer to Figure 4)

- Rugen 105 MS which is located to the east;
- Drumsheugh 99 MS, Elesger 98 MS which is located to the west; and
- Endora 66 MS, Krone 104 MS which is located to the north.

2.3.3.2. *Post-mining Land use*

As per the current legal commitment and requirement in Appendix 13 of the 2012 EIA and EMP, the post-mining land use will be:

CONSERVATION AND ECO-TOURISM.

The most sustainable option will be to partially incorporate Venetia into the Venetia Limpopo Nature Reserve (VLNR) at closure. This will need to be aligned with the BMP which sets out the final land use activities and resource management as well as stability of the rehabilitated WRD, FRD and CRD structures.

Taking cognisance of the land uses of the expanses adjacent to Venetia is imperative as this is a major driver for the proposed post-mining land use. It will ensure that the mine fits into the surrounding environment after mining has ceased:

- The VLNR that falls within the buffer zone of the Mapungubwe National Park which is a legally designated Protected Area and UNESCO World Heritage Site (WHS);
- Key Biodiversity Areas (KBA);
- Game and stock farms; and
- Lodges (eco-tourism)

The specific **onsite closure components** will be treated differently, depending on the following:

- Closure objectives and closure vision for the specific component;
- Feasibility of the land use/s post-closure per closure aspect and taking a phased approach of incorporating these facilities into the VLNR, having a post-mining land use of conservation and eco-tourism.
 - Phase 1:

- Incorporation of rehabilitated areas into the VLNR during the operational phase of the mine. These will potentially be the areas of the **WRD** where concurrent rehabilitation has been done and which should be completed by ± 2026 . The current perimeter fence could be moved once the rehabilitation of the specific areas have been completed and monitored to confirm the success and sustainability of the rehabilitation measures implemented. This should be done once there is confidence that there will be no future disturbances on those areas due to mining activities.

The sooner the fences are opened for animals to enter, utilise and traverse the site, the sooner there will be proof of the sustainability of the rehabilitation technique being followed. It will be imperative to only allow up to certain animal class to maintain stability. Allowing large animals like buffalo and elephant will cause secondary stability issues through trampling and preferred walking paths.

- Phase 2:
 - The **general surface areas**, where footprints of buildings have been rehabilitated, can be incorporated as soon as they become available. The majority of these areas will only be rehabilitated post-mining. Phase 2 will thus only be implemented after ± 2050 (5 years after LoM closure). The possibility of certain infrastructure/buildings having a post-mining use needs to be investigated and confirmed as the closure plan is updated as a workable document, considering the beneficial use of specific buildings when planning for a conservation and eco-tourism land use post-mining;
 - The **CRD** will only be incorporated into the surrounding areas once the rehabilitation has been implemented and monitored. This will probably only be implemented post-mining as deposition of coarse residue will be ongoing until mine closure. Phase 2 will thus only be implemented after 2050 (5 years after LoM closure). The possibility of the CRD material being classified a resource should also be confirmed as this will have a direct impact on the post-mining land use opportunities at this facility.
- Phase 3:
 - The **FRD** will be the last facility to be incorporated into the VLNR due to the associated safety aspects. (Refer to the Risk assessment in Section 8 of the Rehabilitation, Decommissioning and Mine Closure Plan). This

may only be obtained by 2060 (15 years after LoM) when the facility has dried out and the entire top surface is safe to access. Security fencing surrounding the facility will thus remain intact until the facility is trafficable as per the rehabilitation and closure criteria. Access and grazing of animals are not encouraged on these facilities until the rehabilitation monitoring proves to be successful and signed off by the responsible professional engineer/s and environmental scientists;

- Not accessible:
 - According to the rehabilitation and closure criteria, neither the **open pit** nor the **shafts** will be accessible post-mining. The shafts will be sealed and access to the open pit will be restricted by an enviroberm, fence and lockable gates. The pit will not be back-filled although it will not have any potential for further open-pit mining once the underground mine has been fully developed below the pit.
 - The opportunity of having viewpoints or other eco-tourism attractions associated with the pit should be investigated and planned accordingly to have a beneficial use post-mining, and not only be an inaccessible area within the larger conservation area.

3. SUCCESS CRITERIA

The primary focus and content of the Rehabilitation Plan is to identify and address aspects that require attention and interventions, during the mine's operational life, which would contribute to achieving the closure vision and closure objectives, as stipulated in the closure plan, as soon as possible. This requires funding which needs to be budgeted for annually before implementation can commence.

The rehabilitation plans do not address routine environmental matters and considerations arising from operations, as these are covered in the EMP and implemented through the mine's EMS, supporting standards and procedures.

Veneta developed success criteria as part of the Integrated Closure Planning System (ICPS), in consultation with internal and external consultations. This should be refined with the update of the Closure Plan in 2022. The following closure success criteria guide the biophysical monitoring process and underline the drivers for the closure vision and post-mining land use.

Table 2. Closure Success Criteria Early Development stage (0-10 Years)

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Integrated landforms, stable and non-polluting	Is the rehabilitated area stable and not prone to erosion?	All	Surface should be non-water shedding for VM.	Minor erosion only with no bare areas > 0.25 ha. No evidence of areas of unplanned ponding greater than >0.25 ha. Erosion should not pose a risk to animals or vehicle movement. Gully erosion will not exceed: <ul style="list-style-type: none"> • 30cm depth and • 30cm width, and • 100m in length • areas of unintended deposition >0.1 ha 	Identify source of erosion and redirect / disperse energy. Reshaping and re-seeding if required. Use of vegetation or rock material to pack gully.
Integrated landforms, stable and non-polluting	Is water movement controlled within the rehabilitated area?	All	Slope designed to be non-water shedding	Paddocks sized sufficiently to cater for rainfall events. Minimal erosion where water flows from drainage structures.	Areas of erosion and slumping may require treatment. Reshape, rip and seed areas.
Integrated landforms, stable and non-polluting	Is the quality of run-off water acceptable?	All	Slope designed for non-water shedding	Limited evidence of siltation of nearby natural drainage lines. Limited damage to water control paddocks. Areas of unintended deposition >0.1 ha	Repair damage to water control paddocks or desilt if necessary.
Integrated landforms, stable and non-polluting	Are the pit walls stable and pit areas safe?	Open Pit	Pit walls should be stable and access to pits should be prevented.	Berms and fences have been constructed beyond the estimated 100 year break back of the pit. Restricted areas are clearly sign-posted. No illegal access to pit	Move berms and signage, repair fences and install signage.

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Integrated landforms, stable and non-polluting	Is the groundwater or surface water being contaminated?	All	Groundwater / surface water not contaminated beyond acceptable limits.	Groundwater / surface water monitoring indicates that all potential contaminants are in line with the IWUL.	Develop remediation methodologies following a source-pathway-receptor model.
Integrated landforms, stable and non-polluting	Is the rehabilitated area stable and not prone to erosion?	All	Surface should be non-water shedding for VM.	Minor erosion only with no bare areas > 0.25 ha. No evidence of areas of unplanned ponding greater than >0.25 ha. Erosion should not pose a risk to animals or vehicle movement. Gully erosion will not exceed: <ul style="list-style-type: none"> • 30cm depth and • 30cm width, and • 100m in length • areas of unintended deposition >0.1 ha 	Identify source of erosion and redirect / disperse energy. Reshaping and re-seeding if required. Use of vegetation or rock material to pack gully.
Integrated landforms, stable and non-polluting	Is water movement controlled within the rehabilitated area?	All	Slope designed to be non-water shedding	Paddocks sized sufficiently to cater for rainfall events. Minimal erosion where water flows from drainage structures.	Areas of erosion and slumping may require treatment. Reshape, rip and seed areas.
Integrated landforms, stable and non-polluting	Is the quality of run-off water acceptable?	All	Slope designed for non-water shedding	Limited evidence of siltation of nearby natural drainage lines. Limited damage to water control paddocks. Areas of unintended deposition >0.1 ha	Repair damage to water control paddocks or desilt if necessary.

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Integrated landforms, stable and non-polluting	Are the pit walls stable and pit areas safe?	Open Pit	Pit walls should be stable and access to pits should be prevented.	Berms and fences have been constructed beyond the estimated 100 year break back of the pit. Restricted areas are clearly sign-posted. No illegal access to pit	Move berms and signage, repair fences and install signage.
Integrated landforms, stable and non-polluting	Is the groundwater or surface water being contaminated?	All	Groundwater / surface water not contaminated beyond acceptable limits.	Groundwater / surface water monitoring indicates that all potential contaminants are in line with the IWUL.	Develop remediation methodologies following a source-pathway-receptor model.
Integrated landforms, stable and non-polluting	Is the rehabilitated area stable and not prone to erosion?	All	Surface should be non-water shedding for VM.	Minor erosion only with no bare areas > 0.25 ha. No evidence of areas of unplanned ponding greater than >0.25 ha. Erosion should not pose a risk to animals or vehicle movement. Gully erosion will not exceed: <ul style="list-style-type: none"> • 30cm depth and • 30cm width, and • 100m in length • areas of unintended deposition >0.1 ha 	Identify source of erosion and redirect / disperse energy. Reshaping and re-seeding if required. Use of vegetation or rock material to pack gully.
Integrated landforms, stable and non-polluting	Is water movement controlled within the rehabilitated area?	All	Slope designed to be non-water shedding	Paddocks sized sufficiently to cater for rainfall events. Minimal erosion where water flows from drainage structures.	Areas of erosion and slumping may require treatment. Reshape, rip and seed areas.

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Integrated landforms, stable and non-polluting	Is the quality of run-off water acceptable?	All	Slope designed for non-water shedding	Limited evidence of siltation of nearby natural drainage lines. Limited damage to water control paddocks. Areas of unintended deposition >0.1 ha	Repair damage to water control paddocks or desilt if necessary.

Table 3. Closure Success Criteria for Established Rehabilitation and Certification (> 10 Years).

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Integrated landforms, stable and non-polluting	Is the rehabilitated area stable and not prone to erosion?	All	Surface should be non-watershedding for VM.	Minor erosion only with no bare areas > 0.25 ha. No evidence of areas of unplanned ponding greater than >0.25 ha. Erosion should not pose a risk to animals or vehicle movement. Gully erosion will not exceed: <ul style="list-style-type: none"> • 30cm depth and • 30cm width, and • 100m in length • areas of unintended deposition >0.1 ha 	Identify source of erosion and redirect / disperse energy. Reshaping and re-seeding if required. Use of vegetation or rock material to pack gully.

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Sustained growth/resilience (Input from Ecologist)	Are invasive species being controlled?	All	Invasive species should not be dominating plant cover and native species should be present.	Invasive species cover < 20% and native plant cover >10%.	Appropriate control techniques are implemented. Re-seed or plant area with native species. Eradicate and control invasive species for every management unit for at least 10 years after rehabilitation.
	Is the rehabilitated area sustaining sufficient nutrient cycling?	All	Leaf litter should be accumulating, and evidence exists that it is decomposing.	The average scores for litter cover are within 20% of reference system. Consider using a continual improvement standard e.g., annual increase of 2% and should be directly correlated to climatic events to max value 36%.	Apply fertiliser where appropriate. Re-seed with nitrogen fixing species.
	Is there evidence that native species are becoming established?	All	Monitoring should demonstrate that seeded species are establishing.	The vegetation community on the rehabilitation site will have a species richness no less than the 70% of the vegetation recorded in baseline surveys. Total native perennial vegetation cover to be $\geq 20\%$. M. Seiderer: Focus on Landscape Functionality Assessment Index Values (i.e. infiltration, stability and nutrient cycling). Please suggest if the above is not appropriate.	Re-seed by hand. No heavy equipment should be used for vegetation reinforcement initiatives. Re-ameliorate according to soil samples. Use native but less palatable species.

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
	Is there any evidence that native vegetation present is biased to a particular community stratum?	All	Germinating plants should represent tree, shrub and ground cover.	<p>Germinating species in similar proportions for each stratum. Tree species should be within at least 40% of stems / ha (approximately 240 stems per ha) when compared to a similarly sized ecosystem.</p> <p>M. Seiderer: The suggested maximum tree density for your area is 600 tree units per ha. I would suggest after the 10 years mark, we should look at a value of not more than 40% of the maximum value which will be 240 tree units per ha. There will be a gradual increase in the Tree Units per year but should not exceed the prescribed maximum for the area. The maximum depends on the post mining land-use. high tree density may not suit select fauna species you are trying to recover. Similarly with low tree count. High tree count in water catchment areas may reduce run-off and infiltration reducing water availability (I understand this is not the case for Venetia).</p>	<p>Re-seed by hand to create tree & shrub islands / clusters.</p> <p>No heavy equipment should be used for vegetation reinforcement initiatives.</p> <p>Re-ameliorate according to area specific soil samples.</p> <p>Use native but less palatable species.</p>

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Fauna Re-colonisation Note 1: Consult with Todd Bell Note 2: Consider Biodiversity Assessment outcomes aligned to the Building Forever Targets.	Does the area provide habitat for key fauna species?	All	Potential fauna habitat should be present.	At least one conservation significant species utilising rehabilitation for breeding or feeding	Add habitat requirements into area (e.g., rocks, logs or fallen branches). M. Seiderer: This is a bold requirement and should be treated with sensitivity. If a conservation significant species is not present in your area, then you would need to enquire about a suitable species and specific relocation strategies will need to be put in place in order to exactly know the habitat requirements etc. As discussed, if the fence is eventually removed at LoM, species like wild dog and rhino will start moving into these areas which will conform to this requirement. These species will however not be present immediately after the 7-year requirement.
	Does the area facilitate invertebrate species to return?	All	Invertebrate species comparable to reference site should be present.	Ant species representation is comparable (within 50%) to similar sized reference site	Add habitat requirements into area (e.g. rocks, logs or fallen branches)

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Fire Management (Input from Ecologist)	Can the site be integrated into the Ventia Game Reserve Fire Management Plan? (No such plan exists)	All	The rehabilitation has been prescribed burnt (at least once) or a wildfire has burnt the area.	Identified trial blocks on the rehabilitated areas have received prescribed disturbance (e.g., fire, drought etc.) Consider deleting this requirement.	Review monitoring results and undertake active management as required.
Drought Management (Input from Ecologist)	Can the site be integrated into the Ventia Game Reserve Drought Management Plan? (No such plan exists) is there a Venetia Game Park Management Plan? Happy to remove the species drought reference.	All	Rehabilitation can survive one or more seasons of low rainfall.	<10% death of tree species during lower-than-average rainfall M. Seiderer: There was a 34% decline during the drought in species diversity, consider reviewing the 10% target.	Review monitoring results and undertake active management as required. Include annual tree density monitoring. Not a corrective action, rather a monitoring requirement to be added to scope or the master action plan.
Management (Input from Ecologist)	Are there any signs that the rehabilitated area will require ongoing management?	All	The vegetation should display the same qualities as an analogue native ecosystem. Monitoring of selected sites at 5-10 years old.	High rates of premature mortality of perennial plants are not apparent. There are no visible signs of insect infestations or pest attacks on leaves and branches. Evidence of tree regeneration is apparent, with seedlings of the more abundant tree species present.	Review monitoring results and undertake active management as required. Investigate possible causes in order to develop a remedial strategy.

Principle	Criteria and Intent	Domain	Guidelines for Acceptance	Accepted Standard	Potential Corrective Actions
Management	Are there any signs the rehabilitation will require ongoing management?	All	The rehabilitation meets the expectations of the community, government and stakeholders.	No safety hazards exist such as old infrastructure, unstable or dangerously steep areas without adequate controls in place. All artificial barriers and mining equipment have been removed.	Ongoing management, including <i>tube stock</i> planting, weed control, feral animal control. Re-work slopes as required.
Management	Have all legal requirements been met for the issuing of a closure certificate?	All	Legal requirements verified against the Legal Conditions and Commitments Register.	The transfer of ownership and management responsibility has occurred, aligned to the end land use objectives.	Determine and agree on ownership and management details. Source appropriate funds.

4. REHABILITATION CONDUCTED TO DATE

Concurrent rehabilitation of the Venetia WRDs commenced in 2009 when an area of 16 Ha was rehabilitated successfully. No further rehabilitation could be done as no final WRD faces were available due to the WRD being developed from the pit outwards by end tipping the waste. All the dump faces would remain active until reaching the final dump limits at LoM.

During 2010, the dumping strategy was changed to constructing the WRD from the outer dump limits inwards while creating a benched geometry supporting cost-effective rehabilitation. Concurrent rehabilitation could commence as the lower outer benches are not at risk of being disturbed.

The rehabilitation of WRD slopes and benches are the costliest and technically most difficult aspect of WRD rehabilitation when compared to the top surfaces. By rehabilitating these benches as they become available, the premature and LoM closure liabilities are reduced significantly, and the success of rehabilitation can be monitored to support and refine the techniques for future rehabilitation.

Venetia commenced with WRD rehabilitation from 2012 until January 2017 of available WRD slopes and flat areas gaining experience, optimising costs, and proving the success and sustainability of the methods implemented. A total area of 191 ha of the WRD was rehabilitated when concurrent rehabilitation had to be deferred for three years due to cashflow management arrangements. Refer to APPENDIX E which indicates the areas rehabilitated to date.

The 2010 Closure and Rehabilitation plan's closure criteria for WRD rehabilitation were initially implemented (9m intra bench lifts, 18-24-degree slope angle, 10m wide bench step back with a bench paddock capacity enough to contain the surface runoff following a 1:200yr storm event as a minimum).

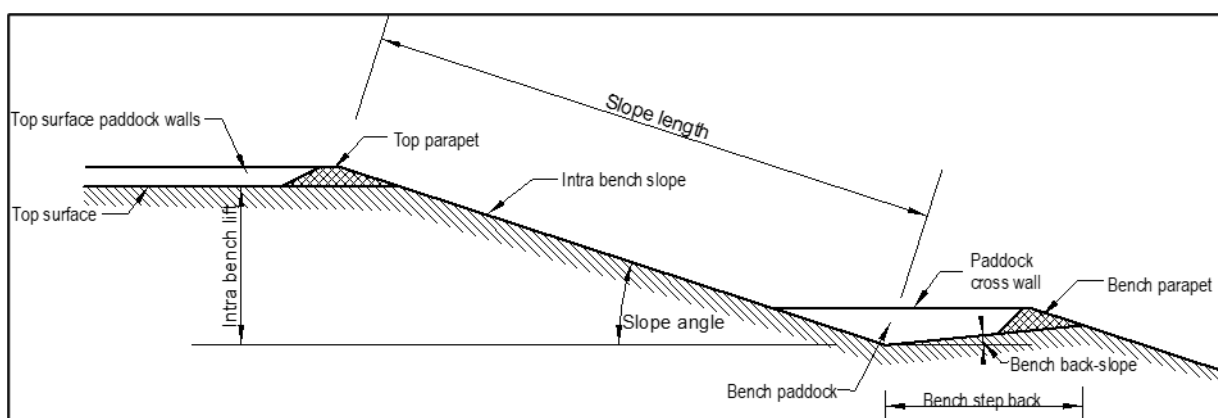


Figure 5: Terminology used to reference a cross-section through profiled WRD slopes.

During implementation, it became evident that the criteria needed to be adjusted based on site experience gained and safety requirements. The criteria now used, and included in the 2018 closure criteria of the Rehabilitation, Decommissioning and Mine Closure Plan (due to be updated in 2022) summarised is as follows:

- Slope angles: below 16 degrees,
- Intra-bench lifts <10m.
- Minimum bench step-back width of 5m after profiling to allow vehicle access to the dump slopes.
- Bench paddocks: Capacity to contain the surface runoff due to a 1:200yr storm event. (Figure 7)
- Contour paddocks constructed on any slopes which exceed 40m in slope length: 200yr storm event containment capacity (Figure 8)
- **100 ± 50mm Ameliorated topsoil¹** ripped into the waste rock surface profile² to create a functional growth medium. Ripping done on-contour (level – no slope).

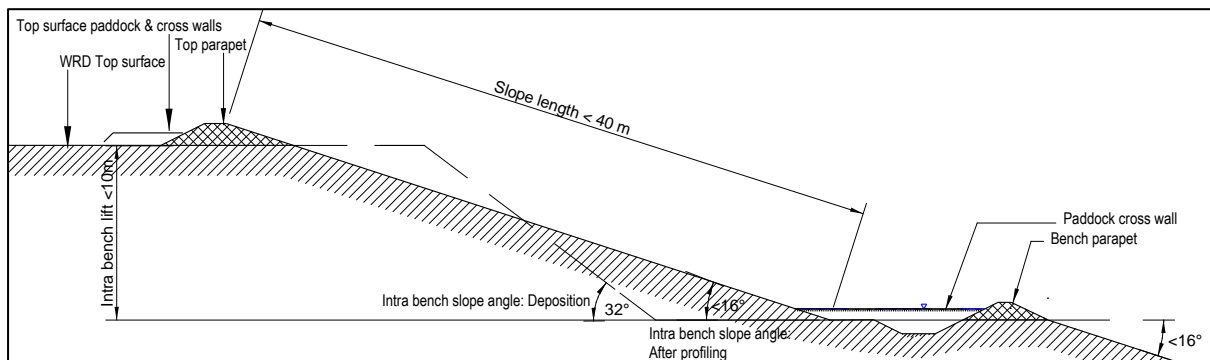


Figure 6: Illustration of ideal dump geometry after reshaping and construction of bench paddocks

¹ Fertilizer, manure, gypsum according to recommendation.

² Topsoil placement depth limited to 100mm – 150mm due to shortfall of topsoil on site.

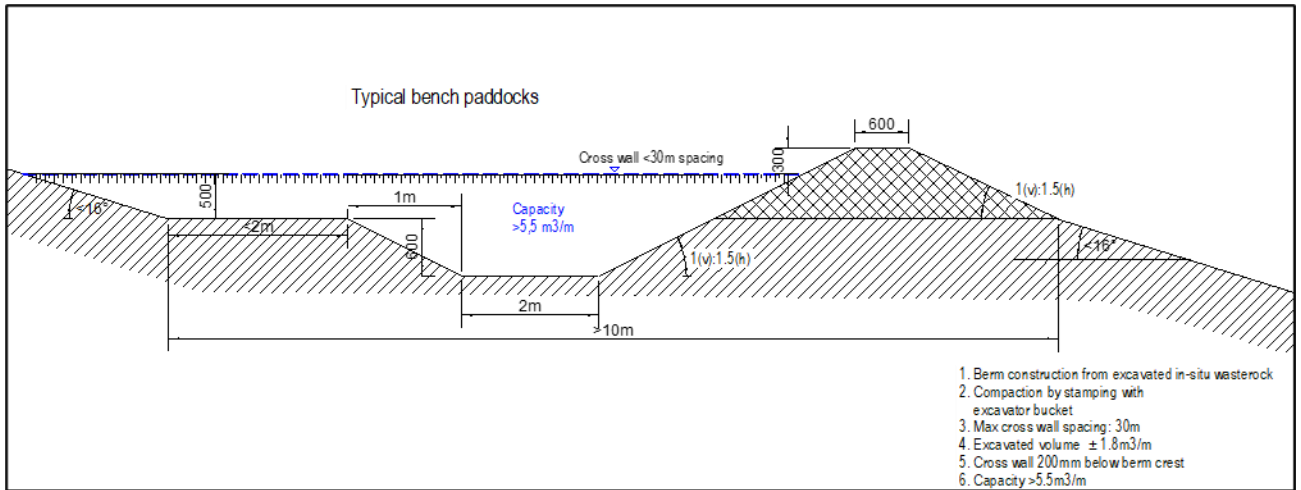


Figure 7: Typical bench-paddock design.

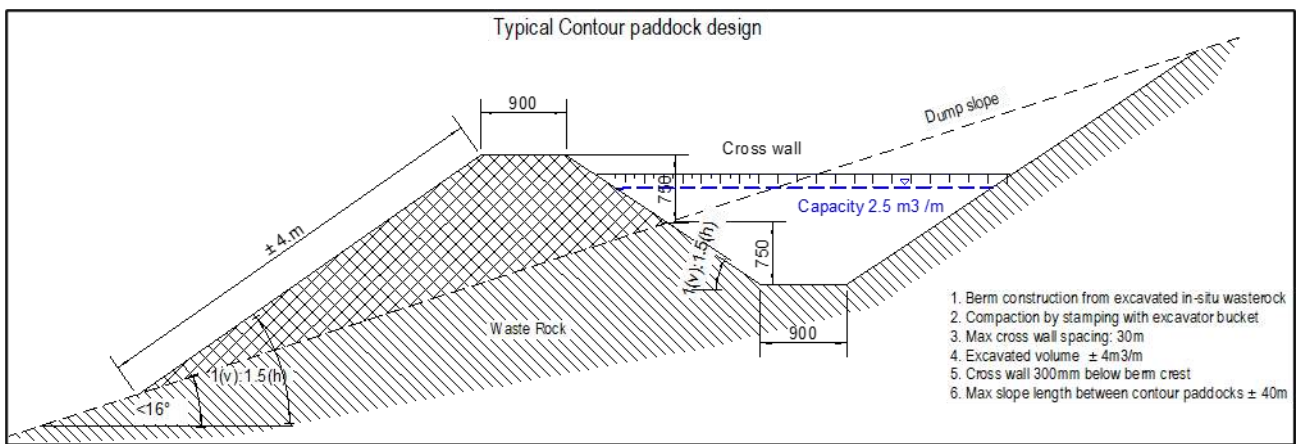


Figure 8: Typical Contour paddock design

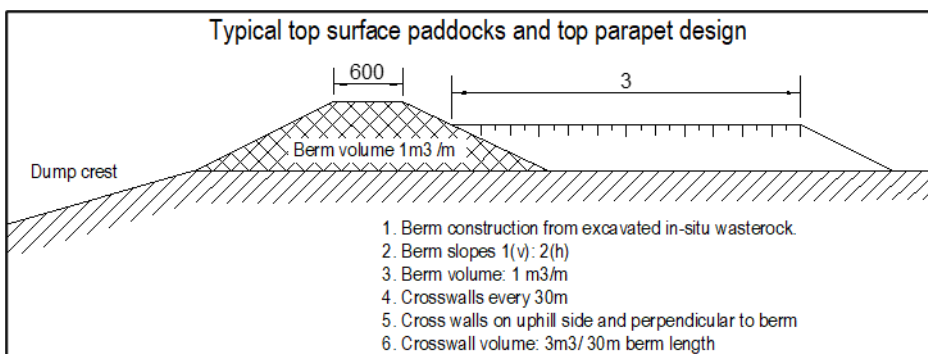


Figure 9: Typical Crest and top surface paddock design

4.1. AREAS COMPLETED ON WRD

Refer to APPENDIX E: PLANNED AREAS AND DATES FOR REHABILITATION OF WASTE ROCK DUMPS (2021 TO 2026), indicating the areas where rehabilitation has been completed on the WRD. This amounts to 191 ha or 26.7% of the total LoM WRD of 716 ha indicated in APPENDIX E and APPENDIX F.

4.2. OBSERVATIONS AND RECOMMENDATIONS FOR COMPLETED AREAS ON WRD

Refer to APPENDIX E: PLANNED AREAS AND DATES FOR REHABILITATION OF WASTE ROCK DUMPS (2021 TO 2026).

The following observations and recommendations were made in the vegetation and rehabilitation monitoring report compiled by GreenThorn in 2020/2021 (Table 4).

Table 4: Summary of observations and recommendations made in the 2020 and 2021 Vegetation and Rehabilitation Monitoring report

	OBSERVATION	CORRECTIVE ACTION
1	<p>The vegetation on the rehabilitated areas is dominated by two or three grass species. Climatic conditions (especially rainfall and heat) during the different seasons are playing a particularly significant role and will continue to determine the success of the rehabilitation attempt. Take cognisance that the success or failure of a rehabilitated site, or even an individual species, is also influenced by a number of other factors, including growth medium, soil nutrient status (chemical composition), soil depth, infiltration rate, density of the soil, microbe activity, erosivity of the soil, slope length, gradient, etc.</p> <p>The pattern observed on the older rehabilitated areas can be expected on the younger sites over time as the same rehabilitation designs, principles and practices were applied.</p>	<p>No physical interventions are proposed at this stage as natural corrections, associated with changing climatic conditions, should occur and ensure sustainability.</p> <p>Annual monitoring must continue.</p> <p>Re-consider the seed mixture used. Select species that are tolerant of high pH conditions and include a number of unpalatable species.</p>

	OBSERVATION	CORRECTIVE ACTION
	Therefore, an increase in the frequency of perennial species, higher basal cover as well as an increase in total herbaceous frequency can be expected.	
3	In some cases, the frequency of bare soil had increased by a small margin, which may also be as a result of the weather conditions, soil nutrient status and the subsequent seasonal decline of annual species in those areas.	Extensive soil sampling of the different rehabilitation sites should be conducted to monitor the nutrient status of the soils. The waste rock fines, and topsoil needs to be considered/sampled separately and mixed to determine the required amelioration approach based on the available plant nutrients in the growth medium. Monitoring/research needs to determine a correlation between bare soil patches and soil nutrient status
4	The re-construction of the contour paddock walls and the construction of more such structures at Rugen has had a positive effect on the stabilising of that area and will prove to be vital in future.	Stormwater control infrastructure forms the backbone of sustainable rehabilitation. Maintenance needs to be done on all rehabilitation sites after a few seasons. Repair the damages and assess the reason for failure – re-alignment of contour paddocks or capacity corrections are sometimes needed while the system is stabilising.
5	Invader control should be an ongoing process at the mine and monitoring of this aspect should be more concisely done in the spring before the invaders' seed matures	Monitor and control alien weeds and invaders before they mature and spread seed.
6	Trees and shrubs are starting to establish and are more visible due to maturity on the older rehabilitated rock dump areas. It needs to be confirmed what the impact thereof will be to the grass cover and sustainability as the tree shade cover and moisture competition increases.	Additional research needs to be conducted on the advantages of trees in dry areas. There are two opposing trains of thought namely the shortage of moisture to support both grasses and trees opposed to the benefits of fixation of nitrogen by certain legumes.

5. REHABILITATION STRATEGY / PROPOSED REHABILITATION TO BE UNDERTAKEN

Rehabilitation will focus on the WRD for the next 5 years:

The selected area of the WRD for implementing rehabilitation during 2022 and 2023 differs from the area delineated in the 2019 ARP. The change was motivated by the realisation that by integrating the stormwater management plan, currently being finalised, with the rehabilitation objectives of the WRD, would reduce the stormwater runoff volume from the WRD to be handled in the pit. This is achieved by retaining all stormwater runoff on the WRD as described below.

The **mine residue deposit (MRD) rehabilitation strategy** and subsequent designs focus on creating non-water-shedding rehabilitated facilities to support sustainable vegetation growth on these hot and dry facilities due to low rainfall and high evaporation. (Refer to section 5.1) This strategy facilitates reducing the risk of flooding of the underground mine below the pit. The current designs of the stormwater retaining infrastructure allow for a 1:200 yr. 24 hr storm event. The capacity can be increased if required by implementing minor changes to the construction criteria of the stormwater management infrastructure.

It is thus vitally important to rehabilitate the catchment on the WRD which drains towards the pit before commencing with other areas of the WRD or other facilities. The catchment covers 221 ha which will be rehabilitated over two years during 2022 and 2023 and the balance of the WRD by year end 2026 (Refer to APPENDIX E).

The detailed design criteria tabulated in the Rehabilitation, Decommissioning and Mine Closure Plan gives a summary of all actions which should be undertaken during the operational life (LoM) of Venetia to ensure the optimisation of operations and minimising the financial commitments at eventual closure (due to be updated in 2022).

5.1. CRITERIA FOR REHABILITATION ACTIONS TO BE UNDERTAKEN

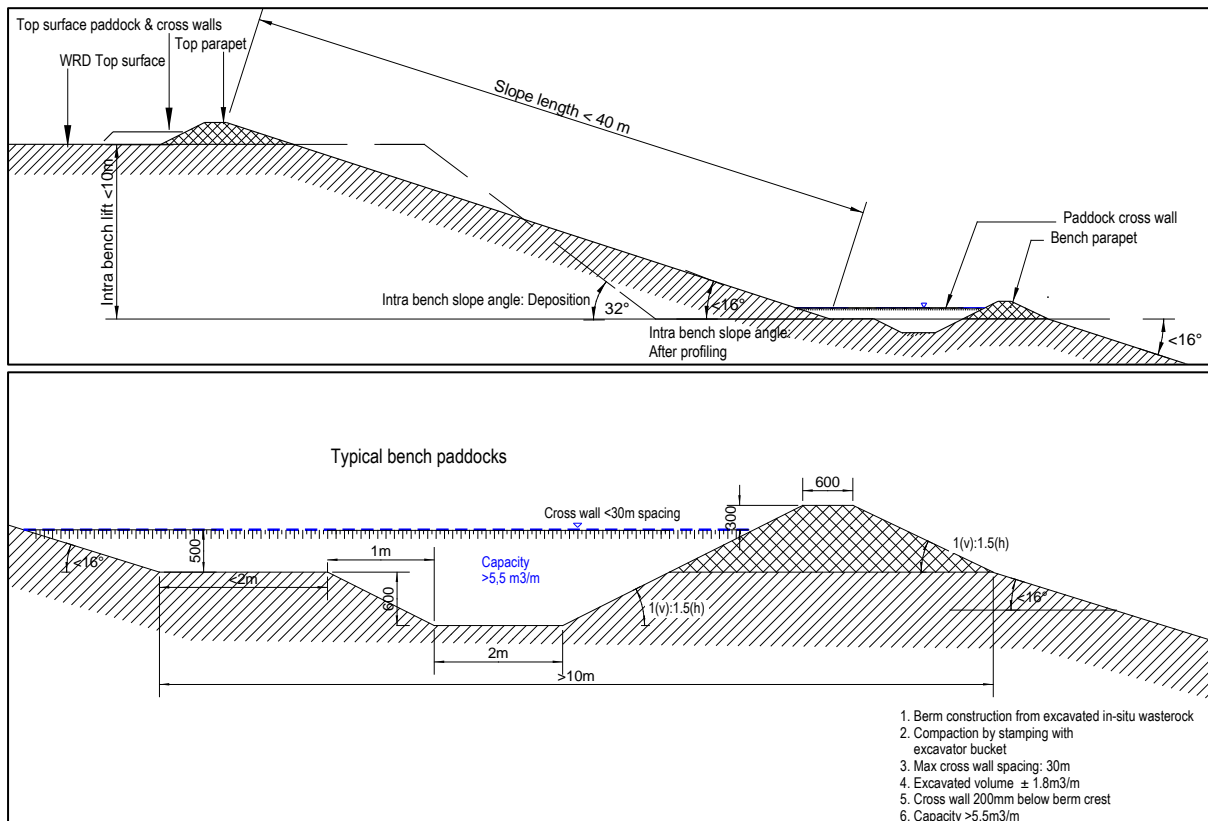
The design criteria to be achieved during the rehabilitation of the WRD are summarised in Table 5 and the associated dump geometry (to ensure stable rehabilitation surfaces) are illustrated in the schematic images below.

Table 5: Rehabilitation methodology

REHABILITATION CRITERIA / ACTIONS	REHABILITATION STRATEGY
i. Intra bench lifts: 8 – 12 m ii. Bench step back ≥ 40 m (before reshaping – slopes at angle of repose) iii. Reshape slope angle $\leq 16^\circ$ iv. Bench step back widths ≥ 8 m after reshaping v. Ameliorated soil depth placed over the reshaped / prepared WRD areas: 100 mm \pm 50 mm	The 2011 Strategic Preliminary Closure Plan (SPCP) states 18° inter bench slope angles. Practical implementation found this to be too steep / impractical to rip the slopes on contour. Thus 16° is safely implementable. <u>Soil amelioration</u> All soils and waste rock fines differ. Analyse all topsoil stockpiles and medium on which topsoil is to be placed and ameliorate according to specialist recommendation based on the mixture of soil and waste rock fines.
vi. Stormwater control contour and bench paddocks: <ul style="list-style-type: none"> • Capacity $\geq 2\text{m}^3/\text{m}$ with zero discharge slope • Paddock cross wall spacing: $\leq 30\text{m}$ • Contour and bench paddock alignment <ul style="list-style-type: none"> ○ WRD top surface: Contour paddocks along the dump crests (Top parapet) ○ WRD top surface flat areas. Paddock alignment maximum spacing $\leq 100\text{m}$ • Elevation difference between contour paddock alignments: $\leq 1\text{m}$ <ul style="list-style-type: none"> ○ Bench paddocks: Along the bench crest (Bench parapet) and flat areas of the bench where required. ○ Inter bench slopes: Contour paddocks on all slopes of which slope lengths $\geq 40\text{m}$ 	<u>Stormwater control</u> <ul style="list-style-type: none"> • All paddocks are to be designed to contain runoff from a 1:200 yr. design flood. • The paddocks are not always level. Crosswalls are required in the paddocks to shorten the paddock to prevent water movement which could result in overtopping at the lowest point. • The bench stepback of $\geq 8\text{m}$ contributes to the capacity of the paddock. • Contour paddocks needed to reduce the inter bench slope length if slope length $\geq 40\text{m}$
vii. Seed with indigenous vegetation species	<u>Vegetation</u> <ul style="list-style-type: none"> • Establish indigenous grass species on the entire facility.

REHABILITATION CRITERIA / ACTIONS	REHABILITATION STRATEGY
	<ul style="list-style-type: none"> Establish indigenous grass species and woody species on the benches. Species composition should be made up out of all ecological classes as well as palatability classes. Nitrogen fixation is critically important for the sustainability of the grasses on the MRD's. Can be achieved by the establishment of <i>Vachellia tortillis</i> (<i>Acacia</i>) tree species on the facility together with the grasses.
viii. Rip entire site of contour	<p><u>Ripping</u></p> <ul style="list-style-type: none"> Rip site to a minimum depth of $\geq 500\text{mm}$ and tine spacing $\leq 600\text{mm}$. Ripping required to alleviate compaction, improve moisture penetration, incorporate topsoil into profile and improve surface roughness to combat erosion. Confirmation was given that no further deposition will be done over the copper anomaly.

The following figures is representative of the above set criteria.



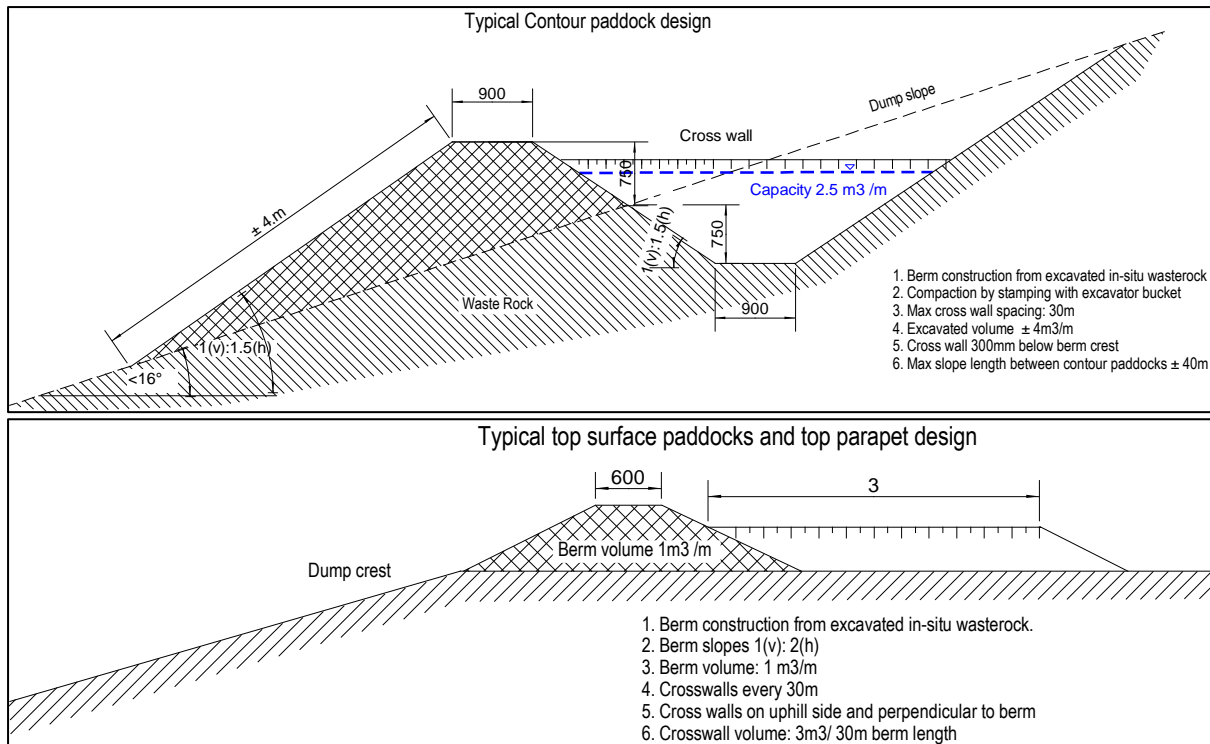


Figure 10: Closure criteria for WRD slope rehabilitation (Schematic)

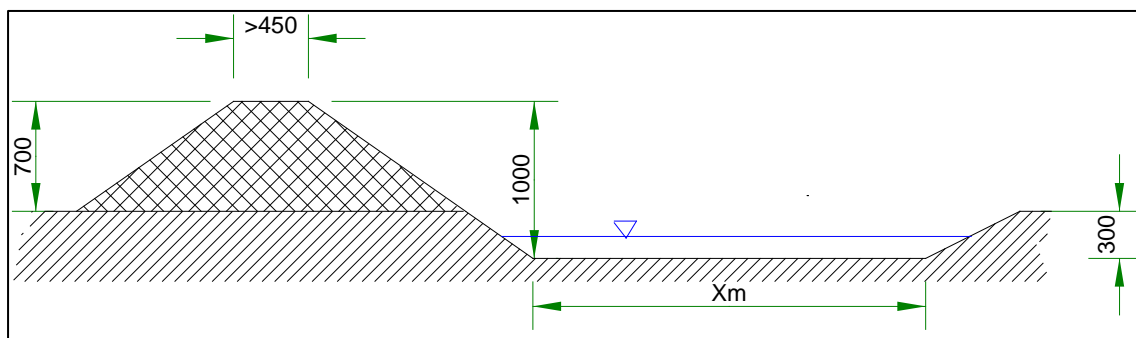


Figure 11: Typical water bearing drain

5.2. AMELIORATION AND SEEDING PROGRAM

5.2.1. Seeding

The following seed mixture is used for the establishment of vegetation on the rehabilitated areas.

Table 6: Grass species and application rate

SPECIES	COMMON NAME	KG/HA
Aristida adscensionis	Sixweeks threeawn	2
Enneapogon cenchroides	Nine awned grasses	4

SPECIES	COMMON NAME	KG/HA
Heteropogon contortus	Spear grass	3
Stipagrostis uniplumis	Silky bushman grass	3
Urochloa brachyura	Fur grass	1
Urochloa mosambicensis	Bushveld signal grass	1
Cenchrus ciliaris Malopo	Blue buffalo grass	3
Cenchrus ciliaris Gayndah	Blue buffalo grass	3
Digitaria eriatha	Smuts finger	1
Eragrostis Teff	Teff	1
Panicum maximum	White buffalo grass	1
Schmidtia pappophoroides	Sand quick grass	2
Chloris virgata	Feather finger grass	2
Eragrostis lehmanniana	Lehmann Love Grass	1
Melinos repens	Natal red top	1
Tragus berteronianus	Burgrass	1
TOTAL		30

5.2.2. Soil Analyses and Fertilization Program

Based on the analyses of the soil being used (Table 7) the following fertilisation recommendation was made:

Soil is saline (EC=420 mS/m) and therefore only a limited amount of feedlot manure (can be applied).

Premix 20 ton/ha manure, 5 ton/ha gypsum, 450 kg/ha Superphosphate and 350 kg/ha Greensulf with 1000 m³ topsoil. Spread 100mm of the mix over the profiled waste rock.

Table 7: Soil analyses

Sample no	pH(KCl)	P(Bray1)	K		Ca		Mg		Na			
		mg kg ⁻¹	cmol kg ⁻¹	mg kg ⁻¹	cmol kg ⁻¹	mg kg ⁻¹	cmol kg ⁻¹	mg kg ⁻¹	cmol kg ⁻¹	mg kg ⁻¹		
1	7.5	34	0.710	277	20.520	4104	3.835	464	0.835	192		
Sample no	Ca:Mg	Mg:K	Ca+Mg:K	K%	Ca%	Mg%	Na%					
1	5.4	5.4	34.3	2.7	79.2	14.8	3.2					
Saturated water paste extract												
Sample no	EC	K		Ca		Mg		Na		SAR	Ca:Mg	Ca %
	mS m ⁻¹	me l ⁻¹	mg l ⁻¹	me l ⁻¹	mg l ⁻¹	me l ⁻¹	mg l ⁻¹	me l ⁻¹	mg l ⁻¹			
1	420	1.714	66.8	14.517	290.3	9.418	113.0	10.849	249.5	3.1	1.5	39.8

5.2.3. Ameliorates and Seed General Notes

When **acquiring grass seed** for the ongoing rehabilitation process it is important to ensure correct **storage** in order to safeguard the viability of the seed and maximize germination percentage. Therefore, when storing seed ensure that they are stored in a cool dry place elevated from the floor through stacking on wooden pallets. Storing seed in shipping container exposed to the elements should be totally avoided. The area should also be protected against pests that can feed on the seed. The seed should also not be stored in areas with chemical fumes or gases. If possible, the ordering of seed should rather be done on a continual basis and not large batches that will be stored for prolonged periods.

As for the **sourcing and acquisition** of goat manure it is advisable that a long-term relationship be built up with a supplier (farmer) that is reliable, has the ability to supply the required quantity of manure required by Venetia on an annual basis. It is also of utmost importance to ensure that the supplier understands the purpose of the goat manure and the required goal of using goat manure in order for him/her to ensure appropriate quality manure. The collection and bagging of manure should take place exactly during the correct time of the season in order to ensure maximum presence of tree species. The supplier should preferably also be situated in an area with the correct trees of which seed is required and not just any tree species. It is also important to identify a supplier that is situated within the same biome and climate region, this will aid in acquiring tree seed that are from a similar phenotype. The latter will aid in more successful establishment of trees over time as they will be better adapted to the local climate. With regards to the timing of harvesting goat manure it is advised that manure be collected in periods when the target trees are dropping their seed pods. This will

ensure manure that has a maximum seed content. If this is too difficult to manage then it is advised that seed is collected by hand and then fed to a selected group of goats in an enclosed area where the manure can then be collected. If the process is left unchecked, then Venetia will be in no control over the quality and effectiveness of the manure that is acquired and then this can become a fruitless exercise.

The **creation of microhabitat** is a vital component in biodiversity reestablishment and development within a natural system, therefore it is advised that as much surface structure be placed on the rehabilitation sites as possible. If Venetia implements any land clearing projects for storm water structures, solar projects, storage facility footprint expansion and infrastructure developments all the wood biomasses must be used as brush packing on the rehabilitation sites. The creation of microhabitat kickstarts the entire biological cycle through controlling soil moisture content, increased organic material that aids in soil biological functioning, soil surface stability, hiding and nesting places for small animals as well as a food source for certain animal species

5.3. HIGH-LEVEL PLANNING

The financing of the underground mine development, Venetia Underground Project (VUP) is reliant on cash generated by the Venetia Open-pit Operation (VOP). During the period 2015 to 2019 Venetia went through a predicted negative cashflow period which was managed by implementing a strict savings drive on non-critical expenditures which included the deferral of all concurrent rehabilitation of the WRD from 2016 until March 2021 when bulk reshaping of the WRD recommenced.

The implementation approach followed by Venetia during the rehabilitation of the WRDs (and FRD-WRW in future) will be as follow, in order to optimise the earth moving equipment fleet utilisation:

- Bulk profiling: Internal operation using one of the mines “D10” bulldozers and operators. These machines have a production rate of approximately 1 800m³ per day³ per dozer and are cost-effective for the mine to implement bulk dozing.
- Follow-up preparation work: **owner fleet** with trained operators and site supervision. (Final profiling of the surfaces before topsoil amelioration, topsoil placement and spreading, ripping and the construction of stormwater control structures).
- Seeding of indigenous grasses: Outsourced to an independent local contractor supplying manual labour and site supervision but managed by the mine.

³ Work rate supplied by Venetia (Mr Lylle Boyce, Accountant)

5.4. WAY FORWARD

Rehabilitation of the WRD and FRD-WRW is planned as an ongoing operation until completion to ensure the continuity of operators, site management, equipment and funding.

From 2022 Venetia will investigate the acquisition and utilization of their own dedicated rehabilitation fleet. The rehabilitation fleet's composition should be based on the required production rate to match the availability of areas ready for rehabilitation and available annual budget to keep working uninterrupted until all the WRD and FRD-WRW rehabilitation work has been completed. This approach will minimise the risk of standing time and completing the work by the agreed completion date.

The remaining dozing (Bulk reshaping) volume and surface area to complete the entire WRD rehabilitation:

- Dozing volume: $\pm 1460\ 980$.
- Surface area: ± 526 ha.

Typically, the required plant fleet for this work could comprise of the equipment listed in Table 8. The estimated production is as follows:

- The total dozing volume required on the WRD ($1\ 460\ 980\text{m}^3$) requires ± 4 years of work for 1 x D10 dozer.
- This fleet should be able to complete **12 to 15 ha**⁴ of surface rehabilitation productively per month depending on the ratio of slopes to flat areas and hauling distance from the topsoil stockpiles to the operational site. The estimated 526 ha thus requires ± 50 months (5 years) to rehabilitate if taking possible standing time into account or poor production rates due to unforeseen circumstances.

Note that the final WRD deposition should be completed during 2022 (Waste profile ⁵) which is when the open pit operation ends.

Table 8: Typical equipment required in a fleet for bulk profiling and surface rehabilitation

MACHINE	SIZE	NR	ACTION
Dozer	D10	1	Bulk profiling of slopes
Dozer	D8	1	Final slope preparation and profiling of areas to be covered with topsoil.

⁴ Production rate achieved up to 2017

⁵ Saungweme, Willis: (2020F08BE3 Deposition plan)

MACHINE	SIZE	NR	ACTION
Dozer	D6	1	Topsoil spreading. Ripping of areas after topsoil has been spread.
Excavator	20/30 ton	1	Construction of stormwater control structures.
Excavator	30/40 ton	1	Loading topsoil onto ADT's.
ADT's	40 Ton	3	Hauling ameliorated topsoil.
FEL	1.5 – 2 m ³	1	Loading manure, gypsum and fertilisers.
Agricultural 4x4 tractor & spreader	75kw tractor, 5-ton spreader	1	Spread gypsum, manure & fertiliser: Topsoil dumps/terraces for pre-amelioration of topsoil prior to spreading on sloped areas. Profiled surfaces of the WRDs flat areas after topsoil spreading has been completed.

6. REHABILITATION FOR THE NEXT 12 MONTHS

As described in Section 5, it is vitally important to rehabilitate the catchment on the WRD which drains towards the pit before commencing rehabilitation of other areas of the WRD or other facilities. The delineated catchment covers 221 ha which needs to be profiled and is hence prioritized according to the proposed targets). The balance of the WRD rehabilitation should be completed by the end of 2026 (APPENDIX G).

6.1. PROFILING AND GENERAL SURFACES

6.1.1. Profiling of Available Slopes

There is currently a backlog of profiling of the WRD and FRD-WRW slopes dumped between 2017 and 2021, according to the agreed dumping plan, at angle of repose. The rate of progress (The profiled hectare available for surface rehabilitation) of a D10 dozer is greater than the surface rehabilitation when using the fleet listed in Table 8. The profiling of the WRD should keep 1x D10 dozer occupied for around 4 years. Surplus dozer capacity, after the WRD has been profiled, can be used for the profiling the FRD-WRW which will be fully constructed with slopes still at angle of repose.

All benches where final deposition has been completed according to the LoM deposition plans, can be profiled as they will not be disturbed in future. This applies to most of the WRD on which deposition will be completed according to the proposed targets.

The benches within the area identified for rehabilitation during the next **12 months** are indicated in APPENDIX E

6.1.2. Surface Rehabilitation

Only bulk profiling is planned for 2022 and surface rehabilitation will commence in 2023.

6.2. TABULATED SUMMARY OF PROPOSED REHABILITATION ACTIVITIES

Refer to Section (e)ii page iv

Table 9: Disturbed areas and availability of areas for concurrent rehabilitation

FACILITY	TOTAL DISTURBED TO DATE (ha)	REHABILITATION COMPLETE (ha)	REMAINING AREAS FOR REHABILITATION (ha)	CURRENTLY AVAILABLE FOR REHABILITATION (ha),	AREA PLANNED FOR FY2022 ONLY BULK RESHAPING AREA (ha)	NOTES
WRDS	717	191	526	526	88	The area on the WRD overlying the copper anomaly and the wellfields pipeline is not available for rehabilitation at this stage. Rehabilitation activities planned for FY2022 includes only bulk reshaping. 96.1ha of reshaping (phase 1) completed in 2021. This still forms part of the total area for rehabilitation (526 ha) as phase 2 (surface work) has not yet taken place. The remainder of the WRDs form part of the 5-year plan.
PIT: WITHIN THE RING-ROAD:	281		281		0	

FACILITY	TOTAL DISTURBED TO DATE (ha)	REHABILITATION COMPLETE (ha)	REMAINING AREAS FOR REHABILITATION (ha)	CURRENTLY AVAILABLE FOR REHABILITATION (ha),	AREA PLANNED FOR FY2022 ONLY BULK RESHAPING AREA (ha)	NOTES
FINE RESIDUE DEPOSITS (FRD) (INCLUDING WRW IMPOUNDMENT)	451		451	90	0	The FRD-WRW has benches available for bulk reshaping. But there is activity on the upper benches which needs to be completed before rehabilitation can commence.
COARSE RESIDUE DUMPS (CRD AND RED AREA)	75		75		0	The CRD is still classified as a resource and therefore not available for rehabilitation.
INFRASTRUCTURE (INCLUDING THE ROADS, PIPELINES & CONVEYORS)	260		260		0	
TOTAL	1784	191	1592	615	88 14%	

Table 10: Details of the planned annual rehabilitation - forthcoming 12 months

i. where areas are available for annual rehabilitation and remediation concurrent with mining, annual rehabilitation and remediation activities related to previous disturbance or expected planned impacts and disturbance, as per the mine works programme, in the period under consideration, which should be tabulated and must indicate, but not necessarily be limited to:	
(aa) nature or type of activity and associated infrastructure;	Profiling of available slopes of the WRD
(bb) planned remaining life of the activity under consideration;	LoM open-pit mining is 2022. LoM of underground mining is 2045.
(cc) area already disturbed or planned to be disturbed in the period of review;	Total disturbed area: 1784 ha: Refer to: APPENDIX C Table 9: Disturbed areas and availability of areas for concurrent rehabilitation
(dd) percentage of the already disturbed or planned to be disturbed area available for concurrent rehabilitation and remediation activities;	WRD: 73% (526 ha available of the 717ha) FRD WRW: 5.4% (90 ha available of the 451ha) CRD: 0
(ee) percentage of the already disturbed or planned to be disturbed area available as per (dd) and on which concurrent rehabilitation and remediation can be undertaken;	WRD: 73% (526 ha available of the 717ha) FRD WRW: 5.4% (24 ha available of the 451ha) CRD: 0
ff) notes to indicate why total available or planned to be available area differs from area already disturbed or planned to be disturbed;	Risk of damage to the rehabilitated areas close to the operational areas mostly FRD. Additional deposition or waste rock removal could be required on areas currently available due to change in the mining plan mostly WRD.
(gg) notes to indicate why concurrent rehabilitation will not be undertaken on the full available or planned to be available area;	Financial, personnel, EMV/equipment limitations Surface rehabilitation, topsoiling and seeding on flat and slope areas is done by external contractors.
(hh) details of rehabilitation activity planned on this area for the period of review;	Venetia will rehabilitate the stormwater catchment on the WRD reporting to the pit to de-risk the underground mine against flooding first. The remainder will follow.

7. REHABILITATION SCHEDULE 1 – 5 YEAR

The following table outlines the schedule in terms of volumes and areas per annum that will be rehabilitated as part of the forecast. Rehabilitation will mainly focus on the WRD which will be completed in 2026. Rehabilitation (bulk reshaping) of the FRD – WRW will commence thereafter.

Table 11: Rehabilitation Schedule

Facility & Activity	Description	Unit	Y2022	Y2023	Y2024	Y2025	Y2026
Waste Rock Dump							
Earthworks							
Bulk dozing of material 50m max, cut to fill down to 15 degrees	Bulk dozing of material (50m max)	m ³	333344,40	218701,20	324044,40	389744,60	0,00
Bulk dozing of material 100m max, cut to fill down to 15 degrees	Bulk dozing of material (100m max)	m ³	156590,40	17377,20	173714,40	139651,20	0,00

8. REHABILITATION PERFORMANCE MONITORING

The Monitoring plan and applicable Closure Success Criteria and Key Performance Indicators (KPIs) should be refined with future updates of this Annual Rehabilitation plan (Appendix 3 of GNR 1147) and be read in conjunction with the Rehabilitation, Decommissioning and Mine Closure Plan which is updated every 5 years.

8.1. DEMONSTRATION PERIOD

Anglo American Group Technical Standards define the minimum requirements for mine closure to ensure that all Anglo-American projects and managed operations pro-actively plan for closure to manage risks and opportunities. According to the Anglo American Mine Closure Standard, Version 3 June 2018, the following Performance Monitoring aspects should be considered:

- Post-production monitoring and maintenance costs shall be included in the closure liability estimate and must allow sufficient time for realistic relinquishment (minimum of 10 years post the decommissioning phase unless otherwise agreed with the Group closure team);
- Performance using concurrent rehabilitation and closure related metrics shall be reported against site annual targets;
- A reconciliation of actual versus planned rehabilitation executed during the year shall be provided with associated variance analysis to the Group closure team;
- Annual performance monitoring against the regulatory requirements and success criteria shall be undertaken, with required maintenance activities identified and implemented;

- Early relinquishment of areas that meet all identified success criteria shall be actively pursued where allowed by the regulators.

It is envisaged that a five-year demonstration period will be required to confirm the success of rehabilitation in terms of vegetation, biodiversity and ecological function monitoring as well as for care and maintenance.

Following the completion of earthworks and vegetation establishment, a visual inspection will be undertaken to inform corrective action required if needed. Thereafter ongoing monitoring and corrective actions as per Table 12 are envisaged at the time of compiling this plan.

Success criteria has been developed and are based on proven rehabilitation monitoring data. Success criteria has been developed with appropriate input from internal and external stakeholders.

Active treatment requirements should be minimised post-closure and shall be considered through integrated closure planning and concurrent rehabilitation.

Figure 12 illustrates the overview of the process for the Rehabilitation plan rollout and Performance monitoring, starting with the Baseline site performance assessment, towards the Final site performance assessment as described below.

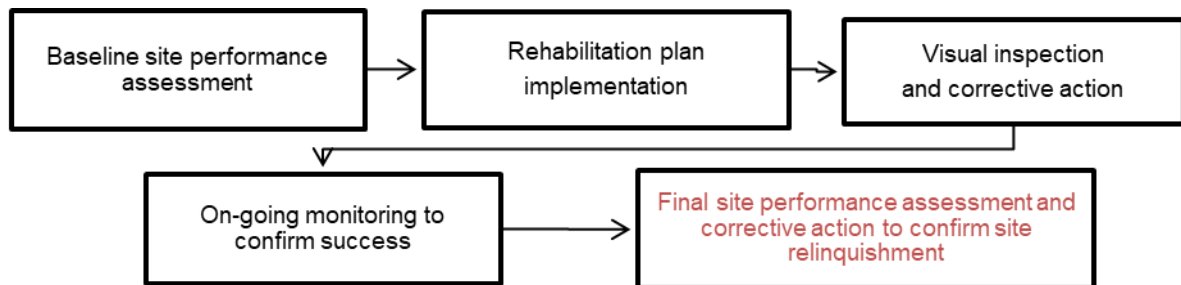


Figure 12: Rehabilitation plan roll-out and performance monitoring

8.2. BASELINE ENVIRONMENTAL SITE PERFORMANCE ASSESSMENT

A baseline site performance assessment (largely based on existing information and supplemented by a dedicated site walkover) has to be conducted prior to rehabilitation implementation. The aim of the environmental site performance assessment is to establish the status quo/baseline and knowledge base against which results of monitoring conducted after rehabilitation will be measured. Additionally, a site performance assessment could be a requirement as part of environmental permitting for decommissioning of the site in terms of the provisions of NEMA.

8.3. MONITORING AND CORRECTIVE ACTION

The rehabilitation performance/progress will be documented in a dedicated bi-annual rehabilitation performance report to be submitted to Venetia until abandonment criteria are met. The report should reflect on the outcome of monitoring undertaken, rehabilitation performance and corrective action required. The monitoring objectives, network, sampling routine and analysis for vegetation and groundwater is reflected in Table 12 should always be refined with each updated of this plan.

8.4. FINAL SITE PERFORMANCE ASSESSMENT

Following completion of rehabilitation and/or the demonstration period (to be confirmed and updated in future and as the mine gets closer to closure) a final performance assessment should be undertaken to document the success of rehabilitation and the corrective action undertaken. The final site performance assessment will be used to document the success of rehabilitation.

Table 12: Rehabilitation Monitoring and Measurement

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
WATER RESOURCES	Surface water quality (Forms part of ongoing site-wide operational monitoring)	<ul style="list-style-type: none"> Undertake to monitor the surface water quality during the operational period according to existing water monitoring programmes. 	<ul style="list-style-type: none"> Quarterly during the operational period Quarterly post-mining for a 5-year period, only 2 surface water monitoring points will be monitored for 10 years. 	<ul style="list-style-type: none"> Acceptable threshold levels of salts, metals and other potential contaminants are maintained; and The applicable thresholds do not pose a threat to surrounding aquatic ecosystems, land uses or land users. 	As reflected in the Integrated Water Use Licence (IWUL) and Integrated Water and Waste Management Plan (IWWMP).
	Groundwater (Forms part of ongoing site-wide operational monitoring)	<ul style="list-style-type: none"> Undertake ongoing monitoring of the groundwater quality during the operational period according to existing water monitoring programmes. 	<ul style="list-style-type: none"> Quarterly during the operational period. Quarterly post-mining for a 5-year period. 	<ul style="list-style-type: none"> Acceptable threshold levels of salts, metals and other potential contaminants are maintained; and The applicable thresholds do not pose a threat to surrounding land uses or land users (groundwater users for domestic or agricultural purposes). 	<ul style="list-style-type: none"> Implement commitments in IWUL and IWWMP.

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
SENSITIVE HABITATS & BIODIVERSITY	Vegetation establishment	<p>Determine whether concurrently established vegetation provides an effective cover and aids in controlling erosion, by undertaking the following:</p> <ul style="list-style-type: none"> Inspect rehabilitated areas to assess vegetation establishment and early detection of erosion in recently planted/seeded areas; Assess rehabilitated areas by means of field inspections. During these assessments measurement of growth performance should be made of: 	<p>Operationally planting should be undertaken at the start of the rainy season and monitoring undertaken as follows:</p> <ul style="list-style-type: none"> After 1 month continue monitoring twice more for the first quarter, Quarterly for the rest of the year and then, Annually thereafter. 	<ul style="list-style-type: none"> No evidence of significant erosion is present; Self-sustaining vegetation establishment occurs; and Presence of exotic invasive species as well as bush encroachment species is effectively controlled. 	<ul style="list-style-type: none"> Re-vegetate poorly established rehabilitated areas; Re-seed bare patches, as required; and Apply additional fertiliser and/or organic matter, depending on the condition of the vegetation and the initial organic material application.
		<ul style="list-style-type: none"> Species present and abundance; Estimates of average plant basal cover, vegetation canopy and ground cover heights; Distribution, densities, growth, and survival of woody species; Dominant plant species 	<ul style="list-style-type: none"> Post-mining: <ul style="list-style-type: none"> i). Sitewide vegetation surveys should be done for a total of 5 years: annually for year 1, 2 and 3 after final rehabilitation, thereafter, followed by surveys in year 6 and again in year 9. 		

COMPONENT / ASPECT	MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
	METHODOLOGY	FREQUENCY/DURATION		
	<p>(woody and herbaceous);</p> <ul style="list-style-type: none"> ○ Presence of exotic invasive species; and ○ The occurrence of erosion, noting aspects such as type, severity, degree of sediment build-up. 	<p>ii). Sitewide bio-ecological functioning monitoring should be conducted for a total of 5 years: annually for year 1, 2 and 3 after final rehabilitation, thereafter, followed by surveys in year 6 and again in year 9.</p>		
Plant Moisture Stress (PMS)	<ul style="list-style-type: none"> • <i>Croton megalabothrys</i> trees were chosen as an indicator species of PMS due to its inherent sensitivity and rapid response to changes in soil moisture, its extensive distribution within the riparian forest and the shape and size of the leaves. • The following sites are being monitored <ul style="list-style-type: none"> ○ Four sites at Greefswald: sites 1 and 4 (control sites), site 2 (mid-wellfield) and site 3 (wellfield); ○ Three sites at Schroda: site 1 (control), site 2 	<ul style="list-style-type: none"> • Monitoring of <i>Croton megalabothrys</i> trees are done in specific sites for 12 months per year (dry and wet seasons). • Post-mining for a 3-year period, based on the outcomes of the Biodiversity Value Assessment and Specialist Studies. 	<ul style="list-style-type: none"> • Demonstrate that the PMS of trees in the wellfields will become negligible and that there are no possible further imbalances in the plant water status of plants due to the ceasing of water abstraction for mining. 	<ul style="list-style-type: none"> • The complete ceasing of pumping of water from wellfields.

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
		(start of wellfield) and site 3 (end of wellfield).			
	Alien Invasive species	<ul style="list-style-type: none"> Visually inspect areas where invasive species have been previously eradicated and areas prone to invasive species (e.g. eroded/degraded areas, along drainage lines, etc.); and Undertake surveys on relevant sites where bush encroachment has previously been identified, to determine the status quo of invasive vegetation. 	<ul style="list-style-type: none"> Monthly during the operational period. Once a year for 5 years post-mining (included under Care and Maintenance) 	<ul style="list-style-type: none"> Category 1, 2 and 3 invader species brought under control and/or prevented; The extended threat to ecosystems, habitats or locally occurring species is minimised; and Increased potential for natural systems to deliver goods and services is maintained. 	<ul style="list-style-type: none"> Revisit mitigation measures and adjust as required; and Ensure ongoing control and management program in place.
OTHER: AIR QUALITY & TOPOGRAPHY	Topography and erosion	<ul style="list-style-type: none"> Conduct a visual assessment to determine areas of potential erosion; Identify incidences of rill and gully erosion and/or excessive siltation in a specific area; and Rehabilitate impacted areas in terms of at least progressive in-filling of voids, shaping, top soiling and grassing. 	<ul style="list-style-type: none"> Monthly during the operational period. Annual Vegetation Surveys are conducted based on the agreed success criteria. Currently no provision specifically post-mining – current results not significant. Should be refined as 	<ul style="list-style-type: none"> Concurrent surface rehabilitation that is aligned to rehabilitation planning; The implemented landform is aligned to the designed landform; and Self-sustaining vegetation establishment occurs. 	<ul style="list-style-type: none"> Adjust earthworks and construction practices to achieve and maintain the desired slopes; Improve vegetation coverage where erosion occurs; Install energy dissipation measures if improved vegetation is not

COMPONENT / ASPECT		MONITORING		PERFORMANCE/SUCCESS CRITERIA	CORRECTIVE ACTION
		METHODOLOGY	FREQUENCY/DURATION		
			mine gets closer to closure.		<p>sufficient/achieved;</p> <ul style="list-style-type: none"> At excessive slope lengths and signs of sheet erosion, construct contour drainage berms that intercept the overland flow; and In areas of runoff concentration, create dedicated surface runoff pathways that are appropriately vegetated.
	Air Quality	<ul style="list-style-type: none"> Conduct dustfall and PM₁₀ monitoring 	<ul style="list-style-type: none"> Monthly during operational phase For a period of 3 years post closure based on the specialist studies (e.g. air dispersion modelling studies) 	<ul style="list-style-type: none"> Dustfall and PM₁₀ results aligned with emissions standards. (Align with Fugitive Emissions and Dust Management Plans for Venetia Mine). 	<ul style="list-style-type: none"> Review rehabilitation criteria

8.5. MONITORING AND MANAGEMENT OF IMPACTS

8.5.1. Functional Requirements of Monitoring Programmes

The purpose of monitoring programmes is to review the mine's impact on various aspects of the environment and to report on changes needed to the management programme.

As a general approach, the mine will ensure that the monitoring programmes comprise the following:

- a formal procedure;
- appropriately calibrated equipment;
- where samples require analysis, they will be preserved according to laboratory specifications;
- an independent, accredited laboratory will undertake sample analyses and/or internal laboratory results will periodically be checked by independent and accredited laboratories;
- parameters to be monitored will be identified in consultation with a specialist in the field and/or the relevant authority;
- if necessary, following the initial monitoring results, certain parameters may be removed from the monitoring programme in consultation with a specialist and/or the relevant authority;
- monitoring data will be stored;
- data will be interpreted and reports on trends in the data will be compiled;
- both the data and the reports will be kept on record for the life of mine.

8.5.2. Roles and Responsibilities

The roles and responsibilities for the execution of the monitoring programmes are defined below and is the responsibility of the Senior Operational Manager and Environmental Department Manager:

- ensure that the monitoring programmes are scoped and included in the annual my budget;
- identify and appoint appropriately qualified specialists/engineers to undertake the programmes;
- appoint specialists in a timeous manner to ensure work can be carried out to acceptable standards.

8.5.3. Timeframes for Monitoring and Reporting

The timeframes for monitoring and reporting thereof are detailed in the monitoring programmes, a summary should be included in the update of this closure plan, after formal sign-off of all current monitoring and proposed monitoring programmes.

8.6. CURRENT AND POST-CLOSURE MONITORING

8.6.1. Surface Water Monitoring

Refer to APPENDIX F and APPENDIX G.

The current surface water monitoring points that are sampled on a quarterly basis by Aquatico. Surface water points such as the pit sumps, water treatment effluent and the red areas are sampled on a monthly basis.

- Currently, 7 locations are being sampled;
- Post-mining, 9 locations from the current locations are proposed to be monitored, 9 of them on a quarterly basis for a 5-year period and 2 surface water monitoring points on a quarterly basis for a period of 10 years. These are the 2 points at the RWDs for FRD1 and FRD2, which need to remain for the pumping of intercepted / seepage water from the FRDs. The results and trends of these sample points should be tracked and refined over time;
- Additional studies will confirm the need for surface water monitoring on the western side of FRD1, the southern side of the CRD as well as the northern and eastern sides of the WRDs.

8.6.2. Groundwater Monitoring

Refer to APPENDIX F and APPENDIX G.

The current groundwater monitoring points that are sampled on a quarterly basis by Aquatico.

- Currently, 21 boreholes are being sampled;
- Post-mining, 15 boreholes from the current set of boreholes are proposed to be monitored on a quarterly basis for a 5-year period. The results and trends of these sampled boreholes should be tracked and refined over time;
- Additional boreholes being drilled as part of the Geohydrological study should also be considered for post-mining monitoring, especially on the western side of FRD1, the southern side of the CRD. Additional studies will confirm the need for groundwater monitoring on the northern and eastern sides of the WRDs. APPENDIX J and APPENDIX K indicates the Venetia Wellfields locations which are currently being

monitored and which will not be monitored post-mining, as all abstraction from the wellfields will stop once operations cease.

8.6.3. Vegetation, Biodiversity and Ecological Function Monitoring

Refer to APPENDIX K for the layout maps indicating the areas for monitoring.

- Currently, Vegetation surveys are being conducted annually on the rehabilitated areas and were last done by Gudani Consulting.
- Post-mining, i). Sitewide vegetation surveys should be done for a total of 5 years: annually for year 1, 2 and 3 after final rehabilitation, thereafter, followed by surveys in year 6 and again in year 9. ii). Sitewide bio-ecological functioning monitoring should be conducted for a total of 5 years: annually for year 1, 2 and 3 after final rehabilitation, thereafter, followed by surveys in year 6 and again in year 9.

8.6.4. Wellfield: Plant Moisture Stress (PMS)

Refer to APPENDIX J: MONITORING: WELLFIELDS PLANT MOISTURE STRESS.

- Currently, monitoring of *Croton megalabothrys* trees is done in specific sites for 12 months per year (dry and wet seasons). *Croton megalabothrys* was chosen as an indicator species of PMS due to its inherent sensitivity and rapid response to changes in soil moisture, its extensive distribution within the riparian forest and the shape and size of the leaves.

The following sites are being monitored

- Four sites at Greefswald: sites 1 and 4 (control sites), site 2 (mid-wellfield) and site 3 (wellfield);
- Three sites at Schroda: site 1 (control), site 2 (start of wellfield) and site 3 (end of wellfield).
- Post-mining: the above monitoring of PMS should continue at the specific sites, for 12 months per year, for a 3-year period. This should demonstrate that the PMS of trees in the wellfields will become negligible and that there are no possible further imbalances in the plant water status of plants due to the ceasing of water abstraction for mining.

8.6.5. Stability Surveillance

Refer to APPENDIX I.

- Decommissioning phase: quarterly inspections for 3 years;
- Post closure: Bi-annual inspections for 5 years followed by annual inspections for 10 years.
- It is assumed that the:
 - WRD will have been rehabilitated by 2026;
 - Portions of the FRD WRW outer faces will be rehabilitated by 2029;

This gives time to gain confidence in the rehabilitation success by mine-closure. The CRD criteria need to be tested.

8.6.6. Care and Maintenance

- Post-mining, allowance is made for site-wide care and maintenance over a 10-year period, this includes invader control.

8.7. ENVIRONMENTAL STANDARDS, ASSURANCE AND REPORTING

The following table summarises the Environmental standards, Assurance and Reporting as per the mines ISO 14001:2015 requirements.

Table 13: Environmental standards and Assurance

Standards	Description	Assurance		
		Self-assessment	Internal Reviews / Audits	External Reviews / Audits
Lifecycle Planning	Requirements for Exploration, Projects and Mining Operations for planning for the entire lifecycle of operations	Environmental Assurance Programme		
			Project Environmental Gate Release Criteria Reviews	
		ISO 14001:2015 audits		
Biodiversity	Requirements for the various phases of the diamond pipeline to ensure that biodiversity is considered and managed	Environmental Assurance Programme		
		BMP Peer Reviews		
			Anglo American Biodiversity Management Standard	Biodiversity Overlap Assessment
Water	Requirements for water management through the mining Programme lifecycle, in order to ensure efficient and sustainable water use.	Environmental Assurance Programme		
		Internal Water Audits & External Compliance Assessments		
Climate Change	Requirements to ensure that the appropriate measures are taken to contribute to combatting climate change and that adequate planning for climate change risks and impacts is undertaken.	Environmental Assurance Programme		
Pollution Prevention and Waste Management	Requirements for the management of hazardous substances and non-mineral waste so as to avoid potential adverse impacts on the environment and prevent pollution.	Environmental Assurance Programme		
Environmental Reporting	Requirements for environmental performance and incident reporting	Environmental Assurance Programme		
			Data verification	Data verification

8.8. AUDITING AND REPORTING

Objectives for auditing and reporting include the following:

- ensuring legal compliance (Environmental Management Systems and Programmes);
- checking the efficiency of current tools and the fulfilling of their intended purpose;
- ensuring environmental performance on a continuous basis;
- reducing environmental liability on environmentally sensitive issues;
- determining whether environmental targets for the particular programme are reached.

Auditing and performance assessments as well as associated reporting to regulatory authorities are being undertaken internally and externally and should meet the requirements of the relevant regulatory approvals.

As required by the MPRDA, performance assessments will be submitted to the Department of Mineral Resources and Energy (DMRE) annually.

Record keeping is aligned to the mine's existing Control of EMS Documented Information Procedure (VEN-00001558).

The -Environmental Management System (ISO 14001:2015) reflects changes as management methods are improved and as the mine operations change.

The environmental department, with the environmental manager, is responsible to implement the Environmental Management System.

Monitoring requirements are reviewed in line with legislative and operational changes given the results of operational monitoring and specialist studies conducted.

All of the above should be done with closure in mind and managing the closure liability estimate through proper execution and assurance of the environmental standards.

9. COSTING

9.1. SUMMARY

The financial provision for concurrent rehabilitation was calculated based on the requirements of GNR 1147 and the AAMCT V3. The financial provision was calculated for the next 5-year period (2022 – 2026).

The following table outline the financial provision per annum which will be provided for as part of the operational expenditure (Opex):

Table 14: Financial Provision Summary

VENETIA MINE EXECUTIVE SUMMARY CONCURRENT REHABILITATION CASHFLOW 5 YEAR FORECAST						
ESTIMATED CLOSURE COST ESTIMATE (INCLUDED TAXES, CONTINGENCIES AND VAT AND EXCLUDED ESCALATION)		Rehab Cashflow	Rehab Cashflow	Rehab Cashflow	Rehab Cashflow	Rehab Cashflow
CLOSURE COMPONENTS		2022	2023	2024	2025	2026
1	INFRASTRUCTURAL ASPECTS	R	R	R	R	R
1.1	PLANT AND RELATED STRUCTURES	R	R	R	R	R
1.2	SHEDS, ADITS AND DECLINES	R	R	R	R	R
1.3	SUPPORTING INFRASTRUCTURE	R	R	R	R	R
1.4	UNDERGROUND INFRASTRUCTURE	R	R	R	R	R
1.5	SOCIAL INFRASTRUCTURE	R	R	R	R	R
1.6	OFF-SITE INFRASTRUCTURE	R	R	R	R	R
1.7	LINEAR ITEMS	R	R	R	R	R
1.8	WASTE DISPOSAL	R	R	R	R	R
1.9	ROAD CONVERSION	R	R	R	R	R
2	MINING ASPECTS	R	R	R	R	R
2.1	OPENING / FILL AREAS	R	R	R	R	R
2.2	WASTE ROCK DUMPS - OVERBURDEN AND SPOES	R	R	R	R	R
2.3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE	R	R	R	R	R
2.4	FINE RESIDUE DEPOSITS - PROCESSING WASTE	R	R	R	R	R
3	BIO-PHYSICAL CLOSURE ASPECTS	R	R	R	R	R
3.1	WATER RESOURCES	R	R	R	R	R
3.2	SENSITIVE HABITATS AND BIODIVERSITY	R	R	R	R	R
3.3	LAND USE AND LAND CAPABILITY	R	R	R	R	R
3.4	SOIL	R	R	R	R	R
3.5	OTHER AIR QUALITY AND TERRESTRIALITY	R	R	R	R	R
4	SOCIAL CLOSURE ASPECTS	R	R	R	R	R
4.1	EMPLOYEES	R	R	R	R	R
4.2	INTERESTED AND AFFECTED PARTIES	R	R	R	R	R
5	GENERAL ASPECTS	R	R	R	R	R
5.1	GENERAL SURFACES	R	R	R	R	R
5.2	POST-CLOSURE MONITORING AND MAINTENANCE	R	R	R	R	R
5.3	SPECIALIST STUDIES	R	R	R	R	R
	SUB-TOTAL 1 Weighted Provisions and General	R	R	R	R	R
	Weighted Contingencies	R	R	R	R	R
	SUB-TOTAL 2 FOR P&G% AND CONTINGENCIES	R	R	R	R	R
	SUB-TOTAL 3 VAT	R	R	R	R	R
	GRAND-TOTAL	R	R	R	R	R

9.2. METHODOLOGY

- All costs relating to annual rehabilitation have been provided in Table 14.
- Unit rates for all civil work activities were based on owner fleet execution and were obtained from Venetia.
- Monitoring activities will be conducted by 3rd party specialists.
- Concurrent rehabilitation will be undertaken on the WRD and FRD WRW for the next 5-year period, refer to Table 12 for the detail calculation of volumes;
- All costs for environmental monitoring were obtained from Venetia and is included as a sum item for the FY2022 period; and

- Detail reference maps were created, these maps indicate the positions of listed activities as per the rehabilitation plan.

9.3. COST ASSUMPTIONS

The following general and site-specific cost assumptions and qualifications are described below:

9.3.1. General Cost Assumptions

- The closure costs were determined and presented in terms of E-TEK's understanding of the current applicable requirements of GN R1147;
- The currency of the estimate: South African Rands (ZAR);
- All monitoring will be conducted by 3rd party specialists;
- It was accepted that all information used to support the costing and supplied by Venetia was accurate and true;
- The financial provision calculated represents the rehabilitation and monitoring requirements for the forthcoming 5-year period (January 2022 to December 2026); and
- Value-added tax (VAT) has been included:
 - VAT – 15% Overall Allowance.

All rates obtained from Venetia is inclusive of P&G's and Contingencies.

9.3.2. Site-Specific Costing Assumptions

9.3.2.1. *Bio-Physical Monitoring*

The following allowances were made with regards to Bio-Physical Monitoring for the period Y2022:

- Air quality monitoring:
 - 2 Monitoring points for PM2.5 and PM10;
 - 4 Monitoring points for SO₂; and
 - 25 Monitoring points for Dust.
- Surface water monitoring:
 - 9 Monitoring points.
- Groundwater monitoring:
 - 21 Monitoring points.
- Plant moisture stress:
 - 7 Monitoring points.

9.3.2.2. Vegetation surveys

Conducted Bi-annually.

9.3.2.3. Invader plant control

Conducted annually.

10. REHABILITATION TRIALS

In order to determine best practice for future rehabilitation, trials are of great value to derive preliminary results of rehabilitation performance and areas for improvement before implementing on large scale. Active rehabilitation trials are being conducted on the CRD material at Venetia mine since 2019 and are monitored annually to assess performance. The details of the trial layout and treatments are outlined in the formal Trials document of 2019. This document requires updating in order to align with AAMCTV3.

It is advised that erosion modelling studies be conducted on all the types of the proposed cover materials for the CRD, in order to align rehabilitation designs with material stability data. This will be the most appropriate method to ensure long-term stability.

11. CONCLUSIONS AND RECOMMENDATIONS

The 5-year rehabilitation cost budget, as reflected in this report, was based on information provided by Venetia, discussions held with key mine personnel, and observations made during dedicated site visits. In those cases where specific rehabilitation requirements were not indicated by the mine, requirements were based on experience.

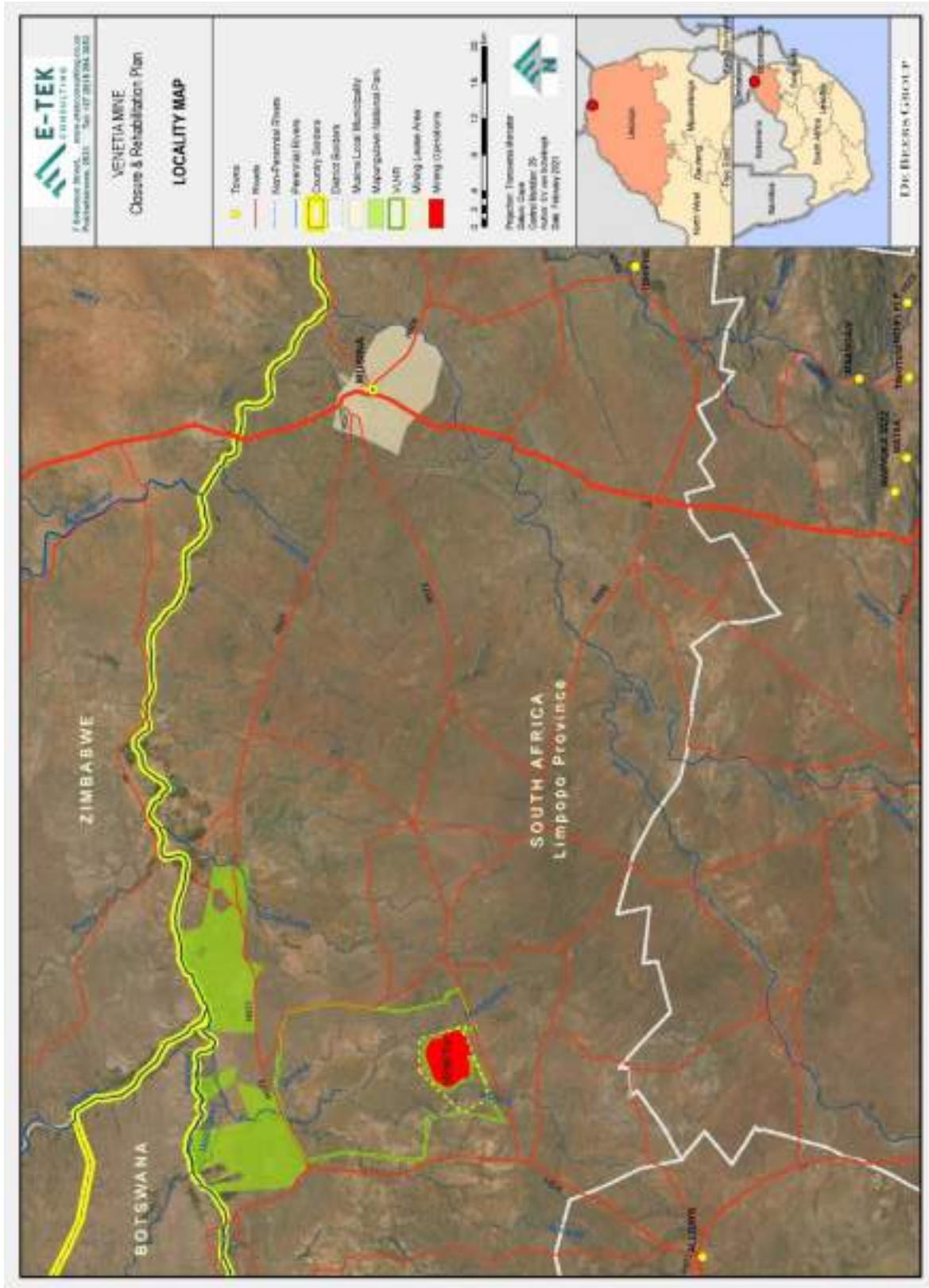
The rehabilitation measures and associated costs reflected in this report are intended as a planning tool for Venetia, to prioritise and subsequently execute on-going rehabilitation actions over the coming twelve-month period (FY2022) as well as the next 5-year period. As such, the plan was developed based on current conditions and site requirements and should be reviewed and updated annually. The rehabilitation planned to be undertaken in this report will also be reviewed in the next iteration of the rehabilitation plan.

12. REFERENCES

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13. APPENDICES

APPENDIX A: LOCALITY MAP



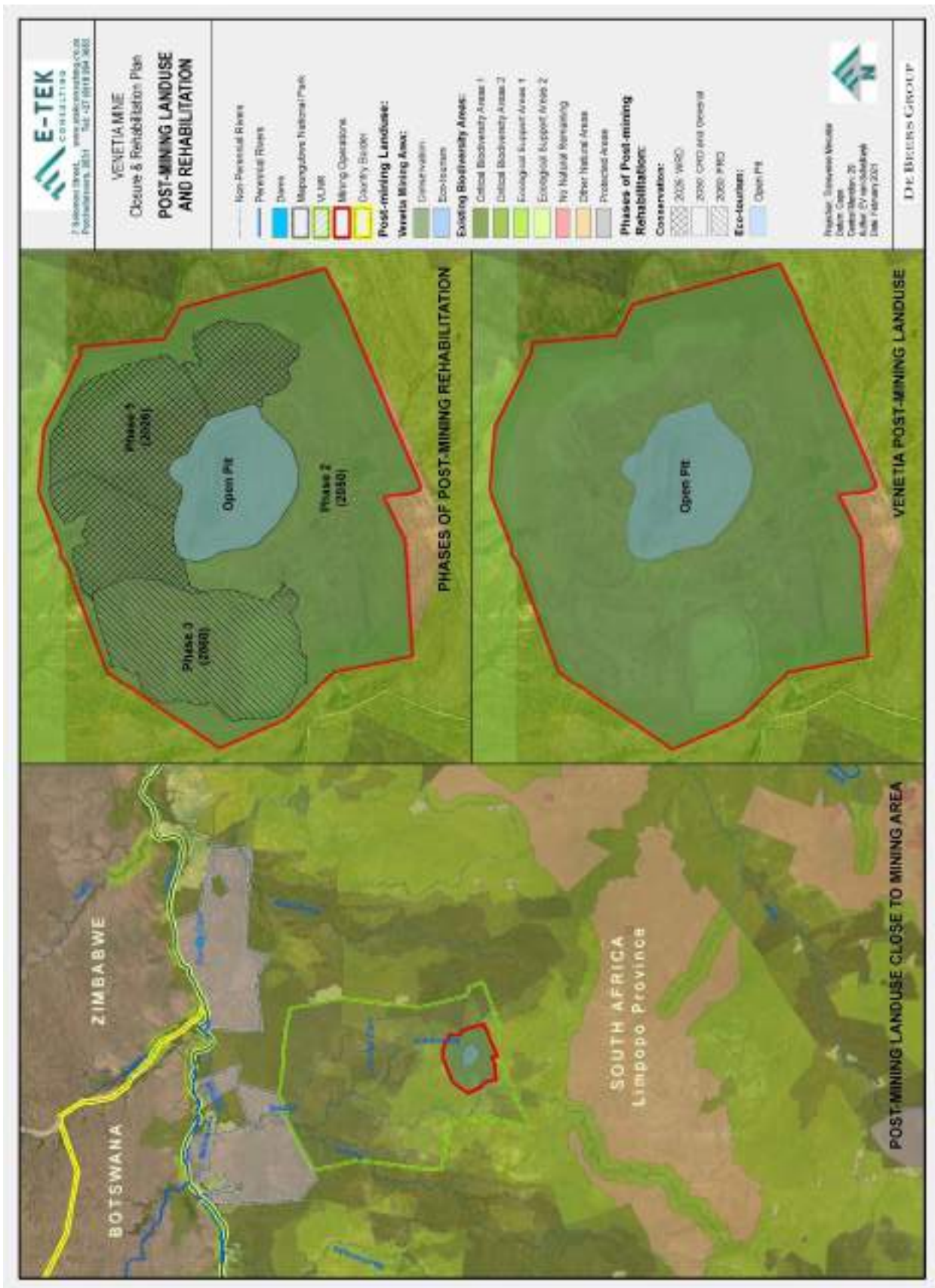
APPENDIX B: VENETIA MINE AREAS OF APPROVED OPERATIONS



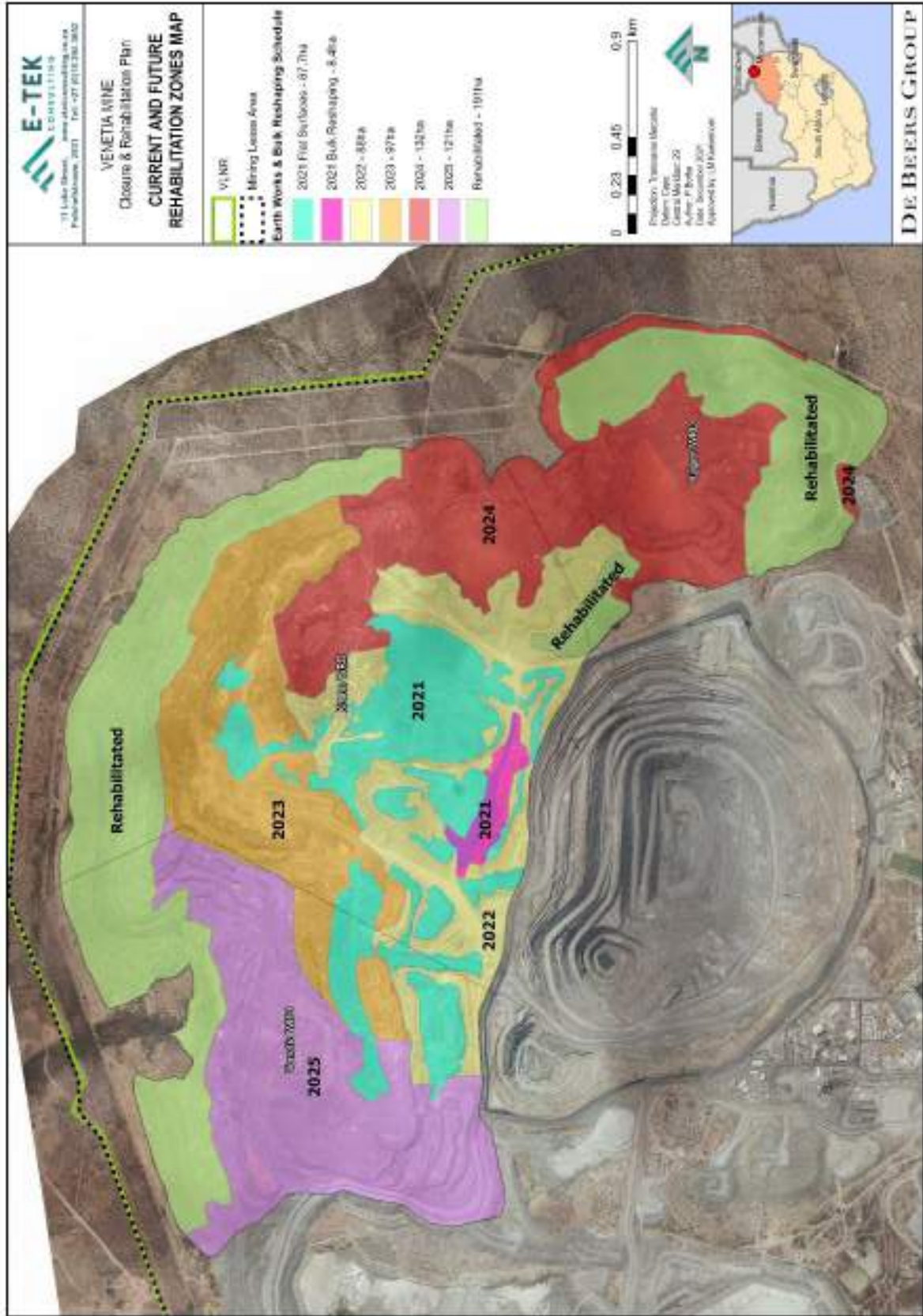
APPENDIX C: LIFE OF MINE DISTURBED AREA



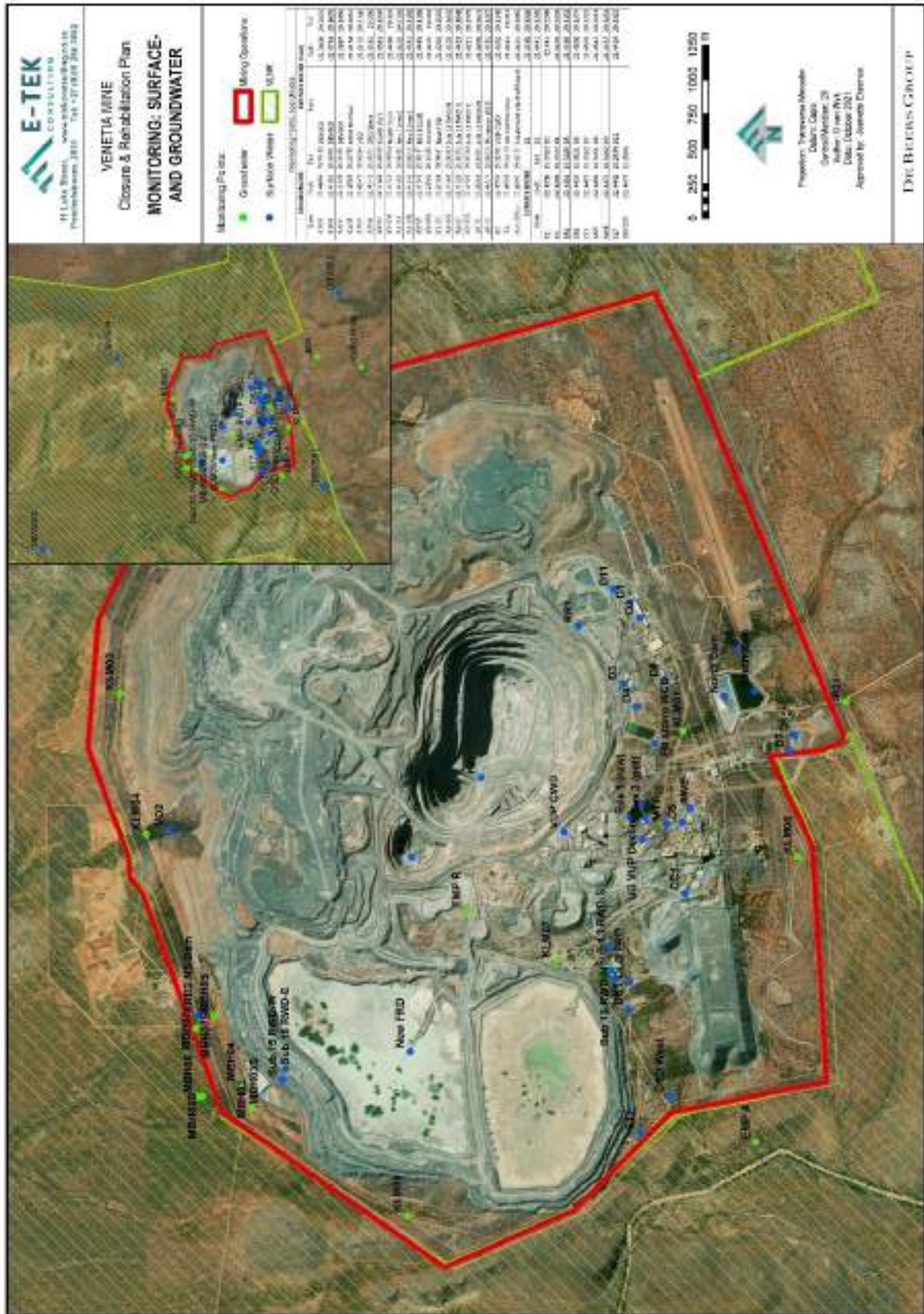
APPENDIX D: POST-MINING LAND-USE



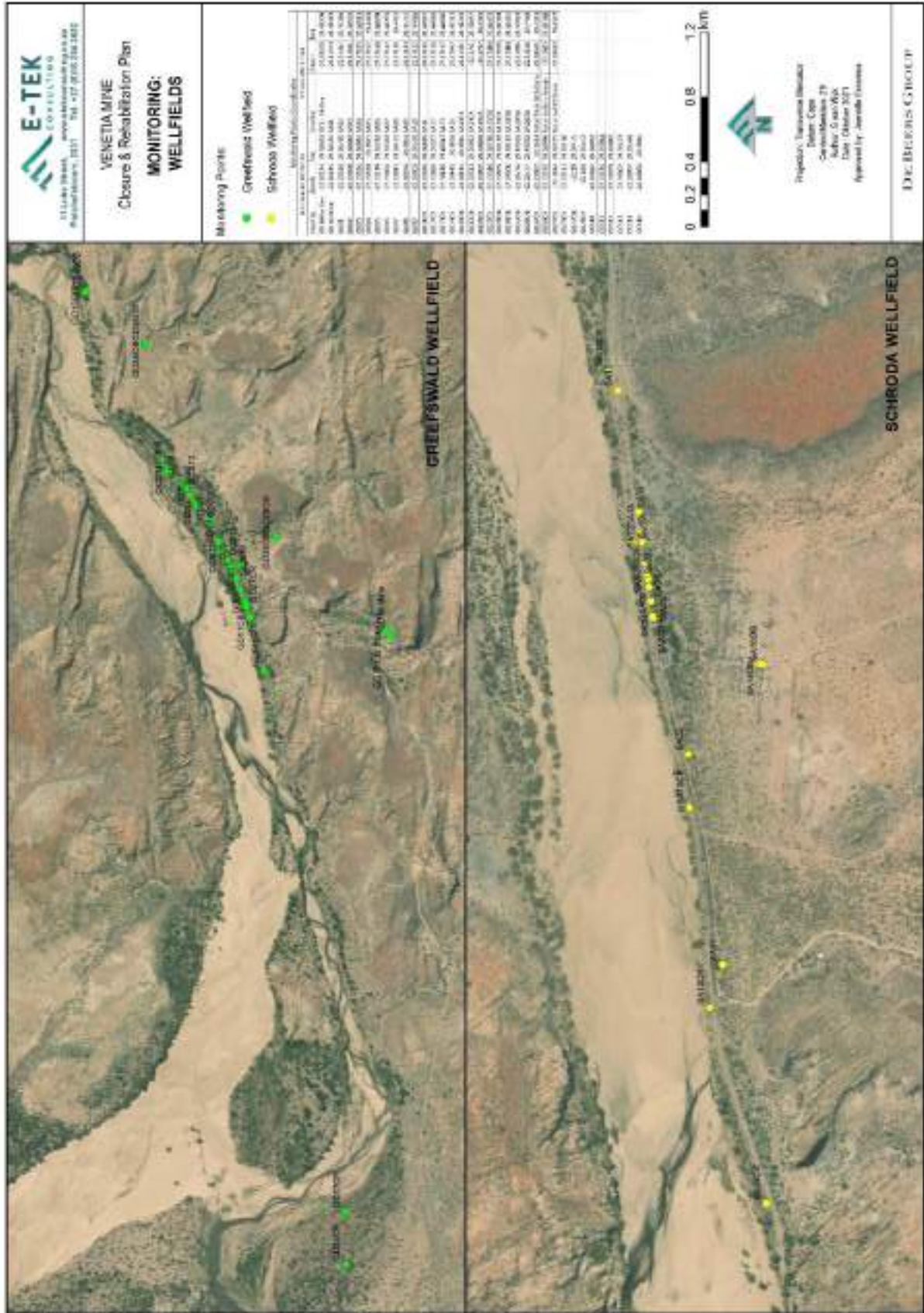
APPENDIX E: PLANNED AREAS AND DATES FOR REHABILITATION OF WASTE ROCK DUMPS (2021 TO 2026)



APPENDIX F: MONITORING: CURRENT SURFACE AND GROUNDWATER (SITE)



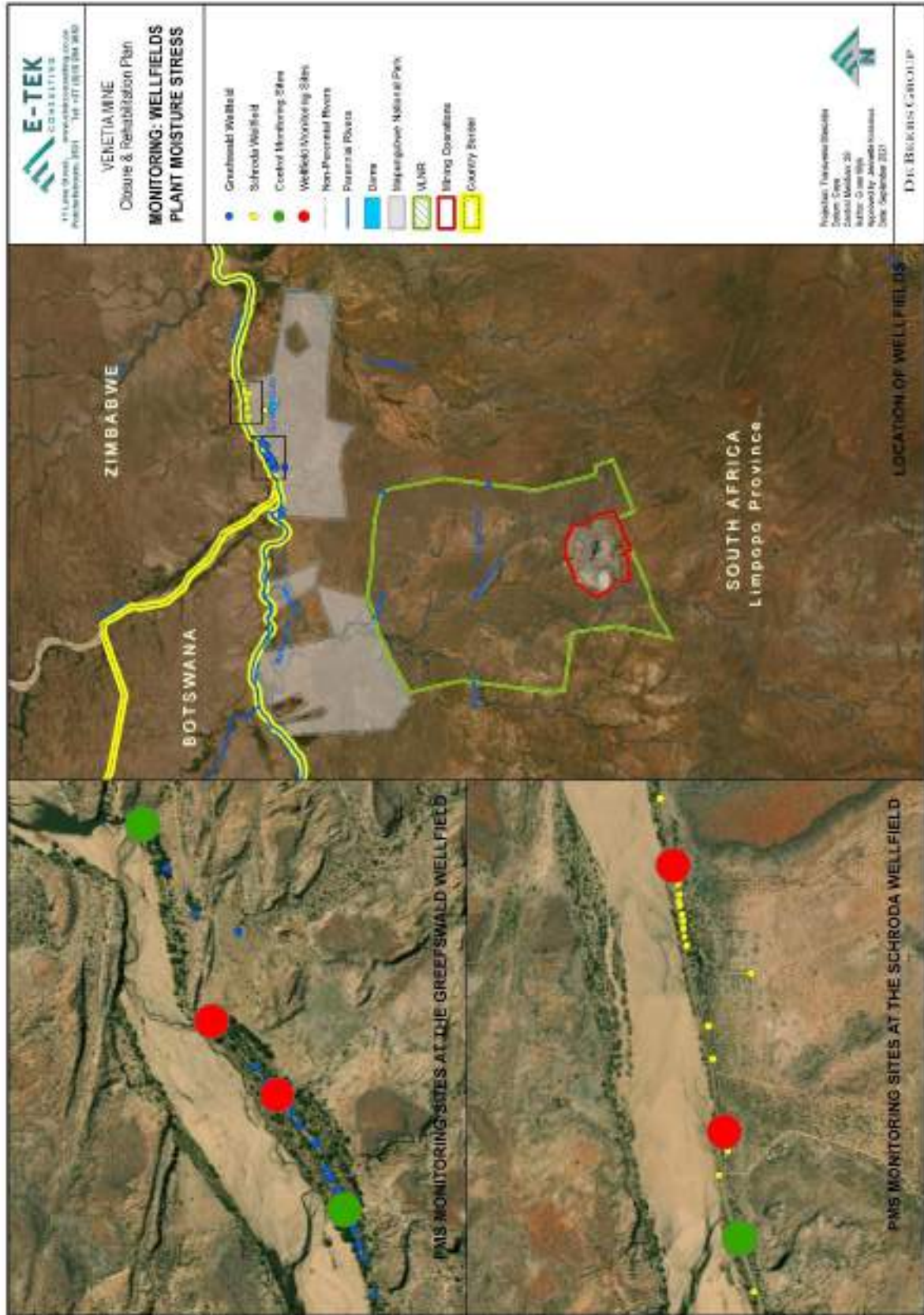
APPENDIX G: MONITORING: CURRENT SURFACE AND GROUNDWATER (WELLFIELDS)



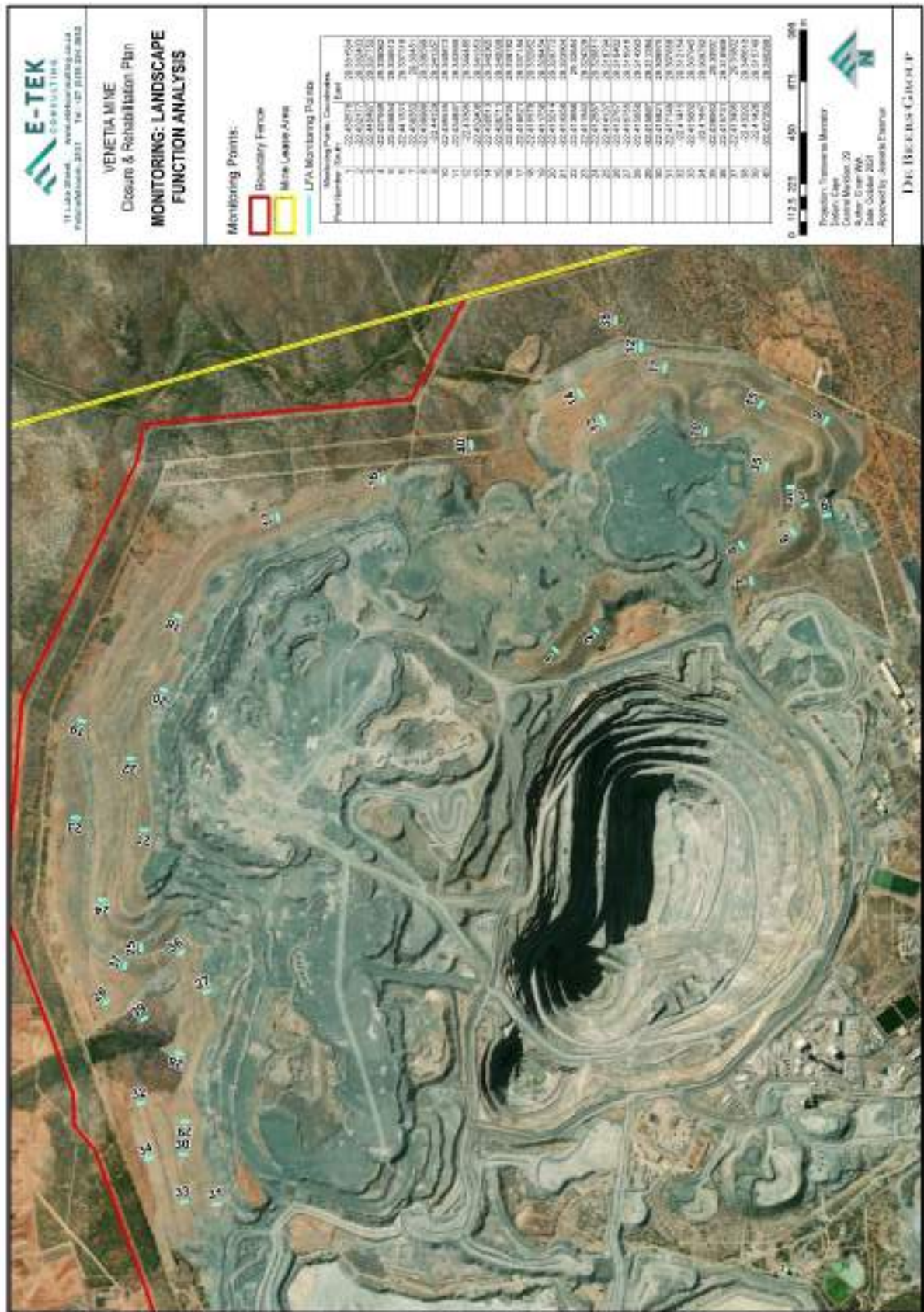
APPENDIX I: MONITORING: STABILITY OF MINE RESIDUE DEPOSITS



APPENDIX J: MONITORING: WELLFIELDS PLANT MOISTURE STRESS



APPENDIX K: VENETIA VEGETATION AND REHABILITATION MONITORING REPORT: 2019 (EXECUTIVE SUMMARY)



Survey findings and discussion (2020):

The findings of the assessment are as follow:

- For landscape organisation (LO) characteristics, ten patch/interpatch types were identified across all sites. Most of the sites, except for the natural veld, had poor LO values as they were dominated by seedling and bare soil interpatches. The LO of the Unseeded areas consisted of Rock and Grass patches. Rock patches were the most dominating patch type, whilst Bare soil was the most prevalent patch/interpatch type across most of the gradsects.
- For LO metrics, threshold values were assigned to three LO indices namely patch area index (>10%), landscape organisation index (>50%) and average interpatch length (<1m). The analyses showed that more than 94% of the gradsects fell below the threshold values for one or more of the LO indices. The implication of this data is that these landscapes are dominated by small, sparse patches with unfavourably long interpatches.
- For the Soil Surface Assessment (SSA), threshold values were assigned to the three LFA indices namely Stability (>50 points), Infiltration (>30 points) and Nutrient Cycling (>20 points). For Stability and Infiltration, 8% of the assessed sites fell below the respective thresholds, in comparison to 33% of the site during 2019. Due to the low vegetation cover and the dominance of Rock patches on some sites, 19% of the assessed sites had Nutrient Cycling values lower than the set threshold, in comparison to the 40% during 2019. The implication of these results is that the soils are not susceptible to erosion due to the high Stability, reduced run-off as well as high infiltration rates. Low vegetation cover and growth is therefore not as a result of poor soil surface indicators but rather a function of climatic events like the prolonged drought.
- The findings of this baseline assessment are that in general the current functionality of the landscape meets the overall threshold values associated with a system nearing a state of self-sustainability if compared to the reference sites. However, it is only through monitoring that a trend will be observed to conclude whether these sites have reached a state of self-sustainability or are deteriorating.

The findings of the vegetation dynamics assessment are as follow:

- There is an overall increase in useable biomass production on the Krone and Venetia rehabilitation sites and a slight decrease on Rugen.

- A significant decrease in the overall mean distance between plants is indicative that the system responded positive towards the above average rainfall the area received during the 2020/2021 season with extensive germination that occurred.
- The number of plants per hectare also showed a 353% increase on the previous year which also indicates positive response towards the good rains.
- All the rehabilitation sites had on average a 5% increase in perennial species, indicative of ecological stabilization and development.
- Pioneer species increased on average with 7% on the previous year, which is normal for a system that came out of a drought period.

Management of all the rehabilitated areas at Venetia Mine is more of a challenge than for example, at The Oaks Mine. This is because it cannot be properly grazed (defoliated) by large herbivores (bulk feeders) such as cattle, and the amount of dead, combustible material cannot be reduced from time to time. The defoliation of an ecological system is paramount for the successful rejuvenation of existing grass plants as well as making space for seedlings to grow. As a result, many of the areas that were evaluated currently pose a fire hazard during the winter months, and in some areas large (older) grass tufts appear to be becoming moribund due to a lack of seasonal removal of excess biomass by grazers or fire, which occur naturally in an open ecological system. Some research in this regard is recommended.

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