



ECC-134-384-REP-03-D

**ENVIRONMENTAL COMPLIANCE REPORT FOR THE ONGOING EXPLORATION  
ACTIVITIES ON ML 197,  
HOCHVELD, KHOMAS REGION NAMIBIA**

**RENEWAL ENVIRONMENTAL CLEARANCE CERTIFICATE**

*PREPARED FOR*

**CRATON MINING AND EXPLORATION (PTY) LTD**

February 2022

## TITLE AND APPROVAL PAGE

<b>Project Name:</b>	Environmental compliance report for the ongoing exploration activities on ML 197, Hochveld, Khomas Region Namibia
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**DEFINITIONS AND ABBREVIATIONS**

ECC	Environmental Compliance Consultancy
ECO	Environmental Control Officer
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
MEFT	Ministry of Environment, Forestry and Tourism

## 1 INTRODUCTION

### 1.1 PROJECT INTRODUCTION

Craton Mining and Exploration (Pty) Ltd (herein referred to as the proponent or Craton) is the Namibian registered subsidiary of Mauritian registered Omico Copper Limited. The proponent is an exploratory mining prospector for base and rare metals, namely copper. Their current exploration project the Omitiomire Copper Project (herein referred to as the Project) is approximately 120 km northeast of Windhoek, Khomas Region, on the Mining Licence (ML) 197 (Figure 1).

The proponent applied for the Mining licence 197 in 2015 which was granted for a period of 20 years in 2016. The proponent's first environmental clearance certificate was issued by the Environmental Commissioner in 2017, which was then amended in 2018 and was valid for a period of three years from the 8th May 2018 to 8th May 2021 (Appendix A).

In terms of the Environmental Management Act. No. 7 of 2007 a renewal application for the project's environmental compliance certificate is required. As part of this application, an environmental compliance review of the works undertaken on site and in compliance with the Environmental Management Plan (EMP) is to be submitted to the Ministry of Environment, Forestry and Tourism (MEFT).



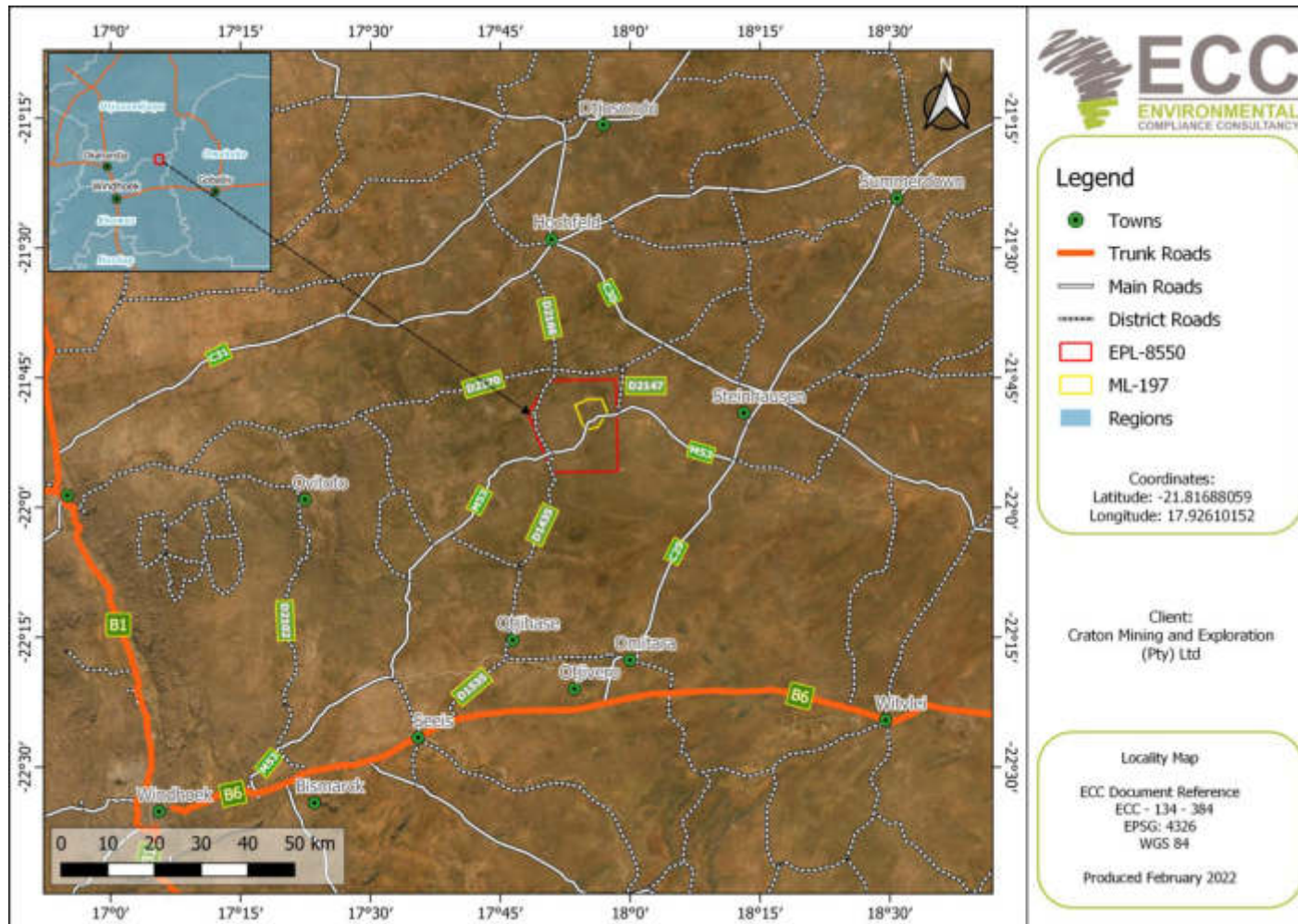


Figure 1 – Locality map of ML 197

## 1.2 THE PROPONENT OF THE PROJECT

**Table 1 - Proponents details**

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## 1.3 ENVIRONMENTAL CONSULTANCY

ECC, a Namibian consultancy registration number CC/2013/11401, has prepared this document on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa in the public and private sector. ECC is independent of the proponent and has no vested or financial interest in the proposed project except for fair remuneration for professional services rendered.

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## 1.4 PURPOSE OF REPORT

Environmental Compliance Consultancy (ECC) has been appointed by the proponent to apply for their renewal of an environmental clearance certificate for the exploration activities on ML 179 in the Khomas Region, Namibia. The purpose of this environmental compliance report is to document the findings of an environmental compliance audit covering the period since the approval of the renewal environmental clearance licence from the 20<sup>th</sup> of September 2017 to 20<sup>th</sup> September 2020.

## 2 BACKGROUND OF THE PROJECT

Craton is a licenced mining prospector operating on ML 197. The project is located 120 km Northeast of Windhoek on Farm Omitiomire. As part of Craton's ultimate plans for mining on the ML, their current plans are exclusively for drilling to further define the deposit. Currently, the planned drilling activities for the ML include mostly definition type drilling to enlarge the deposit and provide infill drill data, as well as planned exploration drilling to further test the ML for mineralization. The detailed and infill drill data will be used for Craton's geologists, engineers, and metallurgists to fully define and cost out the planned mining and processing. Ultimately, and after the detailed drilling is completed, Craton's technical team will further design and expects to propose opencast mining that provides low-grade copper ore to heap leach and electrowinning facilities to produce cathode copper. However, at this time, approval is being sought only for drilling activities.

Due to Covid 19 no activity has taken place on site for the past two or more years.

As per the EIA Regulations and Environmental Management Act No. 7 of 2007, exploration activities on ML 197 cannot be undertaken without an environmental clearance certificate. Therefore, we submit this report on behalf of the proponent as part of their environmental clearance certificate renewal application.



### 3 ENVIRONMENTAL COMPLIANCE AUDIT

#### 3.1 SITE INSPECTION

Environmental Compliance Consultancy (ECC) undertook a site inspection on ML 197 on 27 January 2022. This report is based both on the site visit inspection, review, and verification of owner documentation, and in consideration of all records made available to ECC. The findings of this inspection are included in Table 2, which is provided as additional support for the renewal, and is submitted aligned with guidance provided to ECC by the MEFT. Due to the fact that there has been no work or activity carried out on the ML sections of the EMP with relation to the management actions during the construction and operational phases of the mine's EMP have been excluded.

#### 3.2 ISSUES OF NON-COMPLIANCE

During the site visit a couple of issues of non-compliance were observed:

- Improper disposal of solid waste
- Collection pit for effluent waste outside of toilet was not lined

These issues have been illustrated below:





Figure 2 - Improper management of solid waste





**Figure 3 - Unlined effluent waste collection hole**

### 3.3 ANNUAL COMPLIANCE AUDIT

The EMP compiled by SLR CC in 2017 set out feasible and cost-effective mitigation, monitoring and institutional measures to avoid adverse environmental and social impacts, reduce them to acceptable levels, or compensate for them. Furthermore, the EMP covers all adverse environmental impacts, including any that may result from the exploration activities on ML 197. The EMP provides the technical details for each mitigation, monitoring and institutional measure, including the impact(s) to which it relates and when it is required, together with designs, equipment descriptions and operating procedures in compliance with the approved EMP.

In addition to the compliance audit, the EMP is revised to identify gaps to reflect experience with the activities and recommend additional best practice measures that were not captured in the previous EMP, if necessary.

During the licence period (2018 to 2021) there were no mining activities carried out on the ML and therefore, no compliance audit was carried out during that licence period.

### 3.4 COMPLIANCE AUDIT FINDINGS

The section outlines the findings of the environmental audit completed for the project in January 2022. It addresses obligations in terms of the key acts that govern the activities on the site, the

commitments made in the EMP accompanying this renewal, and presents the findings and recommended corrective actions where applicable (Table 2).

The EMP:

- identifies all mining activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies institutions responsible for ensuring compliance with the EMP and provides their contact information;
- provides standard procedures to avoid, minimise and mitigate the identified negative environmental impacts and to enhance the positive impact of the proposed activities on the environment;
- provides for site and exploration rules and actions required;
- forms a written record of procedures, responsibilities, requirements and rules for contractor/s, their staff and any other person who must comply with the EMP;
- provides a monitoring and auditing programme to track and record compliance and identify and respond to any potential or actual negative environmental impacts; and
- Provides a monitoring programme to record any mitigation measures that are implemented.

**Table 2 - Mining activities compliance table**

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
– Safety and security	– Prevent access of unauthorized people	<ul style="list-style-type: none"> <li>– Warning signs will be erected and maintained at the site boundary and the working area of the mine will be fenced.</li> <li>– Security control will be in place at the access point to prevent uncontrolled vehicle and pedestrian access to existing and future mining, stockpile and waste facility areas during the construction, operation, and decommissioning phases.</li> <li>– Any persons entering the mine area (pit &amp; plant) will be required to undergo a formal induction.</li> <li>– The security company will not live in the mine village – they should not be able to fraternize with the workforce.</li> <li>– Security cameras and traffic monitoring of all vehicles entering the site will be carried out.</li> </ul>	– N/A	–No work has commenced on site and therefore there are no security personnel on site or warning signs erected
	– Safety risks	– Operate an alcohol-free site and will include random testing of employees/contractors on entry to site, at the beginning of shifts and at any time on duty.	– N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<ul style="list-style-type: none"> <li>- Develop a detailed fire management policy and ensure all employees/contractors</li> <li>- are regularly drilled.</li> <li>- Ensure all security personnel are well-vetted and trained.</li> </ul>		
	- Emergency	<ul style="list-style-type: none"> <li>- Develop and implement an emergency response plan for third parties falling into, or off, hazardous excavations and causing injury. This will be kept by the EHS department.</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	No work has commenced on site and therefore not applicable.
	- Blasting and fly rock	<ul style="list-style-type: none"> <li>- A system will be designed to advise neighbours of intended blasting times, and road closures will be made prior to the blast (as required), in accordance with the rules of the use of explosives. Notifications will take place at least 1 week prior to blasting. This will occur via email, sms and signboard. Other means of notification recommended by surrounding land users will also be considered and implemented</li> <li>- Adequate notification will also be provided to any partners/wives of mine workers to ensure their</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	No work has commenced on site and therefore not applicable.



Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		safety during blasting.		
– Surface water (Altering drainage patterns)	– Prevent Natural flow of stormwater (clean and dirty) flowing from surrounding areas into operational area.	<ul style="list-style-type: none"> <li>– Design all clean and dirty stormwater interventions in such a way that the natural flow of water off site is not too greatly impeded by the mine and its infrastructure.</li> <li>– Ensure that dirty stormwater does not erode the HLF, ROM stockpile and topsoil stockpile.</li> <li>– Ensure that these facilities are designed, constructed, and operated to avoid runoff entering the clean water systems.</li> </ul>	– N/A	No work has commenced on site and therefore not applicable.
	– Prevent Flow of dirty stormwater (rainwater that falls onto, and flows across, the site)	– Construct engineered stormwater management systems to direct contaminated water from the processing areas, roads, and offices areas, to the PCD for storage and re-use. Clean water must be directed around and away from the mine site.	– N/A	No work has commenced on site and therefore not applicable.
– Surface water (General)	– Clean & dirty water separation	– Where possible, surface water management facilities will be designed, constructed, and operated so that dirty water is kept separate from clean water	– N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		run-off through a system of berms, channels, trenches, flood protection measures, erosion protection or dams. The need for long term controls around the HLF will be determined as part of closure planning. These commitments apply to construction, operation and decommissioning		
-	- Wash water, workshop areas etc.	- Install silt and oil traps at all areas where there is a possibility of contaminated water entering the environment. Ensure that these traps are regularly maintained/emptied and that the contents are disposed of at the relevant waste facility (waste oils, contaminated silt and effluent water).	- N/A	No work has commenced on site and therefore not applicable.
-	- General surface water pollution/spills	- All hazardous chemicals (new and used), dirty water, mineralised wastes, and non-mineralised wastes are handled in a manner that they do not contaminate surface water run-off or, where this is not possible, demonstrate (through regular monitoring) that the potential contamination is	- N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>within acceptable limits from a human and environmental health perspective</p> <ul style="list-style-type: none"> <li>- Prevent pollution through sound infrastructure design and through education and training of workers (permanent and temporary) in the storage, handling, dispensing and dispersal of hazardous materials (solid and liquid).</li> <li>- Develop an emergency response plan to ensure fast reaction to contain and remediate pollution incidents. This plan will be kept by the EHS department.</li> <li>- Ensure that contractors provide MSDS documents for all products brought to site, and that they have all the necessary hazardous protection equipment for people utilising the product, as well as the necessary equipment for the containment and clean-up of the environment in the advent of a spill</li> <li>- Verify that the fuel transport company's spill containment (emergency clean-up plan and spill clean-up agreement are in place.</li> </ul>		

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<ul style="list-style-type: none"> <li>- Ensure that fuel transporting companies adhere to the Petroleum Products and Energy Act (13 of 1990) and Regulations</li> <li>- Establish and maintain concrete or lined impermeable bunded areas around diesel generators, hazardous material stores, wash bays, workshop floors etc. Ensure drainage to oil and silt sumps that are regularly cleaned.</li> <li>- Develop, implement and maintain hazardous materials and hydrocarbon spill management procedures.</li> <li>- Ad hoc spills will be cleaned up/remediated immediately in line with spillage management procedure.</li> <li>- Place spill kits in all areas where hazardous substances are dispensed and stored and train staff to use it.</li> </ul>		
	<ul style="list-style-type: none"> <li>- Safe disposal and rehabilitation of hydrocarbon contaminated soils and water</li> </ul>	<ul style="list-style-type: none"> <li>- Develop and implement a hydrocarbon remediation procedure that explains how to deal with the treatment of contaminated environments (soil</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		and water). Train selected staff in the remediation of soils or water contaminated by hydrocarbon spills.		
	<ul style="list-style-type: none"> <li>Monitoring of hydrocarbon and other hazardous spills</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that checking for hydrocarbon spills is included in the daily inspections.</li> <li>Report spillages as per the incident management procedure and Namibian legislation.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.
	<ul style="list-style-type: none"> <li>Mine infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that where mine infrastructure becomes damaged, or causes surface water contamination, that it is adequately repaired and maintained.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.
<ul style="list-style-type: none"> <li>Industrial effluent</li> </ul>	<ul style="list-style-type: none"> <li>Prevent industrial effluent from polluting the environment</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the various effluent streams are managed to prevent overflow of the PCD</li> <li>Ensure that a freeboard is maintained to accommodate run-off during a 1:50 year storm event</li> <li>Monitor the effectiveness of the mitigation measures (e.g linear) for damage to ensure the seepage doesn't occur.</li> <li>Design storage/containment facilities with sufficient capacity to</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		cater for the various sources of water, including rainfall.		
-	- Discharge of industrial effluent to the PCD	<ul style="list-style-type: none"> <li>- Ensure that all industrial effluent is discharged into the PCD</li> <li>- Install oil separators at all wash bays to separate hydrocarbons from the water</li> <li>- Skim oil separator regularly and dispose of hydrocarbons as per the waste management procedure</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
-	- Spillage of industrial effluent	- Maintain pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks.	- N/A	No work has commenced on site and therefore not applicable.
- Domestic effluent	- Discharge of raw sewage and grey water	- Conduct regular monitoring to ensure that effluent is not being discharged into the environment.	- N/A	No work has commenced on site and therefore not applicable.
	- Spillage of domestic and treated effluent	- Report spillages as per the incident management procedure and clean up spills within as soon as possible in line with the spillage management procedure.	- N/A	No work has commenced on site and therefore not applicable.
	- Pollution of soil and/or groundwater when a spillage occurs	<ul style="list-style-type: none"> <li>- In the event of domestic effluent discharge into the environment, stop the incident as soon as possible and find the root cause.</li> <li>- In the event of soil or water</li> </ul>	- Non-compliant	Unlined effluent waste collection hole – no septic tank. Drilling crews will



Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		pollution, decontaminate the polluted area(s) using an appropriate methodology. Once clean, rehabilitate the area.		provide chemical toilets for the proposed drilling activities.
	- Awareness and training	- Train operators to understand the legal requirements and how to achieve compliance. - Induct Craton employees and contractors in the use of the spill management procedure.	- N/A	No work has commenced on site and therefore not applicable.
	- Discharge of raw sewage and grey water into appropriate sewage treatment facilities	- Ensure that portable facilities/septic tanks constructed during the construction and decommissioning phases are managed according to the design specifications.	- Non-compliant	Unlined effluent waste collection hole – no septic tank
	- Spillage of domestic and treated effluent	- Maintain portable facilities, pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks. - Ensure that sewage from the portable toilets is disposed of at the nearest municipal sewage works (Windhoek).	- N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
	- Ablution facilities	- Ensure that portable toilets are working properly and are cleaned at least weekly, so they do not pollute the surrounding environment or create hygiene problems	- Non-compliant	Unlined effluent waste collection hole – no septic tank
	- Transport of sewage to a municipal facility	- Ensure that the contractor responsible for the removal of sludge to a municipal facility has an emergency response plan in place in case of accidental spills. - Also, the contractor must provide proof of safe disposal of sewage at the Municipal sewage works.	- Non-compliant	Unlined effluent waste collection hole – no septic tank
- Spills (Hazardous and hydrocarbons )	- Emergency situations - very large spills	- Maintain and implement the emergency response procedure to address large-scale hydrocarbon, hazardous materials, or reagent spills on and off site.	- N/A	No work has commenced on site and therefore not applicable.
	- Hydrocarbon spills	- Ensure Craton or its contractor has the relevant licences and can provide reports that all surface storage tanks are in good condition (as per legal requirements). - Ensure that hydrocarbon (used and new fuel and oil) tanks and drums are stored inside bundled	- N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>areas on impermeable floors with traps and separators for containing spillages. These areas are designed to contain 110% of the volume of one or the largest (in a multi tank setup) tank and that pumps and pipes are maintained in good working order.</p> <ul style="list-style-type: none"> <li>- All wash bays will be equipped with oil traps and separators. All collected oil will be stored as above.</li> <li>- Ensure that all fuel and oil storage facilities and transport tankers have spill kits</li> <li>- Ensure that the fuel transport company has a system in place to deal with hydrocarbon spills and subsequent clean-up thereof.</li> <li>- Contain the spill and commence with remediation as soon as possible. Log an incident and report to the authorities if volumes released are above specific limits.</li> </ul>		

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
	<ul style="list-style-type: none"> <li>- Domestic and Industrial effluent</li> </ul>	<ul style="list-style-type: none"> <li>- Prevent effluent spills by ensuring that treatment and storage facilities are adequate and that pipes are in a good condition.</li> <li>- Ensure that capacities of the various facilities and pipes are not exceeded.</li> <li>- All vehicles and equipment will be serviced in workshops and wash bays with contained impermeable floors, dirty water collection facilities and oil traps.</li> <li>- Contain any spills and clean up as soon as possible and report as per the incident management procedure.</li> <li>- If in situ treatment is not possible or acceptable then the polluted soil must be excavated, and treated as per the Omitiomire waste management procedure</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>
	<ul style="list-style-type: none"> <li>- Legal Compliance - all spills</li> </ul>	<ul style="list-style-type: none"> <li>- Comply with all legal requirements regarding spills and containment structures</li> <li>- Hydrocarbon spills of 200l or more must be reported to MME in terms of Section 49 of the Petroleum Products Regulations</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		2000		
	- Monitoring of spills – all spills	<ul style="list-style-type: none"> <li>- Ensure that the monitoring of all tanks, pipelines and bunds are included in the daily inspection program to develop an early detection system for leaks</li> <li>- Update, maintain and implement a maintenance plan for tanks, tankers, pipelines and bunds.</li> <li>- Identify post-rehabilitation audit criteria for verifying that remediation has been successful.</li> <li>- Conduct periodic audits of facilities to ensure compliance with legal and company standards.</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
	- Awareness and training – all spills	<ul style="list-style-type: none"> <li>- Induct all Craton employees and contractors in the Environmental Policy, spillage management and incident management procedures</li> <li>- Train selected employees in the containment, and handling of spills and in the decontamination and rehabilitation of affected environments</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
	- Emergency situations – all large or remote spills	<ul style="list-style-type: none"> <li>- Major spillage incidents must be handled in accordance with the emergency response procedure</li> <li>- Identify and contract a service</li> </ul>	- N/A	No work has commenced on site and therefore not

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>provider/specialist to assist with the handling and clean-up of emergency spills off site. I&amp;APs will be provided with the details of the EHS team so that they can notify them of any spills that have occurred in the area. The EHS team will be responsible for contacting the above-mentioned service provider.</p> <ul style="list-style-type: none"> <li>Periodically test the emergency response procedures.</li> </ul>		applicable.
-	<ul style="list-style-type: none"> <li>Rainfall-runoff mobilizes contamination from site and pollutes surface water</li> </ul>	<ul style="list-style-type: none"> <li>Divert clean offsite runoff water around potential contaminant sources with drainage ditches.</li> <li>Collect runoff from potential seepage sources to containment dams for reuse within the mine and/or plant.</li> <li>Design of diversion berms or channels and containment dams to deal with 1:100-year storm.</li> <li>Rehabilitation (concurrent) of waste rock dumps with vegetation</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.
- Groundwater	<ul style="list-style-type: none"> <li>Water abstraction and pit dewatering</li> </ul>	<ul style="list-style-type: none"> <li>Groundwater levels in the monitoring network must take place at least quarterly, and the results analysed.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.



Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<ul style="list-style-type: none"> <li>- Abstraction boreholes and related equipment should be protected against vandalism and/or theft.</li> <li>- Records of volumes of water abstracted must be recorded and a water balance for the mine must be kept. Craton must adhere to permitted abstraction rates as stipulated in the water abstraction permits.</li> <li>- Water saving measures in mining, operational and tailings deposition processes should be implemented and continuously improved.</li> <li>- If monitoring results prove conclusively that surrounding farmer's supply boreholes are affected as a result of Craton's mining activities, they will be provided with an alternate water source.</li> <li>- Water meters and water depth monitors must be fitted to all abstraction holes and monitored throughout the life of the mine.</li> <li>- Monitoring of the <i>Vachellia erioloba</i> health in the dewatering cone must be undertaken.</li> </ul>		

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
-	- Legal aspects	<ul style="list-style-type: none"> <li>- Ensure that permits for abstraction and pit dewatering are renewed as required.</li> <li>- Conduct regular audits to ensure that the conditions of the permits are being met.</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
- Air Quality	- Dust and PM <sub>10</sub>	<ul style="list-style-type: none"> <li>- Prepare an air quality management plan to include the following:               <ul style="list-style-type: none"> <li>➤ Land clearing activities:                   <ul style="list-style-type: none"> <li>o If soils are dry, and water is available then utilize water sprays at areas that are to be cleared.</li> <li>o Limit the travel distance between the area to be cleared and the topsoil stockpiles.</li> </ul> </li> <li>➤ Haul an internal road construction activities:                   <ul style="list-style-type: none"> <li>o If water is available, taking into account allowable limits from abstraction, use a water bowser to dampen areas to be graded.</li> </ul> </li> <li>➤ Wind erosion from exposed areas:                   <ul style="list-style-type: none"> <li>o If water availability, periodically wet exposed areas</li> </ul> </li> </ul> </li> </ul>	- N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<ul style="list-style-type: none"> <li>by water bowser especially during dry, windy periods</li> <li>➤ Using cost-effective dust suppression methods, try to keep vehicle entertainment on unpaved internal and haul roads at a 75% control efficiency.</li> <li>- Ensure all construction equipment is subject to an inspection and maintenance program to ensure proper combustion.</li> </ul>		
<ul style="list-style-type: none"> <li>- Noise &amp; Vibrations</li> </ul>	<ul style="list-style-type: none"> <li>- Impact of noise on the environment/ sensitive receptors</li> </ul>	<ul style="list-style-type: none"> <li>- Document and investigate all registered complaints and make efforts made to address the area of concern where applicable</li> <li>- Communication channels are to be established to ensure that prior notice is given to potential receptors if blasting is to occur. Refer to EIA for details on potential receptors.</li> <li>- Ensure that plant and equipment is well-maintained and fitted with the correct and appropriate noise abatement measures.</li> <li>- All diesel-powered equipment must be regularly inspected and</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>maintained and, necessary, replacement of intake and exhaust silencers should be done.</p> <ul style="list-style-type: none"> <li>- Vendors should be requested to optimize equipment design noise levels.</li> <li>- During the planning and design stages of the project, ways to reduce potential noise aspects should be considered.</li> <li>- Vibrating structures are known to be noisy. Efforts should be made in the plant design to limit noise from these structures.</li> <li>- Baseline noise levels should have returned within 2 km of the project boundary so as not to impact on hunting activities taking place on neighboring farms.</li> <li>- Minimize the need for trucks/equipment to reverse. This will reduce the frequency at which disturbing but necessary reverse warnings will occur. Alternatives to the traditional reverse 'beeper' alarm such as a 'self-adjusting' or 'smart' alarm could be considered.</li> </ul>		

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
<ul style="list-style-type: none"> <li>- Biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>- Physical destruction of biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>- Keep the footprints of disturbance of all facilities and roads as small as possible</li> <li>- As far as possible, avoid areas identified sensitive areas such as pans and riverine habitat</li> <li>- Mark out all construction footprints and clearly convey the rule of staying inside these boundaries to all construction crews</li> <li>- Enforce and monitor speed limits to reduce the likelihood of road kills. A GPS installed in a vehicle is an example of an effective method to monitor speed</li> <li>- Protect undisturbed areas outside planned mining operations from all forms of disturbance (these must serve as future source areas for re-colonization after mining).</li> <li>- Prior to construction and in consultation with a specialist, visually scan proposed construction sites for any sensitive flora and fauna and implement the recommendations of the specialist – these could include but not be limited to: a search and</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>rescue of dens and burrows, relocating/demarcating nests (especially large raptors), demarcating flora (protected trees) to either be conserved within the construction site or relocated.</p> <ul style="list-style-type: none"> <li>- Construct roads as narrow as operationally feasible and regularly maintain all roads in good condition so that diversions off roads will not be necessary. Preferably demarcate tracks with wooden poles.</li> <li>- Develop road use policy, including speed limits, and enforce this to avoid off-track driving.</li> </ul>		
	<ul style="list-style-type: none"> <li>- General disturbance of biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>- The working area of the “mini mine” will be fenced.</li> <li>- Allow only mining personnel, service providers and construction staff, as well as registered mine visitors on site.</li> <li>- Drivers must be licensed and given regular awareness training on the need to keep to speed limits, keep on designated tracks. Some form of speed monitoring should be implemented. Limit nighttime</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>



Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>driving.</p> <ul style="list-style-type: none"> <li>- Develop a site waste management policy and actively enforce it.</li> <li>- Provide temporary waste deposition facilities on site (rubbish bins, skips), which are secure from scavengers, storms, or other disturbance (especially jackals and badgers).</li> <li>- Provide adequate toilet facilities for all workers at work sites.</li> <li>- Where possible, avoid destroying trees or disturbing their proximity, so that animals can continue to use them</li> <li>- Implement strict controls over the movement of materials onto and off the site to minimize the spread of invasive plant species; if this becomes a problem monitor the occurrence and spread of invasive species so as to instigate steps for their control, following expert advice.</li> </ul>		
	<ul style="list-style-type: none"> <li>- Disruption of animal dispersal routes along the Black Nossob River</li> </ul>	<ul style="list-style-type: none"> <li>- Do not place any infrastructure in the Black Nossob River valley.</li> <li>- Minimize all activities close to the river, especially at night when</li> </ul>	<ul style="list-style-type: none"> <li>- N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		nocturnal species are active		
- Visual	- Earthworks	<ul style="list-style-type: none"> <li>- During earthworks, all reasonable measures should be taken to prevent excessive dust.</li> <li>- Keep the working footprint to the minimum size possible, and rehabilitate once no longer in use</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
	- Access	- If possible, permanent roads must be tarred/paved in order to minimize dust creation. Speed limits on unpaved surfaces must be controlled to reduce entrainment.	- N/A	No work has commenced on site and therefore not applicable.
	- Lighting	<ul style="list-style-type: none"> <li>- Light pollution should be carefully considered and kept to a minimum – without compromising safety.</li> <li>- Avoid using bright, white colour lights where possible. Preferably use lights emitting a yellow light which travels less than white-coloured lights.</li> <li>- Light public movement areas (pathways and roads) with low level ‘bollard’ type lights and avoid post top lighting.</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<ul style="list-style-type: none"> <li>Avoid high pole top security lighting where possible.</li> </ul>		
	<ul style="list-style-type: none"> <li>Project Area, Development and General</li> </ul>	<ul style="list-style-type: none"> <li>Retain as much as possible of the existing vegetation within the project area and along the project boundaries and roads in aid of screening the project</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.
<ul style="list-style-type: none"> <li>Archaeology</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance of archaeological sites</li> </ul>	<ul style="list-style-type: none"> <li>The site identified in the Scoping Report should be indicated on the project GIS and although it is not possible to conserve this site (since it is in the footprint of the proposed pit) all relevant mine and infrastructure planning should take this position into consideration. Refer to the Scoping Report for an indication of the location of this site.</li> <li>Craton should apply for necessary destruction permits from the NHC, if applicable.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.
<ul style="list-style-type: none"> <li>Socio-economic</li> </ul>	<ul style="list-style-type: none"> <li>Issues relating to change of land use and neighbouring communities</li> </ul>	<ul style="list-style-type: none"> <li>Continue with the Omitiomire Farmers Committee as a platform for dialogue and annually arrange meeting schedules. These are to take place quarterly.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<ul style="list-style-type: none"> <li>Provide an alternative water source should any of the farmers' boreholes run dry and it is proven to be a direct result of the mining activities.</li> </ul>		
- Resource	- Water usage and control	<ul style="list-style-type: none"> <li>Install and calibrate water flow meters on pipes at selected locations (where required)</li> <li>Monitor monthly abstraction volumes to ensure that the permitted monthly and annual volumes are not exceeded</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
	- Maintenance of equipment	<ul style="list-style-type: none"> <li>Regularly inspect and maintain tanks, tankers, pumps and pipes.</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
	- Monitoring of water leaks	<ul style="list-style-type: none"> <li>Checking for water leaks daily. Report water losses.</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.
	- Fuel consumption	<ul style="list-style-type: none"> <li>Maintain and implement the preventive maintenance plan for all equipment and mine vehicles using diesel, petrol and gas on site to avoid wastage and leakages</li> <li>Monitor fuel consumption in all</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		departments.		
– Waste Management (Non-hazardous solid waste, non-mineralised)	– General	– The waste management procedure for Craton must cover the recycling, reuse, storage, handling, transportation and disposal. Ensure that the contractor's responsible for the above are made aware of these procedures.	– Non - compliant	Site has not been adequately cleaned up since exploration activity stopped years ago.
	– Collection of waste	– Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity. Receptacles must have lids to prevent wind borne litter, or scavenging by animals	– Non - compliant	Site has not been adequately cleaned up since exploration activity stopped years ago.
	– Waste storage/separation – domestic waste	– Determine what recycling initiatives are feasible on site and in the area. – All recyclable waste must be separated at source into the relevant containers, before being removed to wheelie bins or luggar bins and skips – Provide the recyclable materials to	– Non- compliant	Site has not been adequately cleaned up since exploration activity stopped years ago.

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>agencies that can utilise them.</p> <ul style="list-style-type: none"> <li>– Non-recyclable waste will be collected and taken to an off-site waste facility.</li> </ul>		
	<ul style="list-style-type: none"> <li>– Waste classification (domestic and industrial)</li> </ul>	<ul style="list-style-type: none"> <li>– A waste inventory should be maintained.</li> </ul>	<ul style="list-style-type: none"> <li>– Non-compliant</li> </ul>	<p>Site has not been adequately cleaned up since exploration activity stopped years ago.</p>
<ul style="list-style-type: none"> <li>– Waste Management (Hazardous solid waste, non-mineralised)</li> </ul>	<ul style="list-style-type: none"> <li>– General</li> </ul>	<ul style="list-style-type: none"> <li>– The waste management procedure for Craton will cover the storage, handling, and transportation of waste. Ensure that the contractor's responsible are made aware of these procedures.</li> </ul>	<ul style="list-style-type: none"> <li>– N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>
	<ul style="list-style-type: none"> <li>– Collection of waste</li> </ul>	<ul style="list-style-type: none"> <li>– Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity.</li> </ul>	<ul style="list-style-type: none"> <li>– N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>
	<ul style="list-style-type: none"> <li>– Waste storage</li> </ul>	<ul style="list-style-type: none"> <li>– Ensure that hazardous waste is kept covered, in impermeable bunded areas until it can be removed from site to the hazardous facility at Windhoek/Kupferberg.</li> <li>– Store empty print cartridges in a designated box at the office assistant's desk until removal from</li> </ul>	<ul style="list-style-type: none"> <li>– N/A</li> </ul>	<p>No work has commenced on site and therefore not applicable.</p>

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		<p>site.</p> <ul style="list-style-type: none"> <li>- Store fluorescent tubes in a special labelled steel drum at the engineering workshop.</li> <li>- Collect and accumulate other hazardous waste i.e. car batteries, miscellaneous batteries, oil filters, etc. at the engineering workshop until such time that the amounts can be removed from site.</li> <li>- Explosives packaging shall be safely burnt at the magazine site according to permit conditions and procedures.</li> <li>- Place oil and greasy cloths and rags into a steel drum and when full transported off site to the hazardous waste site.</li> <li>- Keep empty reagent bags (for a short period of time) at the reagents store until removed by the reagent contractor for refills.</li> <li>- Ensure that waste storage areas and/or containers meet the risk needs for that specific waste (e.g. impervious floor, bunded areas with drainage/containment systems, lids to prevent light</li> </ul>		

Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		material from blowing away or sealed containers for hazardous material).		
	- Waste classification	- An inventory of wastes will be compiled and will include estimated quantities of waste. The inventory will be kept up to date.	- N/A	No work has commenced on site and therefore not applicable.
	- Waste transport	- Appoint a reputable waste management subcontractor to transport waste to the Windhoek landfill.	- N/A	No work has commenced on site and therefore not applicable.
	- Disposal	- Disposal of waste at appropriate permitted waste disposal facilities as follows: <ul style="list-style-type: none"> <li>• Hazardous waste shall be removed from site and may be recycled or disposed of at the nearest hazardous site (i.e. Windhoek/Kupferberg);</li> <li>• Dispose of spoiled reagents offsite at the reagent's facility in Windhoek; and</li> <li>• Damaged reagent bags</li> </ul>	- N/A	No work has commenced on site and therefore not applicable.



Aspect	Management objectives	Management actions	Compliance	Comments or recommendations
		shall also be removed by the reagent contractor for repairs or disposal.		
	- Disposal records	- Written evidence of safe disposal of waste will be kept.	- N/A	No work has commenced on site and therefore not applicable.
- Employee village	- Safety risks	- Occupants of the employee village will remain within the area after working hours	- N/A	No work has commenced on site and therefore not applicable.

## 4 CONCLUSION AND RECOMMENDATIONS

The following have been discussed with the proponent and form part of their plans for addressing the inadequacies observed at the site:

- (i) Implement better measures to manage their solid waste that has been improperly disposed of on site
- (ii) Ensure that a septic tank lined is installed /or the waste pit is lined to collect effluent waste from their toilets at their workercamp
- (iii) The proponent has a land access agreement with the landowner as required
- (iv) Before entering any private property such as a private farm, the proponent gave advanced notices and obtained access permission from the landowner

The proponent has not undertaken any activities during the duration of their licence due to COVID-19 but proposes to continue their mining activities in 2022 and are therefore submitting this application. The proponent is committed to undertake all its mining activities following its company's Health, Safety and Environment (HSE) commitments and its environmental management plan. It is recommended that the proponent continue to adhere to all environmental legislation and company standards to ensure that the best practical environmental protection performance continues as the project activities progress.

## APPENDIX A: ENVIRONMENTAL CLEARANCE CERTIFICATE



REPUBLIC OF NAMIBIA

### MINISTRY OF ENVIRONMENT AND TOURISM

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7 May 2018

#### OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Director  
Craton Mining and Exploration (Pty) Ltd  
P O Box 81123  
Windhoek  
Namibia

Dear Sir/Madam

**SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE PROPOSED AMENDMENT FOR THE OMITIOMIRE COPPER OXIDE MINE, KHOMAS REGION**

The Environmental Impact Assessment and Environmental Management Plan submitted are sufficient as it makes provision of the environmental management concerning the project. From this perspective regular monitoring and evaluation on environmental performance should be conducted. Targets for improvements should be established and monitored from time to time.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project.

On the basis of the above, this letter serves as an environmental clearance certificate for the project to continue. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Craton Mining and Exploration (Pty) Ltd.

This environmental clearance certificate is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

  
Teofilus Nghitila  
ENVIRONMENTAL COMMISSIONER

**"Stop the poaching of our rhinos"**

*All official correspondence must be addressed to the Permanent Secretary*



## APPENDIX B: ENVIRONMENTAL MANAGEMENT PLAN



global environmental solutions

Omitiomire Copper Oxide Mine

Environmental Management Plan for the amendment to the  
approved Omitiomire Copper Mine  
SLR Project No.: 734.03039.00010

Report No.: 2

December 2017

Omitiomire Copper Oxide Mine

Environmental Management Plan for the amendment to the  
approved Omitiomire Copper Mine

SLR Project No.: 734.03039.00010

Report No.: 2

December 2017

## DOCUMENT INFORMATION

<b>Title</b>	Environmental Management Plan for the amendment to the approved Omitiomire Copper Mine
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<b>Issue Date</b>	December 2017

## ENVIRONMENTAL MANAGEMENT PLAN FOR THE AMENDMENT TO THE APPROVED OMITIOMIRE COPPER MINE

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## ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report.

<b>Acronyms / Abbreviations</b>	<b>Definition</b>
ASEC	Alex Speiser Environmental Consultants
DWA	Department of Water Affairs and Forestry
EC	Environmental Clearance
EMP	Environmental Management Plan
EMS	Environmental Management System
EIA	Environmental Impact Assessment
Ha	Hectare
HLF	Heap leach facility
ISO	International Standard Organisation
LOM	Life of mine
MAWF	Ministry of Agriculture Water and Forestry
MC	Mining Commissioner
MET	Ministry of Environment and Tourism
MME	Ministry of Mines and Energy
MS	Method Statement
MP	Management plan
NSD	Noise sensitive development
PM10	Particular matter less than 10 micrometre
RoM	Run of Mine
SANS	South African National Standards
SME	Small-medium enterprise
STP	Sewerage treatment plant
Tpa	Tons per annum
WRD	Waste rock dump

## **ENVIRONMENTAL MANAGEMENT PLAN FOR THE AMENDMENT TO THE APPROVED OMITIOMIRE COPPER MINE**

### **1 INTRODUCTION**

This Environmental Management Plan (EMP) documents a series of individual management plans (MPs) which are designed to meet legal requirements, avoid, minimise or manage the impacts associated with the implementation of the amendments to the Omitiomire project (“mini mining” project). An EIA process was conducted for the larger scale Omitiomire Project between 2010 and 2014 and a subsequent Scoping Report (and assessment) has been produced by SLR Consulting (Namibia) to cater for the amendments associated with the proposed “mini mining” project which Craton Mining and Exploration (Pty) Ltd (craton) is now proposing.

The management plans recommended by the individual specialists in the approved 2014 EIA (SLR, 2014) as well as those recommended by the individual specialists as part of this scoping and assessment process have been compiled into this EMP (refer to Table 1).

#### **1.1 KEEPING EMPs CURRENT**

Section 50 (g) of the Minerals (Mining and Prospecting) Act, 33 of 1992 states that the holder of a mining license shall undertake the periodic review of the EMP(s) should circumstances change.

Should a listed activity(s) as defined in the Environmental Impact Assessment Regulations: Environmental Management Act (EMA), 2007 (Government Gazette No. 4878) be triggered (as a result of future modifications/changes at the mine), this EMP will be required to be updated through another EIA process as stipulate in the EMA and its Regulations.

#### **1.2 DETAILS OF THE PERSONS WHO PREPARED THIS EMP**

SLR Namibia (Pty) Ltd (SLR), the independent firm of consultants who compiled the Omitiomire Copper Oxide “mini mining” scoping report has also compiled this EMP.

Caitlin Hird, the EIA project co-ordinator has approximately seven years of relevant experience in conducting/managing EIAs and compiling EMPs. Werner Petrick, the EIA project manager and reviewer has approximately seventeen years of relevant experience in conducting/managing EIAs, compiling EMPs and implementing EMPs and Environmental Management Systems. Werner is certified as lead environmental practitioner and reviewer under the Environmental Assessment Professionals Association

of Namibia (EAPAN). Immanuel Katali, the project assistant has approximately three years relevant experience in various projects throughout Namibia.

**TABLE 1: SUMMARY OF ISSUES IDENTIFIED IN THE SPECIALISTS AND THE SCOPING REPORT AND CORRESPONDING MANAGEMENT PLANS**

<b>Environmental component (reference to Section 7 of the Scoping Report)</b>	<b>Issue (reference to Section 7 of the Scoping Report)</b>	<b>Relevant MP (reference to Section 6 of the EMP)</b>
Topography	Surface excavations and infrastructure	MP7.1 – Stakeholder consultation MP7.2 – Safety & Security
Soils and land capability	Loss of soil resources from soil pollution	MP7.14 – Waste management
	Loss of soils resource through physical disturbance	MP13 – Soil management
Biodiversity – Natural vegetation and animal life	Physical impacts on biodiversity	MP7.7 – Biodiversity
	General disturbance of biodiversity	MP7.7 – Biodiversity MP7.14 – Waste management
Surface water	Altering drainage patterns	MP7.3 – Surface Water
	Impacts on surface water quality	MP7.3 – Surface Water MP7.14 – Waste Management
Groundwater	Groundwater abstraction	MP7.4 – Groundwater MP7.11 – Socio-Economic
	Impacts on groundwater quality	MP7.4 – Groundwater MP7.14 – Waste management
Air quality	Air pollution	MP7.5 – Air quality
Noise	Noise pollution	MP7.6 – Noise
Blasting	Blasting	MP7.2 – Safety & Security MP7.6 – Noise
Archaeology	Impacts on archaeological resources	MP7.9 – Archaeology
Visual	Visual impact	MP7.8 – Visual
Socio-economic	Economic (income and employment) impact due to change of land use	MP7.1 – Stakeholder consultation MP7.2 – Safety & Security
	Social impact of Change of Land Use	
	Impact on surrounding land users	MP7.11 – Socio-Economic
	Employment and skills development	

<b>Environmental component (reference to Section 7 of the Scoping Report)</b>	<b>Issue (reference to Section 7 of the Scoping Report)</b>	<b>Relevant MP (reference to Section 6 of the EMP)</b>
	Community health, safety and security	
Traffic	Traffic Impact	MP7.10 - Traffic

## 2 SCOPE OF EMP

The components of the EMP are included in Table 2 below.

**TABLE 2: CONTENT OF THE EMP**

EIA Regulation requirement	EMP Reference
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.2
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – <ul style="list-style-type: none"> <li>i. Planning and design</li> <li>ii. Construction activities</li> <li>iii. Operation or undertaking of the activity</li> <li>iv. Rehabilitation of the environment</li> <li>v. Closure, where relevant</li> </ul>	Section 77
A detailed description of the aspects of the activity that are covered by the EMP.	Sections 4 & 5
An identification of the persons to be responsible for the implementation of the mitigation measures.	Sections 5 & 8
Where appropriate, time frames within which the measures contemplated in the EMP must be implemented.	Section 8
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 7 & 9

### 3 ENVIRONMENTAL LEGISLATION

#### 3.1 INTRODUCTION

Craton complies with all Namibian legislation, and where legislation is lacking will comply with international best practice procedures. Table 3 provides a summary list of the relevant legislation applicable to the Omitiomire “mini mine”.

**TABLE 3: LIST OF LEGISLATION RELEVANT TO MINING IN NAMIBIA**

Year	Name
<b>Current Namibian legislation &amp; Bills</b>	
1990	Petroleum Products and Energy Act No. 13 of 1990, as amended
1990	The Constitution of the Republic of Namibia of 1990
1992	The Labour Act, No. 6 of 1992
1992	The Minerals (Prospecting and Mining) Act No. 13 of 1992
1997	Regulations relating to the Health and Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act, No. 6 of 1992 (GN156, GG 1617 of 1 August 1997)
1998	Affirmative Action (Employment) Act No. 29 of 1998
1997	Namibian Water Corporation Act, No. 12 of 1997
1998	The Health Act No. 21 of 1998
1999	Road Traffic and Transport Act No. 22 of 1999
2000	Petroleum Products regulations
2000	Electricity Act No. 2 of 2000
2000	Explosives Act of 2000
2001	The Forestry Act No. 12 of 2001
2003	Pollution control and waste management bill, 2004
2004	Water Resources Management Act, 2004
2004	National Heritage Act No. 27 of 2004
2007	Labour Act No. 11 of 2007
2005	Atomic Energy and Radiation Protection Act No. 5 of 2005
2007	Electricity Act, No, 4 of 2007
2007	Environmental Management Act No. 7 of 2007
2013	Water Resources Management Act, (Act No. 11 of 2013)
<b>Former South African and SWA legislation still applicable in Namibia</b>	
1919	Public Health Act No. 36 of 1919



<b>Year</b>	<b>Name</b>
1956	Water Act No. 54 of 1956
1956	Explosives Act No. 26 of 1956
	Regulations promulgated in terms of the Explosives Act No. 26 of 1956
1968	Regulations made under the provisions of the Mines, Works and Minerals ordinance, 1968 (Ordinance 20 of 1968)
1969	Soil Conservation Act No. 76 of 1969
1974	Hazardous Substances Ordinance No. 14 of 1974
1975	Nature Conservation Ordinance No. 14 of 1975
1976	Atmospheric Pollution Prevention Ordinance No. 11 of 1976
<b>Namibian policy</b>	
1994	Policy for the Conservation of Biotic Diversity and Habitat Protection
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation
1998	Draft White Paper on the Energy Policy of Namibia
1999	Policy for Prospecting and Mining in Protected Areas and National Monuments
2000	National Water Policy White Paper
2004	Minerals Policy for Namibia
<b>International law to which Namibia is a signatory</b>	
1985	Vienna Convention for the Protection of the Ozone Layer
1987	Montreal Protocol on substances that deplete the Ozone Layer
1989	The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal
1989	The Rotterdam convention on the Prior Informed Consent Procedure for Certain Hazardous chemicals and Pesticides in International Trade
1992	The Rio de Janeiro Convention on Biological Diversity
1992	United Nations Framework Convention on Climate Change

### 3.2 PERMITS

Craton Mining and Exploration (Pty) Ltd (Craton) holds the Exclusive Prospecting License (EPL) 3589 and an Environmental Clearance Certificate (ECC) for a copper oxide mine and associated processing plant which is planned to be developed on the farm Omitiomire located approximately 140 km northeast of Windhoek (by road), and approximately 39 km south of Hochfeld, in the Khomas Region of Namibia. EPL3589 was granted for a three-year period on 25 April 2007. In 2010, this EPL was renewed for a two-

year period, and was again renewed for further two year periods in 2012, 2014 and 2016. The tenement covers an area of 542 km<sup>2</sup>.

Subsequent to the MET approval of the original Omitiomire copper mine (2014 EIA), Craton has continued resource investigation and conditions are favourable to warrant expediting mining of oxide ore at Omitiomire via a “mini mining” operation. In this regard, the “mini mining” operation will allow the mining of 10 000 tons/month (instead of the approved 40 000 tons/month), and the pit depth will be limited to 20 m (instead of the approved 50 m). The “mini mining” operation will therefore comprise a purely oxide mine without the capital expense of a powerline, and expensive processing costs. The activities associated with this “mini mining” are different to those assessed and approved as part of the 2014 EIA and therefore require an amendment to the original ECC. Table 4 summarises the notification, registration, approval and permits relating to environmental aspects. Table 4 identifies the permits and certificates that may require application prior to the start of mining.

**TABLE 4: NOTIFICATION, REGISTRATION, APPROVAL AND PERMITS**

<b>Issue</b>	<b>Act/Section</b>	<b>Type of requirement/Ministry</b>
Mining licence	Section 91(f)	Approval of EIA and EMP/MME and MET
Written permission of the MC to erect any accessory works	Section 90 (2) (a)	Written permission from MC/MME
Permission to sell, discharge, etc. Minerals mined	Section 102 (1)	Permission from MC/MME
Permit to store and handle explosives on site	Explosives Act No. 26 of 1956	Permit
Stipulates the use of public water for industrial purposes	Water Act, No 54 of 1956 Section 11 (1) – (7)	Permit
Sets out the requirements to obtain a permit to use public water for industrial purposes	Section 12 (1) – (9)	Permit
Water Abstraction permit – WA002	Section 13 (2)	Permit
Stipulates the purification of waste water and discharge	Section 21 (1) (2) (3) (4) (5) & 22	Permit for industrial waste water and effluent disposal/ water abstraction/ Directorate of Water Affairs in MAWF

<b>Issue</b>	<b>Act/Section</b>	<b>Type of requirement/Ministry</b>
Picking and transport of protected plants	Nature Conservation Ordinance, No. 4 of 1975 Section 73	Plant removal permit/Approval of landowner/Directorate of Parks and Wildlife in MET or the NBRI
Picking, removal of protected plants	Section 73	Permit/DPW in MET
Sale, donation, export and removal of protected plants	Section 74	Plant export permit /MET
Cultivation of protected plants in nursery (if required)	Section 75	Permit/MET
Scheduled processes in controlled area	Atmospheric Pollution Prevention Ordinance, No. 11 of 1976 Section 5(1)	Air pollution control certification/Ministry of Health and Social Service (MHSS)
Registration, selling, operating, installing of infrastructure related to Group I and III hazardous substances	Hazardous Substance Ordinance, No. 14 of 1974 Section 5 (1)(a)(b)(c)	Licences required for the sale, use and storage of "hazardous substances", which are specified in certain groups. MET and MHSS
Disturbing or destroying of national heritage sites (archaeological/paleontological sites)	National Heritage Act, 2004 Section 48 – 52 and 55	Requirement to obtain consent in terms of section 55 before altering or developing any land in which an archaeological object or paleontological site is believed to be located. National Heritage Council
Consumer installation certificate	Petroleum Product Regulations, 2000 Section 18 (5)	Certificate/license MME, Department of Energy
Actions to be taken after a spill has occurred (major petroleum spill means 200 l per spill)	Section 49(1)(4)	Notification/MME, Department of Energy
Storage and use of explosives	Explosive Act, 1956 Section 22	Permit/MME
30-days notification prior to commencement of construction	Labour Act, 1992, Regulations for Labour Act	Notification/Ministry of Labour (MoL)

Issue	Act/Section	Type of requirement/Ministry
	1992, Section 20	
30-days notification prior to commencement of mining operation	Section 21	Notification/MoL
Transport/operating licence to transport goods on public roads	Roads Traffic and Transport Act, 1999 Section 60	Licence/Ministry of Works, Transport and Communication
Approval to work on Sundays, public holidays and continuous operation	Section 33	Approval/Ministry of Labour
Company must inform Chief Inspector (Ministry of Health and Social Services) before commencing building or construction work on the mine	Regulations concerning the Health and Safety of Employees at Work, 1997 (Government Notice 156 of 1997)	Ministry of Health and Social Services and Notification to MME
VAT registration	Value Added Tax Act, 2000	Certification
Tax registration	Income Tax Act, 1981	Certification
Social Security	Social Security Act, 1994 Section 20	Registration
Valid Affirmative Action compliance certificate	Affirmative Action Act, 1998, Section 42	Certification

**TABLE 5: LIST OF PERMITS OR CERTIFICATES THAT MAY BE REQUIRED**

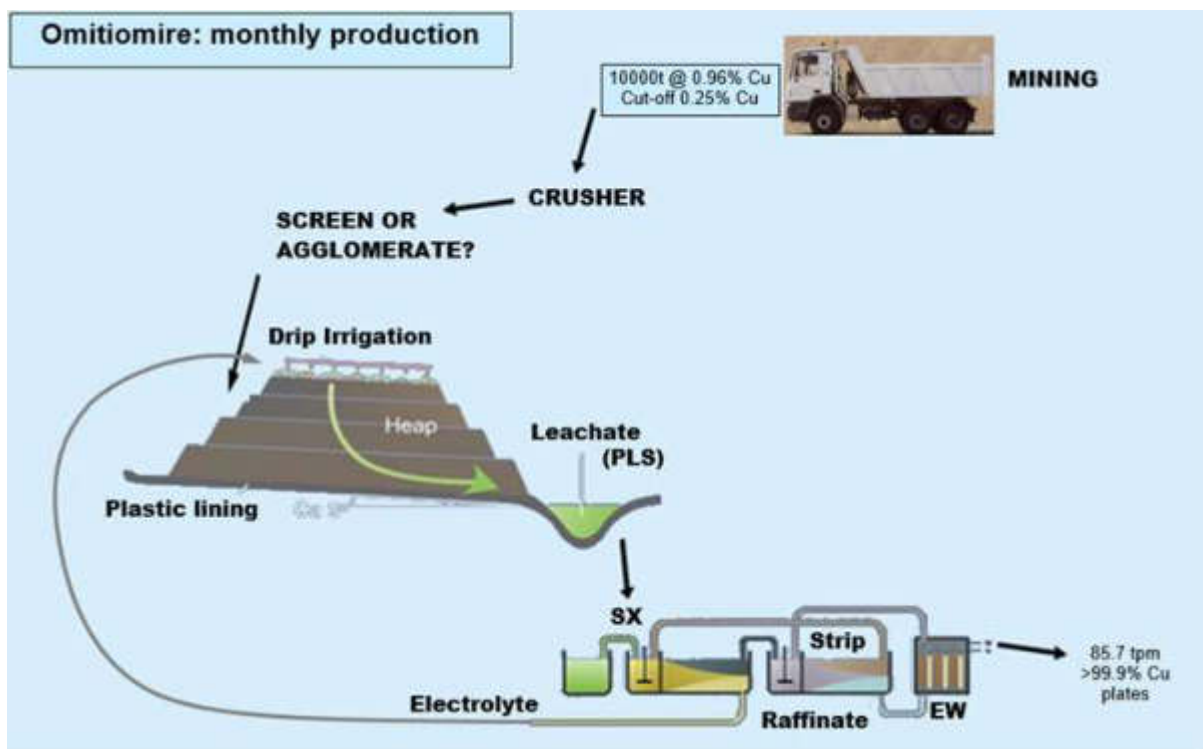
Permit name	Regulator
Mining licence (awaiting issue of ML197)	MME
Environmental clearance for EIA and EMP	MET
Water abstraction and discharge (NamWater)	Ministry of Agriculture, Water and Forestry (MAWF)
Disposal of domestic and industrial water/solid waste	MET/MAWF
Disposal of domestic and industrial effluent	MET/MAWF
Licence for explosives magazine	MME/Police
Explosive burning permit	MME
Registration certificate for scheduled process	MME

## 4 PROJECT OVERVIEW

### 4.1 INTRODUCTION

Subsequent to the MET approval of the original Omitiomire copper mine (2014 EIA), Craton has continued resource investigation and conditions are favourable to warrant expediting mining of oxide ore at Omitiomire via a “mini mining” operation. In this regard, the “mini mining” operation will allow the mining of 10 000 tons/month (instead of the approved 40 000 tons/month), and pit depth will be limited to 20 m (instead of the approved 50 m).

This process flow is illustrated in Figure 1 below. For the full detailed project description refer to Section 4 of the Scoping Report.



**FIGURE 1: HEAP LEACHING, SOLVENT EXTRACTION (SX) AND PRODUCTION OF COPPER THROUGH ELECTRO WINNING (EW) PROCESS**

## 5 ENVIRONMENTAL MANAGEMENT PLAN (ASPECTS AND IMPACTS)

Understanding the biophysical and human environment in which a mine operates is the first step to understanding environmental impacts. The next and possibly more important step is to identify the environmental aspects that give rise to the impacts. For example, the activity of blasting has more than one environmental aspect associated with it; namely, noise, vibration, dust generation and fallout debris. All of these aspects have the potential to cause impacts on the environment in a different way.

Successful management will be gauged by how well Craton avoids, minimises or mitigates all the impacts associated with each environmental aspect at their Omitiomire “mini mine”.

As part of the EIA process for Omitiomire, environmental aspects and potential environmental impacts associated with the activities and facilities were identified. The full suite of Craton’s facilities and activities, associated with the various phases are described in the Scoping Report and in Section 4 of this EMP. Table 6 provides a description of the environmental aspects that are associated with Omitiomire “mini mining” operation and how they impact the biophysical and human environment.

**TABLE 6: DESCRIPTION OF ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS ASSOCIATED WITH OMITIOMIRE MINI MINING OPERATIONS**

Environmental aspects	Potential impact
<b>Aspects associated with consumption of resources</b>	
Energy use	<ul style="list-style-type: none"> <li>• Energy resource depletion, remote impacts</li> </ul>
Use of natural resources	<ul style="list-style-type: none"> <li>• Natural resource depletion, loss of land (habitat), change in land-use potential, loss of future economic opportunities.</li> </ul>
<b>Aspects associated with waste/pollution generation</b>	
Emissions to air:- Fall-out dust and PM <sub>10</sub>	<ul style="list-style-type: none"> <li>• Reduction in visibility.</li> <li>• Nuisance impact and health impact.</li> <li>• Impact on flora (dust impacts growth and health of plant, etc.)</li> </ul>
Emission to land (solid and liquid non-hazardous waste)	<ul style="list-style-type: none"> <li>• Visual pollution (e.g. littering).</li> <li>• Pollution of water – surface and ground water.</li> <li>• Alteration of soil chemistry and/or composition.</li> </ul>
Emission to land (solid and liquid hazardous waste)	<ul style="list-style-type: none"> <li>• Safety and health.</li> <li>• Scavenging by animals.</li> </ul>

<b>Environmental aspects</b>	<b>Potential impact</b>
Emission to water (domestic effluent)	<ul style="list-style-type: none"> <li>• Contamination of streams, dams and groundwater.</li> <li>• Alteration of soil chemistry and/or composition.</li> <li>• Impact on fauna and flora living in aquatic environments.</li> <li>• Safety and health.</li> <li>• Impact on surface water flow.</li> </ul>
Emission to water (industrial effluent)	
Emissions to land and water (medical waste)	
<b>Sound or visual pollutants</b>	
Noise	<ul style="list-style-type: none"> <li>• Negative public perception – nuisance impact.</li> <li>• Potential changes in animal behaviour.</li> </ul>
Visual	<ul style="list-style-type: none"> <li>• Change to the visual landscape</li> <li>• Visual impact (aesthetic quality of environment) - negative public perception</li> <li>• Potential alteration in nocturnal activities of fauna and flora.</li> </ul>
Blasting & Vibrations	<ul style="list-style-type: none"> <li>• Will there be impacts on the safety of third parties?</li> <li>• What impacts on property – buildings and other infrastructure</li> <li>• Impacts on biodiversity</li> </ul>
<b>Disturbance or alteration of ecosystems</b>	
Disturbance of land	<ul style="list-style-type: none"> <li>• Visual change in surroundings, scars, loss of biodiversity, damage to ecosystems, altered soil potential, change in land- use potential, loss of future economic opportunities.</li> </ul>
Disturbance of biodiversity	<ul style="list-style-type: none"> <li>• Impact on biodiversity (physical disturbance or general disturbance).</li> <li>• Reduction of water resource as an ecological driver.</li> </ul>
Disturbance of water courses or groundwater	<ul style="list-style-type: none"> <li>• Alteration of drainage patterns.</li> <li>• Surface and groundwater pollution.</li> <li>• Depletion in water levels in boreholes due to over pumping.</li> <li>• Potential depletion of community supply boreholes.</li> </ul>
<b>Disturbance or alteration of archaeology</b>	
Disturbance of archaeological sites	<ul style="list-style-type: none"> <li>• Damage to archaeological sites.</li> </ul>
<b>Socio-economic aspects</b>	



<b>Environmental aspects</b>	<b>Potential impact</b>
Economic	<ul style="list-style-type: none"> <li>• Direct contribution to Gross Namibian Income (GNI) of the mine during LOM</li> <li>• Reducing income inequality, increasing job creation and economic growth.</li> </ul>
Inward migration of job seekers	<ul style="list-style-type: none"> <li>• Community health &amp; safety and security impacts.</li> <li>• Stimulating the local economy and community organization</li> <li>• Increasing pressure on government services</li> <li>• Informal settlements</li> </ul>
Change of land use	<ul style="list-style-type: none"> <li>• Land prices may devalue due to mine development</li> <li>• Potential lowering of the local groundwater table and concern re the consequent long-term threat to sustainable farming</li> <li>• Loss of sense of place and potential reduction in livelihoods from tourism during construction and operations.</li> <li>• Squatter camps and reduction of safety.</li> </ul>
Traffic	<ul style="list-style-type: none"> <li>• Increased potential for road traffic accidents;</li> <li>• Road deterioration due to road use by mine-related vehicles.</li> <li>• Loose gravel can lead to cracked windscreens; and</li> <li>• The presence of animals and the risk of collision.</li> </ul>
<b>Other (any aspect not considered to fall into the defined aspect categories)</b>	
Emergency situation	<ul style="list-style-type: none"> <li>• There are a number of different situations which could arise, each with its own suite of impacts, e.g. fire will have an impact on air quality, health and safety, surrounding properties, equipment, fauna and flora.</li> </ul>

## 6 OVERALL ENVIRONMENTAL OBJECTIVES FOR THE EMP

The following overall environmental objectives have been set for the Omitiomire “mini mine”:

- To comply with national legislation and standards for the protection of the environment;
- To limit potential impacts on biodiversity through the minimisation of the footprint and the conservation of residual habitat within the mine area;
- To investigate and exploit measures to reduce resource and energy consumption;
- To keep surrounding communities informed of mining activities through the implementation of forums for communication and constructive dialogue;
- To limit contaminated effluent discharge into the environment through the containment, recycling or removal of contaminated water;
- To conserve soil resources by stripping, stockpiling and managing topsoil;
- To protect soils and groundwater resources through the implementation of measures for spill prevention and clean-up;
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste;
- To minimise the potential for dust emissions through the implementation of dust control measures;
- To minimise the potential for noise and vibration disturbance in surrounding areas;
- To protect cultural heritage by avoiding sites of significance, or, if this cannot be done, to ensure thorough documentation and the obtaining of necessary legal approvals thereof prior to destruction;
- To undertake rehabilitation wherever possible during the life of the mine;
- To incorporate final closure objectives in construction and mine planning;
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of the following: ground and surface water, air quality, noise and vibration, biodiversity and rehabilitation;
- To reduce potential impacts on the safety of the surrounding properties through strong site access controls and discouragement of informal settlements;
- To support and encourage environmental awareness and responsibility amongst all employees and service providers;
- To provide appropriate environmental education and training for all employees and service providers;
- To prevent pollution and clean up if incidents occur;
- To incorporate the relevant requirements stipulated in this EMP into the mine, plant process design and mine waste residue disposal;

- To ensure the all the contractors adhere to the construction related management commitments;  
and
- Ensure compliance to the EMP.

## 7 MANAGEMENT PLANS

The management plans (MPs), listed in the table below, are applicable to all the relevant activities and facilities of the Omitiomire “mini mine”. (The MPs follow in the subsequent sections).

**TABLE 7: VARIOUS MPS AND NUMBERS**

Number	Management plan (MP)
7.1	Stakeholder Consultation/Communication MP
7.2	Safety and Security MP
7.3	Surface water/stormwater MP
7.4	Groundwater MP
7.5	Air Quality MP
7.6	Noise & Vibrations MP
7.7	Biodiversity MP
7.8	Visual MP
7.9	Archaeology MP
7.10	Traffic MP
7.11	Socio-Economic MP
7.12	Resource MP
7.13	Soil MP
7.14	Waste Management MP

**7.1**  
**Stakeholder**  
**Consultation/Communication MP**

## 7.1 STAKEHOLDER CONSULTATION/COMMUNICATION MANAGEMENT PLAN

It is important that channels of communication are maintained over the life of the project for surrounding landowners and other relevant stakeholders. Table 8 shows the stakeholder's communication management plan.

### 7.1.1 COMPONENTS

This plan is made up of the following components:

- General Stakeholder communication.

### 7.1.2 MANAGEMENT AND MITIGATION

#### 7.1.2.1 General Stakeholder communication

##### **Objectives**

To ensure that regular communication is provided on the relevant mining activities, together with feedback on the environmental management performance of the mine and that opportunity is provided for interested and affected parties to continue to raise comments and concerns (complaints) on the same – as indicated in the IFC requirements.

##### **Actions**

**TABLE 8: ACTIONS RELATING TO STAKEHOLDER COMMUNICATION**

No	Issue	Management commitment
<b>These commitments apply to <u>all phases</u> of the mining operation</b>		
<b>1</b>	Understanding who the stakeholders are	Maintain and update the stakeholder register. Ensure that all relevant stakeholder groups are included.
<b>2</b>		A representative database would include government, employees, service providers, contractors, farmers, local communities, NGOs, shareholders, customers, the investment sector, community-based organisations, suppliers and the media.
<b>3</b>		If relevant, include marginalised and vulnerable groups in the stakeholder communication process.
<b>4</b>		Record partnerships with local suppliers and investors as well as their roles, responsibilities, capacity and contribution to development.
<b>5</b>	Liaison with interested and affected parties in all phases of the life of mine	Devise and implement a stakeholder communication and engagement strategy. Quarterly meetings with the local Farmers Association will be carried out.

No	Issue	Management commitment
6	Cooperative	Keep identified stakeholders informed about the mine's activities.
7	working relationship with stakeholders	Use appropriate communication channels to consult with, and disseminate information to, the identified stakeholder groups. Quarterly meetings with the local Farmers Association will be carried out.
8	Managing perceptions, issues and/or complaints	<p>Develop and implement a concerns/complaints (grievance) process for stakeholders and publicise the channels through which issues can be submitted to Craton.</p> <ul style="list-style-type: none"> <li>• Document all complaints in an external communications register;</li> <li>• Respond immediately to acknowledge receipt of complaints and comments;</li> <li>• Investigate and report on findings of issue to the complainant;</li> <li>• Keep complete auditable records of complaints, responses and actions taken; and</li> <li>• Introduce an independent mediator if the grievance / complaint cannot be resolved between Craton and the affected party.</li> </ul>
9	Safety of 3 <sup>rd</sup> parties	Through appropriate communication and inductions, provide information to educate third parties about the dangers associated with hazardous excavations and infrastructure.

## **7.2**

# **Safety & Security MP**



## 7.2 SAFETY AND SECURITY MANAGEMENT PLAN

It is essential that safety and security measures are defined and implemented to adequately protect the mine site from being accessed by unauthorised people. An emergency response plan for incidents is also essential.

Note that a separate Occupational Health and Safety (OHS) Plan shall be developed for the mining activities and that this does not form part of this EMP.

### 7.2.1 COMPONENTS

This plan is made up of the following components:

- General (third party) safety and security;
- Construction and operational phase workers; and
- Occupational Health & Safety.

### 7.2.2 MANAGEMENT

#### 7.2.2.1 General (third party) safety and security

##### **Objectives**

The objective of the management measures is to prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure.

##### **Actions**

**TABLE 9: ACTIONS RELATING TO GENERAL (THIRD PARTY) SAFETY AND SECURITY**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommission</u> phases</b>		
1	Access of unauthorised people	Warning signs will be erected and maintained at the site boundary and the working area of the mine will be fenced.
2		Security control will be in place at the access point to prevent uncontrolled vehicle and pedestrian access to existing and future mining, stockpile and waste facility areas during the construction, operation and decommissioning phases.
3		Any persons entering the mine area (pit & plant) will be required to undergo a formal induction.
4		The security company will not live in the mine village – they should not be able to fraternise with the workforce.
5		Security cameras and traffic monitoring of all vehicles entering the site will be carried out.

6		Operate and publicise among all site workers and visitors a detailed security plan for the mine and neighbouring farms, in consultation with the community, the government and unions. The mine cannot lock workers in but it must inform all employees/contractors of the detailed consequences of anyone found in breach of the security measures. It must include a contingency plan to protect the local community if mine labour goes on strike;
6	Safety risks	Operate an alcohol-free site and will include random testing of employees/contractors on entry to site, at the beginning of shifts and at any time on duty.
7		Develop a detailed fire management policy and ensure all employees/contractors are regularly drilled.
8		Ensure all security personnel are well vetted and trained.
9	Emergency	Develop and implement an emergency response plan for third parties falling into, or off, hazardous excavations and causing injury. This will be kept by the EHS department.
10	Blasting and fly rock	A system will be designed to advise neighbours of intended blasting times, and road closures will be made prior to the blast (as required), in accordance with the rules of the use of explosives. Notifications will take place at least 1 week prior to blasting. This will occur via email, sms and sign board. Other means of notification recommended by surrounding land users will also be considered and implemented.
11		Adequate notification will also be provided to any partners/wives of mine workers so as to ensure their safety during blasting.
<b>These commitments apply to <u>operation and decommission</u> phases</b>		
12	Safety Risks	Permanent aboveground waste facilities and stockpiles will be rehabilitated in a manner that they present as land forms that will be stable, protected from flood damage. As far as is possible, the slopes will be re-vegetated.
13		Any mining void that remain open will be made safe to ensure that there is no risk to the safety of people and animals.
<b>These commitments apply to <u>design, construction and operation</u> phases</b>		
14	Safety Risks	The permanent above ground waste facilities (i.e. the HLF) will be designed, constructed and operated in a manner that stability is a priority, flood protection is provided and the risk of failure is limited to acceptable levels.
<b>These commitments apply to <u>operation</u> phase</b>		
15	Sulphuric acid	All legal health and safety requirements will be implemented when transporting sulphuric acid to site.

16		Sulphuric acid transport companies will comply with all legal requirements for the handling and transport of hazardous substances.
17		Acid storage tanks will comply with all relevant health and safety requirements applicable for Namibia.
18		Major spillage incidents will be handled in accordance with the Omitiomire emergency response procedure. Any significant spills will be reported to DWA within 24 hrs and corrective action taken.
19		Induct all relevant employees and contractors in the mine's spillage management procedure.

### 7.2.2.2 Construction and operational phase workers

#### Objectives

The objective of the management measures is to prevent physical harm to contractors/employees staying over at the temporary/permanent contractor's camp resulting from mining and associated mining activities.

#### Actions

**TABLE 10: ACTIONS RELATING TO CONTRACTORS/EMPLOYEE VILLAGE**

No	Issue	Management commitment
<b>These commitments apply to the <u>construction phase</u></b>		
1	Safety risks	Occupants of the employee village will remain within the area after working hours
<b>These commitments apply to the <u>operational phase</u></b>		
2	Worker health and well-being	Craton will participate in the design with the landowner to ensure all permanent buildings are suitable for the mine village and conform to Namibian Labour regulations and relevant standards on workers' housing.
3		Provide recreational and educational facilities, i.e. computers, internet and study area, to keep off-duty employees happily occupied for 15 hours/day, to reduce the risk of them interacting in the broader community.
4		Reduce the number of shared rooms to a minimum to reduce the real risk of spreading HIV and other sexually transmitted diseases within the workforce and their families.
5		Ensure that laundry services are provided for all personnel on a daily basis. (This is absolutely essential to avoid workers engaging women on site to wash their linen which can often lead to payment of other services of a sexual

No	Issue	Management commitment
		nature).
6		Provide a comprehensive voluntary counselling and testing programme for all employees and contractors.
7		Implement a comprehensive employee wellness programme, including HIV/AIDS information and condoms in all changing rooms.

### 7.2.3 OCCUPATIONAL HEALTH & SAFETY

Occupational health and safety aspects of the proposed Omitiomire “mini mine” do not form part of this EMP. Craton will however, adhere to all the relevant Namibian Legislation regarding health and safety, and implement a formal health and safety management system. The main components which should be included in such a management system are summarised below.

The objectives of the health and safety management system will be to ensure:

- A healthy and safe work environment;
- Safe systems of work;
- Safe plant and equipment; and
- The availability of such information, instruction, and training as required for worker health and safety.

Health and safety induction will be a requirement for all employees, contractors and visitors. Specific training sessions will be developed and provided to employees regarding specific health and safety skill sets.

All hazardous chemicals used on site will have readily available material safety datasheets (MSDSs). Chemical hazards training will be an integral part of safety training and induction. Procedures will be developed for the use and handling of all dangerous chemicals. Correct personal protective equipment will be supplied for the relevant work.

## **7.3**

# **Surface Water MP**

### 7.3 SURFACE WATER MANAGEMENT PLAN

Water is a scarce resource in Namibia, Craton will undertake its operations to maximise the recycling and reuse of water.

Industrial effluent (from the HLF, laboratory, wash bay and stormwater drains) will be recycled if it is suitable for use in the process (i.e. water quality will negatively impact the plant process). The aim is to have a facility that does not discharge effluent into the environment. Treated effluent from the sewage plant will also be re-used where possible.

Domestic effluent includes grey water from the laundry, shower block and kitchen and sewage from the ablution facilities. During construction, Craton will make use of existing septic tanks. During operations this effluent will flow into a sewage treatment plant. If the treated water is acceptable for discharge it will either be used for dust suppression. No water that is not suitable for discharge be released to the environment. Water quality testing will be carried out in accordance with the requirements outlined in the monitoring section of this report (Section 9). Water that does not meet these requirements will be circulated back through the sewage treatment plant.

#### Hydrocarbons

Used hydrocarbons are hazardous liquid wastes and will be disposed of in compliance with Craton's waste disposal procedures and according to Namibian legislation.

There are a number of sources in all project phases that have the potential to pollute surface water, particularly in the unmanaged scenario. Generally, in the construction and decommissioning phases these potential pollution sources, such as oil spills, are temporary and can generally be readily mitigated.

The operational phase will potentially develop long term pollution sources through the construction of the final land forms (HLF) that may have the long term potential to contaminate surface water through long term seepage and/or run-off. (Note, neither the ore or waste rock material contain major pollutants). The potential for spillage of chemicals used in the plant process present a slightly greater threat to pollution of surface waters. Potential spillages from the plant are to be included in the mine's emergency response plan.

Refer to Section 7.3.2 for conceptual stormwater management requirements.

The commitments derived from the scoping report with regards to surface water, form the basis of this MP:

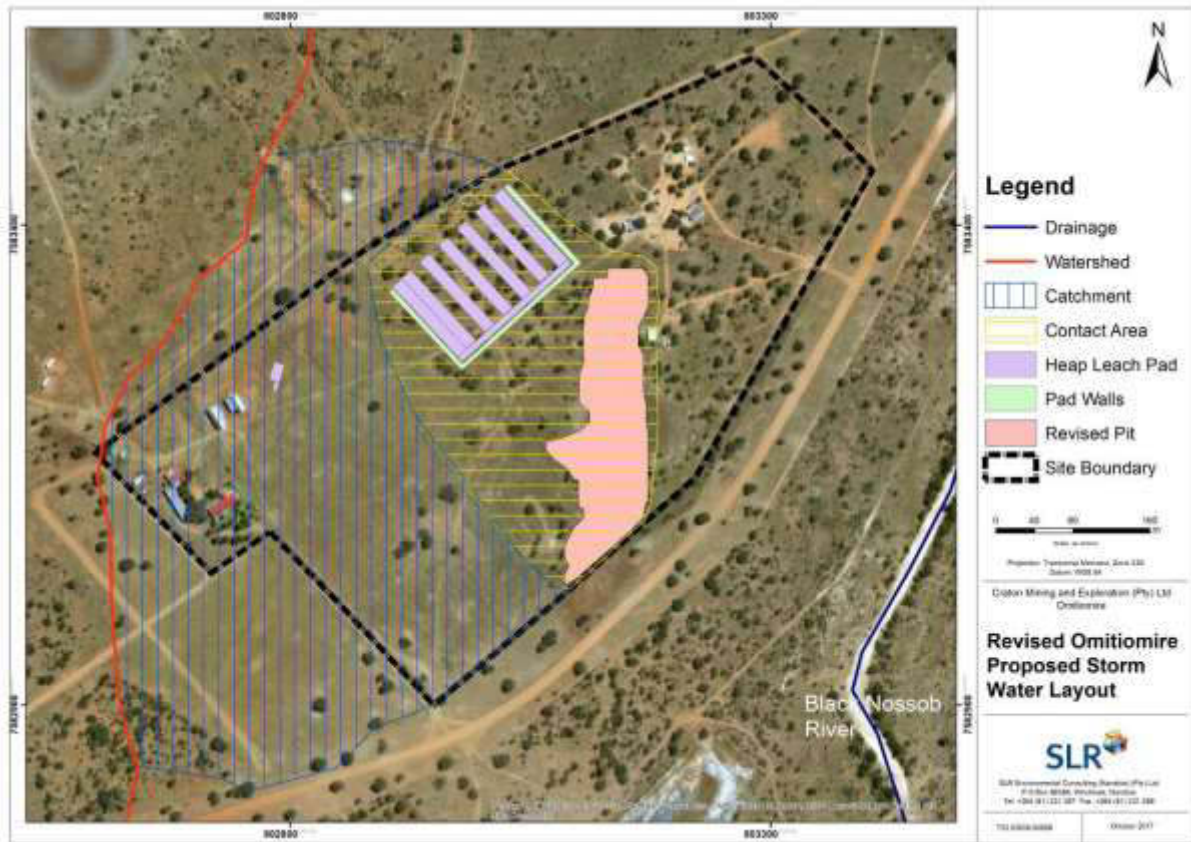
### 7.3.1 COMPONENTS

This plan is made up of the following components:

- Altering drainage patterns;
- Pollution of surface water – general;
- Industrial effluent;
- Domestic effluent; and
- Spills.

### 7.3.2 CONCEPTUAL STORMWATER DESIGN REQUIREMENTS

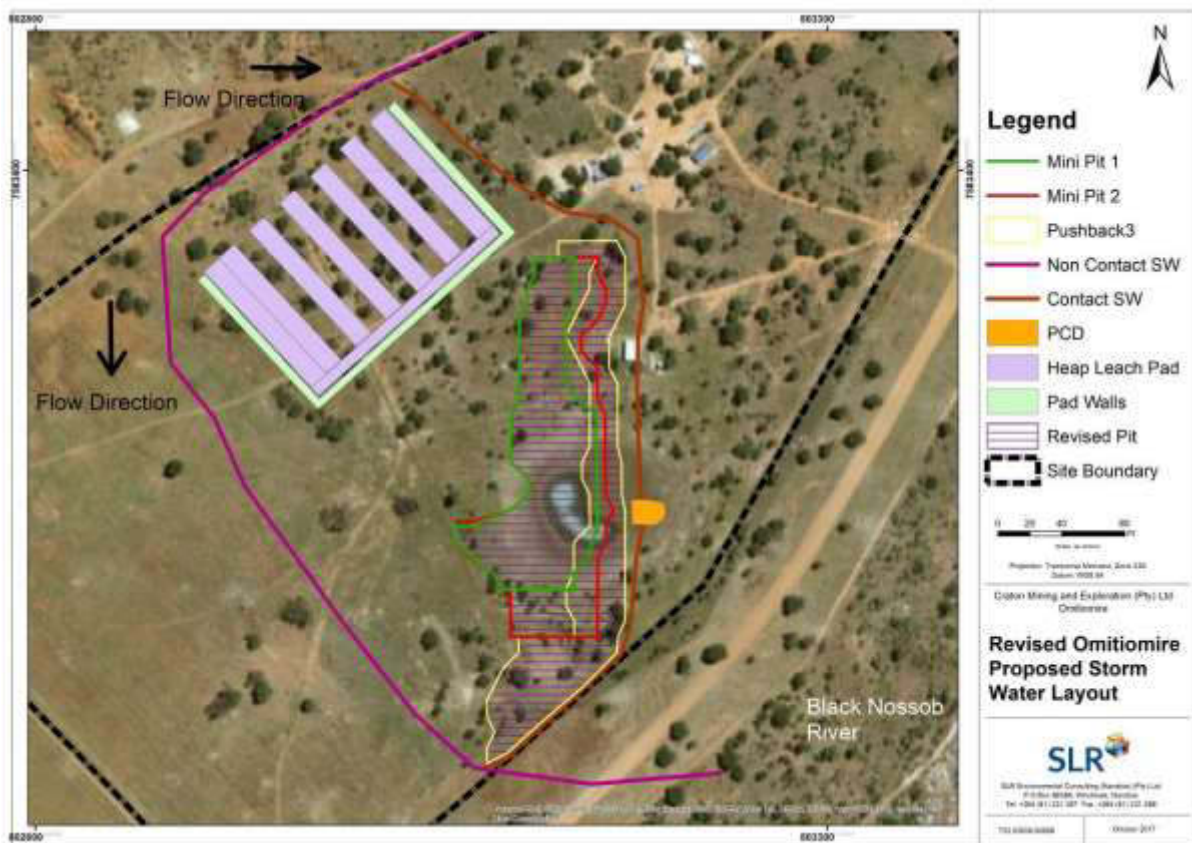
Stormwater management can be divided into two parts, managing the clean (non-contact) water that is arriving at the site from upstream, and managing the dirty (contact) water that is generated on site from coming into contact with equipment, disturbed ground and other possible pollution sources. Figure 2 shows the mining area and surrounds with the non-contact water catchment area (approximately 199 100 m<sup>2</sup>) shaded with blue vertical stripes and the smaller contact water catchment area shown with yellow horizontal stripes. The total contact water area (approximately 87 700 m<sup>2</sup>) should be reduced by the area of the leach pads (approximately 18 000 m<sup>2</sup>) as this area will be an isolated lined site which will not contribute any runoff during storm events, giving a contributing contact water catchment area of approximately 69 500 m<sup>2</sup>.



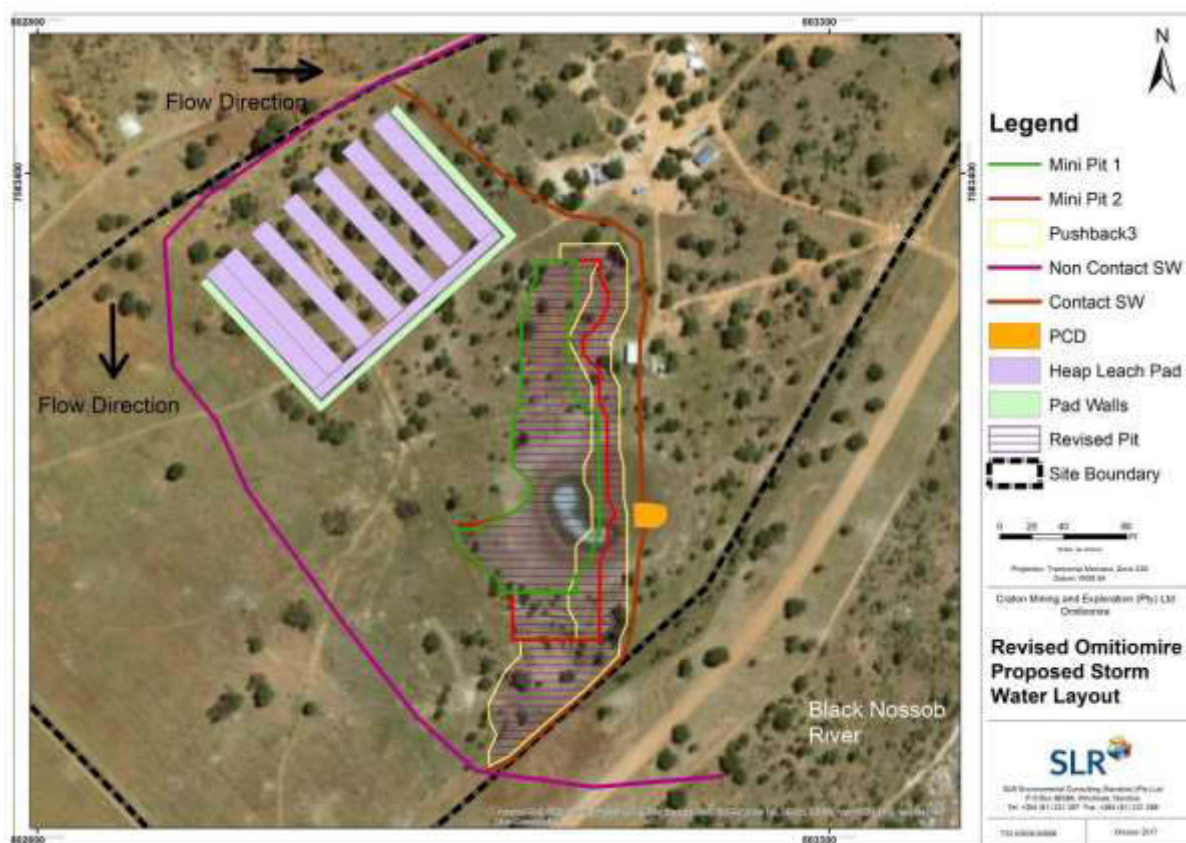
**FIGURE 2: CALCULATED STORMWATER MANAGEMENT AREAS**

below shows the conceptual storm water design for the updated mining area, with an outer non-contact water channel on the northern and western boundaries and a contact water channel on the eastern and southern boundaries with a pollution control dam (PCD) in the vicinity of the pit. With the significant reduction in the footprint of the mining site a revised storm water management plan is recommended and the conceptual plan is discussed below. Once the final infrastructure drawings and plans have been completed, the conceptual storm water plan can be updated to take into account the final layouts.





below shows the conceptual storm water design for the updated mining area, with an outer non-contact water channel on the northern and western boundaries and a contact water channel on the eastern and southern boundaries with a pollution control dam (PCD) in the vicinity of the pit. With the significant reduction in the footprint of the mining site a revised storm water management plan is recommended and the conceptual plan is discussed below. Once the final infrastructure drawings and plans have been completed, the conceptual storm water plan can be updated to take into account the final layouts.



**FIGURE 3: RECOMMENDED STORMWATER MANAGEMENT MEASURES**

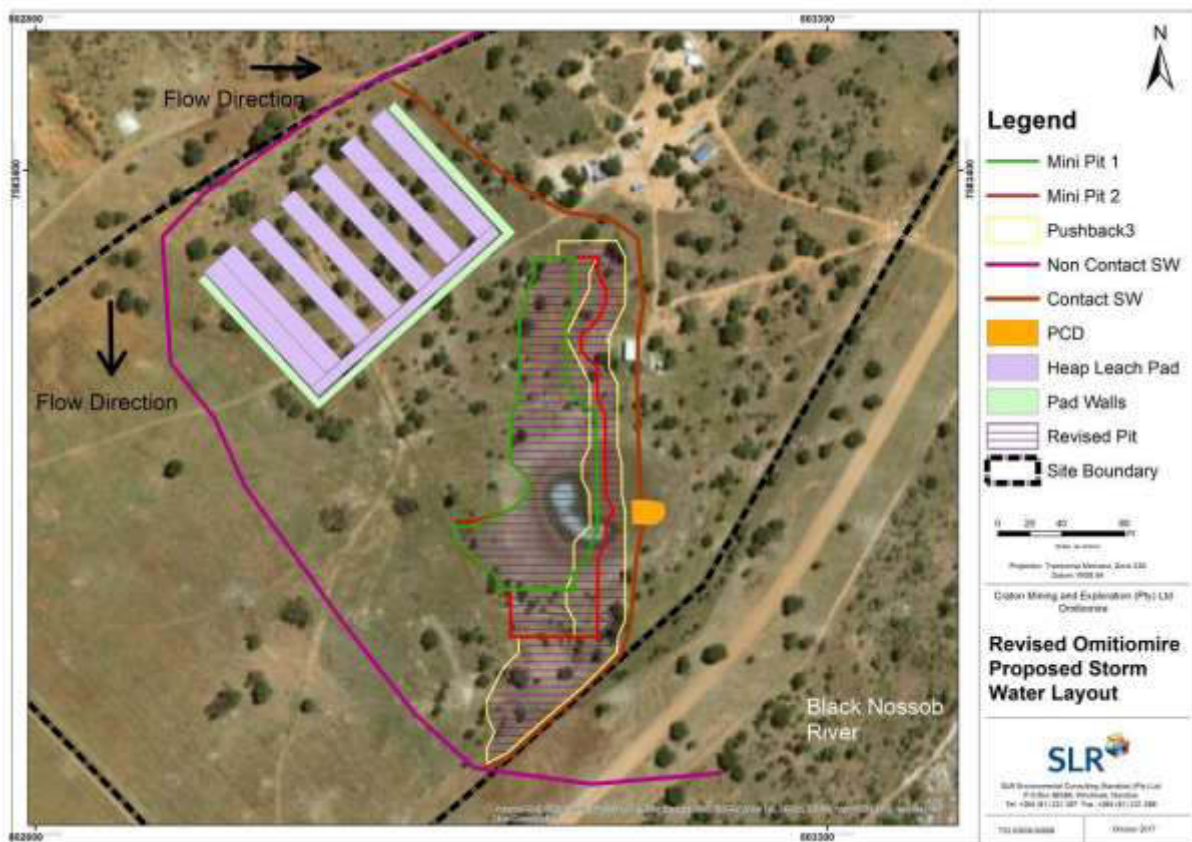
It should be noted that the processing plant infrastructure is located in the non-contact catchment area to the west of the leach pads, close to two farm buildings (Figure 2), but it is assumed that this plant area will have suitable measures in place to prevent any pollution of storm water in the vicinity (such as a bund surrounding the plant to divert storm water around the plant and to contain any possible pollution source within the plant perimeter). If this is not feasible then the storm water management plan would need to be modified to extend the contact water channel to include this plant, and to adjust the non-contact water channel to be sited to the west of this plant area and the catchment areas and peak flows recalculated.

### 7.3.3 NON-CONTACT (CLEAN) STORM WATER

The objective of managing non-contact water is to provide flow pathways for storm water from upstream catchments to be contained and / or diverted around surface infrastructure, thereby preventing this storm water from becoming contact water. Any water contained or diverted should where possible be re-introduced into the local drainage downstream of the mining infrastructure to continue flowing in the local drainage network.

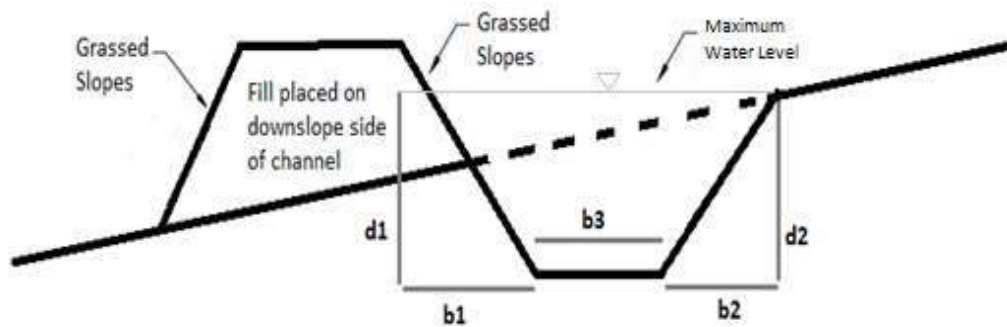
As the upstream catchment is limited due to the watershed which runs approximately north to south along the north-western edge of the site boundary, the volumes of non-contact water generated upstream of the

mining infrastructure (pit and leach pads) will be small. The general slope across the site is in a south-easterly direction towards the Black Nossob River, so it is recommended that a simple drainage channel is excavated to run downslope from the western corner of the leach pads, in a southern direction along the western side of the pads and in an eastern direction along the northern side of the HLF (see below shows the conceptual storm water design for the updated mining area, with an outer non-contact water channel on the northern and western boundaries and a contact water channel on the eastern and southern boundaries with a pollution control dam (PCD) in the vicinity of the pit. With the significant reduction in the footprint of the mining site a revised storm water management plan is recommended and the conceptual plan is discussed below. Once the final infrastructure drawings and plans have been completed, the conceptual storm water plan can be updated to take into account the final layouts.



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**FIGURE 4: RECOMMENDED STORMWATER CHANNEL DESIGN**

It is recommended that this channel be contoured into the existing terrain where possible and designed for a peak flow value of approximately  $1.6 \text{ m}^3/\text{s}$ . The channel should be compacted to reduce erosion and infiltration (see Figure 4 for design details). The section running eastward along the northern boundary can be reduced to accommodate half the capacity as it has a significantly smaller contributing catchment.

At the outlet points on the northern and southern perimeter small energy dissipators could be constructed to reduce downstream erosion problems. The northern channel has been extended past the eastern edge of the leach pad infrastructure to ensure that collected storm water is not released to flow southward through the buildings shown on the satellite imagery, but if these are removed once mining starts, then the length of the northern channel could be reduced to a point closer to the eastern edge of the leach pads.

The southern channel has been extended to pass under the district road (if levels allow) so that storm water is released towards the Black Nossob River downstream of the road and does not cause erosion or ponding issues at the road.

#### 7.3.4 CONTACT (DIRTY) STORM WATER

The objective of managing contact water is to collect all storm water which is potentially polluted by contact with mining activities, and to dispose of this water without it being released to the environment as runoff. Water quality testing of the captured contact water should be undertaken to indicate whether the contact storm water quality is sufficiently good for the water to be utilised for dust suppression purposes, or if it should only be stored and allowed to evaporate. The options for the site are discussed below.

The contact water generation area is the land within the outer non-contact water infrastructure and includes the HLF site and the pit, but the majority of this water will be directed into the pit area footprint where it will need to be collected in a pit sump and pumped out into a lined pollution control dam (PCD), where it will either evaporate or be used to supplement process water or used for dust suppression purposes depending on the quality.

The contact water generating area is approximately 87 200 m<sup>2</sup>, but of this area approximately 18 200 m<sup>2</sup> is the HLF site, where any rainfall will be contained and not be included in contact water runoff, giving a contributing area of approximately 69 000 m<sup>2</sup> at the start of mining. If a 1 hour storm with 1:50 year recurrence takes place over this area, the volume of water can be calculated as follows;

1:50 year 1 hour rainfall intensity (HRU 2/78 IDF curves) = 54.9 mm

1:50 year 1 hour rainfall intensity (Modified Hershfield equation) = 71.4 mm

Average of the two methods = 63.2 mm over an area of 69 000 m<sup>2</sup> gives a volume of 4 350 m<sup>3</sup>, then taking an estimated runoff coefficient of 0.7 produces a runoff volume of approximately 3 000 m<sup>3</sup>.

Hence the total holding volume for the pit sump plus the PCD should be 3 000 m<sup>3</sup>, but as the pit footprint increases the volume of contact water captured by the pit will increase and the volume captured by the perimeter contact water channel will decrease. However, for operational reasons it will probably be advantageous to pump any sump water out to the PCD immediately after a storm to maintain access within the pit for continued mining.

The contact water channels can be the same design as the non-contact water channels, but the peak flow value for the reduced contact water catchment with a 1:50 year recurrence will be approximately 0.7 m<sup>3</sup>/s.

Channel design and dimensions will be done once final infrastructure plans are available

### 7.3.5 MANAGEMENT

#### 7.3.5.1 Altering drainage patterns

##### **Objectives**

The objective of the management measures is to separate clean water (water that falls outside the mine site) from dirty water (water that emanates from the mine site).

##### **Actions**

**TABLE 11: ACTIONS RELATING TO THE ALTERING OF DRAINAGE PATTERNS**

No	Issue	Management commitment
<b>These commitments apply to all <u>phases</u></b>		
1	Natural flow of stormwater (clean and dirty) flowing from surrounding areas into	Design all clean and dirty stormwater interventions in such a way that the natural flow of water off site is not too greatly impeded by the mine and its infrastructure. Ensure that dirty stormwater does not erode the HLF, ROM stockpile and topsoil stockpile. Ensure that these facilities are designed, constructed and operated to avoid runoff entering the clean water systems.

No	Issue	Management commitment
	operational area	
<b>These commitments apply to <u>construction and operation</u> only</b>		
<b>2</b>	Flow of dirty stormwater (rain water that falls onto, and flows across, the site)	Construct engineered stormwater management systems to direct contaminated water from the processing areas, roads and offices areas, to the PCD for storage and re-use. Clean water must be directed around and away from the mine site.

### 7.3.5.2 Impacts on surface water quality - general

#### Objectives

The objective of the management measures is to prevent pollution of surface water run-off.

#### Actions

**TABLE 12: ACTIONS RELATING TO THE MANAGEMENT OF SURFACE WATER – GENERAL**

No	Issue	Management commitment
<b>These commitments apply to <u>design, construction and operation</u> phases</b>		
<b>1</b>	Clean & dirty water separation	Where possible, surface water management facilities will be designed, constructed and operated so that dirty water is kept separate from clean water run-off through a system of berms, channels, trenches, flood protection measures, erosion protection or dams. The need for long term controls around the HLF will be determined as part of closure planning.
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
<b>2</b>	Wash water, workshop areas etc.	Install silt and oil traps at all areas where there is a possibility of contaminated water entering the environment. Ensure that these traps are regularly maintained / emptied and that the contents are disposed of at the relevant waste facility (waste oils, contaminated silt and effluent water).
<b>3</b>	General surface water pollution/ spills	All hazardous chemicals (new and used), dirty water, mineralised wastes, and non-mineralised wastes are handled in a manner that they do not contaminate surface water run-off or, where this is not possible, demonstrate (through regular monitoring) that the potential contamination is within acceptable limits from a human and environmental health perspective.
<b>4</b>		Prevent pollution through sound infrastructure design and through education and training of workers (permanent and temporary) in the storage, handling, dispensing and dispersal of hazardous materials (solid and liquid).
<b>5</b>		Develop an emergency response plan to ensure fast reaction to contain and

No	Issue	Management commitment
		remediate pollution incidents. This plan will be kept by the EHS department.
6		Ensure that contractors provide MSDS documents for all products brought to site, and that they have all the necessary hazardous protection equipment for people utilising the product, as well as the necessary equipment for the containment and clean-up of the environment in the advent of a spill.
7		Verify that the fuel transport company's spill containment (emergency clean up) plan and spill clean-up agreement are in place. Ensure that fuel transporting companies adhere to the Petroleum Products and Energy Act (13 of 1990) and Regulations
8		Establish and maintain concrete or lined impermeable bunded areas around diesel generators, hazardous material stores, wash bays, workshop floors etc. Ensure drainage to oil and silt sumps that are regularly cleaned.
9		Develop, implement and maintain hazardous materials and hydrocarbon spill management procedures.
10		Ad hoc spills will be cleaned up/remediated immediately in line with spillage management procedure.
11		Place spill kits in all areas where hazardous substances are dispensed and stored and train staff to use it.
12		Develop audit criteria for post rehabilitation in situ spills to ascertain when/whether the remediation has been successful.
13	Mine infrastructure	Ensure that where mine infrastructure becomes damaged, or causes surface water contamination, that it is adequately repaired and maintained.
14	Emergency	Major spillage incidents that contaminate flood waters will be handled in accordance with the Craton emergency response procedure and reported to the authorities as stipulated in the Namibian legislation.
15	Training and awareness	Induct all employees and contractors in Craton's spillage management procedure.
16	Safe disposal and rehabilitation of hydrocarbon contaminated soils and water	Develop and implement a hydrocarbon remediation procedure that explains how to deal with the treatment of contaminated environments (soil and water). Train selected staff in the remediation of soils or water contaminated by hydrocarbon spills.
17	Monitoring of hydrocarbon	Ensure that checking for hydrocarbon spills is included in the daily inspections.
18	and other	Report spillages as per the incident management procedure and Namibian

No	Issue	Management commitment
	hazardous spills	legislation.

Please refer to Section 7.14 for management measures relating to waste management.

Spill remediation options include in situ treatment or disposal of hydrocarbon contaminated soils as hazardous waste. The former is generally considered to be the preferred option because with successful in situ remediation the soil resource is retained. The *in situ* options include bioremediation at the point of pollution, or removal of soils for washing and/or bio remediation at a designated area after which the soils are replaced. Soils contaminated with more hazardous materials should be disposed of at a registered hazardous landfill site.

### 7.3.5.3 Industrial effluent

#### Objectives

The objective of the management measures is to prevent pollution of surface water, etc. due to industrial effluent.

#### Actions

**TABLE 13: ACTIONS RELATING TO INDUSTRIAL EFFLUENT**

No	Issue	Management commitment
<b>These commitments apply to <u>operation phase only</u></b>		
1	Discharge	Ensure that no discharge takes place (closed system).
2	Spillage of industrial effluent	Prevent spillages of industrial effluent. Where spillage does occur, ensure it is properly contained.
3		Checking for industrial effluent spills included in the daily inspection checklist.
4		Report spillages as per the incident management procedure and clean up spills as soon as possible.
5	Pollution of soil and / or water when spillage or discharge occurs.	In the event of industrial effluent discharge into the environment, follow the relevant emergency response procedures and then investigate the cause of the incident.
6		In the event of soil or water pollution, spills will be cleaned up/remediated as soon as possible in line with spillage management procedure.
<b>These commitments apply to <u>construction, operation and decommissioning</u></b>		
7	Prevent industrial effluent	Ensure that the various effluent streams are managed to prevent overflow of the PCD
8	from polluting	Ensure that a freeboard is maintained to accommodate run-off during a 1:50



No	Issue	Management commitment
	the environment	year storm event.
9	(PCD)	Monitor the effectiveness of the mitigation measures (e.g. liner) for damage to ensure that seepage does not occur.
10		Design storage/containment facilities with sufficient capacity to cater for the various sources of water, including rainfall.
11	Discharge of	Ensure that all the industrial effluent is discharged into the PCD.
12	industrial effluent	Install oil separators at all wash bays to separate hydrocarbons from the water.
13	to the PCD	Skim oil separator regularly and dispose of hydrocarbons as per the waste management procedure.
14	Spillage of industrial effluent	Maintain pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks.
<b>These commitments apply to <u>construction and operation</u> only</b>		
15	Prevent industrial effluent from polluting the environment	Recycle all process water back into the plant as per the design specifications.
16	Storage and disposal of liquid waste (hydrocarbons)	All liquid hydrocarbon waste will be collected, safely stored in sealed drums on impermeable surfaces within bunded areas, preferably under rain proof cover. These areas will be designed to contain 110% of the volume of one or the largest (in a multi drum setup) drum and will be equipped with traps and oil separators to contain spilled hydrocarbons. The used hydrocarbon liquid waste will be provided to third parties for environmentally acceptable recycling thereof. Related records will be kept.

#### 7.3.5.4 Domestic effluent

##### **Objectives**

The objective of the management measures is to prevent pollution of surface water, etc. due to domestic effluent.

##### **Actions**

**TABLE 14: ACTIONS RELATING TO DOMESTIC EFFLUENT**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operations and decommissioning</u></b>		
1	Discharge of raw	Conduct regular monitoring to ensure that effluent is not being

No	Issue	Management commitment
	sewage and grey water	discharged into the environment.
2	Spillage of domestic and treated effluent	Report spillages as per the incident management procedure and clean up spills within as soon as possible in line with the spillage management procedure.
3	Pollution of soil and / or ground water when spillage occurs.	In the event of domestic effluent discharge into the environment, stop the incident as soon as possible and find the root cause.
4		In the event of soil or water pollution, decontaminate the polluted area(s) using an appropriate methodology. Once clean, rehabilitate the area.
5	Awareness and Training	Train operators to understand the legal requirements and how to achieve compliance.
6		Induct Craton employees and contractors in the use of the spill management procedure.
<b>These commitments apply to the <u>construction</u> phase</b>		
7	Discharge of raw sewage and grey water into appropriate sewage treatment facilities	Ensure that portable facilities / septic tanks constructed during the construction and decommissioning phases are managed according to the design specifications.
8	Spillage of domestic and treated effluent	Maintain portable facilities, pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks.
9		Ensure that checking for domestic and treated effluent spills is included in the daily inspection checklist.
10	Ablution facilities	Ensure that portable toilets are working properly and are cleaned at least weekly, so they do not pollute the surrounding environment or create hygiene problems.
11		Ensure that sewage from the portable toilets is disposed of at the nearest municipal sewage works (Windhoek).
12	Transport of sewage to municipal facility	Ensure that the contractor responsible for removal of sludge to a municipal facility has an emergency response plan in place in case of accidental spills.  Also, the contractor must provide proof of safe disposal of sewage at the Municipal sewage works.

No	Issue	Management commitment
<b>These commitments apply to <u>operation and decommissioning</u> only</b>		
13	Sewage treatment plant	Regularly service and maintain sewage treatment plant to keep it in proper working condition.
14	(STP)	If the treated water is acceptable for discharge it will be reused. Under no circumstance will water that is not suitable for discharge be released to the environment
15		Sewerage sludge shall be removed by the sewage services contractor for appropriate disposal or will be land farmed to produce compost for mulching and rehabilitation purposes.
16	Legal compliance	Apply to DWA for the STP and a possible Waste Water Discharge permit. Conduct regular inspections and audits relating to the STP activities and ensure compliance to conditions of such possible permits issued by DWA (i.e. monitoring, etc.), where required.
<b>These commitments apply to <u>operation</u> only</b>		
17	Treatment of sewage and grey water	Operate the sewage treatment plant according to the operations manual to ensure optimum performance.

### 7.3.5.5 Spills (Hazardous and hydrocarbons)

#### Objectives

The objective of the management measures is to prevent pollution of surface water, etc. due to spillages.

#### Actions

**TABLE 15: ACTIONS RELATING TO SPILLAGES**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u></b>		
1	Emergency situations – very large spills	Maintain and implement the emergency response procedure to address large scale hydrocarbon, hazardous materials or reagent spills on and off site.
2	Hydrocarbon spills	Ensure Craton or its contractor has the relevant licences and can provide reports that all surface storage tanks are in good condition (as per legal requirements).
3		Ensure that hydrocarbon (used and new fuel and oil) tanks and drums are stored inside bunded areas on impermeable floors with traps and separators for containing spillages. These areas are designed to contain 110% of the volume of one or the largest (in a multi tank setup) tank and that pumps and pipes are maintained in good working order.
4		All wash bays will be equipped with oil traps and separators. All collected oil will be stored as above.
5		Ensure that all fuel and oil storage facilities and transport tankers have spill kits.
6		Ensure that the fuel transport company has a system in place to deal with hydrocarbon spills and subsequent clean-up thereof.
7		Contain the spill and commence with remediation as soon as possible. Log an incident and report to the authorities if volumes released are above specific limits.
8		If contamination of water ponds occurs, separate the hydrocarbons from water and treat the water before recycling and re-use.
9		Domestic and Industrial effluent
10	Ensure that capacities of the various facilities and pipes are not exceeded.	
11	All vehicles and equipment will be serviced in workshops and wash bays with contained impermeable floors, dirty water collection facilities and oil traps.	
12	Contain any spills and clean up as soon as possible and report as per the	

No	Issue	Management commitment
		incident management procedure.
13		If in situ treatment is not possible or acceptable then the polluted soil must be excavated, and treated as per the Omitiomire waste management procedure.
14	Legal Compliance	Comply with all legal requirements regarding spills and containment structures.
15	– all spills	Hydrocarbon spills of 200l or more must be reported to MME in terms of Section 49 of the Petroleum Products Regulations 2000.
16	Monitoring of spills – all spills	Ensure that the monitoring of all tanks, pipelines and bunds are included in the daily inspection programme to develop an early detection system for leaks.
17		Update, maintain and implement a maintenance plan for tanks, tankers, pipelines and bunds.
18		Identify post rehabilitation audit criteria for verifying that remediation has been successful.
19		Conduct periodic audits of facilities to ensure compliance with legal and company standards.
20	Awareness and training – all spills	Induct all Craton employees and contractors in the Environmental Policy, spillage management and incident management procedures.
21		Train selected employees in the containment, and handling of spills and in the de-contamination and rehabilitation of affected environments.
22	Emergency situations – all large or remote spills	Major spillage incidents must be handled in accordance with the emergency response procedure.
23		Identify and contract a service provider/specialist to assist with the handling and clean-up of emergency spills off site. I&APs will be provided with the details of the EHS team so that they can notify them of any spills that have occurred in the area. The EHS team will be responsible for contacting the above-mentioned service provider.
24		Periodically test the emergency response procedures.
25	Rainfall runoff mobilizes contamination	Divert clean off site runoff water around potential contaminant sources with drainage ditches.
26	from site and pollutes surface water	Collect runoff from potential seepage sources to containment dams for reuse within the mine and/or plant.
27		Design of diversion berms or channels and containment dams to deal with 1:50 year storm.
28		Rehabilitation (concurrent) of mineralised waste facilities with vegetation where and when possible.

No	Issue	Management commitment
29	Flow in Black Nossob River Floods Mine pit	Flood defence bunds will be constructed to prevent 1 in 100 year river flows from entering mine pit – this is considered unlikely to be completely effective against major flows, but would reduce the speed of mine pit flooding.
30		Implement warning system to ensure that the mine pit is evacuated in the event of major upstream river flows (e.g. due to upstream dam collapse) which could overflow bunds.
31	Dewatering of pit in the event of flood events	In consultation with the MWAF, test water quality before pumping to available containments dams.
<b>These commitments apply to <u>operation</u> only</b>		
32	Reagent spills	Ensure that the reagent supply and/or transportation companies are in possession of the relevant transport licences, can prove transport and storage tanks are in good condition and have an emergency response system in place to deal with spills the clean-up thereof.
33		Ensure that reagent tanks are housed inside impermeable lined, or concrete, bunds and that dispensing takes place on an impermeable surface. No reagents may be discharged to the environment. Spills must be cleaned up and waste disposed of according to MSDS recommendations.
34		Ensure that bunds are designed to contain 110% of the volume of the SX area and that pumps and pipes are maintained in good working order. (Risk assessment mitigation measures must be implemented).
35	Process solution spills	Ensure that bunds have been designed to capture any release of solution to the extent of 110% of the largest tank constructed inside the bunded area.
36		As far as possible keep bunds clean and empty.
37		Ensure that pumps and pipelines are in place to pump solutions from the bunds back into the process.
38		Maintain and implement an emergency procedure for the containment and clean-up of process solutions if bunds are breached, and the consequent treatment of contaminated areas.
<b>These commitments apply to <u>operation and decommissioning</u> only</b>		
39	Reagent spills	Contain the spill using appropriate spill kits, and clean up as soon as possible as per the MSDS specification, report and investigate as per the incident management procedure.
40		All solid reagents to be picked up and placed in the relevant reagent tank for use in the plant. If the reagent is polluted it must be disposed of at a hazardous landfill.

No	Issue	Management commitment
41		If contamination of water occurs, contain the water and treat it, or direct it into the process dam for use into the process plant.
42		Identify and utilise a service provider to assist with the clean-up of very large reagent spills (emergency situations) as required.
43		All major spills (>200l) will be reported to the MAWF.
44		Continuous monitoring of the spill site will take place until such time as it is proven that contamination no longer occurs.
45	Slightly elevated copper and other	Ensure that all discharges of dewatering water are contained for re-use in mine processes.
46	trace metal concentrations	Construct flood-proof erosion containment structures for the waste rock dumps (refer to stormwater management plan for details).
47	reach the Black	Erosion protection e.g. concurrent rehabilitation of HLF with vegetation.
48	Nossob River alluvial aquifer by contaminant transport in surface water	Surface water quality in the Black Nossob downstream of the site will be monitored during rainfall events (refer to Section 9).

## **7.4**

# **Groundwater MP**



## 7.4 GROUNDWATER MANAGEMENT PLAN

Potential groundwater quality and quantity impacts are a potential issue during the construction and operation of the various mining activities and infrastructure, unless measures are undertaken to prevent and mitigate such impacts. The purpose of this groundwater management and mitigation plan is to provide for methods to be followed to achieve such mitigation.

The commitments derived from the EIA Report with regards to groundwater management forms the basis of this MP.

### 7.4.1 COMPONENTS

This plan is made up of the following components:

- Water abstraction; and
- Contamination of groundwater.

### 7.4.2 MANAGEMENT

#### 7.4.2.1 Water Abstraction

##### **Objectives**

The objective of the groundwater management measures is to minimise the impact of the abstraction of water and to prevent the loss of groundwater to other users in the area.

##### **Actions**

**TABLE 16: ACTIONS RELATING TO WATER ABSTRACTION**

No	Issue	Management commitment
1	Water abstraction	Groundwater levels in the monitoring network must take place at least quarterly, and the results analysed.
2		Abstraction boreholes and related equipment should be protected against vandalism and/or theft.
3		Records of volumes of water abstracted must be recorded and a water balance for the mine must be kept. Craton must adhere to permitted abstraction rates as stimulated in the water abstraction permits. This excludes the abstraction required in order to prevent pit in-flooding.
4		Water saving measures in mining and operational processes should be implemented and continuously improved.
5		If monitoring results prove conclusively that surrounding farmer's supply boreholes

No	Issue	Management commitment
		are affected as a result of Craton's mining activities, they will be provided with an alternate water source.
6		Water meters and water depth monitors must be fitted to all abstraction holes and monitored throughout the life of the mine.
7		Monitoring of the <i>Vachellia erioloba</i> health in the dewatering cone must be undertaken.
8		Minimize abstraction during dry seasons and droughts when abstraction is not offset by precipitation and floods.
9		Consider using the borehole located close to the river (ORC514) only as a standby, especially in dry seasons. Alternatively, provided yields can match expected production requirements, consider using any alternative borehole located north of the pit.
10		Recycle pit drainage water as far as possible, provided that the quality of the water meets the standards of the purpose it will be used for.
11		Minimise the mine's water usage through an integrated water management plan that addresses both demand and supply aspects.
12		Regulate and manage all water usage, including domestic consumption through education and awareness raising and through metering of all usage
13	Legal aspects	Ensure that permits for abstraction and pit dewatering are renewed as required.
14		Conduct regular audits to ensure that the conditions of the permits are being met.

Refer to the Biodiversity MP for management requirements relating to the potential impacts of the reduction of water resources as an ecological driver.

#### 7.4.2.2 Impacts on Groundwater Quality

##### Objectives

The objective of the management measures is to limit groundwater pollution related impacts.

##### Actions

**TABLE 17: ACTIONS RELATING TO PROTECTION OF GROUNDWATER CONTAMINATION**

No	Issue	Management commitment
<b>These commitments apply to <u>design phase</u> only (refer to design criteria following this table for further details)</b>		
1		Measures identified during the detail design phase of the mineralised waste facilities will aim at further reducing potential impacts on the environment (refer to

No	Issue	Management commitment
		7.4.2.3 for design criteria).
<b>These commitments apply to <u>construction and operations phases</u></b>		
2	Groundwater contamination from	The groundwater quality monitoring network currently in place will be retained, and improved upon if deemed necessary (refer to Section 9.1.2 for further information regarding groundwater monitoring).
3	construction and operational activities	Groundwater seepage monitoring points shall be identified/installed. Water quality results will be regularly analysed and abnormal trends investigated. Mitigation measures will be installed should pollution plumes of concern are identified (refer to Section 9.1.2 for further information regarding groundwater monitoring).
4		Adequate hydrocarbon and hazardous materials containment and bunding facilities to be used. All fuel tanks will be banded and fuel transfer will take place over an impermeable surface.
5		All hydrocarbons and other hazardous materials (including chemicals) will be managed to prevent contamination of groundwater.
6		All vehicles and machines must be maintained to limit oil leaks, and drip trays are to be used by problem equipment.
7		Refuelling of construction vehicles must take place over a banded area draining to an oil separator.
8		Adequate ablution facilities must be provided for all persons working on site. Sewage must be contained, in mobile toilets, or septic tanks and regularly removed and disposed of at a municipality. Sewage disposal certificates must be obtained from the municipality.
9		No uncontrolled water discharges from the construction/employee village shall be permitted.
10		In the unlikely event of proven mine related impacts on groundwater or surface water users, replacement water supplies would need to be provided to affected parties.
<b>These commitments apply to the <u>operational phase only</u></b>		
10	Groundwater contamination	No uncontrolled discharges shall be permitted from the plant, mine, PCD or other facility that may result in pollution of the receiving environment and aquifer.
11	from the mining operation	Water seeping into the open pit (in rainfall events) during mining should be directed into a sump and pumped to specifically designed surface drainage dams and not into any clean water system, natural drainage line, or the aquifer.
12		If monitoring results prove conclusively that surrounding farmer's supply boreholes are affected as a result of Craton's mining activities, they will be provided with an alternate water source.

No	Issue	Management commitment
13		Design of diversion berms or channels and containment dams to deal with 1:50 year storm.
14		The groundwater flow model should be updated within one year after mining commences and every two years thereafter.
15		Continuous geochemical testing of seepage water from potential contaminant sources.
16	Emergency	Major spillage incidents will be handled in accordance with the Craton emergency response procedure. The MWAF will be informed of, and consulted on, major spillages.
17		Warning system for evacuation of mine pit in the event of major upstream river flows, to avoid risk to mine safety;
<b>These commitments apply to the <u>operational phase</u> only</b>		
10	Groundwater contamination post closure	Post closure rehabilitation of potential seepage sources with vegetation cover (stock piling of suitable topsoil) and/or plastic liners (depending on monitoring results) to further minimise the risk of seepage by reducing rainfall infiltrations.

#### 7.4.2.3 Design criteria relating to groundwater quality

The following design criteria recommendations have been made:

- The HLF base comprising of in-situ eutric cambisol and calcareous soils must be compacted to suitable density to prevent the seepage of residue water from HLF in case the synthetic liner is damaged or disintegrates (>100 years after LOM). Additionally, calcareous soils and calcrete, stripped from the mine pits should be stockpiled and used for the HLF base layer;
- The hydraulic parameters and mineral/chemical composition of the compacted base layer should be tested for in-situ permeability prior to operation. A maximum saturated permeability of the base layer of 10<sup>-8</sup>m/s should be achieved;
- The HLF will be lined with plastic liner and underdrain system to recover and process the metal enriched seepage during LOM. Any damage of the liner during construction or operation must be repaired and documented;
- After completion of the leaching process the residue should be washed to remove acid used in the process;
- A seepage control system should be established including monitoring wells along the perimeter of the HLF intersecting the regional aquifer;

- The capping of the HLF with waste rock and soil should be considered as part of the closure plan. Capping by suitable means and possible re-vegetation would prevent rainfall infiltration and reduce potential long term seepage of HLF residue water into the regional bedrock aquifer;
- Flood bund walls to minimise river flows from entering mine pit or mobilising contaminants from mine pit; and
- Engineered containment of process areas, sewage systems, vehicle maintenance areas, and fuel and oil storage areas to minimize risk of contaminants being mobilized to environmental receptors.

## **7.5**

# **Air Quality MP**

## 7.5 AIR QUALITY MANAGEMENT PLAN

There are a number of emission sources in all phases of the Omitiomire “mini mine” that have the potential to pollute the air. In the construction and decommissioning phases these potential pollution sources are temporary in nature, usually existing for a few weeks to a few months. The operational phase will present more long term potential sources and the closure phase will present final land forms (HLF) that may have the potential to pollute the air through long term wind erosion if not mitigated in some way.

The commitments derived from the Scoping Report with regards to Air Quality forms the basis of this MP.

### 7.5.1 COMPONENTS

This plan is made up of the following components:

- Dust fallout, PM<sub>10</sub> and other gaseous emissions

### 7.5.2 MANAGEMENT

#### **Objectives**

The objective of the management measures is to prevent unacceptable air quality related pollution impacts.

#### **Actions**

**TABLE 18: ACTIONS RELATING TO FALL-OUT DUST, PM<sub>10</sub> AND GASEOUS EMISSIONS**

No	Issue	Management commitment
<b>These commitments apply to the <u>construction</u> phase</b>		
1	Dust and PM <sub>10</sub>	Prepare an air quality management plan to include the following: <ul style="list-style-type: none"> <li>• Land clearing activities:               <ul style="list-style-type: none"> <li>○ If soils are dry, and water is available then utilise water sprays at areas that are to be cleared.</li> <li>○ Limit the travel distance between the area to be cleared and the topsoil stockpiles.</li> </ul> </li> <li>• Haul and internal road construction activities:               <ul style="list-style-type: none"> <li>○ If water is available, taking into account allowable limits from abstraction, use a water bowser to dampen areas to be graded.</li> </ul> </li> <li>• Wind erosion from exposed areas               <ul style="list-style-type: none"> <li>○ If water is available, periodically wet exposed areas by water bowser, especially during dry, windy periods.</li> </ul> </li> <li>• Using cost effective dust suppression methods, try to keep vehicle entrainment on unpaved internal and haul roads at a 75% control efficiency.</li> </ul>

No	Issue	Management commitment
		<ul style="list-style-type: none"> <li>• Ensure all construction equipment is subject to an Inspection &amp; Maintenance programme to ensure proper combustion.</li> </ul>
<b>These commitments apply to <u>operation</u> phase</b>		
2	Dust and PM <sub>10</sub>	<ul style="list-style-type: none"> <li>• Prepare an air quality management plan.</li> <li>• The proposed new fallout dust monitoring network described in Section 9.1.3 must be implemented.</li> <li>• Should wind erosion from exposed stockpiles result in visible dust generation these must be controlled through effective mitigation measures.</li> <li>• Monitor the HLF slopes to determine if sufficient vegetation cover has grown to limit erosion of the facility sides by wind and water. Put in place management measures if erosion is occurring.</li> <li>• Speed limits on all haul roads (max 40 km/h)</li> <li>• Ensure that the entire mine fleet is effectively maintained.</li> </ul>
<b>These commitments apply to the <u>decommission and closure</u> phases</b>		
3	Dust and PM <sub>10</sub>	<p>Prepare a dust and PM<sub>10</sub> management plan to include the following:</p> <ul style="list-style-type: none"> <li>• Stockpiled topsoil must be used for rehabilitation and re-vegetation of the area.</li> <li>• Place topsoil cover onto HLF and supplement with native grass species.</li> <li>• Contour berm at pit and vegetated with native grass species.</li> <li>• Should the infrastructure removal at the processing plant site produce significant dust, mitigation measures should be applied.</li> <li>• Replant any previously removed native plant species in disturbed areas.</li> <li>• Indigenous plant species should be used in the final landscaping of the rehabilitated mine site.</li> <li>• Ensure an adequate dust prevention vegetation cover on HLF as defined by the final closure and decommissioning plan.</li> <li>• Use water sprays, if available, where demolition of infrastructure generates dust.</li> <li>• Ensure the site is restored to grazing or wilderness conditions.</li> </ul>



## **7.6**

# **Noise & Vibrations MP**

## 7.6 NOISE AND VIBRATION MANAGEMENT PLAN

There are a range of construction, operation and decommissioning activities that have the potential to generate noise and cause noise pollution even though exceedances of recommended guidelines are not expected at any third party receptors.

The commitments derived from the Scoping Report with regards to noise and vibrations forms the basis of this MP.

### 7.6.1 COMPONENTS

This plan is made up of the following components:

- Noise pollution

### 7.6.2 MANAGEMENT

#### 7.6.2.1 Noise

##### **Objectives**

The objective of the management measures is to limit excessive noise.

##### **Actions**

**TABLE 19: ACTIONS RELATING TO NOISE**

No	Issue	Management Commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u></b>		
1	Impact of noise on the environment/ sensitive receptors	Document and investigate all registered complaints and make efforts made to address the area of concern where applicable.
2		Communication channels are to be established to ensure that prior notice is given to potential receptors if blasting is to occur. Refer to EIA for details on potential receptors.
3		Ensure that plant and equipment is well-maintained and fitted with the correct and appropriate noise abatement measures.
4		All diesel powered equipment must be regularly inspected and maintained and, if necessary, replacement of intake and exhaust silencers should be done.
5		Vendors should be requested to optimise equipment design noise levels.
6		During the planning and design stages of the project, ways to reduce potential noise aspects should be considered.

No	Issue	Management Commitment
7		Vibrating structures are known to be noisy. Efforts should be made in the plant design to limit noise from these structures.
8		Baseline noise levels should have returned within 2 km of the project boundary so as not to impact on hunting activities taking place on neighbouring farms.
9		Minimise the need for trucks/equipment to reverse. This will reduce the frequency at which disturbing but necessary reverse warnings will occur. Alternatives to the traditional reverse 'beeper' alarm such as a 'self-adjusting' or 'smart' alarm could be considered.
10	Monitoring	Periodic noise monitoring programme should be undertaken, as per suggestion in Table 42.

### 7.6.2.2 Blast Impacts

#### Objectives

The objective of the management measures is to limit air blast and ground vibrations.

#### Actions

**TABLE 20: ACTIONS RELATING TO AIR BLAST IMPACTS**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u></b>		
1	Minimise impacts of blasting	<p>The blast design, implementation and monitoring will, as a general rule, ensure that:</p> <ul style="list-style-type: none"> <li>• Ground vibration when blasting, must be less than 12mm/s peak particle velocity at the closest third party structures (farm buildings directly adjacent to the south-western farm boundary and the Otjere Farmhouse);</li> <li>• Air blast at the closest third party structures mentioned above must be less than 130dB;</li> <li>• Noise monitoring will be carried periodically, at a specified point, day and night, to provide records of noise impacts from the mining operation;</li> <li>• All registered complaints will be documented and investigated by the EHS team and efforts will be made to address the area of concern where possible;</li> </ul>

# **7.7**

## **Biodiversity MP**

## 7.7 BIODIVERSITY MANAGEMENT PLAN

To understand biodiversity one must appreciate all of its components. It is not just about the species of plants and animals and the different habitats in which they live (biodiversity patterns), but also the way that factors, such as wind, water, steepness of slope and presence of pollinators, affect the habitats and the species living in them (ecosystem processes).

The commitments derived from the Scoping Report with regards to Biodiversity form the basis of this MP.

### 7.7.1 COMPONENTS

This plan is made up of the following components:

- Managing the physical destruction of biodiversity; and
- Managing general disturbance of biodiversity.

### 7.7.2 MANAGEMENT

#### 7.7.2.1 Physical destruction of biodiversity

##### **Objectives**

The objective of the management measures is to prevent or limit the unacceptable loss of biodiversity and related functionality through physical destruction.

##### **Actions**

**TABLE 21: ACTIONS RELATING TO THE PHYSICAL DESTRUCTION OF BIODIVERSITY**

No	Issue	Management commitment
<b>These commitments apply to <u>design phase</u></b>		
1	Physical destruction of biodiversity	Keep the footprints of disturbance of all facilities and roads as small as possible.
<b>These commitments apply to <u>construction phase</u></b>		
2	Physical destruction of biodiversity	<ul style="list-style-type: none"> <li>• As far as possible, avoid areas identified sensitive areas such as pans and riverine habitat.</li> <li>• Design footprints of roads to be as small as is legally and practically possible.</li> <li>• Mark out all construction footprints and clearly convey the rule of staying inside these boundaries to all construction crews</li> <li>• Enforce and monitor speed limits to reduce likelihood of road kills. A GPS installed in a vehicle is an example of an effective method to monitor speed.</li> <li>• Implement a restoration plan for all disturbed areas as soon as possible.</li> </ul>

No	Issue	Management commitment
		<ul style="list-style-type: none"> <li>• Protect undisturbed areas outside planned mining operations from all forms of disturbance (these must serve as future source areas for re-colonisation after mining).</li> <li>• Prior to construction and in consultation with a specialist, visually scan proposed construction sites for any sensitive flora and fauna and implement the recommendations of the specialist – these could include but not be limited to: a search and rescue of dens and burrows, relocating/demarcating nests (especially large raptors), demarcating flora (protected trees) to either be conserved within the construction site or relocated.</li> </ul>
<b>These commitments apply to <u>construction and operation phase</u></b>		
3	Physical destruction of biodiversity	<ul style="list-style-type: none"> <li>• Clearly demarcate boundaries of the HLF.</li> <li>• Where possible avoid cutting or relocating protected trees and develop plans to care for them during the life of mine until their surroundings have been restored.</li> <li>• Where disturbance of protected trees is unavoidable, apply for the necessary permits in a timely manner.</li> <li>• Remove and stockpile topsoil, along with its soil fauna and seed banks, and devise management plan for stockpiling and redeployment for restoration to prevent erosion by wind and water and devise plans.</li> <li>• All large animals will be removed from the mining area (smaller ones are likely to move away because of the disturbance).</li> <li>• Construct roads as narrow as operationally feasible and regularly maintain all roads in good condition so that diversions off roads will not be necessary. Preferably demarcate tracks with wooden poles.</li> <li>• Aggregate borrow pits for road construction should be sited on the proposed mining site to reduce overburden stockpiling and unnecessary environmental disturbance.</li> <li>• Develop road use policy, including speed limits, and enforce this to avoid off track driving.</li> <li>• Upon completing construction, initiate restoration of all roads and other sites that were only impacted during construction and will not be required for mining operation.</li> <li>• Increase environmental awareness through training of key staff, including their ability to handle animals during evacuation; and</li> <li>• Rigorously police the construction crews' and mining staff's adherence to the rules and utilise the appropriate management measures to discipline the offenders. This will be the responsibility of the construction crew foremen as</li> </ul>

No	Issue	Management commitment
		well as the EHS team.

### 7.7.2.2 Managing general disturbance

#### Objectives

The objective of the management measures is to prevent disturbance to biodiversity.

#### Actions

**TABLE 22: ACTIONS RELATING TO THE GENERAL DISTURBANCE TO BIODIVERSITY**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning phases</u></b>		
1	General disturbance of biodiversity	The working area of the “mini mine” will be fenced.
2		Develop a policy that limits independent movements by staff into the veld outside the fenced-in mining site. Strictly prevent poaching and harvesting, including of firewood, or possession of any such natural materials.
3		Provide, or ensure, that there is adequate food for workers on site to prevent foraging.
4		Allow only mining personnel, service providers and construction staff, as well as registered mine visitors on site.
5		Train all mine staff to appreciate the values of biodiversity, as well as legislation relating to protected species.
6		Raise awareness concerning recognising venomous snakes (of which there are some extremely venomous in the area) and invertebrates (scorpions) from non-dangerous ones, and ensure that sufficient personnel are trained to handle snakes/invertebrates so as to move them away from the mine without killing them.
7		Mosquito screens should be considered for certain areas to exclude flying insects from indoor working areas. This should be considered important for the site kitchen and canteen area.
8		Drivers must be licensed, and given regular awareness training on the need to keep to speed limits, keep on designated tracks. Some form of speed monitoring should be implemented. Limit night time driving.
9		Use yellow outdoor lights (sodium vapour floodlights with orange covers, or yellow bulbs/tubes for incandescent and fluorescent lights) wherever possible as this is less glaring to invertebrates while serving human requirements.
10		Consider ways to keep night insects out of the mine village buildings. However, the use of insecticides must be avoided.



No	Issue	Management commitment	
11		If automated, UV-attractant pest management devices have to be deployed, such systems should be either kept indoors (e.g. in maintenance sheds, inside administrative blocks, or inside production plants) or should be covered with wire mesh to ensure that only target organisms of the right size are electrocuted.	
12		Ensure that animals have no access to contaminated water sources.	
13		Fence in HLF and other areas that are regularly artificially wetted and use other proven means to deter birds from reaching them. Try to avoid pooling of mine related water.	
14		All chemicals, emissions, and leaching products must be strictly contained and regularly and timely cleaned or neutralised, adhering to best practices.	
15		Develop a site waste management policy and actively enforce it.	
16		Develop policy for the management of hazardous materials and actively enforce it.	
17		Provide temporary waste deposition facilities on site (rubbish bins, skips), which are secure from scavengers, storms, or other disturbance (especially jackals and badgers).	
18		Provide adequate toilet facilities for all workers at work sites.	
19		Where possible, avoid destroying trees or disturbing their proximity, so that animals can continue to use them	
20		Locate linear infrastructure in a way that minimises new fragmentation, e.g. using infrastructure corridors	
21		Rehabilitate areas around linear infrastructure after installing it such that they minimise habitat fragmentation, allowing populations to be connected across them	
22		Implement strict controls over the movement of materials onto and off the site to minimise the spread of invasive plant species; if this becomes a problem monitor the occurrence and spread of invasive species so as to instigate steps for their control, following expert advice.	
23		Disruption of animal dispersal routes along the Black Nossob River	Do not place any infrastructure in the Black Nossob River valley.
24			Minimise all activities close to the river, especially at night when nocturnal species are active
25		Emergency	Major spillage incidents will be handled in accordance with the Craton emergency response procedure. Refer to Section 7.14.2.2.
26			Certain instances of injury to animals may be considered emergency situations. These will be managed in accordance with the Craton emergency response procedure.

No	Issue	Management commitment
<b>These commitments apply to <u>decommissioning &amp; closure phases</u></b>		
27	Closure planning	As part of closure planning, the designs of any permanent and potentially polluting structures will take consideration of the requirements for long term pollution prevention and confirmatory monitoring.
28		Dispose of re-usable waste (such as power cables, pipelines and building material) in the appropriate manner (recycling is preferable).
29		A mine rehabilitation and closure plan must be developed and updated at least every two years, and adequate provision made for decommissioning and closure.

## 7.8 Visual MP

## 7.8 VISUAL MANAGEMENT PLAN

It is predicted that negative visual impacts would result from the construction, operational and decommissioning phases of the project. During the closure phase the site will be rehabilitated but the HLF and pit will remain and will therefore contribute to the long term negative visual impact of the project.

The commitments derived from the Scoping Report with regards to visual impacts form the basis of this MP.

### 7.8.1 COMPONENTS

This plan is made up of the following components:

- Visual disturbance.

### 7.8.2 MANAGEMENT

#### 7.8.2.1 Visual disturbance

##### **Objectives**

The objective of the management measures is to limit visual impacts.

##### **Actions**

**TABLE 23: ACTIONS RELATING TO VISUAL DISTURBANCE**

No	Issue	Management commitment
<b>These commitments apply to <u>construction and only</u></b>		
1	Earthworks	During earthworks, all reasonable measures should be taken to prevent excessive dust.
2		Keep the working footprint to the minimum size possible, and rehabilitate once no longer in use.
<b>These commitments apply to <u>design, construction and operation phase</u></b>		
3	Access	If at all possible, permanent roads must be tarred / paved in order to minimise dust creation. Speed limits on unpaved surfaces must be controlled to reduce entrainment.
4	Lighting	Light pollution should be carefully considered and kept to a minimum – without compromising safety.
5		The negative impact of night lighting, glare and spotlight effects, can be mitigated using the following methods: <ul style="list-style-type: none"> <li>• Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the project.</li> </ul>

No	Issue	Management commitment
		<ul style="list-style-type: none"> <li>Avoid using bright, white colour lights where possible. Preferably use lights emitting a yellow light which travels less than white coloured lights.</li> <li>Light public movement areas (pathways and roads) with low level 'bollard' type lights and avoid post top lighting.</li> <li>Avoid high pole top security lighting where possible.</li> </ul>
6	Materials	Buildings and structures could be painted with a matte finish in a shade of grey or green that would best reduce the colour contrast between the structures and the receiving landscape. Avoid the use of bright colours and shiny finishes, especially on roofs and taller structures.
7	Project Area Development and General	It is recommended that a vegetation screen be planted along the eastern boundary or that the vegetation along the eastern boundary of the project property be densified to assist with screening the mine from Otjere. Planting vegetation haphazardly could be considered along the MR53 to screen the view from motorists
8		In terms of layout, it is proposed that the project components be located as low as possible in the topography in order to avoid elevated views, but also to cluster the structures as close as possible to minimise the area of disturbance / spread of the visual disturbance.
9		Retain as much as possible of the existing vegetation within the project area and along the project boundaries and roads in aid of screening the project.
<b>These commitments apply to <u>construction, operation and decommissioning phases</u></b>		
10	Access	During construction, operation, rehabilitation and closure of the project, access and haul roads will require an effective dust suppression management plan, such as the use of non-polluting chemicals.
11		Keep the speed limit as low as possible in order to minimise the creation of dust.
12		Ensure that, when trucks are transporting materials on public roads that the load bed is covered to prevent dust pollution.
13	Managing vegetation and soils	All potentially screening vegetation within the mine site that is not removed needs to be protected.
14	General	Rehabilitate / restore exposed areas as soon as possible after construction activities are complete.
15		Only indigenous vegetation should be used for rehabilitation / landscaping purposes.
16	Mineralised waste	Final shaping and dumping should be implemented such that the sides of the waste facilities (HLF) are articulated in a fashion that create areas of light and shadow interplay.

No	Issue	Management commitment
17	facilities	Harsh, steep engineered slopes should be avoided if at all possible. It is important that a long-term view of the HLF's integration with the surrounding landscape be taken.
18		The final landform height and slope angles for the HLF should be designed as low as possible. The preferred slope design is a 'spur-end' slope plan with a concave or complex (convex-concave) profile. The use of terraces or contoured banks should be avoided.
19		Grass seeding and tree planting on the HLF should be undertaken to emulate the groupings of natural vegetation within the study area.
<b>These commitments apply to <u>decommissioning &amp; closure phases</u></b>		
20	Rehabilitation	Rehabilitation of all the faces of the HLF to grass / scrub bushes and some trees; Reduce the angle of the HLF slope if rehabilitation not adequate.
21	Closure	For the closure phase: <ul style="list-style-type: none"> <li>• Craton will maintain a closure plan and closure costing plan;</li> <li>• All components of the non-permanent infrastructure used during operation must be removed (with the exception of the accommodation facilities which will revert back to the landowner). The site must be visually 'cleaned up' so as to portray an uncluttered landscape; and</li> <li>• Areas from which infrastructure has been removed must be contoured to fit the surrounding natural landforms, with the natural hydrological patterns recreated as far as possible.</li> </ul>

# 7.9

## Archaeology MP

## 7.9 ARCHAEOLOGY MANAGEMENT PLAN

In summary, the archaeological assessment concluded that the “mini mining” project will have a negligible impact on the archaeology of the project area and that the project is therefore not expected to have any implications in terms of the National Heritage Act.

The commitments are derived from the Scoping Report with regards to archaeology and form the basis of this MP.

### 7.9.1 COMPONENTS

This plan is made up of the following components:

- Archaeological sites; and
- Chance heritage finds.

### 7.9.2 MANAGEMENT

#### 7.9.2.1 Archaeological sites

##### **Objectives**

The objective of the management measures is to prevent the unacceptable loss of archaeological sites and related historical information.

##### **Actions**

**TABLE 24: ACTIONS RELATING ARCHAEOLOGICAL SITES**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning phases</u></b>		
1	Disturbance of archaeological sites	The site identified in the Scoping Report should be indicated on the project GIS and although it is not possible to conserve this site (since it is located in the footprint of the proposed pit) all relevant mine and infrastructure planning should take this position into consideration. Refer to the Scoping Report for an indication of the location of this site.
2		Craton should apply for necessary destruction permits from the NHC, if applicable.
3	Training	All workers (temporary and permanent) will be given training on the chance find procedure.



### 7.9.2.2 Chance archaeological finds

Although the area has been subject to a heritage survey and assessment it is still possible that sites or items of heritage significance may be found in the course of development work. The personnel and contractor heritage induction process is intended to sensitise people so that they may recognize heritage “chance finds” in the course of their work. The “chance finds procedure is intended to ensure compliance with the relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): “ a person who discovers any archaeological object must as soon as practicable report the discovery to the Council”. The procedure of reporting set out below must be observed so that heritage remains identified in the field are reported to the NHC.

#### Objectives

To ensure that the correct actions are taken to preserve or document chance archaeological finds.

#### Actions

**TABLE 25: ACTIONS RELATING CHANCE ARCHAEOLOGICAL FINDS**

No	Issue	Management commitment
<b>These commitments apply to <u>construction and operation phases</u></b>		
1	Chance Finds Procedure	<p>The “chance finds procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.</p> <p><u>Action by person identifying archaeological or heritage material:</u></p> <ul style="list-style-type: none"> <li>• If operating machinery or equipment - stop work;</li> <li>• Identify the site with flag tape;</li> <li>• Determine GPS position if possible; and</li> <li>• Report findings to foreman.</li> </ul> <p><u>Action by foreman:</u></p> <ul style="list-style-type: none"> <li>• Report findings, site location and actions taken to superintendent; a d</li> <li>• Cease any works in immediate vicinity</li> </ul> <p><u>Action by superintendent:</u></p> <ul style="list-style-type: none"> <li>• Visit site and determine whether work can proceed without damage to findings;</li> <li>• Determine and mark exclusion boundary; and</li> </ul>

No	Issue	Management commitment
		<ul style="list-style-type: none"> <li>• Site location and details to be added to project GIS for field confirmation by archaeologist.</li> </ul> <p><u>Action by archaeologist:</u></p> <ul style="list-style-type: none"> <li>• Inspect site and confirm addition to project GIS;</li> <li>• Advise NHC and request written permission to remove findings from work area; and</li> <li>• Recovery, packaging and labelling of findings for transfer to National Museum.</li> </ul> <p><u>In the event of discovering human remains:</u></p> <ul style="list-style-type: none"> <li>• Actions as above;</li> <li>• Field inspection by archaeologist to confirm that remains are human; and</li> <li>• Advise and liaise with NHC and Police.</li> </ul>

**7.10**  
**Traffic MP**

## 7.10 TRAFFIC MANAGEMENT PLAN

There will be traffic impacts because of activities associated with the “mini mine”, particularly in the construction and operational phases (although there will still be traffic generated during decommissioning). This MP aims to provide measures to limit the negative impacts.

The commitments are derived from the Scoping Report with regards to traffic issues form the basis of this MP.

### 7.10.1 COMPONENTS

This plan is made up of the following components:

- Infrastructure – road use.

### 7.10.2 MANAGEMENT

#### **Objectives**

The objective of the management measures is to increase safety and reduce the potential for vehicle related impacts on road users.

#### **Actions**

**TABLE 26: ACTIONS RELATING TO ROAD USE**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Road use	A driver trainer programme for all Craton employees will be implemented to include: complying with speed limits, holding valid licences, ensuring vehicles are roadworthy, zero tolerance for drinking and driving and using lights appropriately for night driving.
2		All road users are required to comply with Namibian Roads Authority regulations.
3		The M53/C29 route has been identified as the preferred haulage route to the mine but road improvements need to be considered prior to use.
4		Discussions have been, and continue to be, held with the Roads Authority concerning the roads leading to and from Omitiomire. Any upgrade or maintenance to the roads will be determined by the Roads Authority and are not yet known.
5		At points where water accumulates on the roads, the installation of culverts will be investigated as a priority over the general packing of gravel and road aggregate.
6		Craton will liaise with the Roads Authority to ensure safe entrance to the site. A single entrance to the mine to be positioned at a location with adequate sight distance.
7		Craton should liaise with the roads authority regarding signage on the M53.

No	Issue	Management commitment
8		The mine will be responsible for repairing damage caused by their use of the roads.
9	Emergency	Any mine related road accident must be handled in accordance with the emergency response procedure.
10		All legal health and safety requirements will be implemented when transporting sulphuric acid to site.
11		Sulphuric acid transport companies will comply with all legal requirements for the handling and transport of hazardous substances.

**7.11**  
**Socio-economic MP**

## 7.11 SOCIAL AND ECONOMIC MANAGEMENT PLAN

The activities associated with the mine have socio-economic impacts in all mine phases – some positive and some negative. These impacts related to amongst others employment/job creation, inward migration of potential job seekers, local- and regional economies, land use and surrounding landowners and community safety and security. This MP aims to provide measures to enhance the positive impacts and limits the negatives impacts.

The commitments derived from the Scoping Report with regards to socio-economic issues form the basis of this MP.

### 7.11.1 COMPONENTS

This plan is made up of the following components:

- Economic Impact;
- Social impact of change of land use on the Farm Groot Omitiomire;
- Socio-economic impact on the neighbouring community;
- Employment and skills development;
- Housing for construction and mine employees; and
- Community health, safety and security.

### 7.11.2 MANAGEMENT

#### 7.11.2.1 Economic Impact

##### **Objectives**

The objective of the management measures is to enhance the positive impacts associated with job creation and investment.

##### **Actions**

**TABLE 27: ACTIONS RELATING TO ECONOMIC IMPACT**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Spending	Endeavour to integrate potentially affected neighbouring landowners into service provision and supply chains to the mine – e.g. supply of meat, fresh produce and accommodation.
2	Employment opportunities and	Refer to Section 7.11.2.4.

No	Issue	Management commitment
	development benefits.	

### 7.11.2.2 Social impact of change of land use on the Farm Groot Omitiomire

#### Objectives

The objective of the management measures is to limit the impacts associated with the change of land use on the Farm Groot Omitiomire.

#### Actions

**TABLE 28: ACTIONS RELATING TO CHANGE OF LAND USE ON THE FARM GROOT OMITIOMIRE**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Ensuring land use post closure	Develop and maintain a mine closure plan. Consult the neighbouring farming community with respect to the closure objective at least two years before the end of life of mine.
2		Ensure that the sides of the HLF are sloped and rehabilitated.
3		Disturbed areas should be converted back to productive grazing land, sown with palatable indigenous grass species.
4	Emergency situations	Ensure that access to the pit by non-authorized personnel and animals is restricted.
5		The pit should have an exit slope so that any person or animal which has fallen in, can escape.

### 7.11.2.3 Change of land use and neighbouring communities

#### Objectives

The objective of the management measures is to reduce negative impacts on land use and neighbouring communities.

#### Actions

**TABLE 29: ACTIONS RELATING TO CHANGE OF LAND USE AND NEIGHBORING COMMUNITIES**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Issues relating to	Continue with the Omitiomire Farmers Committee as a platform for dialogue and annually arrange meeting schedules. These are to take place quarterly.



No	Issue	Management commitment
2	change of land use and neighbouring communities	Develop a grievance procedure and publicise to all stakeholders, so that issues and concerns can be addressed adequately and promptly.
3		Provide an alternative water source should any of the farmers' boreholes run dry and it is proven to be a direct result of the mining activities.
4		Fence the mining area, construction camp and mine village and enforce strict access controls.
5		Labour recruitment will not take place on site, but will be done in Windhoek. Local settlements such as Omitara can be advised of the recruitment process.
6		Informal "kapana" sellers near the fenced areas and land where Craton has control will reported to the police and other local authorities.
7		Inform all employees on site of the law regarding trespassing on private property. Walking or sport running may only take place along public roads.
8		Provide full catering services on site to all employees to reduce the risk of informal buying, and poaching, of meat from neighbouring farms
9		The mine should give the most affected neighbouring farms opportunities to provide goods and services, to the mining contractor such as supplying farm produce (meat, etc.) and accommodation for managers and visitors.
10		The employee camp must ensure that access controls and security are maintained.
11		The planting of bush fences/ thick shrubs around the farm's perimeter should be considered to create a noise and dust shield and to limit employee's access to the farm to the security gate.
12		Neighbours will be informed of blasting schedules. Blasting schedules will also be indicated on signs along the M53 in order to inform road users.
13		Investigate ways in which to limit the noise range of noise of truck reversing beepers.
14		Use the minimum nightlights necessary for safety and direct these lights away from neighbours' houses wherever possible.
15		Work closely with the Roads Authority and contribute to repairing the accumulative damage done to the gravel roads by additional mine traffic.
16		Craton to liaise with the direct neighbours around insurance cover for fire.

#### 7.11.2.4 Employment and skills development

##### Objectives

The objective of the management measures is to maximise employment and skills development.

##### Actions

**TABLE 30: ACTIONS RELATING TO EMPLOYMENT AND SKILLS DEVELOPMENT**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Employment opportunities and development benefits.	Weight tender selection in favour of contractors and suppliers of goods and services which employ Namibians and Namibian suppliers down the supply chain.
2		Ideally, identify potential employees, including women, and skill them prior to the commencement of mining.
3		To reduce social problems, recruit a balanced workforce – not only Grade 12 youth but also people with experience of different ages.
4		Ensure that Craton's employees, and those of its mining and plant contractor, are paid market related wages
6		Establish credible and trusted operational procedures to address employees' concerns and grievances.
7		Encourage the workforce and labour unions to respect the law and the procedures in place to address their grievances, and to have a responsibility towards the people employed by the support industries that serve the mine.
8		Implement a mine procurement policy which promotes the use of small and medium enterprises (SMEs), giving preference to those provided by the neighbouring community, then other Namibian companies.
9		Ensure that the mine closure plan is understood by the workforce.
10		Emergency situations
11		At closure, the employee village will revert back to the landowner for his use and/or will be re-erected at a needy village such as Omitara.

#### 7.11.2.5 Housing for construction and mine employees

##### **Objectives**

The objective of the management measures is to ensure suitable housing provision and limit the impacts associated removal of the village at closure.

##### **Actions**

**TABLE 31: ACTIONS RELATING TO HOUSING AND ACCOMMODATION**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Housing	Construct the mine village buildings in a way which enhances the ease of their removal and/or reuse following closure of the mine.
2		Provide recreational and perhaps educational facilities, i.e. computers, internet and study area, to keep off-duty employees on the mine property.
3		Reduce the number of shared rooms to a minimum.
4		Implement tight security measures (detailed in the next section).
5		Ensure that laundry facilities are provided for all personnel
6		Consider entering agreements to rent guest rooms on neighbouring farms.
7		Encourage MTC/Telecom to provide good telecommunications not only for the mine, but also for the wider community.
8		Allow mine workers to have their partners/wives to stay over for several nights/month (this can be at a minimum cost)
9	Emergency situations	In the event of mine stoppages, Craton will employ a security company to protect the employee village from illegal occupation or vandalism. At closure the village will be disassembled and rehabilitated.

**7.11.2.6 Community health, safety and security****Objectives**

The objective of the management measures is to ensure community health, safety and security.

**Actions****TABLE 32: COMMUNITY HEALTH, SAFETY AND SECURITY**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u> phases</b>		
1	Community health, safety and security	The mine and plant working areas will be alcohol free. Random testing of employees/contractors on entry to site may be undertaken. Recreational facilities will be provided on the mine site for employees after hours.
2		Craton will install reasonable security measures to prevent labour unrest and to protect the neighbours from labour unrest.
3		Provide recreational and educational facilities for off-duty employees and contractors.
4		Provide a comprehensive voluntary HIV/AIDS counselling and testing programme for all employees, contractors and community members.

No	Issue	Management commitment
5		Implement a comprehensive HIV/AIDS policy and programme that could include peer education, an employee wellness programme and HIV/TB information days, condoms in all changing rooms, etc.
6		Develop a detailed fire management policy and ensure all employees/contractors regularly undertake practice fire drills.
7		Fire breaks must be made around the mine site, and the farm boundaries in accordance with the local fire committee/legislation pertaining to land management
8		Neighbouring farm livestock losses due to theft by persons directly related to Craton will be investigated and mutual resolution will be sought. The mine will ultimately be held responsible for these losses in the event of proof of theft by mine personnel being obtained.

**7.12**  
**Resource MP**

## 7.12 RESOURCE MANAGEMENT PLAN

This MP provides management actions regarding scarce sources like water and provides suggestion for reducing consumption of resources.

### 7.12.1 COMPONENTS

This plan is made up of the following components:

- Consumption of water; and
- Consumption of fuel.

### 7.12.2 MANAGEMENT

#### 7.12.2.1 Consumption of water

##### **Objectives**

The objective of the management measures is to monitor the water consumption and to optimise water usage.

##### **Actions**

**TABLE 33: ACTIONS RELATING TO WATER CONSUMPTION**

No	Issue	Management commitment
<b>These commitments apply to <u>all phases</u></b>		
1	Water usage and control	Install and calibrate water flow meters on pipes at selected locations (where required)
2		Monitor monthly abstraction volumes to ensure that the permitted monthly and annual volumes are not exceeded.
3	Maintenance of equipment	Regularly inspect and maintain tanks, tankers, pumps and pipes.
4	Monitoring of water leaks	Checking for water leaks daily. Report water losses.
6	Training and awareness	Maintain and implement water awareness programme for Craton employees and contractors.
<b>These commitments apply to <u>operation and decommissioning only</u></b>		
7	Water usage and control	Ensure that stormwater falling inside the processing area is captured and directed to the relevant dam for containment and reuse.

No	Issue	Management commitment
<b>These commitments apply to <u>operations</u> only</b>		
<b>8</b>	Water usage and control	Ensure that the design of the relevant clean and dirty water systems are sufficient to cater for the water volumes associated with the infrequent flood events and that unacceptable discharges of polluted water are prevented.
<b>9</b>		Optimise the recycling of water in processing phase to reduce the demand for fresh water.

### 7.12.2.2 Consumption of fuel

#### **Objectives**

The objective of the management measures is to monitor the fuel consumption and to find ways to optimise fuel usage.

#### **Actions**

**TABLE 34: ACTIONS RELATING TO FUEL CONSUMPTION**

No	Issue	Management commitment
<b>These commitments apply to <u>construction, operation and decommissioning</u></b>		
<b>1</b>	Fuel consumption	Maintain and implement the preventive maintenance plan for all equipment and mine vehicles using diesel, petrol and gas on site to avoid wastage and leakages.
<b>2</b>		Monitor fuel consumption in all departments.

**7.13**  
**Soil MP**



### 7.13 SOIL MANAGEMENT PLAN

Management of soils is important as mining is a temporary land use where-after rehabilitation is the key to re-establishing post closure land capability that will support conservation, agricultural and tourism type land uses. Soil is a key part of rehabilitation.

The commitments derived from the Scoping Report with regards to soil form the basis of this MP.

#### 7.13.1 COMPONENTS

This plan is made up of the following components:

- Topsoil stockpiling/management.

#### 7.13.2 MANAGEMENT

##### 7.13.2.1 Topsoil stockpiling/management

###### **Objectives**

The objective of the management measures is to ensure that all topsoil stripping, stockpiling and replacement operations will be undertaken in a manner that limits impacts on the soil functionality and to ensure it can be used for rehabilitation as and when required.

###### **Actions**

**TABLE 35: ACTIONS RELATING TO TOPSOIL STOCKPILING/MANAGEMENT**

No	Issue	Management commitment
<b>These commitments apply to <u>construction phase</u></b>		
1	Topsoil removal and stockpiling	Stripping will only occur where soils are to be disturbed by activities that are described in the design report, and where a clearly defined end rehabilitation use for the stripped soil has been identified.
2		Soils should preferably be handled in dry weather conditions so as to cause as little compaction as possible. Utilisable soil (topsoil and upper portion of subsoil B2/1) must be removed and stockpiled separately from the lower "B" horizon, with the calcrete layer being separated from the soft/decomposed rock, and wet based soils separated from the dry soils if they are to be impacted.
3		The "Utilisable" soil should be stripped to a depth of 750mm where possible or until hard rock/calcrete is encountered. These soils will be stockpiled together with any vegetation cover present (only large vegetation to be removed prior to stripping).
4		Stockpiling areas will be identified in close proximity to the source of the soil to limit handling and to promote reuse of soils in the correct areas.

No	Issue	Management commitment
5		Soils stockpiles will be demarcated, and clearly marked to identify both the soil type and the intended area of rehabilitation.
<b>These commitments apply to <u>operations phase</u></b>		
6	Topsoil stockpile management	Implement measures, such as seeding or inert rock cladding, the stockpiles to prevent erosion thereof.
7		Stockpiles will be established/engineered with stormwater diversion berms in place to prevent erosion.
8		Soil stockpile and berm heights will be restricted where possible to <1.5m to avoid compaction and damage to the soil seed pool. However, depending upon the footprint of the intended stockpiles, where stockpiles higher than 1.5m cannot be avoided, these will be benched to a maximum height of 15m. Each bench should ideally be 1.5m high and 2m wide. For storage periods greater than 3 years, vegetative or rock cover is necessary. The stockpile side slopes should be stabilised at a slope of 1 in 6. This will promote vegetation growth and reduce run-off related erosion.
9		Equipment, human and animal movement on the soil stockpiles should be limited to avoid topsoil compaction and subsequent damage to the soils and seedbank.
<b>These commitments apply to <u>decommissioning and closure phases</u></b>		
10	Rehabilitation of Disturbed land & Restoration	Stockpiled soil will be used to rehabilitate disturbed sites either ongoing as disturbed areas become available for rehabilitation and/or at closure. The stockpiled topsoil must be placed on the rehabilitated areas to 300- 500mm deep and contoured to achieve an approximate free draining surface profile, (Conservation land capability and/or Low intensity wildlife grazing),.
11	of Soil Utilisation	The stockpiled soils will be analysed to determine the nutrient status and chemistry. Based on the analysis, fertilisers will be applied if necessary.
12		Erosion control measures will be implemented to ensure that the soil is not washed away and that erosion gulleys do not develop prior to vegetation establishment.
13		If soil (whether stockpiled or in its undisturbed natural state) is polluted, the first management priority is to treat the pollution by means of in situ bioremediation.
14		If <i>in situ</i> treatment is not possible then the polluted soil must be placed in bins and transported to the hazardous landfill in Windhoek.

# **7.14**

## **Waste Management MP**

## 7.14 WASTE MANAGEMENT PLAN

Waste is generated during all phases of the mine. This MP deals with solid waste management.

### 7.14.1 COMPONENTS

This plan is made up of the following components:

- Non-hazardous solid waste (non-mineralised);
- Hazardous solid waste (non-mineralised); and
- Medical waste.

#### Waste Inventory list:

Waste type	Waste specifics (example of waste types)	Source
Non-hazardous solid waste (non-mineralised)	Metal Cut offs, rubber, wood, product packaging, organic materials, glass, plastics, food scraps, cardboard/paper, used PPE, etc.	Across site
Hazardous solid waste (non-mineralised).	Printer cartridges, sewerage, batteries, hydrocarbons (oils, grease), fluorescent bulbs, etc.	Admin building, workshops, accommodation facilities
Medical waste	Syringes, material with blood stains, bandages, etc.	Admin building

### 7.14.2 MANAGEMENT

#### 7.14.2.1 Non-hazardous solid waste (non-mineralised)

##### **Objectives**

The objective of the management measures is to ensure proper storage, recycling, re-using, removal, transportation and disposal of non-hazardous solid waste.

##### **Actions**

**TABLE 36: ACTIONS RELATING TO NON-HAZARDOUS SOLID WASTE (NON-MINERALISED)**

No	Issue	Management commitment
<b>These commitments apply <u>construction, operation and decommissioning</u> phases</b>		
1	General	The waste management procedure for Craton must cover the recycling, re-use, storage, handling, transportation and disposal. Ensure that the

No	Issue	Management commitment
		contractor's responsible for the above are made aware of these procedures.
2	Collection of waste	Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity. Receptacles must have lids to prevent wind borne litter, or scavenging by animals.
3	Waste storage/separation – domestic waste	Determine what recycling initiatives are feasible on site and in the area. All recyclable waste must be separated at source into the relevant containers, before being removed to wheelie bins or luggar bins and skips.
4		Provide the recyclable materials to agencies that can utilise them.
5		Non-recyclable waste will be collected and taken to an off-site waste facility.
6	Waste classification (domestic and industrial)	A waste inventory should be maintained.

#### 7.14.2.2 Hazardous solid waste (non-mineralised)

##### Objectives

The objective of the management measures is to ensure proper storage, removal, transportation and disposal of hazardous solid waste

##### Actions

**TABLE 37: ACTIONS RELATING TO HAZARDOUS SOLID WASTE (NON-MINERALISED)**

No	Issue	Management commitment
<b>These commitments apply <u>construction, operation and decommissioning</u> phases</b>		
1	General	The waste management procedure for Craton will cover the storage, handling, and transportation of waste. Ensure that the contractor's responsible are made aware of these procedures.
2	Collection of waste	Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity.
3	Waste storage	Ensure that hazardous waste is kept covered, in impermeable bunded areas until it can be removed from site to the hazardous facility at Windhoek/Kupferberg.
		Store empty print cartridges in a designated box at the office assistant's desk until removal from site.
4		Store fluorescent tubes in a special labelled steel drum at the engineering workshop.

No	Issue	Management commitment
5		Collect and accumulate other hazardous waste i.e. car batteries, miscellaneous batteries, oil filters, etc. at the engineering workshop until such time that the amounts can be removed from site.
6		Explosives packaging shall be safely burnt at the magazine site according to permit conditions and procedures.
7		Place oil and greasy cloths and rags into a steel drum and when full transported off site to the hazardous waste site.
8		Keep empty reagent bags (for a short period of time) at the reagents store until removed by the reagent contractor for refills.
9		Ensure that waste storage areas and/or containers meet the risk needs for that specific waste (e.g. impervious floor, bunded areas with drainage/containment systems, lids to prevent light material from blowing away or sealed containers for hazardous material).
10	Waste classification	An inventory of wastes will be compiled and will include estimated quantities of waste. The inventory will be kept up to date.
11	Waste transport	Appoint a reputable waste management subcontractor to transport waste to the Windhoek landfill.
12	Disposal	Disposal of waste at appropriate permitted waste disposal facilities as follows: <ul style="list-style-type: none"> <li>• Hazardous waste shall be removed from site and may be recycled or disposed of at the nearest hazardous site (i.e. Windhoek/Kupferberg);</li> <li>• Dispose of spoiled reagents offsite at the reagents facility in Windhoek; and</li> <li>• Damaged reagent bags shall also be removed by the reagent contractor for repairs or disposal.</li> </ul>
13	Disposal records	Written evidence of safe disposal of waste will be kept.

### 7.14.2.3 Medical waste

#### Objectives

The objective of the management measures is to ensure proper storage, removal, transportation and disposal of medical waste

**ACTIONS****TABLE 38: ACTIONS RELATING TO MEDICAL WASTE**

No	Issue	Management commitment
<b>These commitments apply <u>construction, operation and decommissioning</u> phases</b>		
<b>1</b>	General	The medical waste handling procedure for Craton will cover the storage, handling, and transportation of all medical waste. Ensure that the contractor's responsible are made aware of these procedures.
<b>2</b>	Disposal	Incinerate the medical waste offsite at an approved medical facility.

## 8 PARTIES RESPONSIBLE FOR THE IMPLEMENTATION OF THE EMP

This section describes the roles and responsibilities for implementing the various management plans.

### 8.1 GENERAL MANAGER

The Omitiomire Mine General Manager has overall responsibility for environmental management on the mine and for ensuring this EMP is implemented. To assist the General Manager, Omitiomire will have an Environmental Officer that will be dedicated to managing and monitoring the environmental issues associated with the mine's activities.

The General Manager must ensure the environmental management plan is included in all contracts and to ensure that contractors adhere to the conditions of the EMP.

Contract documents should consider the inclusion of penalties for non-conformance to the EMP, or to link the sign off of the Contract to a retainer clause. The client retains part of the contract fees until the Craton's appointee/SHE or ECO has signed off the clearance certificate, indicating satisfaction with the rehabilitation of the Contractor's a work and laydown area.

### 8.2 ENVIRONMENTAL DEPARTMENT

The Omitiomire Environmental Officer will be responsible for assisting the General Manager and various other managers in all environmental and community issues, and specifically to ensure that the commitments as set out in this EMP are implemented during the design, operations, decommissioning and closure phases.

In addition to the above, the Environmental Officer is responsible for ensuring that all persons involved with Omitiomire Mine comply with this EMP.

As outlined in Section 8.3, each contractor will be required to develop their own individual EMPs and/or relevant Method Statements (MS) based on this EMP any other relevant Omitiomire Mine requirements and specifications, and any permits or authorisations issued to Omitiomire. These contractor EMPs/MS will focus on the specific aspects of the contractors work requirements and work areas.

The Environmental Officer will be responsible for the following aspects related to compliance of this EMP:

- Regular inspections and auditing compliance to this EMP and any other relevant legal requirements e.g. permits and authorisations.
- Conduct environmental awareness training during induction training and on an ad hoc basis thereafter.



- Conduct scheduled monitoring as outlined in section 9 as well as any additional monitoring required by permit and authorisations issued to Omitiomire by relevant authorities.
- Ensure compliance to this EMP and permits and authorisations issued to Omitiomire by relevant authorities. Ensure responsibilities and target dates are developed for each one of the commitments in this EMP. This will be through one of the following mechanisms:
  - Design requirements; or
  - Construction tender documents and contracts.
- Submit required information to relevant authorities such as reporting related to monitoring and with regard to compliance with the EMP, permit and relevant authorisations.
- Liaise with Omitiomire Management and various external stakeholders such as authorities and interested and affected parties on environmental management (where required).

### 8.3 CONTRACTORS

All contractors and their sub-contractors and employees will be contractually required to comply with the various commitments in this EMP. As indicated above, the contractors will also be required to develop their own EMPs and or MSs related to their specific work requirements and work areas based on the EMP's, any other relevant Omitiomire Project minimum requirements, specifications, authorisations, procedures and/or permits.

The EMPs/MSs contained in the returned tender documents will be adjudicated by the EPCM contractor and/or the project Owner's Team. This adjudication will be against aspects such as the equipment to be used, waste to be generated, provision of MSDSs etc. An adjudication checklist will be developed for this purpose.

The Environmental Officer, as well as the EPCM Environmental Manager, will conduct regular informal inspections at contractor areas. Non-compliances will be recorded in the EMS to be developed, and action plans developed in conjunction with the contractor that contravened the clause of the EMP.

Contractors will be formally audited on a quarterly basis in order to determine compliance with the relevant EMPs/MSs. In the event of non-conformances, the contractor will be required to take corrective action according to the requirements of the Environmental Officer. Clean up may be done on their behalf, and if so, the contractor will be back-charged accordingly. Final payment certificates can be withheld by the Environmental Officer until the manager is satisfied with the rehabilitation of the contractor's sites.

Two of these formal audits will form the basis of the information to be provided in the Bi-Annual reports to the relevant authorities.

#### **8.4 EXTERNAL SPECIALISTS**

Craton may appoint external environmental specialists, as and when required, to assist with the implementation of certain commitments made in the various management plans.

An independent auditor will also assess compliance against the EMP on a bi-annual basis.

## 9 MONITORING AND AUDITING

### 9.1 MONITORING

The management plans in Section 7 have covered various aspects of the proposed monitoring. This section both augments those requirements and sets further detail where relevant. Craton will develop detailed monitoring procedures including the relevant monitoring commitments spelled out in this EMP.

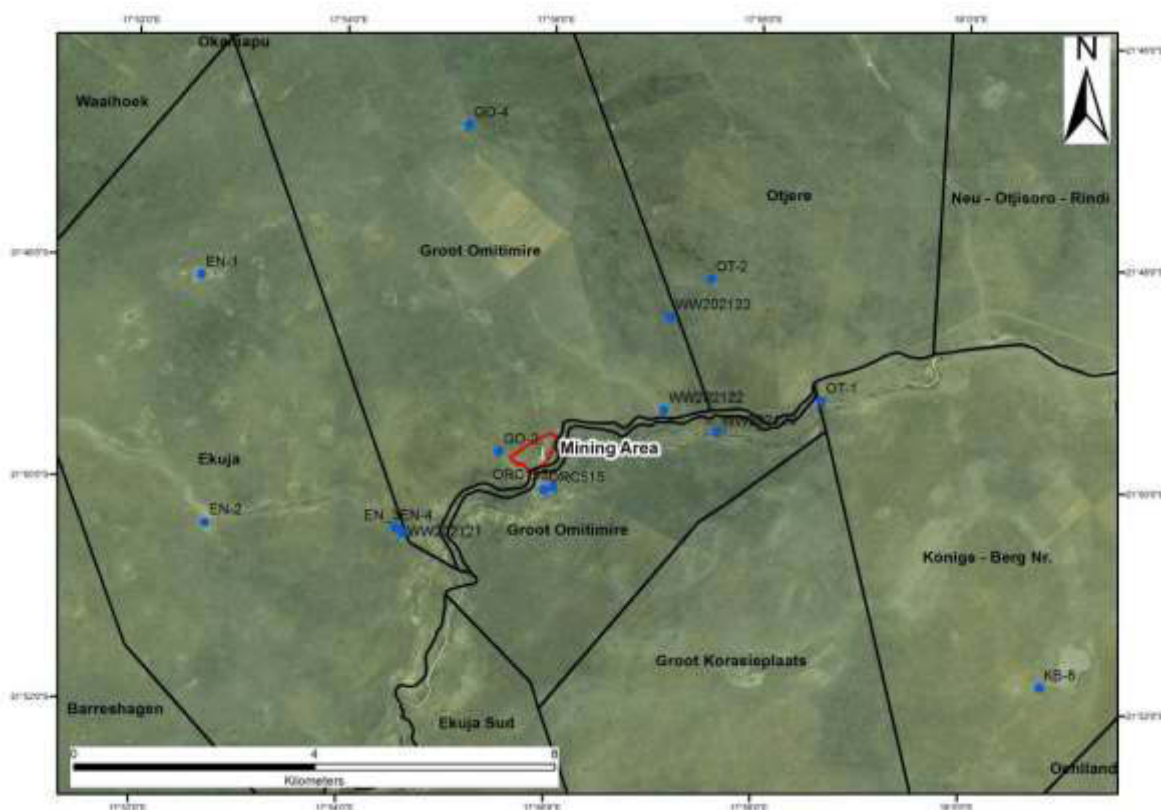
As a general approach, the monitoring procedures will comprise the following:

- A formal procedure;
- Appropriately calibrated equipment – regular inspections and calibration of equipment will be undertaken in line with the equipment calibration/validation procedure;
- Where samples require analysis, they will be preserved according to laboratory specifications;
- Where practical, an accredited, commercial laboratory will undertake sample analyses;
- Parameters to be monitored can 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 in a structured database;
- Data will be interpreted and reports on trends in the data will be compiled on a quarterly basis; and
- Both the data and the reports will be kept on record for the life of mine.

As a general comment, if monitoring points become damaged or redundant then they can be replaced with new points.

#### 9.1.1 WATER MONITORING

The existing monitoring programme should resume immediately if the project is approved. The regional monitoring on neighbouring farms should be done on a bi-annual base (twice a year). The proposed regional groundwater monitoring boreholes are shown in Figure 5 and Table 38 below. The on-site monitoring of compliance boreholes, having a WW-Number from DWAF, should be continued on a quarterly basis as implemented before the project came to a stand-still in 2015. The location of compliance monitoring boreholes is shown in Figure 6 and in Table 39. Groundwater analysis parameters are presented in Table 40.



**FIGURE 5: REGIONAL BI-ANNUAL MONITORING BOREHOLES LOCATED ON FARMS SURROUNDING THE PROJECT AREA ON FARM GROOT OMITIOMIRE**

**TABLE 39: BI-ANNUAL AND QUARTERLY MONITORING BOREHOLES**

Borehole ID	X	Y	Zone	Monitoring Schedule	Monitoring type
EN-1	797458	7586215	UTM33S	Bi-annual	Both
EN-2	797511	7582091	UTM33S	Bi-annual	Monitor
EN-3	800687	7581991	UTM33S	Bi-annual	Sample
EN-4	800685	7581994	UTM33S	Bi-annual	Monitor
GO-2	802406	7583263	UTM33S	Bi-annual	Monitor
GO-4	801917	7588701	UTM33S	Bi-annual	Sample
ORC-153	803301	7582670	UTM33S	Quarterly	Both
ORC-515	803151	7582623	UTM33S	Quarterly	Both
OT-1	807767	7584100	UTM33S	Bi-annual	Both
OT-2	805939	7586131	UTM33S	Bi-annual	Both
WW202120	806030	7583571	UTM33S	Quarterly	Both
WW202121	800800	7581917	UTM33S	Quarterly	Both
WW202122	805150	7583950	UTM33S	Quarterly	Both
WW202123	805265	7585500	UTM33S	Quarterly	Both
KB-8	191271	7579373	UTM34S	Bi-annual	Sample



FIGURE 6: QUATERLY MONITORING BOREHOLE LOCATIONS ON FARM GROOT OMITIOMIRE

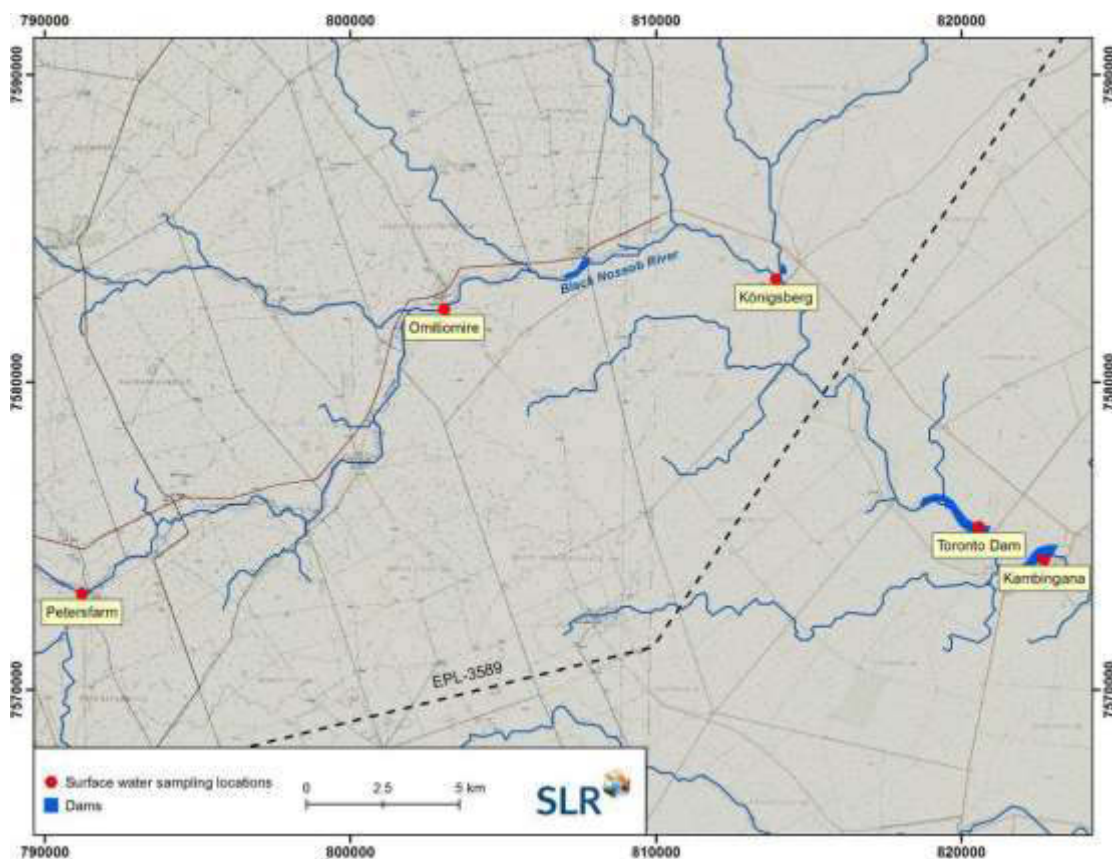
TABLE 40: PARAMETERS ANALYSED FROM GROUNDWATER

Groundwater Sampling	
Total Metals	Major Ions
Aluminium as Al	pH
Antimony as Sb	Electrical Conductivity
Arsenic as As	Turbidity
Barium as Ba	Total Dissolved Solids (calc.)
Beryllium as Be	P-Alkalinity as CaCO3
Boron as B	Total Alkalinity as CaCO3
Cadmium as Cd	Total Hardness as CaCO3
Chromium as Cr	Ca-Hardness as CaCO3
Copper as Cu	Mg-Hardness as CaCO3
Iron as Fe	Chloride as Cl-
Lead as Pb	Fluoride as F-
Lithium as Li	Sulphate as SO42-
Manganese as Mn	Nitrate as N
Mercury as Hg	Nitrite as N
Molybdenum as Mo	Sodium as Na
Nickel as Ni	Potassium as K
Selenium as Se	Magnesium as Mg
Strontium as Sr	Calcium as Ca
Thorium as Th	Stability pH, at 25°C
Tin as Sn	Langelier Index
Titanium as Ti	Ryznar Index
Uranium as U	Corrosivity ratio
Vanadium as V	
Zinc as Zn	

### 9.1.2 SURFACE WATER/SEDIMENT ANALYSIS

Surface water and sediment samples from selected farm dams upstream and downstream the project area (Figure 7) were sampled as part of the baseline study and should be continued throughout the mining operations on an annual basis.

Contaminants from the mine site originating from HLF, plant area and other sources and transported with Black Nossob River floods downstream into farm dams will be monitored on a regular basis. Stormwater management measures will prevent contaminants leaving the mine site but monitoring is required to prove the efficiency and proper functioning of the mitigation measures.



**FIGURE 7: SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS**

Recommended parameters to be analysed from surface water and sediments from farm dams are presented in Table 41 below.

**TABLE 41: PARAMETERS FOR ANALYSIS: SURFACE WATER AND SEDIMENT SAMPLING**

Surface Water Sampling		Sediment Sampling
Major Ions	Total Metals	Analysis
p H	Aluminium as Al	Water Soluble Chlorides
Electrical Conductivity	Arsenic as As	Organic Carbon
Total Dissolved Solids (calc.)	Boron as B	Particle Size Analysis
P-Alkalinity as CaCO <sub>3</sub>	Cadmium as Cd	Acid Soluble Sulphates
Total Alkalinity as CaCO <sub>3</sub>	Chromium as Cr	Total Nitrogen
Total Hardness as CaCO <sub>3</sub>	Cobalt as Co	Total Phosphate
Ca-Hardness as CaCO <sub>3</sub>	Copper as Cu	Total Na
Mg-Hardness as CaCO <sub>3</sub>	Iron as Fe	Total K
Chloride as Cl <sup>-</sup>	Lead as Pb	Total Ca
Fluoride as F <sup>-</sup>	Manganese as Mn	Total Mg
Sulphate as SO <sub>4</sub> <sup>2-</sup>	Molybdenum as Mo	Total Fe
Nitrate as N	Nickel as Ni	Total Mn
Nitrite as N	Selenium as Se	EPA Digestion : As
Sodium as Na	Tin as Sn	EPA Digestion : Cd
Potassium as K	Zinc as Zn	EPA Digestion : Co
Magnesium as Mg		EPA Digestion : Cr
Calcium as Ca		EPA Digestion : Cu
Free & saline ammonium as N		EPA Digestion : Pb
Stability pH, at 25°C		EPA Digestion : Se
Langelier Index		EPA Digestion : Ni
Ryznar Index		EPA Digestion : Zn
Corrosivity ratio		

### 9.1.3 AIR MONITORING

Key performance indicators against which progress may be assessed from the basis for all effective environmental management practices. Performance indicators are usually selected to reflect both the source of the emission directly and the impact on the receiving environment. Ensuring that no visible evidence of windblown dust exists represents an example of a source-based indicator, whereas maintaining off-site dust fallout levels to below 1 200 mg/m<sup>2</sup>/day represents an impact- or receptor-based performance indicator.

Recommended source based performance indicators for the proposed Omitiomire project include:

- No visible dust when trucks/vehicles drive on the roads. It is recommended that dust fallout in the immediate vicinity of the road perimeter be less than 1 200 mg/m<sup>2</sup>/day;
- The absence of visible dust plume at all tipping points and outside the crusher would be the best indicator of effective control equipment in place. In addition the dust fallout in the immediate vicinity of the tipping and crushing sources should be less than 1 200 mg/m<sup>2</sup>/day; and

- From all activities associated with the proposed Omitiomire Mine, dust fallout levels should not exceed 1 200 mg/m<sup>2</sup>/day outside the project boundary.

#### **9.1.3.1 Proposed operational phase dust fallout monitoring network**

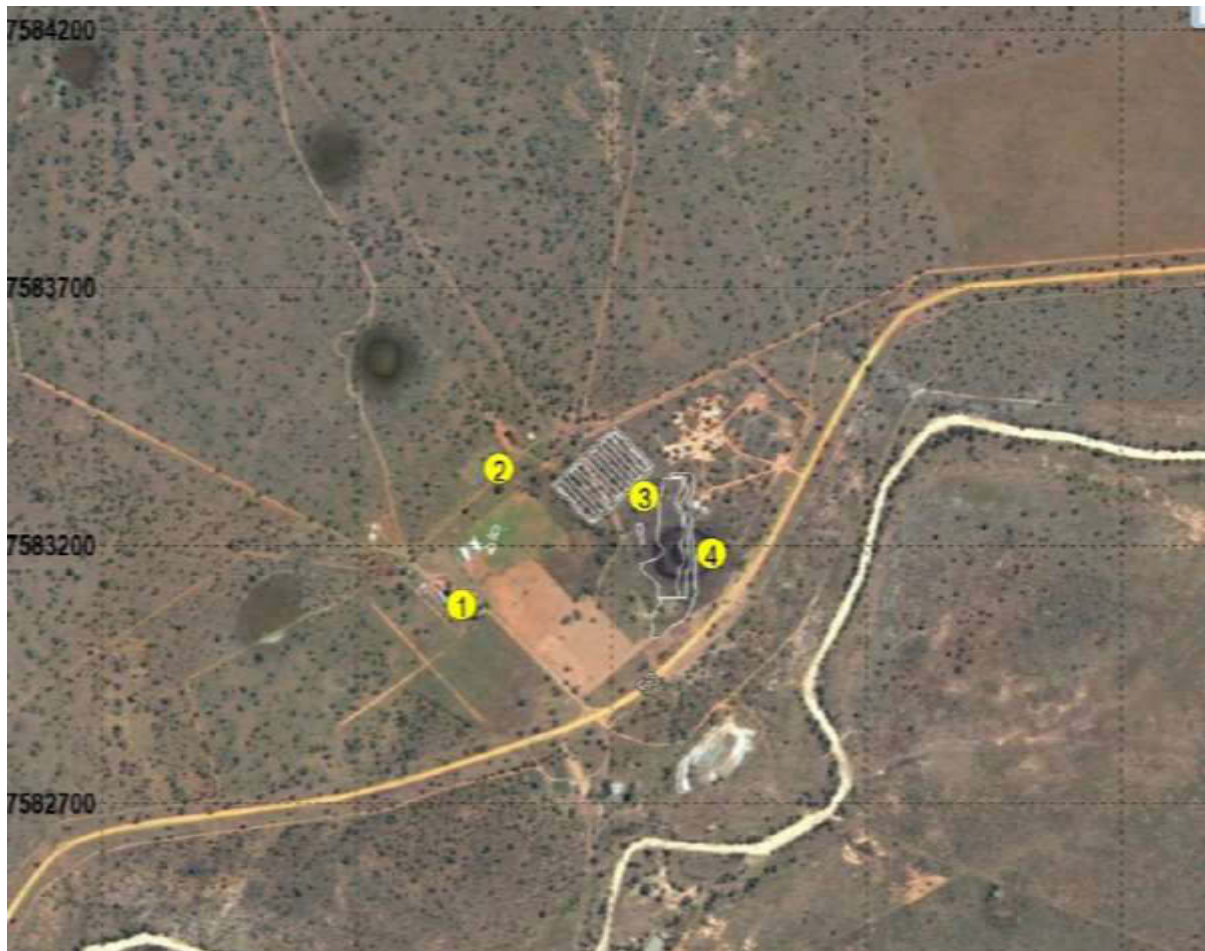
A dust fallout network provides management with an indication of what the reduction in fugitive dust levels are once mitigation measures are implemented. In addition, a dust fallout network can serve to meet various objectives, such as:

- Compliance monitoring;
- Validate dispersion model results;
- Use as input for health risk assessment;
- Assist in source apportionment;
- Temporal trend analysis;
- Spatial trend analysis;
- Source quantification; and
- Tracking progress made by control measures

Based on the impacts from the proposed project it is recommended that a dust fallout sampling network of four dust buckets be implemented prior to operations in order to understand the baseline conditions and then during operations to ensure management measures implemented are effective and evaluation criteria are met at sensitive receptors in the area. Since there are no off-site receptors located close to the proposed mining operations, the dust buckets are mainly recommended as indicators for management. Refer to Figure 8 for the recommended locations of the dust buckets.

It is recommended that dust fallout in the immediate vicinity of these single dust buckets be less than 1 200 mg/m<sup>2</sup>/day. The single dust fallout buckets should be designed according to the American Society for Testing and Materials standard method for collection and analysis of dust fallout (ASTM D1739-98). The ASTM method employs a simple device consisting of a cylindrical container (not less than 150 mm in diameter) exposed for one calendar month (30 ±2 days). The bucket is placed at a height of 2m above the ground.





**FIGURE 8: RECOMMENDED DUST FALLOUT MONITORING NETWORK**

A detailed Dust Fallout Monitoring Procedure is included in the Air Quality Assessment report (Airshed, 2017) appended to the Scoping Report.

#### **9.1.4 NOISE MONITORING**

An environmental noise monitoring campaign should be conducted once during construction and annually during the operational phase, at the mine boundary.

An environmental noise monitoring campaign should be conducted once before construction at the hunting grounds (downwind of the project) and annually (at the same selected location) during the operational phase. The duration of these monitoring campaigns should be one to seven days long.

Also, In the event that noise related complaints are received short term (24-hour) ambient noise measurements should be conducted as part of investigating the complaints. The results of the measurements should be used to inform any follow up interventions.

The frequency of noise monitoring as well as the parameters that should be determined are summarised in Table 42. In addition to the measurement of sound pressure levels, the 3<sup>rd</sup> octave band frequency spectra should also be recorded. Frequency spectrum data can provide useful insight into the nature of recorded sound pressure levels and assist with distinguishing between potential sources of noise that contribute to noise levels at a certain location. Source noise measurements could be conducted to confirm equipment manufacturer sound power data and assumed sound power data used in the current study.

**TABLE 42: NOISE MONITORING PROGRAMME**

<b>Proposed Monitoring Plan</b>	
<b>Parameters to be Measured</b>	<b>Frequency</b>
<b>L<sub>Aeq</sub>(1 hour) between 07:00 and 22:00</b>	One campaign during the construction phase One campaign per year of operation
<b>L<sub>Aeq</sub>(1 hour) between 22:00 and 07:00</b>	One campaign during the construction phase One campaign per year of operation
<b>3<sup>rd</sup> Octave band frequency spectrum</b>	During every campaign

#### 9.1.5 BIODIVERSITY MONITORING

The biodiversity monitoring will include the following:

- An ecological management plan that includes recommendations on best rangeland management practises including a fire management plan, suitable game species and stocking rates, drinking water placement and vegetation monitoring.
- The loss of large *V. erioloba* specimens is inevitable. An offset strategy would be to physically protect some juvenile *V. erioloba* in certain areas as replacements for lost trees and by following good rangeland management practises in general.
- Monitor the occurrence and spread of invasive species so as to instigate steps for their control, following expert advice.
- Enforce speed limits, including using speed-reducing methods and speed-monitoring devices.
- Limit and monitor staff movements in order to ensure no unauthorised access to surrounding farms so that poaching and illegal harvesting can be prevented.

#### 9.1.6 SOIL MANAGEMENT MONITORING

Regular inspections of soil stockpiles and rehabilitated areas will be undertaken to ensure that the soil conservation procedure is being implemented.

### **9.1.7 MINERALISED WASTE FACILITIES**

The following issues will, where relevant, be monitored on a quarterly basis and reported as required by relevant permits and authorisations issued to the Omitiomire “mini mine” by the authorities:

- Slope stability, integrity of walls and liner in the HLF, presence of seepage, capacity of dirty water system, and functioning of drains.
- The volume of mineralised waste generated as well as the disposal area, height and footprint of mineralised waste disposal/storage facilities will be monitored and recorded as required. The results will be reported bi-annually.

### **9.1.8 NON-MINERALISED SOLID AND LIQUID WASTE**

Weekly inspections of non-mineralised waste handling and management facilities will be undertaken to ensure that the waste management procedures are being implemented. The volume and type of non-mineralised waste, and the disposal destination, will be monitored and recorded as required. The results will be reported annually.

## **9.2 AUDITING COMPLIANCE OF THE EMP**

The commitments contained in this EMP will, once an environmental clearance and the Mining Licence ML197 have been obtained, be Craton’s contractual agreement with the Namibian authorities for sound environmental management. All employees, contractors and sub-contractors and any visitors to site will be expected to comply with the commitments contained herein.

### **9.2.1 AUDITS AND INSPECTIONS**

The Environmental Officer will conduct internal management audits against the commitments in the EMP. During the construction phase, these audits will be conducted every month. In the operational phase, these audits will be conducted on a quarterly basis. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

In addition, an independent professional will conduct an EMP performance assessment at least once a year for the Bi-Annual Report. The mine’s compliance with the provisions of the EMP and the adequacy of the EMP relative to the on-site activities will be assessed in this report.

The Environmental Officer will furthermore conduct daily inspections during construction and weekly inspections during mining operations.

**9.2.2 SUBMISSION OF INFORMATION**

As a minimum, the following documents will be submitted to the relevant authorities on an ongoing basis:

- The bi-annual report required by the MET will be submitted every six months; and
- Other monitoring reports will be provided to the relevant authorities as per the permit and other agreements.



**Caitlin Hird**  
**(Project Co-ordinator)**



**Werner Petrick**  
**(Project Manager and**  
**Reviewer)**



**RECORD OF REPORT DISTRIBUTION**

<b>SLR Reference:</b>	734.03039.00010
<b>Title:</b>	Omitiomire Mini Mine EMP
<b>Report Number:</b>	2
<b>Proponent:</b>	Craton Mining and Exploration (Pty) Ltd

<b>Name</b>	<b>Entity</b>	<b>Copy No.</b>	<b>Date issued</b>	<b>Issuer</b>
Various	IAPs	1	Nov 2017	CH

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## APPENDIX A: MINE CLOSURE FRAMEWORK

### 1. Introduction

The aim of this Mine Closure Framework (MCF) is to present Craton Mining and Exploration's (Craton) commitment and approach towards closure of all aspects relating to the mine's operations. Ultimately it provides the basis for developing the Mine Closure Plan in conjunction with:

- Applicable legislation and relevant guidelines;
- All stakeholders; and
- Best Practice.

This document will therefore be a living document to be reviewed and updated when applicable and will form the basis of the Mine Closure Plan.

### 2. Approach

The *Namibian Mine Closure Framework* specifies the following content for this MCF:

- "Key objectives (for instance housing, community integration, future use of disturbed areas);
- Main closure aspects and associated components;
- Closure risk analysis;
- Stakeholder expectations;
- Evaluation of alternatives; and
- Identification of preferred alternatives.

Craton intends to follow the above mentioned guidance in developing its Mine Closure Plan which will be a dynamic process that is integrated with life-of-mine planning to ensure a seamless transition from the operational to the decommissioning phases in the project life cycle. Regular risk and opportunity assessment will be undertaken to ensure a consistent approach to the identification and management of issues associated with mine closure.

Successful mine completion is achieved with final lease relinquishment, the key to which is early establishment and agreement amongst all parties concerned, on attainable closure criteria. The Mine Closure Plan which is central to this process evolves in complexity throughout the life of the mine. There will always be a level of residual risk or uncertainty throughout the process and this requires on-going assessment and management. All closure planning will therefore be risk-based and consider environmental, social, economic and regulatory risks.

### 3. Legislation

Guidance relating to mine closure is provided in the *Namibian Mine Closure Framework* developed by the Namibian Chamber of Mines in November 2008. This document outlines the Namibian regulatory setting in some detail, with reference to the following pieces of legislation:

- Minerals Policy of Namibia, 2002;
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation, 1994;
- Policy for Prospecting and Mining in Protected Areas and National Monuments, 1999;
- General Environmental Assessment Guidelines for Mining (Onshore and Off-shore) Sector of Namibia, 2000;
- Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994;
- The Minerals (Prospecting & Mining) Act, No 33 of 1992;
- The Environmental Management Act, 7 of 2007;
- Water Act, 54 of 1956;
- The Atmospheric Pollution Prevention Ordinance, 11 of 1976; and
- Labour Act No. 6 of 1992.

Craton will take into account the requirements of the above mentioned legislation and will implement the relevant requirements when developing the Mine Closure Plan.

#### 4. Mine closure objectives

The Omitiomire Mine closure planning process will be guided by the following objectives that are endorsed by the Namibian Chamber of Mines (2008):

- To enable all stakeholders to have their interests considered during the mine closure process;
- To ensure the process of closure occurs in an orderly, cost-effective and timely manner;
- To ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability;
- To ensure there is clear accountability and adequate resources for implementation of the closure plan;
- To establish a set of indicators which demonstrate the successful completion of the closure process; and
- To reach a point where the company has met agreed completion criteria to the satisfaction of the responsible Government regulator.

Ultimately it will be necessary for Craton to demonstrate that closure of the Omitiomire Mine is socially, technically, and economically feasible without incurring long term liabilities for the government of Namibia. In addition to the above, Craton also acknowledges the mine closure objectives as specified in the *Namibian Mine Closure Framework*:

- Prepare for changes in employment conditions at closure (negative social effects on people dependent on mine);
- Understand closure risks and prepare to mitigate impacts on associated communities and dependent businesses;
- Protect public health and safety and the environment by using safe and responsible closure practices;
- Reduce or eliminate adverse environmental effects once the mine ceases operations;
- Establish conditions which are consistent with the predetermined end use objectives; and
- Reduce the need for long-term monitoring and maintenance by establishing effective physical, chemical and ecological stability of disturbed areas.



## 5. Key environmental values

The Mine Closure Framework is based on addressing the following key environmental values:

- Disturbed areas other than those comprising the open pit and mineralised waste facilities will be returned to as close to the natural habitat as practicable;
- Permanent visible features such as the mineralised waste facilities and related environmental bunds as well as safety bunds around the open pit will be left in a form that blends with the surrounds;
- The processing plant, crusher and conveyors will all be dismantled, and salvageable elements will be de-contaminated and sold. The remainder of the processing plant including steelwork, concrete, liners, brickwork etc. will be dismantled or broken up and disposed of at a site approved by the relevant authorities;
- Linear infrastructure comprising roads etc. will be removed and the disturbed land rehabilitated to blend with the surrounding natural environment;
- All structures associated with these facilities will be broken and salvageable elements will be de-contaminated and sold. The remainder of the infrastructure will be dismantled or broken up and disposed of at a site approved by the relevant authorities. Contaminated soils underlying the structures will be excavated for disposal at a hazardous waste disposal facility or for bio remediation at a designated area on the ML after which the soils will be carted to the open pit; Residual excavations will be backfilled and levelled using selected overburden material from open pit mining operations;
- Contamination beyond the mine site by wind, surface runoff or groundwater movement will be prevented through appropriate erosion resistant covers, containment bunds and drainage to the open pit; and
- Socio-economic impacts (including the loss of employment) will be minimised through careful planning and preparation for closure beginning three to five years before closure takes place.

The above principles and concepts will be refined as part of ongoing detailed closure planning and costing during the life of mine.

## 6. Closure needs

Craton has developed a number of closure needs, based the key environmental and community values as described in Section 4. These include the following:

- Remove all infrastructure;
- Re-establish a landscape that can over time regenerate sustainable endemic vegetation communities;
- Ensure that an ecologically functioning (Fauna & flora) environment is left behind;
- Effectively decontaminate and remediate all areas affected by the mine; and
- Socio-economic factors (employees, suppliers, community).

In addition to the above, the government and community needs will also be taken into consideration but there is currently limited information available on this. However, the objective of future stakeholder engagement is, amongst others, to understand these stakeholders' mine closure needs.

## 7. Stakeholder consultation

Craton acknowledges the importance of both the positive and negative effects of the mine's activities on key stakeholders, including employees, local suppliers, communities, government and interested non-government organisations. The development of a successful Mine Closure Plan will require the involvement of all affected parties.

Understanding the concerns and obtaining the input from stakeholders will be an important part of the process while Craton develops the Mine Closure Plan and during its periodic review throughout the LOM. Craton believes the benefits of a successful stakeholder engagement process include:

- Improved planning decisions;
- Improved cooperation with government;
- Better closure decisions;
- Good corporate governance; and
- Improved community receptiveness.

Craton expects to take the following steps to ensure quality stakeholder engagement:

### Stakeholder identification

Stakeholders include employees, management and shareholders of the company, as well as external parties such as communities (for instance, local business, landholders, NGOs) and government (ministries, departments, local government and parastatals).

During the identification of the stakeholders for mine closure, Craton will recognise the difference between those directly affected by mine closure such as employees and those that have an interest in the process of mine closure, and will address the issues of each different group in the Mine Closure Plan.

#### Effective consultation and working with communities

Craton intends to engage with stakeholders throughout the mine's life, starting during the planning phase, and continuing throughout operation and into the closure and relinquishment phases. The EIA process that was followed for the proposed Omitiomire Copper Mine has already give stakeholders the opportunity to provide input into the closure objectives, needs, etc.

Craton will consult and provide feedback to stakeholders and interested parties and intends to follow a two-way communication approach. Additionally, Craton's intention will be to manage and guide expectations of affected stakeholders and to mitigate, as best as possible, negative (economic, social and bio-physical) impacts and to enhance positive impacts for the establishment of the mine project.

#### Targeted communication strategy

Craton aims to develop a communication strategy ensuring that the needs of stakeholder groups and interested parties are adequately addressed and reflected in the Mine Closure Plan.

Craton understands that the different stakeholder groups, having different concerns and needs, are addressed in the appropriate manner, e.g. employees and suppliers will need to find other business opportunities, and the local communities will like to see the area adequately restored.

#### Adequate human and financial resources

Craton's intention is that all stakeholders have the necessary information to cooperate effectively in the closure process. To achieve this goal Craton intends to ensure that adequate human and financial resources are allocated from the start of the life of mine to plan for mine closure.

## 8. Alternatives

Based on the closure needs described in this EMP, only one option is currently being considered. It is proposed, that the mine site is returned to its original condition of conservation/wilderness (or as close to this condition as possible).

## 9. Closure criteria

Completion criteria will be used to facilitate the fulfilment of mine closure objectives and the closure needs, as follows:

- Specific to the Omitiomire mine site reflecting its set of environmental, social and economic circumstances;
- The basis on which successful reclamation is determined, and should be developed in consultation with stakeholders. This ensures that there is broad agreement on both the end land use objectives and the basis for measuring the achievement of that objective;
- Flexible enough to adapt to changing circumstances without compromising the agreed end objective. This provides certainty of process and outcome (relinquishment of tenement when the conditions have been met);
- Completion criteria are periodically reviewed and modified of in light of improved knowledge or changed circumstance;
- The closure criteria will be developed and included in the Mine Closure Plan and will take, amongst others, the following commitments into consideration:
  - The removal of all infrastructure, plant and equipment;
  - The engineering of all remnant mine landforms such that they are stable, non-polluting and blend into the surrounding landscape as far as possible;
  - The rehabilitation of ecology/land use (e.g. ecosystem functionality);
  - The implementation of an effective community exit strategy;
  - Establishing an accurate closure cost estimate such that adequate closure provision can be made; and
  - Post closure monitoring and maintenance.

## 10. Risk assessment

All closure planning is risk-based and considers environmental, social, economic and regulatory risks.

A formal closure risk assessment is required to fully evaluate the potential closure risks and possible mitigation/control strategies.

The basis of this risk assessment process is the identification of Environmental Aspects and Impacts associated with mine closure. This process was initiated through the EIA process conducted (SLR 2013) and has been refined as part of this 2017 EIA process. Moreover, this will be further refined through the mine's closure planning process as more detail becomes available.

The risk assessment shall take the following categories into consideration:

- Mined area;
- Infrastructure;
- Processing Plant and Logistical support;
- Mineralised waste facilities; and

- Stakeholders (Employees, contractors/service providers, Government, local community, NGOs).

*Risk assessment process*

The following steps will be undertaken when conducting the risk assessment:

- 1) Under each category (as described above) establish the “risk title” which describes the specific risk.
- 2) Determine the causes/indicators/triggers for each risk title.
- 3) Describe the potential impacts/consequences for each of the above
- 4) Establish which controls are already in place
- 5) Provide a likelihood and a risk rating (consequence) for each potential impact with reference to the descriptors in Table 43 and Table 44.
- 6) Determine the risk level based on the matrix presented in Table 45.
- 7) Provide risk management measures during operations and closure.

**TABLE 43: LIKELIHOOD DESCRIPTORS**

LIKELIHOOD DESCRIPTORS		
	Description	Indicative frequency
<b>Almost Certain:</b>	The event will occur on an annual basis	Once a year or more frequently
<b>Likely:</b>	The event has occurred several times or more in your career	Once every three years
<b>Possible:</b>	The event might occur once in your career	Once every ten years
<b>Unlikely:</b>	The event does occur somewhere from time to time	Once every thirty years
<b>Rare:</b>	Heard of something like the event occurring elsewhere	Once every 100 years

**TABLE 44: CONSEQUENCE DESCRIPTORS**

<b>CONSEQUENCE DESCRIPTORS</b>						
<b>Severity level</b>	<b>Consequence Types</b>					
	<b>Financial (Revenue/Costs)</b>	<b>Health and safety</b>	<b>Natural environment</b>	<b>Social/cultural Heritage</b>	<b>Community/govt./ reputation/media</b>	<b>Legal</b>
<b>Catastrophic:</b>	>\$100M	Multiple fatalities, or significant irreversible effects to >50 persons	Very serious, long-term environmental impairment of ecosystem functions			Significant prosecution and fines Very serious litigation including class action
<b>Major:</b>	\$20M –\$100M	Single fatality and/or severe irreversible disability		On-going serious social issues. Significant damage to structures/items of cultural significance	Serious public or media outcry (international)	Major breach of regulation Major litigation
<b>Moderate:</b>	\$1M - \$20M	Moderate irreversible disability or impairment (>30%) to one or more persons	Serious medium term environmental effects		Significant adverse national media/public/NGO attention	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible
<b>Minor:</b>	\$100, 000- \$1M	Objective but reversible disability requiring hospitalization	Moderate, short-term effects but not affecting ecosystem functions	On-going social issues. Permanent damage to items of cultural significance	Attention from media and/or heightened concern by local community. Criticism by NGOs	Minor legal issues, non-compliances and breaches or regulations
<b>Insignificant:</b>	<\$100,000	No medical treatment required	Minor effects on biological or physical environment	Minor medium-term social impacts on local population. Mostly repairable	Minor Adverse local public or media attention or complaints	

**TABLE 45: RISK CATEGORIES**

<b>RISK CATEGORIES</b>					
<b>LIKELIHOOD</b>	<b>CONSEQUENCES</b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	<b>Insignificant</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>	<b>Catastrophic</b>
<b>5 Almost Certain:</b>	<b><u>M</u></b>	<b><u>H</u></b>	<b><u>H</u></b>	<b><u>VH</u></b>	<b><u>VH</u></b>
<b>4 Likely:</b>	<b><u>M</u></b>	<b><u>M</u></b>	<b><u>H</u></b>	<b><u>H</u></b>	<b><u>VH</u></b>
<b>3 Possible:</b>	<b><u>L</u></b>	<b><u>M</u></b>	<b><u>H</u></b>	<b><u>H</u></b>	<b><u>H</u></b>
<b>2 Unlikely:</b>	<b><u>L</u></b>	<b><u>L</u></b>	<b><u>M</u></b>	<b><u>M</u></b>	<b><u>H</u></b>
<b>1 Rare:</b>	<b><u>L</u></b>	<b><u>L</u></b>	<b><u>M</u></b>	<b><u>M</u></b>	<b><u>H</u></b>

## 11. Closure planning

The end use of the mine site has still to be determined through negotiation with stakeholders (including relevant Governmental Departments, NGOs and I&APs). At this stage however it is assumed that the mine area will revert back to its original land use. As such the mine closure goal is to return the site to, as close as possible, its original state.

As such the closure strategy is to remove all buildings and structures from the project area and rehabilitate the sites, disposing of all chemicals and contaminated material in an environmentally-safe manner. All physical landforms/features resulting from mining operations are to be engineered in such a manner that their long-term landforms are stable, safe and re-vegetated. The water quality of any seepage or run-off will be such that it meets baseline water standards.

## 12. Closure Plan

Craton acknowledges the requirements for the Closure Plan content specified in the *Namibian Mine Closure Framework* and the Mine Closure Plan will therefore include:

- Social Plan (employees and communities);
- Progressive rehabilitation plan;
- Decommissioning plan;
- Final rehabilitation plan;
- Monitoring plan; and
- Detailed closure costing.