

SISHEN IRON ORE COMPANY (PTY) LTD

**DEVELOPMENT OF AN AIRPORT NEAR
POSTMASBURG, NORTHERN CAPE**

**ENVIRONMENTAL IMPACT ASSESSMENT
&
ENVIRONMENTAL MANAGEMENT PROGRAMME
PART B**

DRAFT FOR PUBLIC COMMENT

DENC REFERENCE: NC/EIA/06/ZFM/TSA/POS1/2020

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&
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PART B
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NAME OF APPLICANT: Sishen Iron Ore Company (Pty) Ltd – Kolomela Mine

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REF NUMBER: NC/EIA/06/ZFM/TSA/POS1/2020

SUBMITTED FOR AUTHORISATION IN TERMS OF:

LISTED ACTIVITIES UNDER THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT

PREPARED BY: EXM Environmental Advisory (Pty) Ltd

Date: 18 December 2020

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ACRONYMS AND ABBREVIATIONS

	Definition
BID	Background Information Document
DENC	Northern Cape Department of
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GNR	Government Notice Regulation
IAP	Interested and Affected Party
IWWMP	Integrated Water and Waste Management Plan
mamsl	Metres above mean sea level
NDCR	National Dust Control Regulations
NEMA	National Environmental Management Act
NEM: BA	National Environmental Management Biodiversity Act
NEM: WA	National Environmental Management Waste Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NIA	Noise Impact Assessment
SIOC	Sishen Iron Ore Company
SACNASP	South African Council for Natural & Scientific Professionals
SAHRA	South African Heritage Resource Agency
SANS	South African National Standards
SIOC	Sishen Iron Ore Company (Pty) Ltd
SLP	Social Labour Plan
TOPS	Threatened or Protected Species
TIA	Traffic Impact Assessment

1. DETAILS OF THE EAP

1.1 Details of EAP who prepared the report

Name of The Practitioner: Trevor Hallatt

Affiliation: Senior Environmental Scientist at EXM Advisory Services

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1.2 Expertise of the EAP

Trevor obtained a B.Sc. degree from the North-West University (Potchefstroom campus) in Geography, Zoology and Tourism in 2010. This degree provided him with a sound base and understanding of the environment and human impacts on the environment. He also obtained an honours degree in Environmental Management at the NWU in 2011. Furthermore, Trevor obtained a Masters degree in Environmental Management (cum laude) in 2014.

Trevor Hallatt has more than 9 years of environmental management experience in mining, power generating, industrial and local government sectors. His duties entail the planning and execution of projects related to environmental management, including ISO 14001: 2004 and legal compliance audits, Environmental Impact Assessments (EIA), Compilation of Environmental Management Programmes, Environmental Risk Assessments and Environmental Management Systems. Furthermore, he performed different functions in the planning and delivery of environmental short courses, including the development of modules and presenting on different topics. Trevor is also a registered Natural Science Professional with the South African Council for Natural Scientific Professions (Reg nr: 300123/15).

Declaration of Independence

The undersigned declare that this report represents an independent and objective assessment of the risks associated with the proposed development. Curriculum vitae and proof of registration of the EAP is provided in Appendix A.

Name	Affiliation	Designation	Signature	Date
Trevor Hallatt	EXM Advisory Services (Pty) Ltd	EAP Pr.Sci.Nat.		2020/12/18

2. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

2.1 Description of activities to be undertaken

3.1.1 Background

Sishen Iron Ore Company (Pty) Ltd (SIOC) – Kolomela mine, part of Kumba Iron Ore (Kumba) is proposing the development of a new airport on the Farm Kalkfontein 474 R/E, south of Postmasburg in the Tsantsabane Local Municipal area. The purpose of the airport will be to accommodate air traffic related to passengers travelling to and from Kolomela mine.

Currently, flights carrying passengers for Kolomela are serviced by Assmang's Tommy's Airfield. SIOC makes use of SA Airlink for air travel to Postmasburg. This involves 7 flights in 29-seater J41 turbo-prop aeroplanes per week. However, there is a shortage of capacity on the Kolomela flights and many passengers are forced to fly to Sishen and are subjected to a long (over 100 km) and potentially dangerous road transfer from Kathu to Postmasburg. The existing runway at Tommy's Field is too short to accommodate larger planes. The short runway also does not allow for safe departures of fully-loaded aircraft under 'hot and high' conditions and various safety incidents have been reported. Furthermore, it is probable that SA Airlink will retire the fleet of J41 aircraft currently servicing Kolomela in the future. There is thus a need for a longer, safer runway to accommodate air traffic to Kolomela mine.

3.1.2 Infrastructure

The proposed new airport and associated infrastructure will cover approximately 80 hectares. A conceptual layout of the airport is given in Figure 4 -1.

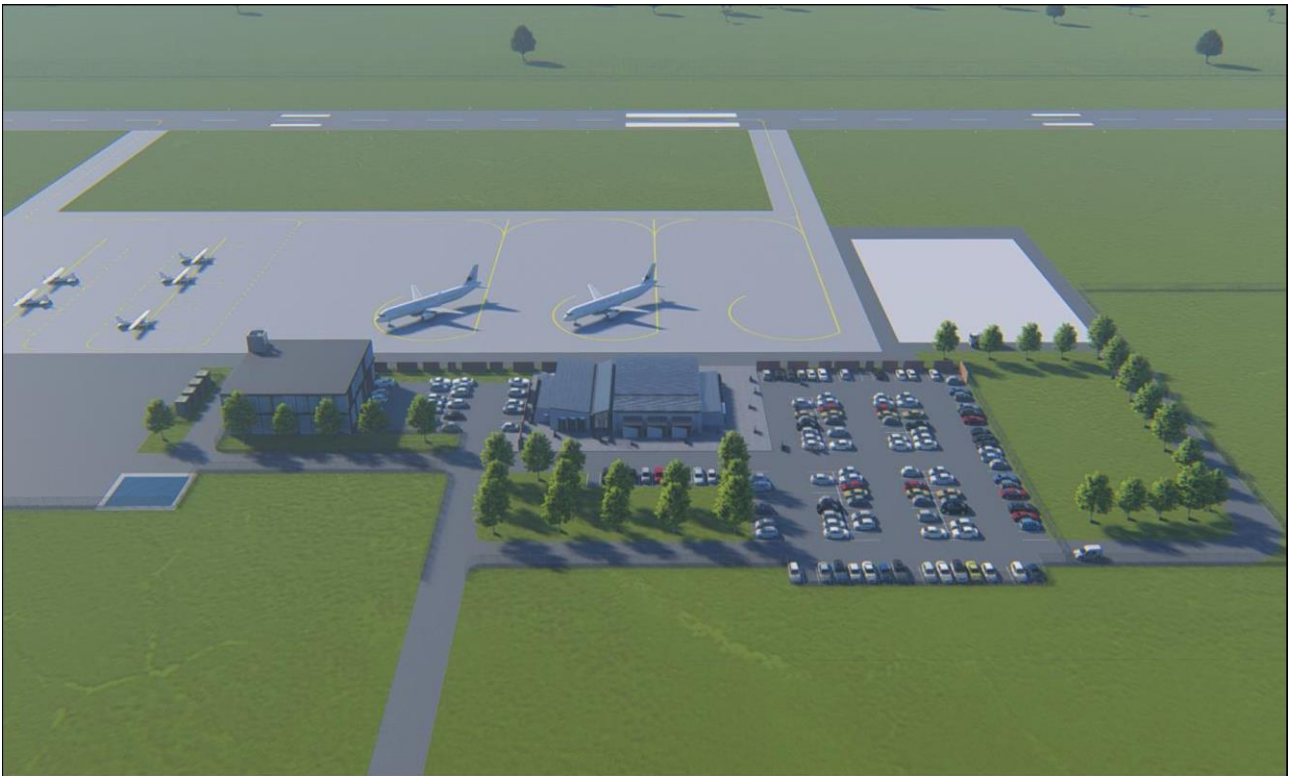


FIGURE 2-1: AIRPORT CONCEPTUAL LAYOUT

2.1.1.1 Runway and helipad(s)

The runway will be approximately 2.2 km in length and 30 meters wide, assuming a level runway. The dimensions of the runway have been calculated in terms of the type of aircraft that will be accommodated by the airport. Factors such as take-off and landing velocity of the aircrafts were considered. A helipad(s) will also be developed to accommodate helicopters at the facility.

2.1.1.2 Access road

A paved access road will be developed which will connect the proposed airport with the R325 regional road. The road will be approximately 1600 m in length and 7 meters wide.

2.1.1.3 Fuel storage and supply

A fuel farm will be developed to accommodate fuel storage tanks that will be used for the refuelling of aircraft. The ERJ41 turbo-prop aeroplanes that will be the dominant aircraft in the fleet has a fuel capacity of 6 000 liters and fuel will be delivered on 2-week intervals. The storage capacity of the fuel farm will be sized accordingly. Currently it is estimated that a total volume of +/- 40 000 liters will be stored on site. A re-fuelling depot with pumps and delivery systems will also be developed.

2.1.1.4 Parking area

A parking area will be developed for airport staff and travellers. The parking area will also accommodate car hire vehicles.

2.1.1.5 Fire station

A fire station building will be developed which will include an elevated fire lookout. Dedicated water tanks will be established for firefighting purposes.

2.1.1.6 Electricity supply lines

A new electricity supply line of 11kV will be developed to connect the proposed facility with a substation nearby the existing Postmasburg airport or alternative substation.

2.1.1.7 Terminal and supporting facilities.

The terminal will entail a departures lounge with 60 seat capacity plus standing room for 20 pax at 1,2 m². The terminal will also include a baggage reclamation area, offices, a kitchen and ablution facilities. For reliable security and passenger processing, 2x X ray machines will be installed to improve throughput, provide redundancy and reduce boarding times. An initial conceptual layout of the terminal is given in Figure 4-2.

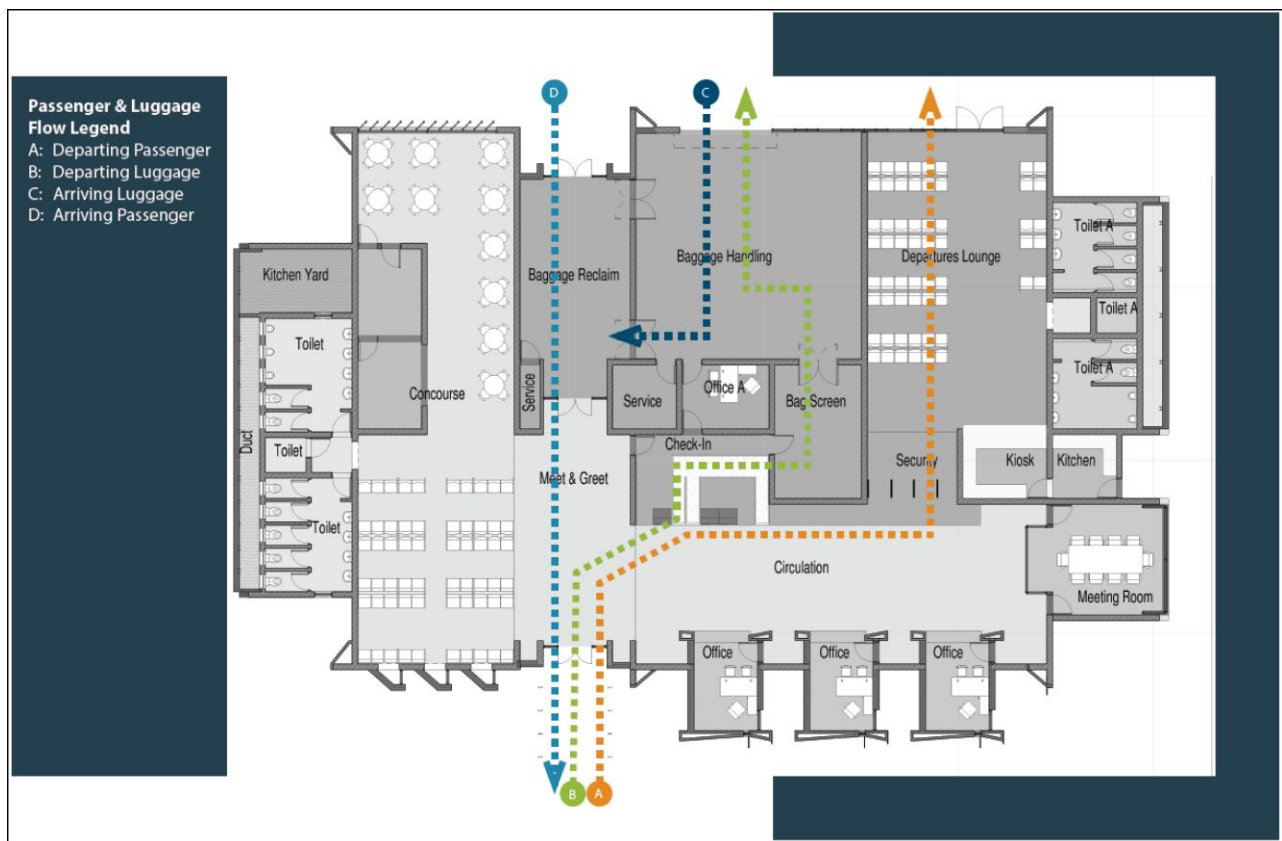


FIGURE 2-2: CONCEPTUAL TERMINAL LAYOUT

3.1.3 Water storage and supply

Water use required at the new facility is expected to be in the form of drinking, sanitation, firefighting, maintenance and general use. The water demand for the will be approximately 40m³/day during the construction phase and 11m³/day during the operational phase. SIOC proposes to abstract groundwater from a borehole(s) in the surrounding area to supply the water requirements at the airport. Water storage tanks will be established at the facility for distribution/pumping to the respective areas. Figure 4-3 illustrates the water supply system that will be installed at the facility. A Water Use Licence (IWUL) application will be submitted to the Department of Water and Sanitation (DWS) for Activity (a) listed under Section 21 of the National Water Act (No. 36 of 1998) to obtain authorisation for the abstraction of groundwater (see Section 6.7).

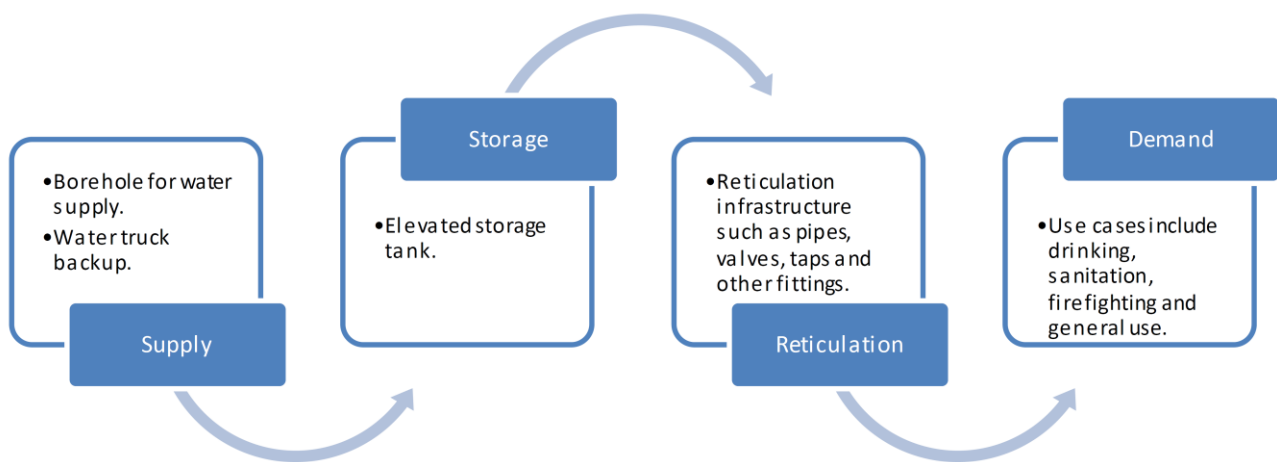


FIGURE 2-3: ONSITE WATER SUPPLY SYSTEM

3.1.4 Wastewater management

A septic tank system will be utilised at the facility for the management of grey water and sewage emanating from the airport operations. A septic tank system utilises settling and anaerobic digestion to provide primary treatment to wastewater. The septic tank(s) will be located underground to facilitate gravity flow into the tank. Sludge emanating from the system requires secondary treatment which will be conducted. The sludge will be removed via a vacuum truck and transported to the Postmasburg Wastewater Treatment Works for secondary treatment.

An evapotranspiration (ET) system is proposed to manage the effluent emanating from the septic tanks. An ET system utilises the evaporation effect for the management of effluent. An ET system features a network of slotted distribution pipes surrounded by a layer of filter sand and, if needed, a geotextile. Effluent is channelled into the distribution pipes via gravity and allowed to infiltrate into the surrounding material. The effluent is then evaporated in the ET bed via the evapotranspiration mechanism. Effluent is stopped from exiting the ET bed via a seepage mechanism by means of two layers of geosynthetic clay liner (GCL) below a 1.5 mm HDPE liner.

The septic tank system and the management of the effluent will also trigger activity g listed in Section 21 of the NWA and will therefore be included in the WUL application.

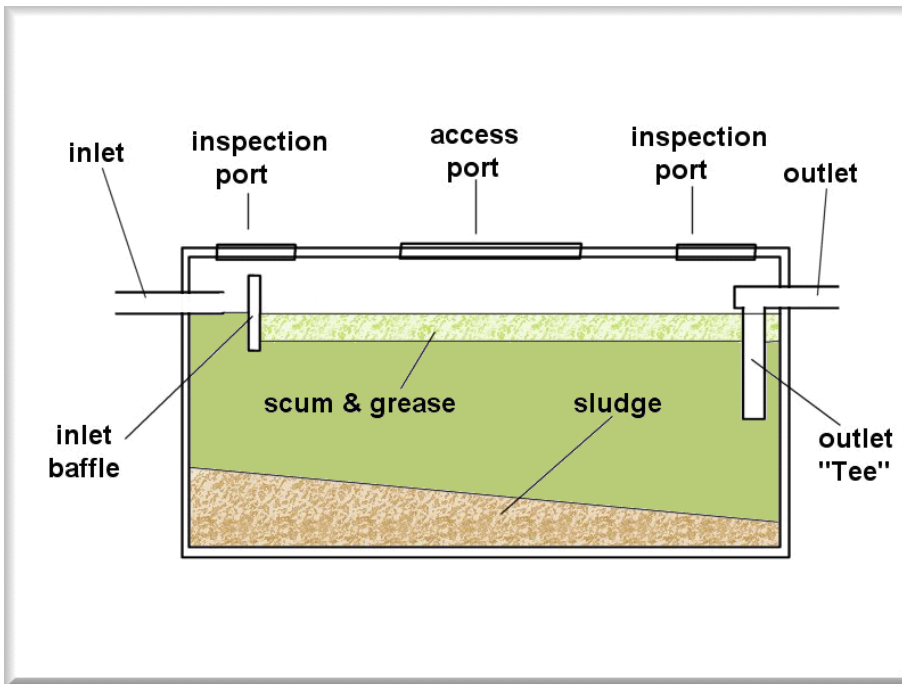


FIGURE 2-4: ILLUSTRATION OF A TYPICAL SEPTIC TANK SYSTEM

3.1.5 Stormwater management

There is no existing stormwater infrastructure in the area on which the proposed airport will be developed. The runway will be designed to allow stormwater to be removed from the surface as swiftly as possible to maintain skid resistance and enhance safety. Minor systems such as culverts and channels will be utilised to convey upstream and on-site runoff. There will be no open ditches, holes or embankments on the aircraft overrun area.

Upstream runoff will be diverted around the terminal and apron areas **area** by means of channels or berms and released further downstream. It will be ensured that the velocities involved will be managed in such a way as to not cause erosion either within the diversion infrastructure or beyond the downstream release point.

In the case of the access roads, taxiways and runway, direct runoff will be channelled off of these surfaces by means of a camber into the natural drainage systems if pooling is not a problem. Where pooling may be an issue, diversion channels will be used to convey stormwater to acceptable release points. Where natural drainage lines are found to cross these structures, culverts will be provided. Runoff velocities will be managed to ensure that erosion does not occur.

Velocity management may be in the form of linings for stormwater management channels. Energy dissipation at release points may include riprap lined areas that would provide protection of in situ material, dissipate energy and spread flow over large areas to encourage sheet flow.

Contaminated areas, such as fuelling installations, will be banded to capture potentially contaminated runoff from these areas that will then be disposed-of appropriately.

3.1.6 Borrow pit

Bulk earthworks related to runway construction is often the dominant cost component for a small airport facility. Fill materials for construction purposes will therefore be sourced from an on-site borrow pit which will reduce costs significantly, compared to the sourcing of such material from external sources. The sandy transported soils are expected to be easily excavated using conventional excavators and/or dozers, however, the hardpan calcrete layers may require the use of pneumatic action and/or blasting before excavation can take place. The development of the borrow pit will be subject to a geotechnical investigation.

3. COMPOSITE MAP

A map which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities showing how areas are to be avoided is provided as Figure 3-1.

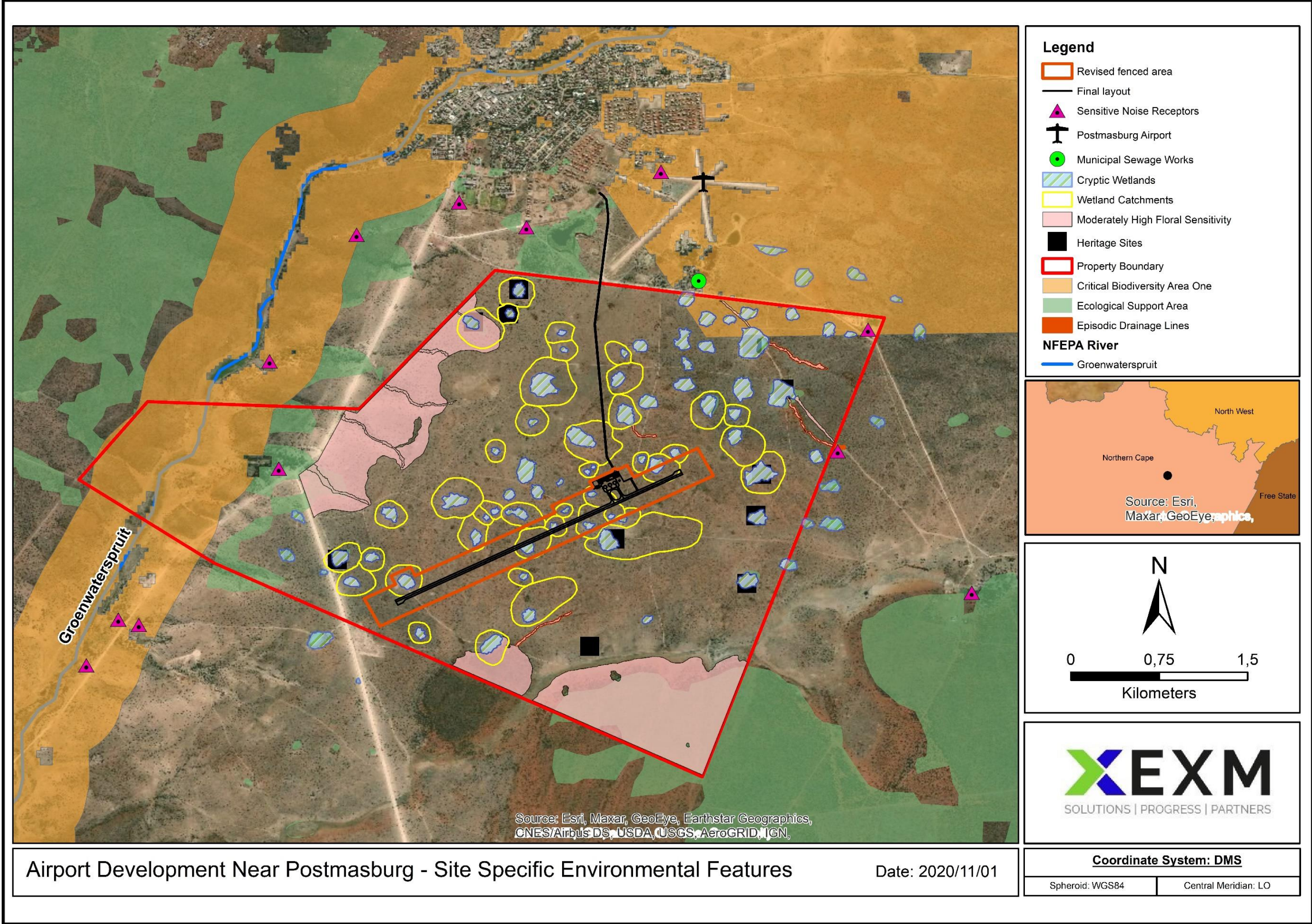


FIGURE 3-1: ENVIRONMENTAL SENSITIVITY MAP

4. IMPACT MANAGEMENT OBJECTIVES

4.1 Proposed management objectives and the impact management outcomes for inclusion in the EMPr

- Implementation of project layout as per Mitigated Scenario.
- The site operational manual must include measures to minimise noise from aircrafts approaching and departing the facility.
- The construction footprint must be clearly demarcated according to the mitigated layout and activities must be restricted to the predetermined footprint.
- The sensitive habitats, including the wetland pans (not impacted), the banded iron stone outcrops and calcrete outcrops must be established as no-go areas.
- Adequate containment measures for hazardous substances must be implemented to prevent soil and surface water contamination.
- Implement a stormwater management plan which addresses potential erosion and spill management at refuelling area.
- Conduct thorough consultation with the users of the existing Postmasburg airfield to reach an agreement on the way forward for the potential use of the proposed airport.
- SIOC must implement measures to ensure that appropriate land management is implemented at the remainder of the farm, i.e. rehabilitation of disturbed areas, alien and invasive plant management etc.
- Sufficient resources must be available to manage fires on the property.
- Implement measures to minimise impact on the social environment, including i.e.
 - Procurement plan to set aside contracts for local contractors where such contracts do not require specialised work.
 - Engage with the landowner to verify to the way forward regarding the people currently residing on the property.

5. ENVIRONMENTAL MANAGEMENT PROGRAMME

The Tables below contain the measures that must be implemented to prevent/minimise potential environmental impacts associated with the proposed airport project.

5.1 Planning phase

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Surface Water Resources					
Planning of facility Proposed surface infrastructure layout	Destruction of wetlands. Indirect impacts such as sedimentation	Footprint development	<ul style="list-style-type: none"> Realignment of the fence to prevent encroachment of wetlands on the outer edge of the facility. Implement the mitigated project layout. Develop and implement a stormwater management plan with specific measures to prevent erosion. Contractor laydown areas, and material storage facilities to remain outside of the cryptic wetlands and episodic drainage lines and their associated catchments. 	Water Use Licence conditions	Pre-construction
Biodiversity					
Encroachment of fauna and flora habitat	Direct or indirect impacts on habitat	Footprint development	<ul style="list-style-type: none"> A licence from the Department of Environment, Forestry and Fisheries (DEFF) is required for the removal of NFA protected tree species. For the disturbance of protected flora in terms of the NCNCA, a license is required from the Department of Environment and Nature Conservation (DENC). Construction footprint must be clearly demarcated according to mitigated project layout. All areas of increased ecological sensitivity should be designated as No-Go areas. Property to be included in the Kolomela Biodiversity Management Plan, including measures to manage invader plant species. 	National Forest Act NCNCA	Pre-construction

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Socio-economic					
Planning in terms of social considerations.	<p>Job creation</p> <p>Potential immigration and land invasions</p> <p>Relocation of people residing on property.</p>	Project	<ul style="list-style-type: none"> • Procurement planning to prioritise the awarding of contracts to local entities. • Plan to ensure security measures including access control and maintenance of fences are implemented. • Investigate subdivision of land to allow for continued use of portions for engineering works or if not possible allow for compensation to allow businesses to continue elsewhere. • Engage with landowner for the potential subdivision of the property. • Engage with landowner to source a way forward for people residing on property. • Consultation with stakeholders at aviation club. • Plan to accommodate the users of Postmasburg airfield at new airport. • Investigate opportunity for continued use of Postmasburg Airfield as co-dependent runway. 	N/A	Pre-construction

5.2 Construction phase

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Soil					
Earth works	Loss of soil and land capability	Construction site	Soils to be removed and protected from erosion for use in rehabilitation and landscaping of temporarily disturbed areas.	N/A Kolomela Soil Management Procedure	On-going throughout construction phase
Storage and use of hazardous substances	Soil pollution	Construction site Contractor laydown areas	Hazardous substances containers must be clearly marked and must be stored in an area with containment measures in place.	Hazardous Substances Act Kolomela Hazardous Substances Management Procedure	On-going throughout construction phase
			Spill response equipment must be readily available. Safety data sheets must be available on site for all hazardous substances.		
			Large spills must be reported as incidents and managed accordingly.		
			Refuelling (if any) must be conducted in a designated area with containment measures in place.		
			Drip trays are to be in place to contain oil drips and spillages.		
General waste generation	Litter in adjacent areas Soil pollution	Construction site Waste storage areas	Store general waste in designated areas in marked containers.	National Waste Management Act and Regulations	On-going throughout construction phase
			Littering must be prohibited.		
			Construction footprint and adjacent areas must be inspected regularly to detect and clean up any litter.		
			Dispose general waste that cannot be recycled at a licenced facility.		
			Dispose general waste that cannot be recycled at a licenced facility.		
			Provide separated waste streams to a registered waste management facility for recycling/reuse.		
A waste manifest system must be implemented for the site.					
Hazardous waste generation	Storage and management of hazardous waste (contaminated rags and PPE, used oil)	Construction site Waste storage areas	Store hazardous waste in designated areas in marked containers with containment in place.	National Waste Management Act and Regulations	On-going throughout construction phase
			Any spillages must be cleaned up appropriately.		
			Dispose hazardous waste at a licenced facility		

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Air quality					
Construction activities (earth works, moving equipment, vehicles travelling)	Increased dust fall. Nuisance conditions	Construction site	Watering of exposed surfaces, i.e., by using a water bowser.	National Dust Control Regulations.	On-going throughout construction phase
			Integrate complaints management into the Kolomela complaint management procedure.		
			Conduct dust fall monitoring in terms of the National Dust Control Regulations if complaints are received. Implement additional measures if required.		
Construction activities (earth works, moving equipment, vehicles travelling)	Contribution to greenhouse gas emissions.	Construction site	Maintain of vehicles and equipment to ensure emissions are kept to a minimum.	N/A	On-going throughout construction phase
Noise					
Construction activities (earth works, moving equipment, vehicles travelling)	Nuisance conditions for receptors in the area.	Construction site	All diesel-powered equipment and plant vehicles should be kept at a high level of maintenance.	National Noise Control Regulations IFC Standards	On-going throughout construction phase
			Implement strict speed limits on the access road between Postmasburg and the airport.		
			Limiting construction activity and vehicle traffic to hours between 06:00 and 18:00 where possible.		
			A noise complaints register must be kept, communication channels with nearby NSRs established and noise complaints investigated.		
Biodiversity - Flora					
Construction of facility	Impact on floral Habitat and Diversity	Construction site - footprint	All areas of increased ecological sensitivity (i.e. Calcrete Outcrops, Cryptic Wetlands outside of the construction footprint, Banded Ironstone Outcrops) should be designated as No-Go areas to avoid impacts on biodiversity.	N/A	On-going throughout construction phase
			Vehicles should be restricted to travel only on designated existing roadways		
			No temporary waste storage sites should be allowed in areas with natural vegetation.		
			All soil compacted as a result of construction activities should be ripped, profiled and reseeded;		

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Construction of facility	Impact on floral SCC	Construction site - footprint	Any unauthorised collection or harvesting of floral species or material must be prohibited;	N/A	On-going throughout construction phase
			An invader plant control plan must be developed and implemented for the site and must include ongoing alien and invasive plant monitoring and clearing/control.		
Biodiversity – Fauna					
Construction of facility	Impact on faunal Habitat and Diversity	Construction site - footprint	The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint	N/A	On-going throughout construction phase
			Any structures which may act as perching sites for birds should be installed with anti-perching spikes;		
Construction of facility	Impact on SCC	Construction site - footprint	Providing shelter for wildlife increases their potential activity around the airport. Methods to reduce available shelter include: 1) Exclusion measures such as spikes, netting, panelling on ledges and holes around buildings assist in prevention of birds taking residence, 2) Nest removal and 3) Cutting of grass within the fenced off infrastructure area and/or 30m from the runway.	N/A	On-going throughout construction phase
			No hunting/trapping or collecting of faunal species is allowed.		
			Internal resources with appropriate training should be used for the removal of smaller, less venomous snakes. For larger venomous snakes, a suitably trained official or specialist should be contacted to affect the relocation of the species, should it not move off on its own.		
			Any natural areas beyond the development footprint, that have been affected by the construction activities, must be rehabilitated using indigenous plant species.		
Surface water					
Storage and use of hazardous substances	Pollution of surface water resources	Construction site – contractor laydown areas	Refer to section related to soil pollution	Hazardous Substances Act Kolomela Hazardous Substances Management Procedure	On-going throughout construction phase
Soil disturbance	Erosion and sedimentation of water courses	Construction site	Develop and implement a stormwater management plan to prevent erosion and the associated sedimentation of wetlands.	N/A	On-going throughout construction phase

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
			Monitor all potentially affected wetlands, which are not lost during construction, for changes in vegetation structure and composition.		
Establishment of footprint	Total or partial loss of wetland pans and or the associated catchments	Construction site	Construct airport facility according to the mitigated layout plan to avoid/minimise impacts on wetlands.	N/A	On-going throughout construction phase
			Contractor laydown areas, and material storage facilities to remain outside of the wetland pans and their associated catchments.		
			Refer to section related to soil pollution		
			The wetland pans, not impacted by the development, must be demarcated and defined as no-go areas.		
			Only designated personnel must be allowed to enter the areas where the fence will be constructed across the wetland pans.		
Surface Water Resources					
Management of sewage system	Pollution of surface water resources	Construction site – temporary toilets	Temporary toilets to be provided during construction. Ablutions are to be serviced regularly and safe disposal documented through a waste manifest system.	N/A	On-going throughout construction phase
			Good housekeeping must be applied to maintain high hygienic levels.		
Establishment of borrow pit	Erosion and sedimentation of water courses	Borrow pit	Erosion control measures must be implemented at borrow pit if required.	N/A	On-going throughout construction phase
Establishment of borrow pit	Direct or indirect impacts on wetlands.	Borrow pit	The location of the borrow pit must take into consideration site sensitivities and avoid impacts on wetlands and sensitive floral habitats.	N/A	On-going throughout construction phase
			The footprint of the borrow pit must be clearly demarcated and excavation must be limited to that area.		
			Rehabilitation of borrow pit must commence as soon as possible after construction has been completed.		
Hydropepelogical impacts					
Site preparation	Soil compaction and sedimentation of the wetland;	Construction site	Refer to section related to surface water resources.	N/A	On-going throughout construction phase

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Construction of the proposed surface infrastructure	Removal of vegetation and compaction of soil.	Construction site			
Groundwater					
Groundwater abstraction from on-site borehole	Potential impact on aquifer yield and groundwater users	Borehole	Monitor groundwater consumption.	WUL conditions	On-going throughout construction phase
			Monitor levels of other boreholes.		
Use of hazardous substances, including hydrocarbons	Potential pollution of groundwater	Construction site – contractor laydown areas	Conduct groundwater quality monitoring at boreholes on the property.		
			Refer to section related to soil pollution,		
Heritage					
Footprint construction	Impact on burial ground and graves	Construction site	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	National Heritage Resources Act	On-going throughout construction phase
			In the event that any of the identified archaeological sites will be impacted, a Phase 2 archaeological mitigation process must be implemented. A permit issued under s35 of the NHRA will be required to conduct such work.		
Footprint construction	Impact on archaeological sites	Construction site	If fossil remains are discovered during construction, either on the surface or exposed by fresh excavations the Chance Find Protocol must be implemented by the ECO.		
Footprint construction	Impact on palaeontological resources	Construction site			
Visual					
Establishment of footprint	Visual intrusion of facility	Construction site footprint	Keep footprint of facility as small as possible according to demarcated area.	N/A	On-going throughout construction phase
			Landscaping around airport building.		
			Rehabilitation temporary disturbed areas.		
Socio-economic					
Employment of local persons during operations	Permanent Employment Local Procurement	N/A	Maximise the employment of local persons (unemployed youth) by contractors.	Anglo Social Way	During construction phase

CONSTRUCTION PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Local contractors used in construction and operational activities			Maximise the employment of local persons.		
			Procurement plan to set aside contracts for local contractors where such contracts do not require specialised work.		
			Maximise expenditure within the area of influence.		
			Employment practices focussed on local labour.		
			Consultation with local municipality with respect to planning and Kolomela mine to provide support in future planning as required.		

5.3 Operational phase

OPERATIONAL PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Soil					
Storage and use of hazardous substances	Soil pollution	Refuelling area	Hazardous substances containers must be clearly marked and must be stored in an area with containment measures in place.	Hazardous Substances Act Kolomela Hazardous Substances Management Procedure	On-going throughout operational phase
Bulk fuel storage	Surface water pollution	Tank storage tank	Spill response equipment must be readily available.		
Refuelling			Safety data sheets must be available on site for all hazardous substances.		
			Large spills must be reported as incidents and managed accordingly.		
			Refuelling must be conducted in a designated area with containment measures in place.		
			Bulk fuel storage containers must be placed in a bunded area with capacity to contain 110% of the tank volume or 25% of the volume where multiple tanks are stored.		
			Runoff from the bulk fuel storage and refuelling area as well as the fire truck wash bay must be diverted to an oil separator prior to discharge into the ET ponds.		
Washing of emergency vehicles	Environmental pollution	Wash bay	Runoff from the washday must be captured and diverted to the oil trap and to the ET beds.	N/A	
Impervious surfaces	Soil erosion and loss of topsoil Sedimentation of wetland pans	Runway	Maintain stormwater infrastructure to prevent any blockages.	Stormwater management plan	On-going throughout operational phase
Soil and surface water resources					
Hazardous waste generation	Environmental pollution	Waste storage area	Store hazardous waste in designated areas in marked containers with containment in place.	National Environmental Management Waste Act	On-going throughout operational phase
			Any spillages must be cleaned up appropriately.		
			Dispose hazardous waste at a licenced facility		
Washing of emergency vehicles	Environmental pollution	Wash bay	Runoff from the washday must be captured and diverted to the oil trap and to the ET beds.		
General waste generation	Litter in adjacent areas Environmental pollution	Waste storage area	Store general waste in designated areas in marked containers.		
			Littering must be prohibited.		
			Construction footprint and adjacent areas must be inspected regularly to detect and clean up any litter.		
			Dispose general waste that cannot be recycled at a licenced facility.		
			Provide bins for separate waste streams.		

OPERATIONAL PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
			Provide separated waste streams to a registered waste management facility for recycling/reuse.		
Noise					
Take-off and landing of airplanes	Nuisance conditions for receptors in the area.	Runway	Construct airport according to the mitigated layout plan to reduce noise levels at sensitive receptors.	National Noise Control Regulations	On-going throughout operational phase
			Specific mitigation measures that must be incorporated in the operational manual to minimise noise levels are included in section 6 of the EMP. These measures relate to the optimisation of the landing and departures which specifically states how the airplanes will approach or depart from the facility in terms of the identified receptors.		
			Implement complaint management procedure		
			Flight schedules should be communicated to nearby NSRs, especially those to the northeast and southwest of the airport. Any deviation to flight schedules must be communicated to affected parties		
Biodiversity - Flora					
Operational activities	Impact of floral Habitat and Diversity	N/A	No additional habitat is to be disturbed during the operational phase of the development;	Biodiversity Management Plan	On-going throughout operational phase
Operational activities	Impact of SCC		Prohibit vehicles to drive through sensitive habitat and natural areas;		
			The airport area must be adequately fenced to prevent personnel and customers from entering the remaining natural veld.		
Biodiversity - Fauna					
Operational activities	Impact on faunal Habitat and Diversity	N/A	No hunting/trapping or collecting of faunal species is allowed.	Biodiversity Management Plan	On-going throughout operational phase
Operational activities	Animal/bird strikes on access roads		Internal resources with appropriate training should be used for the removal of smaller, less venomous snakes. For larger venomous snakes, a suitably trained official or specialist should be contacted to affect the relocation of the species, should it not move off on its own.		
Operational activities	Impact on SCC				Enforce a strict speed limit on access road - signs indicating the presence of animals (especially kudus) can be erected on the access road.

OPERATIONAL PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Land management	Improve status of environmental characteristics of the remaining portions of the farm Kalkfontein	Other portions of the property	Rehabilitation of identified disturbed areas within the property.	Biodiversity Management Plan	On-going throughout operational phase
			Removal of Alien and Invasive plants currently on site.		
			Investigate the management of bush encroachment, especially in Banded Iron Stone Outcrops.		
			Where practicable, rehabilitate current disturbance of cryptic wetlands.		
			Implement solution to prevent further discharge of sewage effluent onto the property.		
			Assess property for erosion problems and implement measures to remediate.		
			Integrate property with Kolomela Biodiversity Management Plan		
Vermin management	Increased rodent problem which may affect adjacent farming activities	All Kitchen	Appoint a certified Pest Control Operator to manage rodents and other pests	N/A	On-going throughout operational phase
			Rodent traps must be changed as required by PCO or manufacturer's specifications.		
			Ensure food waste is properly managed and good housekeeping practices applied.		
			Food waste must be regularly removed and disposed or provided to livestock farmers to prevent rotting thereof.		
Surface Water Resources					
Operational activities	Degradation of remaining wetland pans	Adjacent areas	Remaining wetland pans must be designated as no-go areas	WUL conditions	On-going throughout operational phase
			Prohibit placement of any material in the remaining wetland pans		
Management of sewage system	Pollution of surface water resources	Septic tank system	Inspect remaining wetland pans in close proximity to the airport on a quarterly basis.		
			Regular inspection of sewage system. Maintenance must be conducted as required by standard practice.		On-going throughout operational phase
Hydropepelogical impacts					
Operation of the stormwater management structures	Altered surface runoff characteristics, change in runoff volumes delivered in each pan	Stormwater runoff	Ensure that the pre and post runoff volumes to each pan is not altered.	WUL conditions	On-going throughout operational phase

OPERATIONAL PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Groundwater					
Groundwater abstraction from on-site borehole	Potential impact on aquifer yield and groundwater users	Borehole	Monitor groundwater consumption. Monitor levels of other boreholes.	WUL conditions Hazardous Substances Act Kolomela Hazardous Substances Management Procedure	On-going throughout operational phase
Use of hazardous substances, including hydrocarbons	Potential pollution of groundwater	Refuelling area	Conduct groundwater quality monitoring at boreholes on the property.		
		Tank storage tank	Refer to section related to soil pollution/		
Storage of effluent from the on-site septic tanks system in evaporation ponds.	Potential pollution of groundwater	Septic tank system	Installation and maintenance of liner system.		
			Inspections and maintenance of ET beds.		
Continuation of sewerage being diverted to dam on property	Pollution of groundwater	Septic tank system	Engage with the municipality to discontinue with the discharge of sewage onto the property.		
			Investigate a solution, in collaboration with the municipality, to resolve capacity issues at the waste water treatment works. A full analysis, including organic compounds (i.e. e-coli) must be conducted prior to commencement of water abstraction from the water supply borehole.		
Resource consumption					
Electricity consumption	Indirect contribution to greenhouse gas emissions.	All	The following measures can be considered to manage energy consumption: <ul style="list-style-type: none"> • Installation of low energy light bulbs. • Use of natural light during day time. • Solar heating systems. • Use of gas in kitchens. • Solar lights on runways if practicable. • Awareness training. 	Building Regulations	On-going throughout operational phase
Visual					
Establishment of footprint	Visual intrusion of facility	All	Landscaping around airport building.	N/A	On-going throughout operational phase
			Rehabilitation temporary disturbed areas.		

OPERATIONAL PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Fire management					
Bulk fuel storage Refuelling	Veld fires affecting adjacent properties and farming activities	Refuelling area	Firefighting equipment must be placed at strategic locations and serviced according to manufacturer's specifications.	Bylaws Hazardous Substance Act	On-going throughout operational phase
		Tank storage tank	Implement an emergency preparedness plan. Sufficient emergency water must be available on site for firefighting purposes.		
			Collaborate with adjacent farmers with regards to fire management.		
			Implement a Fire Break Management Procedure		
Safety and security					
Management of boundary fences	People gaining access to adjacent properties.	Adjacent properties	Implement a fence maintenance agreement with adjacent land owners, which stipulates the roles and responsibilities of the parties involved and how the maintenance of fences will be managed.	N/A	On-going throughout operational phase
Traffic					
Employees and passengers traveling to and from the airport	Increased traffic volumes through town (surfaced road).	N/A	The minimal impact (if detected) can be offset by minor slipway	N/A	On-going throughout operational phase
			improvements and improved road signs.		
Employees and passengers traveling to and from the airport	Safety (collisions) due to the increased peak traffic volumes - specifically proximity of the school.	N/A	Safety can be improved by upgrading road signs and paint markings.		
			Traffic calming measures are required including speed restriction.		
Employees and passengers traveling to and from the airport	An existing and increased safety risk due to dust.	N/A	The recommended action is the upgrading to a surfaced standard of the gravel road sections.		

OPERATIONAL PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/ MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Employees and passengers traveling to and from the airport	Possible negative impact on neighbouring farmers due to dust on grazing.	N/A	The recommended action is the upgrading to a surfaced standard of the gravel road sections.		

5.4 Decommissioning and Closure

DECOMMISSIONING AND CLOSURE PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
Soil					
Removal of infrastructure	Soil erosion	Infrastructure footprint	Appropriate sloping of areas to reflect natural landscape.	Rehabilitation Plan	Decommissioning phase
		Fence	Monitor site after closure and decommissioning for erosion problems		
Movement of vehicles	Affect soil characteristics and fertility/	Site footprint	Rip all compacted areas prior to seeding.		
General waste generation	Litter in adjacent areas Environmental pollution	Waste storage area	Store general waste in designated areas in marked containers.	National Environmental Management Waste Act	Decommissioning phase
			Littering must be prohibited.		
			Construction footprint and adjacent areas must be inspected regularly to detect and clean up any litter.		
			Dispose general waste at a licenced facility.		
Hazardous waste generation	Environmental pollution	Waste storage area	Store hazardous waste in designated areas in marked containers with containment in place.		
			Any spillages must be cleaned up appropriately.		
			Dispose hazardous waste at a licenced facility		
Biodiversity - Flora and flora					
Decommissioning of infrastructure	Impact on habitat	Site footprint	Clearly demarcate area for decommissioning	Rehabilitation Plan	Decommissioning phase
			Rehabilitate footprint with indigenous floral species.		
			Implement follow up and monitoring to ensure sustained vegetation growth.		
Surface Water Resources					
Decommissioning / removal of surface infrastructure	Sedimentation of wetlands *Proliferation of alien vegetation *Potential	Site footprint	Pollution prevention through infrastructure design, in order to prevent, eliminate and/or control potential pollution of soils, groundwater and surface water should be implemented	Rehabilitation Plan	Decommissioning phase
			Implement a monitoring programme to detect and prevent the pollution of soils, surface water and groundwater.		

DECOMMISSIONING AND CLOSURE PHASE					
ACTIVITIES/ASPECT	IMPACT	AREA	PROPOSED MITIGATION/MANAGEMENT MEASURES	COMPLIANCE WITH STANDARDS/ACTS	SCHEDULING
	indiscriminate disposal of rubble		Restrict any movement in undisturbed cryptic wetlands during decommissioning.		
Land use					
Closure and rehabilitation of facility.	Restoration of ecosystems Return land to predevelopment state.	Site footprint	Implement rehabilitation plan upon decommissioning.	Rehabilitation Plan	Decommissioning phase
Socio-economic					
Decommissioning	Job losses		Engage with employees timeously prior to closure.	Rehabilitation Plan	Decommissioning phase
			Investigate the reallocation of resources.		

6. MITIGATION RELATED TO NOISE MANAGEMENT

The facility's operational manual should include the following measures to minimise noise levels:

- Implement offset approaches from the west, to displace the noise footprint. This will be for operators to implement, based on aircraft operational procedures and approach design parameters.
- Implement offset departure surfaces for movements to the west i.e. accommodate early turnout options subject to aircraft performance parameters.
- Implement steeper approaches per aircraft capability. ICAO Annex 14 visual approaches for Code 3 VMC runways require an approach surface of 3,3 % but the design aircraft (ERJ 135/140) is capable of significantly higher approach angles, especially if lightly loaded, which it will be for the short sectors to Kolomela.
- Implement steeper departure surfaces than ICAO Annex 14 requirement of 2 % for Code 3. Again, ERJ is capable of 5 % dependent on loading and atmospheric conditions for specific movements.

7. MECHANISMS FOR MONITORING COMPLIANCE

7.1 Noise

As part of the Noise Management Plan of the Kolomela Mine, regular monitoring campaigns are already conducted at several NSRs to the east of Kolomela Mine, as shown in Figure 14. It is recommended that the environmental noise monitoring campaigns be expanded to include the NSRs most likely to be impacted by the airport (where monitoring is not currently conducted), including NSRs E ,G, H, I and P. The following procedure should be adopted for all noise surveys:

- Any surveys should be designed and conducted by a trained specialist.
- Sampling should be carried out using a Type 1 SLM that meets all appropriate IEC standards and is subject to annual calibration by an accredited laboratory.
- The acoustic sensitivity of the SLM should be tested with a portable acoustic calibrator before and after each sampling session.
- Samples sufficient for statistical analysis should be taken with the use of portable SLM's capable of logging data continuously over the time period. Samples representative of the day- and night-time acoustic environment should be taken.




- The following acoustic indices should be recorded and reported: LAeq (T), LAeq (T), statistical noise level LA90, LAFmin and LAFmax, octave band or 3rd octave band frequency spectra.
- The SLM should be located approximately 1.5 m above the ground and no closer than 3 m to any reflecting surface.
- Efforts should be made to ensure that measurements are not affected by the residual noise and extraneous influences, e.g. wind, electrical interference and any other non-acoustic interference, and that the instrument is operated under the conditions specified by the manufacturer. It is good practice to avoid conducting measurements when the wind speed is more than 5 m/s, while it is raining or when the ground is wet.
- A detailed log and record should be kept. Records should include site details, weather conditions during sampling and observations made regarding the acoustic environment of each site.

It is recommended that, during noise surveys conducted for the area, that at least one daytime measurements at NSRs G, I, K, L, O and P be scheduled to coincide with flights to and from the airport.

In addition to the above annual sampling campaigns, ad-hoc noise sampling campaigns should be conducted at NSRs locations if complaints are received.

Kolomela Airport

Proposed Noise Sampling Locations

-  Closest NSR Locations
-  Current Sampling Locations
-  Proposed Additional Sampling Locations

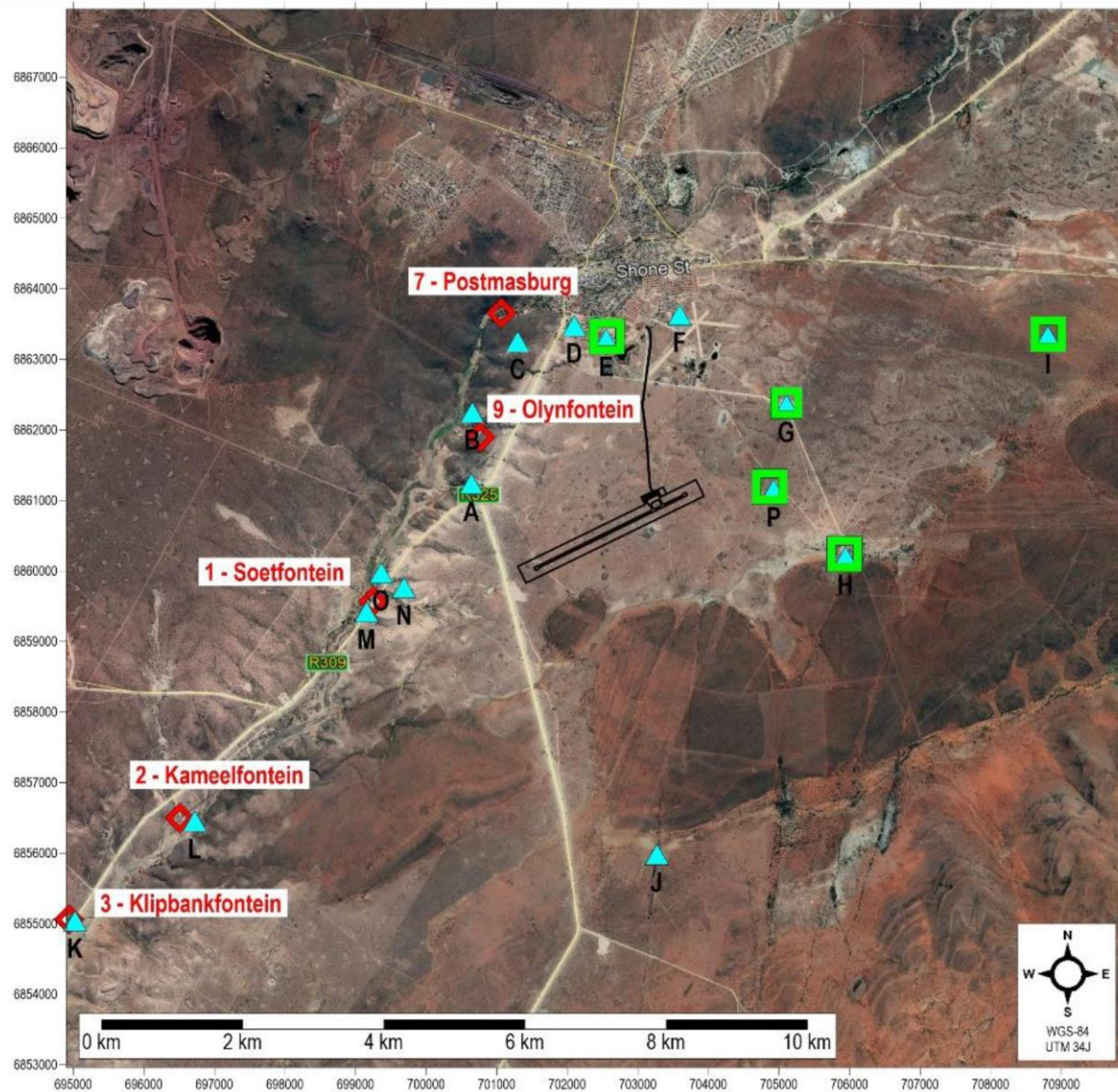


FIGURE 7-1: NOISE MONITORING PROGRAMME

7.2 Biodiversity

The following monitoring is recommended in terms of biodiversity management:

- Edge effects from the proposed activities must be monitored and mitigated when their impacts become apparent.
- Monitor AIP establishment around the development, including the access road, during all life cycle stages. Implement measures for the eradication of AIP when detected.
- Implement a Biomonitoring Programme for the remaining portions of the property.

7.3 Groundwater

Groundwater quality

Groundwater quality monitoring must be conducted at the boreholes/fountains indicated in the Figure below should be conducted on a biannual basis. Groundwater levels at the boreholes must be monitored on a quarterly basis. The groundwater abstracted from the on-site borehole must be monitored on a monthly basis, and the constituents must include hydrocarbons and organic content (i.e. e-coli).

TABLE 7-1: GROUNDWATER MONITORING POINTS

Borehole number	Latitude (S)	Longitude (E)	Type	Quality monitoring frequency	Level monitoring frequency
KAL01	-28,349735	23,09344	Borehole	Biannual	Quarterly
KAL02	-28,34937833	23,09302667	Borehole	Biannual	Quarterly
KAL03	-28,35190833	23,05444833	Borehole	Biannual	Quarterly
KAL04	-28,36034167	23,048615	Fountain	Biannual	N/A
KAL05	-28,36182833	23,04630333	Borehole	Biannual	Quarterly
KAL06	-28,36135833	23,04178167	Borehole	Biannual	Quarterly
KAL07	-28,36667	23,0667	Borehole	Biannual	Quarterly
Abstraction borehole	-28.361772°	23.066325°	Abstraction	Monthly	Monthly

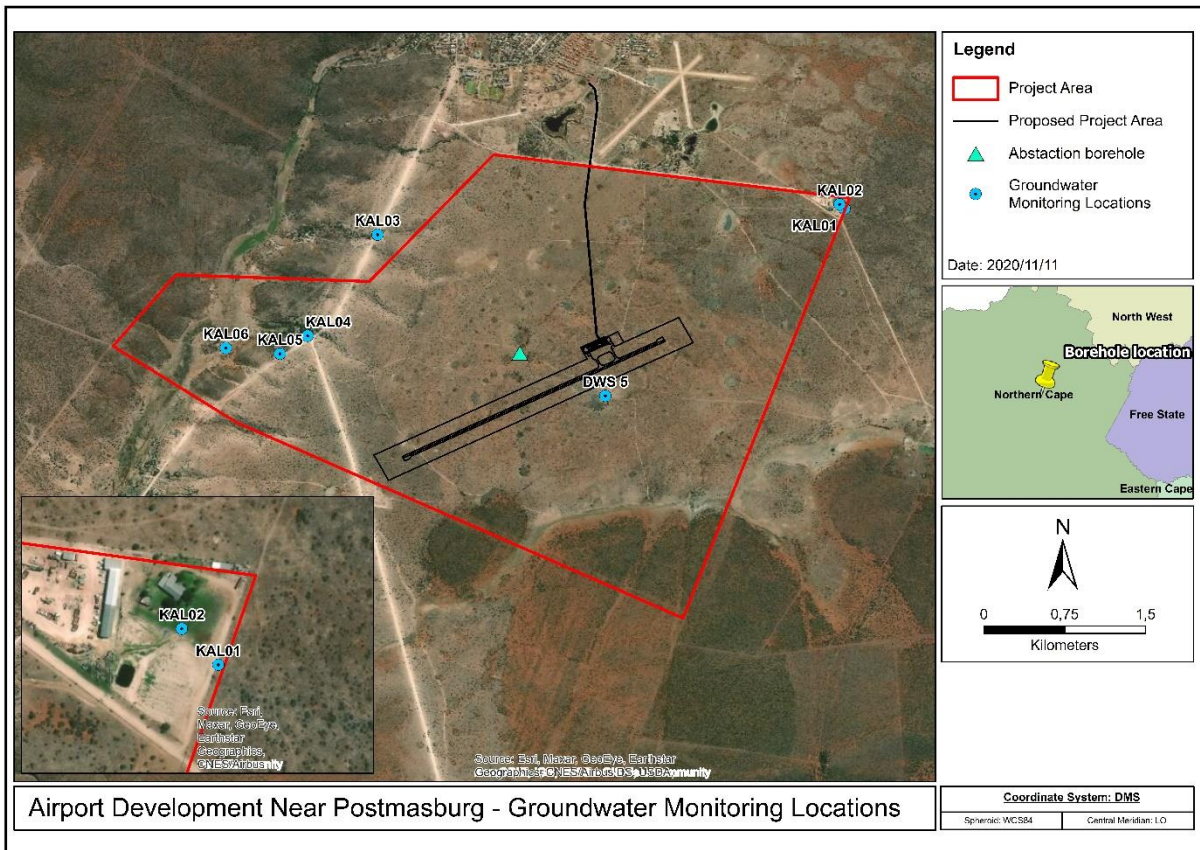


FIGURE 7-2: GROUNDWATER MONITORING LOCATIONS

7.4 Wetlands

Monitor the wetlands in the vicinity of the site not affected or partially affected. The monitoring must include the following:

- General condition.
- Erosion.
- Sedimentation.
- Alien and invasive plants.

8. SUBMISSION OF AUDIT REPORTS

Compliance Audits will be compiled in accordance with legislative requirements (as applicable at the time) including:

- (1) Regulation 34 of the EIA Regulations (GN. 982 of 4 December 2014, as amended);
- (2) Regulation 55 of the Minerals and Petroleum Resource Development Act.

The compliance audits will be submitted in accordance with the Environmental Authorisation.


9. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

None applicable.

10.UNDERTAKING

I, **Trevor Hallatt**, acting as independent environmental assessment practitioner hereby confirm:

- The correctness of the information provided in the reports;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from specialist reports, where relevant; and
- The acceptability of the project in relation to the finding of the assessment and the level of mitigation proposed.

Report Sign-Off			
Name	Designation	Signature	Date
Trevor Hallatt	EAP Senior Environmental Scientist Pr.Sci.Nat		2020/12/18