

Annex B

## Project Facilities and Infrastructure Summary Table

**Table 1.1 Summary table of construction phase project infrastructure**

Project component	Location	Specification/ Detail
<b>Construction Phase components</b>		
Bulk Requirements	Water: Off take from existing bulk supply pipeline between Pella and Aggeneys.	<ul style="list-style-type: none"> <li>• 2,000 m<sup>3</sup> of water per day required.</li> <li>• Sourced from the Orange River via an off take pipe of 5 km that extends from the Pella Water Board water pipeline, located to the north of the N14.</li> <li>• The off take pipe will be 550 -750 mm in diameter and will be constructed aboveground from the discharge point to the mine, except for the section that crosses the N14.</li> <li>• The off-take pipe covers an area of 0.5 hectares.</li> <li>• 1 reservoir located along this pipeline. It will be located near to the plant construction site.</li> <li>• The construction footprint of the pipeline is 1000 m<sup>2</sup></li> </ul>
	Power:	<ul style="list-style-type: none"> <li>• The construction phase is expected to require a temporary 4 MVA supply point on the existing Gamsberg 11kV line using 21 million kilowatts hour per year.</li> <li>• The electricity will be supplied to the construction site via a 5km overhead line and 4 x 500kVA miniature substations.</li> <li>• One of the substations will be in a fixed position at the construction camp and the other 3 will be movable units on the construction site. One miniature substation has a footprint of about 4 square meter.</li> </ul>
	Sewage: Located within the Contractors Camp	<ul style="list-style-type: none"> <li>• There will be one sewage plant constructed common for the construction and operation</li> </ul>
	Fuels and lubricants: Located within the contractors camp	Fuel: <ul style="list-style-type: none"> <li>• 50 m<sup>2</sup> bund area</li> <li>• Total storage of 100 m<sup>3</sup> per day</li> </ul> Lubricants: <ul style="list-style-type: none"> <li>• 10 m<sup>2</sup> bund area</li> <li>• Total storage of 20 m<sup>3</sup></li> </ul>
	Linear developments: Power lines, pipelines and access roads are depicted on the layout plan.	Please identify and provide all dimensions for any linear developments.
Construction Camp	Just on the South side of the plant.	A total area of 2 to 4 hectares, including the following facilities: <ul style="list-style-type: none"> <li>○ Workshop</li> <li>○ Office complex</li> <li>○ Truck yard and vehicle parking</li> <li>○ Washing and servicing of equipment</li> <li>○ Potential for storm-water capture and re-use</li> </ul>
Temporary Staff Housing	Located within the contractors camp	<ul style="list-style-type: none"> <li>• 5 000 construction jobs over a 30 month period</li> <li>• Total area of approx. 30 hectares</li> <li>• Total of 500 units</li> <li>• 0.2 Million kW-hours per annum</li> </ul>

		<ul style="list-style-type: none"> <li>Bulk water requirement of 250 m<sup>3</sup> of water/day</li> </ul>
Waste Management Facilities	Contractors' camp	<p>Two separate contractors employed to collect and dispose domestic and hazardous wastes.</p> <p><u>Domestic wastes:</u></p> <ul style="list-style-type: none"> <li>Paper and plastics will be recycling</li> <li>Disposed of at a registered landfill facility –Existing landfill facility at BMM will be used</li> <li>Industrial waste include steel, packaging material and material off-cuts</li> <li>Total area of 200 m<sup>2</sup></li> </ul> <p><u>Hazardous wastes:</u></p> <ul style="list-style-type: none"> <li>Mainly oil contaminated wastes</li> <li>Storage facility capacity – 0.5 hectares</li> <li>Disposed of at a registered hazardous landfill facility</li> <li>Collected and disposed of once in a month</li> <li>Total area of 100 m<sup>2</sup></li> </ul>

**Table 1.2** *Summary table of operational phase project infrastructure*

Project Component	Location	Specification/ Detail
<b>Operational Phase: On-site Mine Infrastructure</b>		
Open Pit Zinc Mine	On the Northern side of the Inselberg running from the West of the Kloof to South-West.	<p>Maximum pit dimensions:</p> <ul style="list-style-type: none"> <li>Total area of approx. 330 hectares</li> <li>Depth approx. 650 m</li> <li>Slope angles – 45 to 53 degrees</li> <li>Length, width, footprint of any buffer areas, access roads, piping, stormwater infrastructure, powerlines, fencing etc. (i.e. any associated infrastructure to the open pit).</li> </ul>
Crusher	Located on Northern side slope of the Inselberg. Approximately 70m from the top of the Inselberg.	<ul style="list-style-type: none"> <li>Total processing capacity of 10 000 000 tpa</li> <li>Total height of crusher 35 m above ground level</li> <li>Total area of 0.1 hectares</li> <li>Length, width, footprint of any buffer areas, access roads, piping, stormwater infrastructure, powerlines, fencing etc. (i.e. any associated infrastructure to the crusher).</li> </ul>
Concentrator Plant	Located between N-14 and the Inselberg.	<ul style="list-style-type: none"> <li>1 000 0000 ore treatment capacity</li> <li>40 m high</li> <li>A total number of 4 dust extraction vents that are approximately 30m high</li> <li>Total area of 45 hectares</li> <li>Length, width, footprint of any buffer areas, access roads, piping, powerlines, fencing etc. (i.e. any associated infrastructure to the plant).</li> </ul>
Tailings Dam	<ul style="list-style-type: none"> <li>Located approximately 2 km north of the Gamsberg Inselberg, along the northern</li> </ul>	<ul style="list-style-type: none"> <li>Final height of 70 m high</li> <li>Cover a total area of 280 hectares</li> <li>Total storage capacity of 132 million tonnes</li> </ul>

	border of the N14.	<ul style="list-style-type: none"> <li>Length, width, footprint of any buffer areas, access roads, dams, piping, stormwater infrastructure, powerlines, fencing etc. (i.e. any associated infrastructure to the tailings dam).</li> </ul>
Waste Rock Dump	<ul style="list-style-type: none"> <li>Located on the North side of the Inselberg.</li> </ul>	<ul style="list-style-type: none"> <li>Final capacity of 1.5 billion tonnes</li> <li>Total final area of 480 hectares</li> <li>Total final height of 215 m</li> <li>Waste rock slopes with an average slope angle of 35 degrees</li> <li>Length, width, footprint of any buffer areas, access roads, piping, stormwater infrastructure, powerlines, fencing etc. (i.e. any associated infrastructure to the waste rock dumps).</li> </ul>
Two Modular Sewage Plants	One Sewage treatment plant will be located near to the Concentrator mineral processing plant.	<ul style="list-style-type: none"> <li>Processing capacity of 600 m<sup>3</sup> per day</li> <li>It will service an expected workforce of 2500 people</li> <li>Generate 480 m<sup>3</sup> of treated effluent per day</li> <li>Treated effluent will be used for dust suppression and plantation</li> <li>Produce 1500 tons of sludge per month</li> <li>Sludge will be used in the rehabilitation purposes</li> <li>Length and width of any buffer areas, access roads, dams, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure to the sewage plant).</li> </ul>
	Expansion of existing Aggeneys wastewater treatment works.	<ul style="list-style-type: none"> <li>Total treatment capacity of 1000 m<sup>3</sup> per day</li> <li>Generate 800 m<sup>3</sup> of treated effluent</li> <li>Effluent will be used for plantation</li> <li>Generate 2500 MT of sludge per month.</li> <li>Sludge will be used in the rehabilitation purposes</li> <li>Length, width, footprint of any buffer areas, access roads, dams, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure to the sewage plant).</li> </ul>
Sewerage collection sump	Near the Concentrator Plant	<ul style="list-style-type: none"> <li>Expected to service mine work force of approximately 140 people</li> <li>Total capacity of 70 m<sup>3</sup> (7 days storage)</li> <li>Total area of 40 m<sup>2</sup></li> </ul>
Treated sewage effluent dam	Located near Sewage treatment plant	<ul style="list-style-type: none"> <li>7 day capacity</li> <li>HDPE lined pond</li> <li>Total depth of 5m</li> <li>Total height above ground is maximum 1.5 m</li> <li>Total storage capacity of 1200 m<sup>3</sup></li> <li>Total area of approx. 250 m<sup>2</sup></li> <li>Length and width of any buffer areas, access roads, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure to the effluent dam).</li> </ul>
Salvage Yard	Located within the Plant.	<ul style="list-style-type: none"> <li>Total footprint of 750 m<sup>2</sup></li> <li>Total storage capacity of 1800 m<sup>3</sup> for</li> </ul>

		<p>general wastes</p> <ul style="list-style-type: none"> <li>• Maximum height of 3 m</li> <li>• Length and width of any buffer areas, access roads, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure to the salvage yard).</li> </ul>
Domestic Waste Facility	Located within the Plant.	<ul style="list-style-type: none"> <li>• Total footprint of 100m<sup>2</sup></li> <li>• Total capacity of 150 m<sup>3</sup></li> <li>• Maximum height of 2 m</li> <li>• Waste to be disposed of at the designated site.</li> <li>• Length and width of any buffer areas, access roads, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure for this facility).</li> </ul>
Temporary Hazardous Waste Management Facility	Located within the Plant.	<ul style="list-style-type: none"> <li>• Storage capacity of 100 m<sup>3</sup></li> <li>• Total area of 150 m<sup>2</sup></li> <li>• Maximum height of 2 m</li> <li>• All hazardous waste collected will be transferred to the Vissershok hazardous waste disposal facility.</li> <li>• Length and width of any buffer areas, access roads, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure for this facility).</li> </ul>
Internal Haul and Mine Area Roads	All haul and mine area roads are depicted on the map.	<ul style="list-style-type: none"> <li>• 10 km of internal haul and mine area roads</li> <li>• All haul roads, including the pit access road, is 45 m wide gravel road</li> <li>• All mine roads would be 10 m wide</li> <li>• Slope angles of roads not more than 10 degrees</li> <li>• Gravel road, compacted with surface material</li> <li>• Total footprint area of internal haul and mine area roads 55 Ha</li> <li>• Surface material sourced from suitable overburden material and/or available burrow pits at Lemoenplaas</li> <li>• Length and width of any buffer areas, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure)</li> <li>• An existing approach road towards Western side of the Inselberg will be widened to 12 m width (including 2m shoulder on either side) as approach for start-up activities. Main &amp; permanent approach road will be constructed from Northern side, once the permission is granted.</li> </ul>
Plant Area Roads	Plant area roads are located on the map.	<ul style="list-style-type: none"> <li>• 4 km of total plant area road</li> <li>• 6 m and 8 m wide, depending on function</li> <li>• The construction footprint of the plant roads is maximum 12 m wide</li> <li>• Total area of off-road parking 5000 m<sup>2</sup></li> <li>• Access tracks for inspection and maintenance: Total area of 1000 m<sup>2</sup></li> </ul>

		<ul style="list-style-type: none"> <li>Length and width of any buffer areas, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure)</li> </ul>
Material Laydown and Storage Area	Located within the Plant.	<ul style="list-style-type: none"> <li>Total area of 2,500 m<sup>2</sup></li> </ul>
Equipment and Engineering Workshops	Workshop one located within the Plant.	<ul style="list-style-type: none"> <li>Total area of 1 Ha</li> <li>Length and width of any buffer areas, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure)</li> </ul>
	Workshop two (heavy duty workshop) located between the process plant and waste rock dump sites, along the plains.	<ul style="list-style-type: none"> <li>Total area of 1.5 Ha</li> <li>Length, width, footprint of any buffer areas, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure)</li> </ul>
Ore Stockpiles	In-pit open stockpile area (prior to primary crushing). Location reflected on layout plan.	<ul style="list-style-type: none"> <li>Total area of 1 Ha</li> <li>Maximum height of 4 m</li> <li>Length, width, footprint of any buffer areas, fencing etc. (i.e. any associated infrastructure)</li> </ul>
	Open stockpile area located within the Plant (prior to secondary crushing).	<ul style="list-style-type: none"> <li>There is no secondary crushing</li> </ul>
	Ore stockpiles (4 Nos – two ore, blended ore and one concentrate) area located within the Plant.	<ul style="list-style-type: none"> <li>Maximum height of 20 m</li> <li>Width of 54 m</li> <li>Length of 90 m for high grade, 72 m for low grade and 60 m for blended.</li> </ul>
	Zinc concentrate stockpile located within the Plant.	<ul style="list-style-type: none"> <li>Storage capacity of 7 days</li> <li>Total area of 0.25 Ha</li> <li>Maximum stockpile height of 12 m</li> <li>50 m in length</li> <li>Length, width, footprint of any buffer areas, fencing etc. (i.e. any associated infrastructure)</li> </ul>
Administrative Office Block	Located within the Plant.	<ul style="list-style-type: none"> <li>Total area of 1,500 m<sup>2</sup></li> <li>Maximum height of 12 m</li> <li>Expected to contain more than 100 employees, working 7 days a week</li> </ul>
Control Rooms	Control room 1: Located within the Plant.	<ul style="list-style-type: none"> <li>Total area of approximately 300 m<sup>2</sup></li> <li>Maximum height of 12 m</li> <li>Length, width, footprint of any buffer areas, piping, powerlines, stormwater infrastructure, fencing etc. (i.e. any associated infrastructure)</li> </ul>
Equipment Wash Area	Located within the Plant.	<ul style="list-style-type: none"> <li>Total area of 750 m<sup>2</sup></li> <li>45,000 m<sup>3</sup> of water will be required annually</li> <li>The water will be sourced from recycled water reservoirs only</li> <li>Length, width, footprint of any buffer areas, piping, powerlines, berms, fencing etc. (i.e. any associated infrastructure)</li> </ul>
Explosives Storage Area and Ammonium Nitrate and Emulsion Silos	Located on the North of Inselberg, in the plain area.	<ul style="list-style-type: none"> <li>Total area of 20 hectares</li> <li>Total height of 12m</li> <li>2 x 85 ton Emulsion silos and 2 x 50 ton silos</li> <li>Length, width, footprint of any buffer areas, piping, powerlines, berms, fencing etc. (i.e. any associated</li> </ul>

		infrastructure)
Parking Area	Located adjacent to the Plant.	<ul style="list-style-type: none"> <li>• Total area of 5,000 m<sup>2</sup></li> <li>• The material to tar the road will be sourced from waste rock / borrow pit</li> <li>• It will accommodate 300-350 vehicles</li> </ul>
Stormwater Management Infrastructure	Storm water dam to be constructed adjacent to and south of the Plant and along the western foothills of the Inselberg.	<ul style="list-style-type: none"> <li>• There will be one storm water dam</li> <li>• Total storage capacity will be 5000 m<sup>3</sup></li> <li>• Each dam cover a total area of 1000 m<sup>2</sup></li> <li>• Wall height above ground of 3 m (Partially below ground)</li> </ul>
Bulk Storage Tank Farms	Adjacent to the Plant as reflected on the layout plan.	<ul style="list-style-type: none"> <li>• Store 100 m<sup>3</sup> of diesel and petrol</li> <li>• Total area of 400 m<sup>2</sup> (fuel, oil and lubricants storage area)</li> <li>• 2 fuel supply points</li> </ul>
	Located adjacent to the mine workshop area (Fuel, oil & lubricant storage) as depicted on the layout plan.	<ul style="list-style-type: none"> <li>• Store 500 m<sup>3</sup> of diesel</li> <li>• Total area of 2,500 m<sup>2</sup></li> <li>• 6 re-fueling bays</li> <li>• 5,000 litres of lubricants</li> <li>• Total area of 1,000 m<sup>2</sup></li> </ul>
Medical clinic	Located within the Plant.	<ul style="list-style-type: none"> <li>• Total area of 80 m<sup>2</sup></li> <li>• Total height of 6 m</li> <li>• Result in production of hazardous wastes of 5-6 kg per month</li> </ul>
Internal Conveyor System	From the Primary crusher located at open pit to the northern face of the Inselberg up to the stockpiles	<ul style="list-style-type: none"> <li>• Closed system;</li> <li>• The conveyor will be 2 m wide and approximately 2.5 km long.</li> </ul>
Raw water Storage Dam	Located within the Plant.	<ul style="list-style-type: none"> <li>• 1 dam</li> <li>• Storage capacity of 25, 000 m<sup>3</sup></li> <li>• Wall height of 4.5 m</li> <li>• Source of water: Orange River, via the Pella Water Board water supply system.</li> </ul>
Process Water Dam	Located within the Plant.	<ul style="list-style-type: none"> <li>• A total number of 1 dam</li> <li>• Storage capacity of 25,000 m<sup>3</sup></li> <li>• Wall height of 4.5m</li> <li>• Sources of process water: recycled water from the plant, treated water and make-up water from raw water dam</li> </ul>
Dust Suppression Tank	Located in the plain area adjacent to the plant.	<ul style="list-style-type: none"> <li>• There will be one metallic/concrete tank</li> <li>• Storage capacity of 1,000m<sup>3</sup></li> <li>• Max height of 4.5m</li> <li>• Source of water: raw water dam</li> </ul>
Fire Control System	Water from raw water storage dam is pumped to a clean water tank. From there it will be pumped to the fire hydrant pipe network	<ul style="list-style-type: none"> <li>• There will be a tank with a storage capacity of 2000 m<sup>3</sup></li> <li>• Wall height of 5m</li> <li>• Source of water: raw water dam</li> </ul>
Return water dams	Located between the tailings dam and N14	<ul style="list-style-type: none"> <li>• Three pollution control dams to be constructed adjacent to the tailings facility.</li> <li>• A total cumulative storage capacity of 25 000 m<sup>3</sup>.</li> <li>• Three meters high dam wall and cover a total area of half hectare.</li> <li>• HDPE lined.</li> </ul>
Entrance and Exit Points	Main entrance/exit point will be Located along the southern border of the N14.	<ul style="list-style-type: none"> <li>• Main entrance/exit point: Total width of 45 m; Tar road.</li> <li>• Second entrance/exit: Total width of 15</li> </ul>

	Second entrance/exit point will be located along the western border of the inselberg, leading onto the existing Loop 10 gravel road.	<p>m; Compacted gravel road</p> <ul style="list-style-type: none"> <li>• Surface material sourced from existing borrow pit located north of the inselberg.</li> </ul>
Security and induction training areas	Near the main entrance, along the southern border of the N14.	<ul style="list-style-type: none"> <li>• Security single storey building, covering a total area of approximately 120 m<sup>2</sup></li> <li>• Induction training area covering a total area of approximately 500 m<sup>2</sup></li> </ul>
<b>Operational Phase: Off-site Mine Infrastructure</b>		
Power Infrastructure Including Sub-stations and Distribution Lines	Two sub-stations along the northern and southern border of the N14 and two connecting distribution lines.	<ul style="list-style-type: none"> <li>• The 220kV/66V substation will cover a total area of 2 hectares and reach a total height of 8 m</li> <li>• 66 kV/11kV sub-station</li> <li>• The 660kV/11KV substation will cover a total area of 1 hectares and reach a total height of 8 m</li> <li>• Two 66 kV distribution lines</li> <li>• The connecting distribution lines will extend 3 km and require 12 pylons, with a span length of 6m each.</li> <li>• The distribution lines will cover a total distance of 10 km and total footprint of 2 Ha.</li> </ul>
Operational Phase Housing	Located in the town of Aggeneys, between the northern and southern township.	<ul style="list-style-type: none"> <li>• An additional 1000 houses</li> <li>• Will cover a total area of 100 hectares</li> <li>• Require 12 Million kW-hour of power per annum</li> <li>• Generation of approximately 1 200 m<sup>3</sup> of additional sewage per day</li> <li>• Requires 1500 m<sup>3</sup> of water per day (sourced from Orange River)</li> </ul>
Transport Corridor:	Extends from proposed mine to Saldanha Bay Port, via two transport options.	<p><u>Option 1:</u></p> <ul style="list-style-type: none"> <li>• Truck via the N14 and N7 to Saldanha Bay Port.</li> <li>• No. of trucks required per day: Phase 1 = 30; Phase 2 = 30; Phase 3 = 45.</li> </ul> <p><u>Option 2:</u></p> <ul style="list-style-type: none"> <li>• Concentrate will be trucked 160 km along the Loop 10 Gravel Road to Loop 10 siding and then loaded onto the Sishen-Saldanha Railway Line during phases 2 and 3.</li> <li>• No. of trucks required per day: Phase 2 = 30; Phase 3 = 45.</li> </ul>
Loop 10	Infrastructure for the storage and handling of zinc concentrate will be required at Loop 10	<p>BMM has an existing offloading facility at Loop 10 siding. The existing storage shed at the siding covers a total area of 2000 m<sup>2</sup> and has a total height of 10 m. It is anticipated that additional facilities, located within the existing disturbed footprint will accommodate Phase 2 volumes of zinc concentrate generated by Gamsberg. However, due to the expected volumes at Phase 3 of production (500 000 Mtpa), additional infrastructure will be required at BMM's existing Loop 10 siding facility, which is as follows:</p> <ul style="list-style-type: none"> <li>• Truck unloading and wash station;</li> </ul>



		<ul style="list-style-type: none"><li>• Truck Loading Facilities and Equipment (324nos of 67t trucks per week);</li><li>• Truck Cue/Parking;</li><li>• Concentrate Storage Facility;</li><li>• Support Facilities/offices/lab;</li><li>• Rail Wagon Loading Facilities and Equipment; and</li><li>• Rail Yard/Storage.</li></ul>
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