

DECEMBER 2023

## KAREE TAILINGS STORAGE FACILITY (TSF) 4

### DETAILS OF TAILINGS STORAGE FACILITY

<b>Tailings Storage Facility (TSF) Name</b>	Karee Mine K4 Concentrator TSF 4
<b>Operation</b>	Marikana
<b>Operational Status</b>	Active
<b>Operating Segment</b>	RSA - PGM
<b>Location</b>	45km east of the town of Rustenburg in the North West province - please refer to Figure 1
<b>Latitude, Longitude (decimals)</b>	-25.6498, 27.4491
<b>Ore Source</b>	Underground
<b>Type of Storage Facility</b>	Impoundment (upstream development)
<b>Deposition Methodology</b>	Spigot, converting to Hybrid Paddock System during 2023
<b>Year of Commissioning</b>	2008
<b>Consequence Classification (GISTM, 2020)</b>	Very High
<b>Operating Contractor</b>	Fraser Alexander (Pty) Ltd (FAT)
<b>Engineer of Record (EoR)</b>	SLR Consulting (Pty) Ltd
<b>Current Maximum Height (m)</b>	17
<b>Final Maximum Height (m)</b>	36
<b>Maximum Storage Capacity (tons/month)</b>	220 000
<b>Total Volume Already Deposited (Mm<sup>3</sup>)</b>	9.6
<b>Life of TSF (year)</b>	2045 @1.3m/yr, 2043 @1.5m/yr



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## TECHNICAL ASPECTS:

### Design Criteria

GISTM and best practice guidelines including Australian National Committee on Large Dams (ANCOLD) (Guidelines on Tailings Dams, July 2019). Site specific design criteria were specified by the EoR. Details are included in the Design Basis Report (DBR).

### Stability Assessment and Mitigation Measures

A detailed stability assessment based on piezocone probing and laboratory test work was conducted in 2022. (SLR Project No: 720.19129.00042 Rev 0, 28 February 2023)

All the FoS are above the recommended limits and thus no mitigation measures were required

### Dam Breach Assessment

Assessment completed in 2022  
(SLR Project No: 720.19129.00011 Rev 1, February 2023)

### Area of Inundation

Has been identified by EoRs – please refer to Figure 2

### Summary of Human Exposure

Consequence classification has been based on Population at Risk (PAR). Communities have been identified and are being engaged through various means including Community Engagement Forums (CEF)

## DOCUMENTATION:

### Site Specific OMS Manual

Version 2022 available

Mandatory Code of Practice (MCOP) Document No: SS-ZA-PGM's-MCOP-CON-TLS-0101 is in place (dated September 2022)

### Design Basis Report (DBR)

Version 2022 available  
(SLR Project No: 720.19129.00033 Rev 1, February 2023)

### Environmental Management System

The Environmental Management System is ISO accredited (ISO 14001:2015)

The initial Environmental Management Programme (EMPr) is dated 2014.



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## **Surveillance:**

### **Surveillance Frequency**

Daily by the Operator and monthly reports of critical controls submitted to and reviewed by the EoR

### **Surveillance Technology/System**

K2Fly Decipher

### **Deformation Monitoring**

Interferometric Synthetic Aperture Radar (InSAR)

### **Phreatic Surface Levels & Pore Pressure Measurements**

Standpipe piezometers  
AquaSense Retrofit piezometers (IoT device)

## **RISK MANAGEMENT / EMERGENCY PREPAREDNESS:**

### **Risk Assessment**

Annual Risk Assessment (Bowtie) completed with no untoward risk identified

### **Risk Management**

Site specific OMS Manual in place  
Site specific Trigger Action Response Plans (TARPs) in place  
Critical controls established and implemented  
Operating contractor Technical and Operational Risk Assessment System (TORAS)

### **Site Specific Emergency Preparedness & Response Plans (EPRP)**

Version 2023 available

Annual emergency mock drill for a catastrophic TSF failure – undertaken on 15 June 2023 with SSW employees and contractors.

Environmental emergency preparedness is managed on site according to ISO14001: 2015.

## **CLOSURE & POST CLOSURE**

### **Closure Planning**

In place - report prepared by Golder Associates  
(Golder Reference: 20141966-340280-9, June 2021)

### **Closure Costing**

Adequate financial capacity in place  
Financials prepared by Golder Associates  
(Golder Reference: 21467970-349390-1, December 2021)

### **Asset Insurance Cover**

In place – July 2023 to June 2024



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## Independent Reviews:

### Independent Tailings Review Board (ITRB)

12 July 2022 with no material concerns identified

### Future ITRB Review

2025

### Performance Reviews

Annual and quarterly reports and inspections completed by EoR  
(SLR Project No: 720.19129.00033 Rev 0, March 2023)

### Dam Safety Review (DSR)

Carried out by an independent third party in 2020. All recommendations at the time have been addressed in the last 2 years.  
(KP Reference: RI301-00877/02 Rev B, 26 August 2022)

Next review scheduled for 2025



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**Figure 1:** Layout of Karee Tailings Dam Complex



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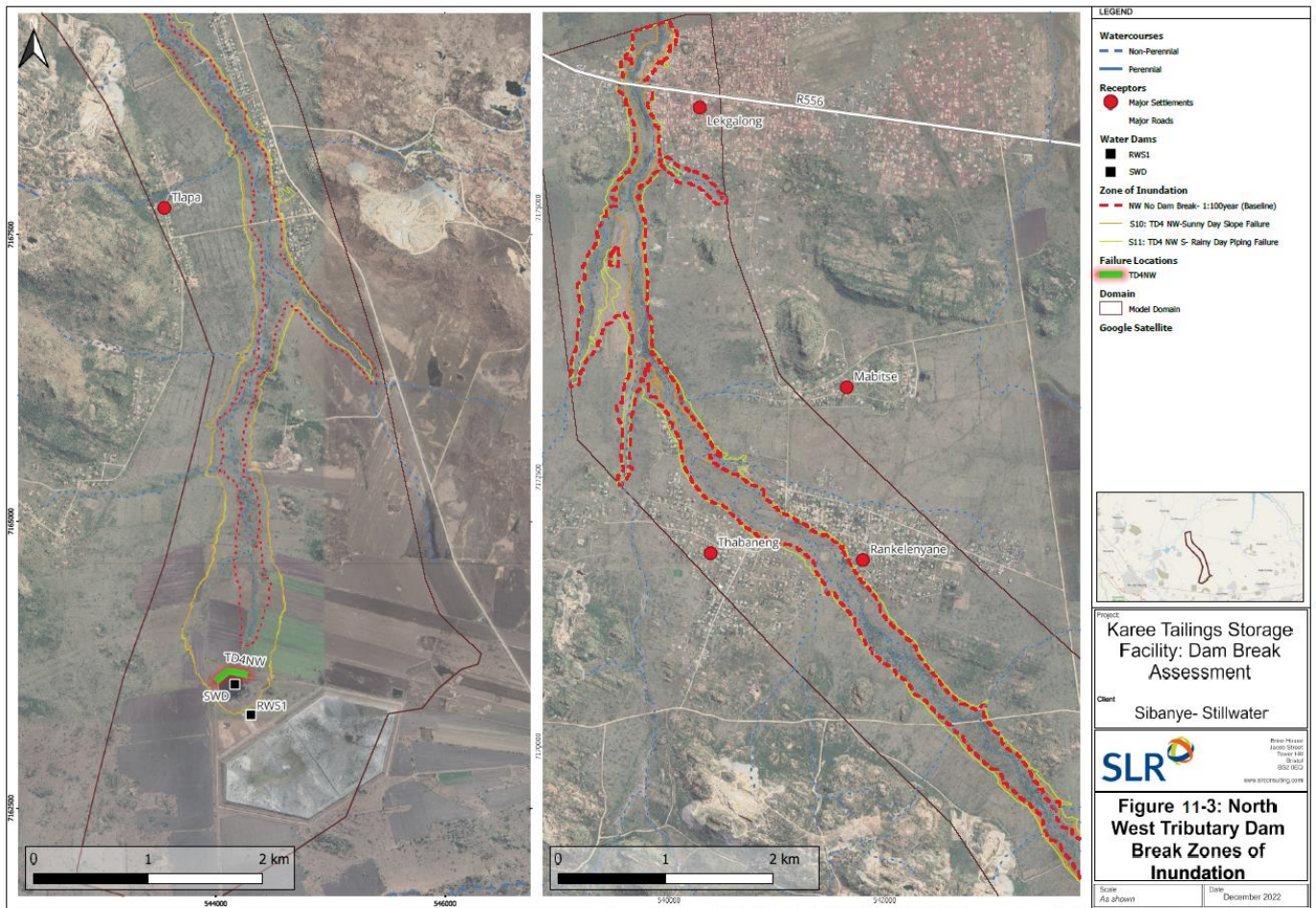
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**Figure 2:** Area of Inundation (North-West tributary)

