

JULY 2023

PAARDEKRAAL TAILINGS
STORAGE FACILITY (TSF)
COMPLEX

DETAILS OF TAILINGS STORAGE FACILITY

Tailings Storage Facility (TSF) Name	Paardekraal TSF Complex - Central, PK4 and PK5
Operation	Rustenburg
Operational Status	Active
Operating Segment	RSA - PGM
Location	Approximately 10km from the central town of Rustenburg - please refer to Figure 1
Latitude, Longitude (decimals)	Central: -25.6373, 27.3171 PK4: -25.6273, 27.3053 PK5: -25.6457, 27.3271
Ore Source	Underground
Type of Storage Facility	Impoundment (upstream development)
Deposition Methodology	Spigot with a possibility of converting to a hybrid paddock system in 2023
Year of Commissioning	Central: 1983 PK4: 2007 PK5: 2008
Consequence Classification (GISTM, 2020)	Extreme
Operating Contractor	Fraser Alexander (Pty) Ltd (FAT)
Engineer of Record (EoR)	Knight Piesold (Pty) Ltd (KP)
Current Maximum Height (m)	Central: 62 PK4: 23 PK5: 36
Final Maximum Height (m)	Central: 68 or 75 (extension) PK4: 61 PK5: 60
Maximum Storage Capacity (tons/month)	Central: 480 000 PK4: 200 000 PK5: 400 000
Total Volume Already Deposited (Mm³)	Central: 115.8 PK4: 15,7 PK5: 7.2

Life of TSF (year)

Central: 2026 @2.5m/year or 2031 (extension) @2.5m/year
 PK4: 2069 @2.5m/year
 PK5: 2069 @2.5m/year

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. (KP Reference: RIV301-00868/08, Rev 1, 1 March 2023) The assessment indicated unacceptable FoS requiring mitigation measures.

The seepage identified on northwest section of PK4 will be addressed by buttressing. The design is based on the geotechnical investigation and various other technical analysis.

The dormant portion of PK5 will be recommissioned in Q4 2023 to increase deposition capacity and resolve the seepage concerns on the division wall between the dormant area and PK Central.

Dam Breach Assessment

Assessment completed in 2022
 (KP Reference: PR301-00868/02 Rev 0, 10 May 2022)

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 2023 available
 Mandatory Code of Practice (MCOP) Reference No: SS-ZA-PGM's-MCOP-CON-TLS-0101 is in place (dated June 2019)



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Design Basis Report (DBR)

Version 2022 available
 (KP reference: RIV301-00868/03 Rev B, 28 February 2023)

Environmental Management System

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

The initial Environmental Management Programme (EMPr)
 is dated 2016.

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 14 June 2023 with SSW employees and
 contractors.

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



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CLOSURE & POST CLOSURE

Closure Planning

In place - report prepared by Golder Associates
 (Golder Reference: 20138269-341343-2, April 2021)

Closure Costing

Adequate financial capacity in place
 Financials prepared by Golder Associates
 (Golder Reference: 20138269_SS_RPM_CC_FINAL_incl.
 ARP_20210804)

Asset Insurance Cover

In place – July 2022 to June 2023 (currently undergoing renewal)

Independent Reviews:

Independent Tailings Review Board (ITRB)

19 October 2021 with no material concerns identified

Future ITRB Review

2024

Performance Reviews

Annual and quarterly reports and inspections completed by EoR
 (KP Reference: RIV301-00868/11 Rev 0, 11 May 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: RI301-00868/01 Rev B, April 2020)

Next review scheduled for 2024



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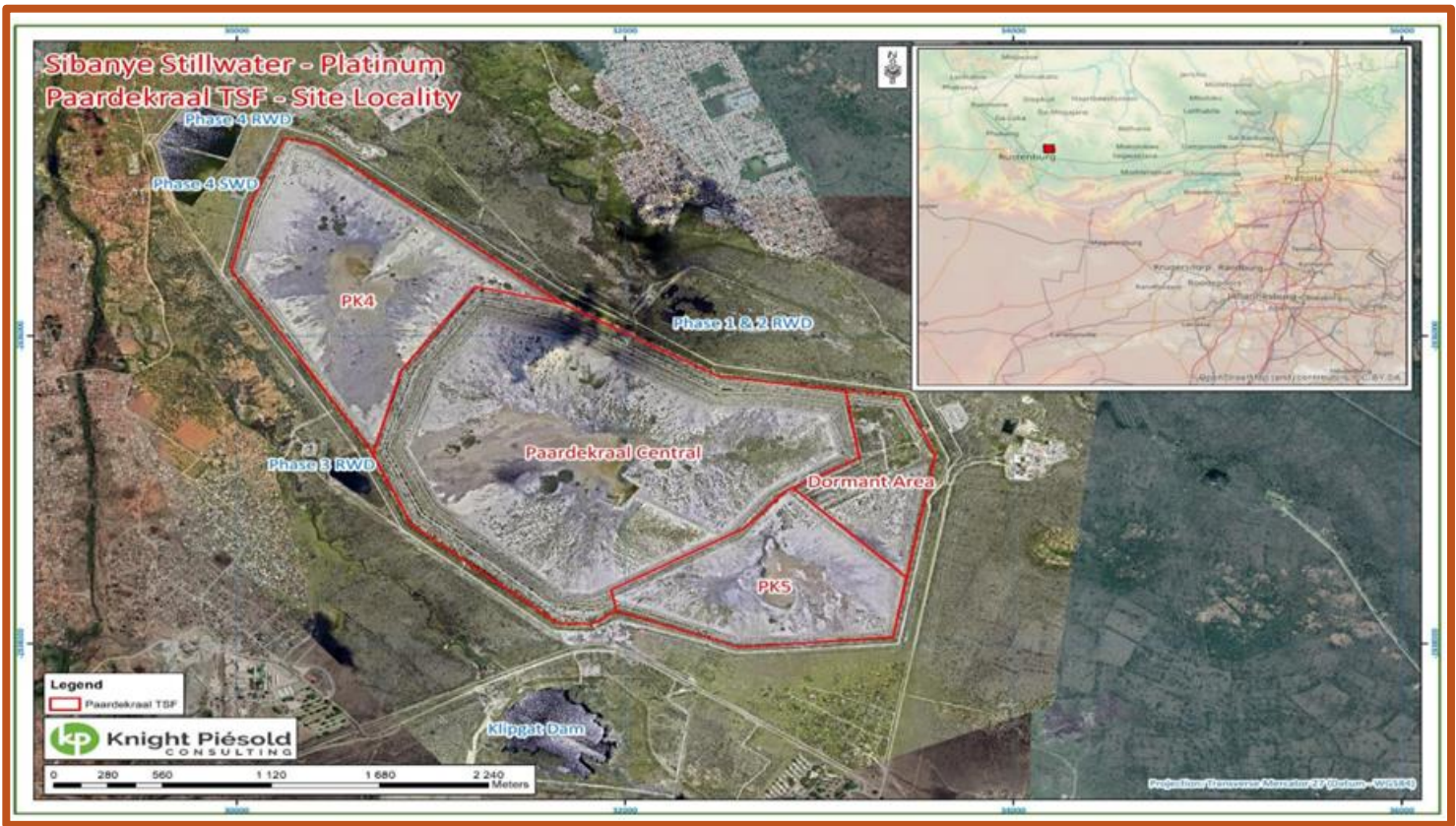


Figure 1: Layout of Paardekraal Dam Complex



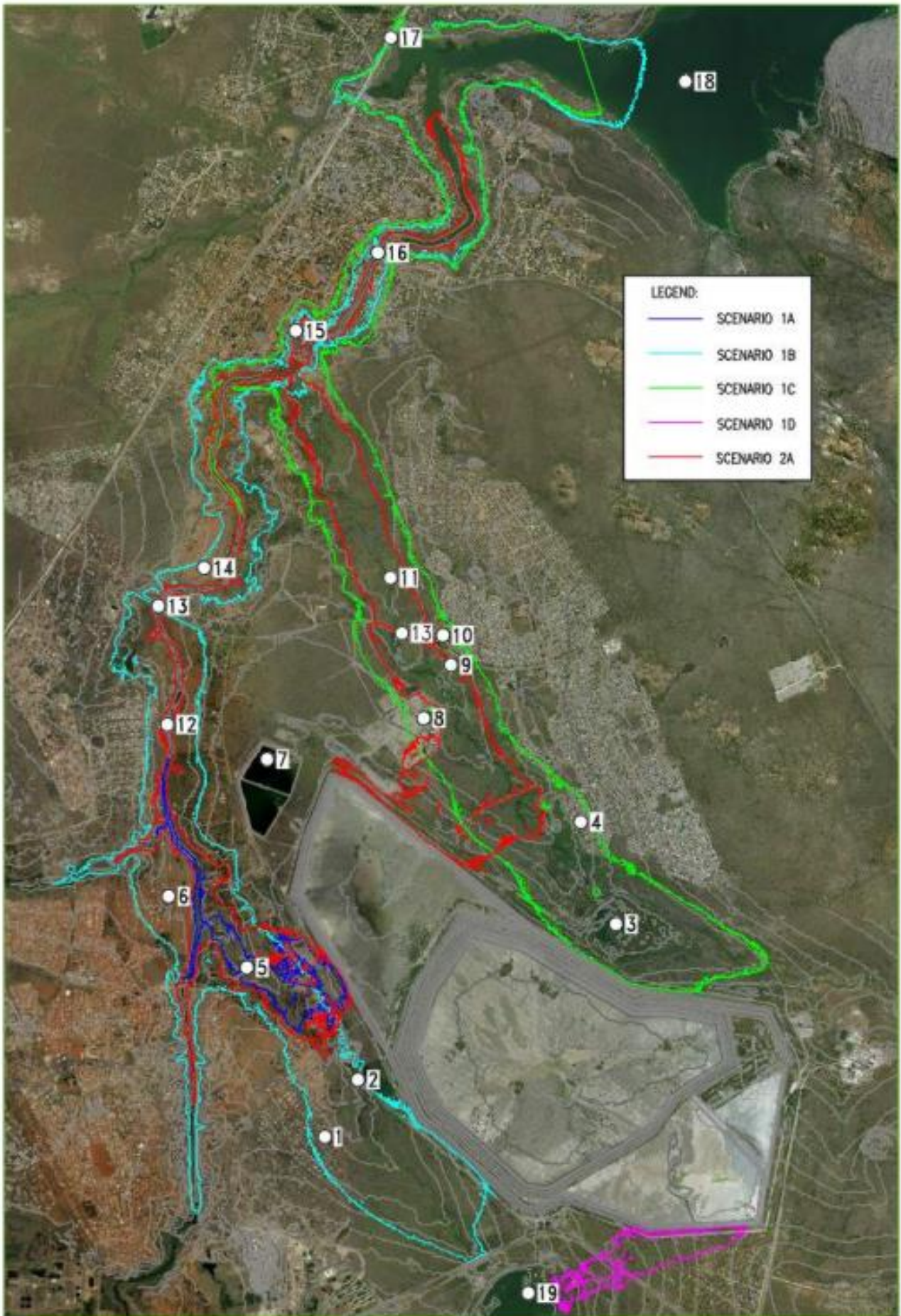


Figure 2: Consolidated view of the sunny-day failure scenario inundation boundaries