

DECEMBER 2023

## K1, K2 and K150 TAILINGS STORAGE FACILITY (TSF)

### DETAILS OF TAILINGS STORAGE FACILITY

<b>Tailings Storage Facility (TSF) Name</b>	K1 TSF, K2 TSF and K150 TSF
<b>Operation</b>	Kroondal Operations (SSKO) - K1 and K2 Concentrators
<b>Operational Status</b>	Active
<b>Operating Segment</b>	RSA - PGM
<b>Location</b>	5 km west of the town of Rustenburg situated on the Kroondal Farm 304-JQ - please refer to Figure 1
<b>Latitude, Longitude (decimals)</b>	K1: -25.71306, 27.3296 K2: -25.71688, 27.3604 K150: -25.7164, 27.35163
<b>Ore Source</b>	Underground
<b>Type of Storage Facility</b>	Impoundment (upstream development)
<b>Deposition Methodology</b>	K1: Spigot K2: Spigot K150: Cyclone
<b>Year of Commissioning</b>	K1: 1999 K2: 2005 K150: 2001
<b>Consequence Classification (GISTM, 2020)</b>	K1: Extreme K2: Extreme K150: Extreme
<b>Operating Contractor</b>	EnviroServ Waste Management (Pty) Ltd
<b>Engineer of Record (EoR)</b>	Knight Piesold (Pty) Ltd (KP)
<b>Total Volume Already Deposited (Mm<sup>3</sup>)</b>	K1: 8,1 K2: 14,7 K150: 14.0
<b>Current Maximum Height (m)</b>	K1: 38 K2: 70 K150: 60



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### Final Maximum Height (m)

K1: 46,5  
K2: 77,5  
K150: 69

### Maximum Storage Capacity (tons/month)

K1: 28 000  
K2: 86 000  
K150: 86 000

### Life of TSF (year)

K1: 2028 @ 2m/year  
K2: 2026 @ 2m/year  
K150: 2026 @ 3,7m/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 limited laboratory results was conducted in 2023.  
(KP reference.: 301-00851/09 Rev 0, July 2023).

All the FoS are above the recommended limits and thus no mitigation measures were required. This assessment will be refined based on laboratory testing results and shear vanes test results once they become available in Q1 2024

K2 TSF – extension of the existing buttress will be assessed to manage the adjacent seepage

### Dam Breach Assessment

Assessment completed in 2022  
(K1 - KP reference: PR301-00851/05 Rev 0, 17 February 2023 – DHR0077), (K2 & K150 - KP Reference: PR301-00851/05 Rev 0, 17 February 2023 – DHR0081)

### Area of Inundation

Has been identified by EoRs – please refer to Figures 2 to 5

### 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)



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## DOCUMENTATION:

### Site Specific OMS Manual

Version 2022 available  
Mandatory Code of Practice (MCOP) Reference No: ZA-PGM's-MCOP-CON-TLS-0101 is in place (dated June 2019)

### Design Basis Report (DBR)

Version 2022 available  
(KP Reference: SAND301-00851/07 Rev 0, 27 February 2023)

### Environmental Management System

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

The initial Environmental Management Programme (EMPr) is dated 2010. Numerous addendums have been submitted with the latest being in 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)  
Vibrating Wire Piezometers (VWP's) currently being installed

## RISK MANAGEMENT / EMERGENCY PREPAREDNESS:

### Risk Assessment

Annual Risk Assessment (Bowtie and Fault Event Tree) 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



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

Version 2023 available

Annual emergency mock drill for a catastrophic TSF failure – undertaken on 12 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: 20353611-341349-2, April 2021)

### Closure Costing

Adequate financial capacity in place  
Financials prepared by Golder Associates  
(Golder Reference: 21467925-349386-1, December 2021)

### Asset Insurance Cover

In place – July 2023 to June 2024

## Independent Reviews:

### Independent Tailings Review Board (ITRB)

11 July 2022 with no material concerns identified

### Future ITRB Review

2025

### Performance Reviews

Annual and quarterly reports and inspections completed by EoR  
(KP Reference: SAND301-00851/13 Rev 0, 20 April 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 3 years.  
(KP Reference: RI301-00851/01 Ref B, August 2019)

Next review scheduled for 2025



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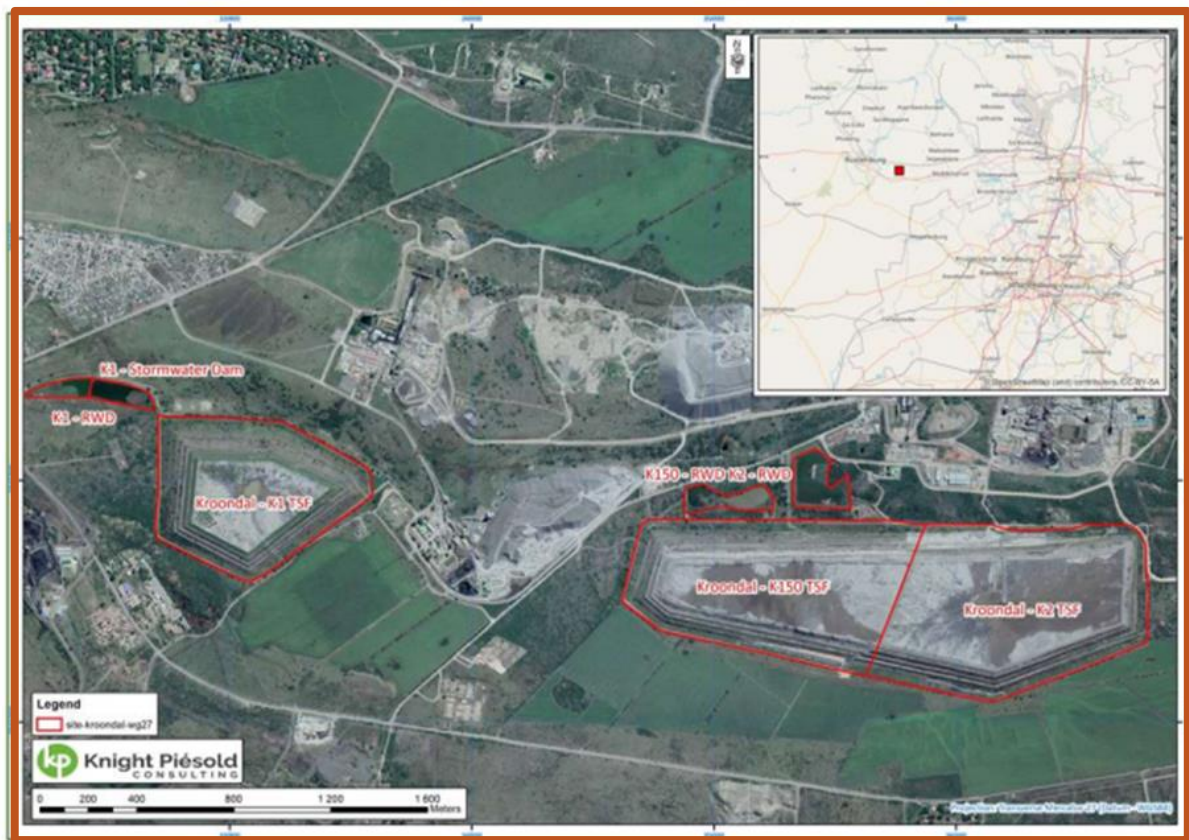


Figure 1: Layout of Kroondal Tailings Dam Complex













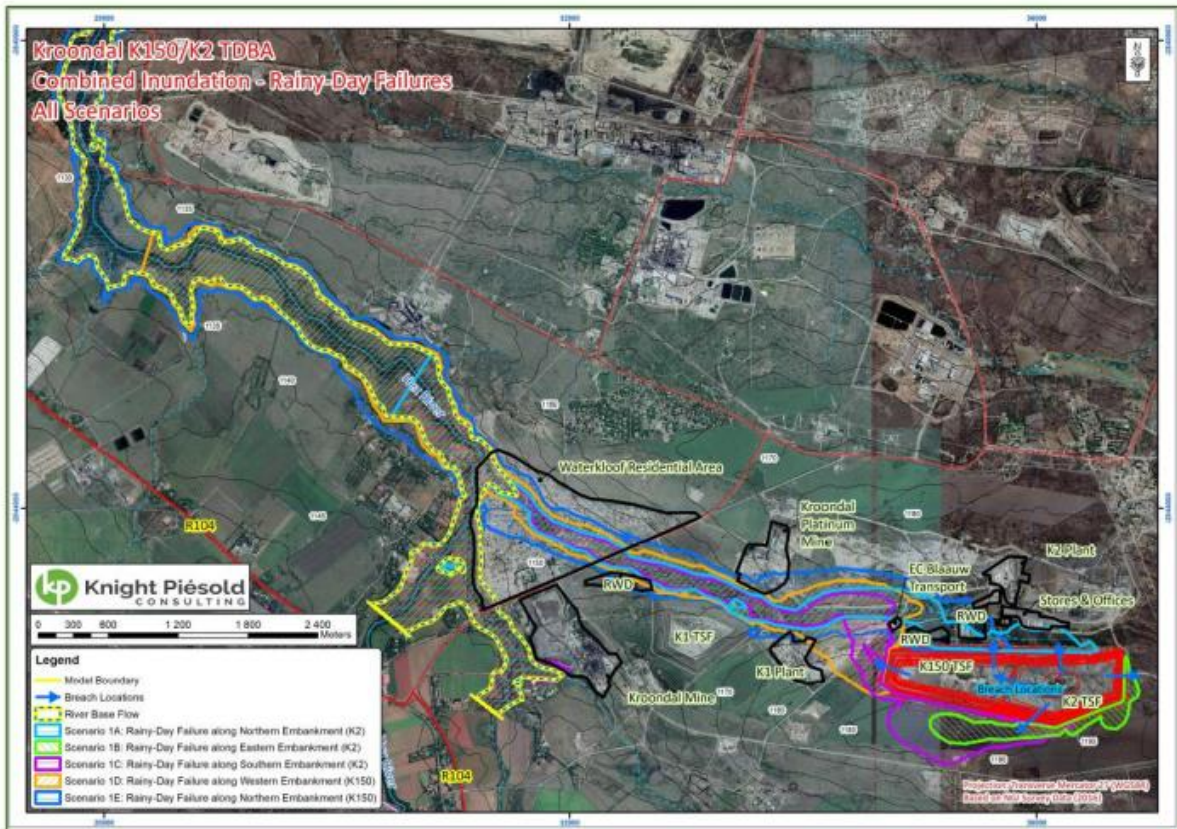


Figure 4: Consolidated view of the rainy-day failure scenario inundation boundaries (K2 and K150)

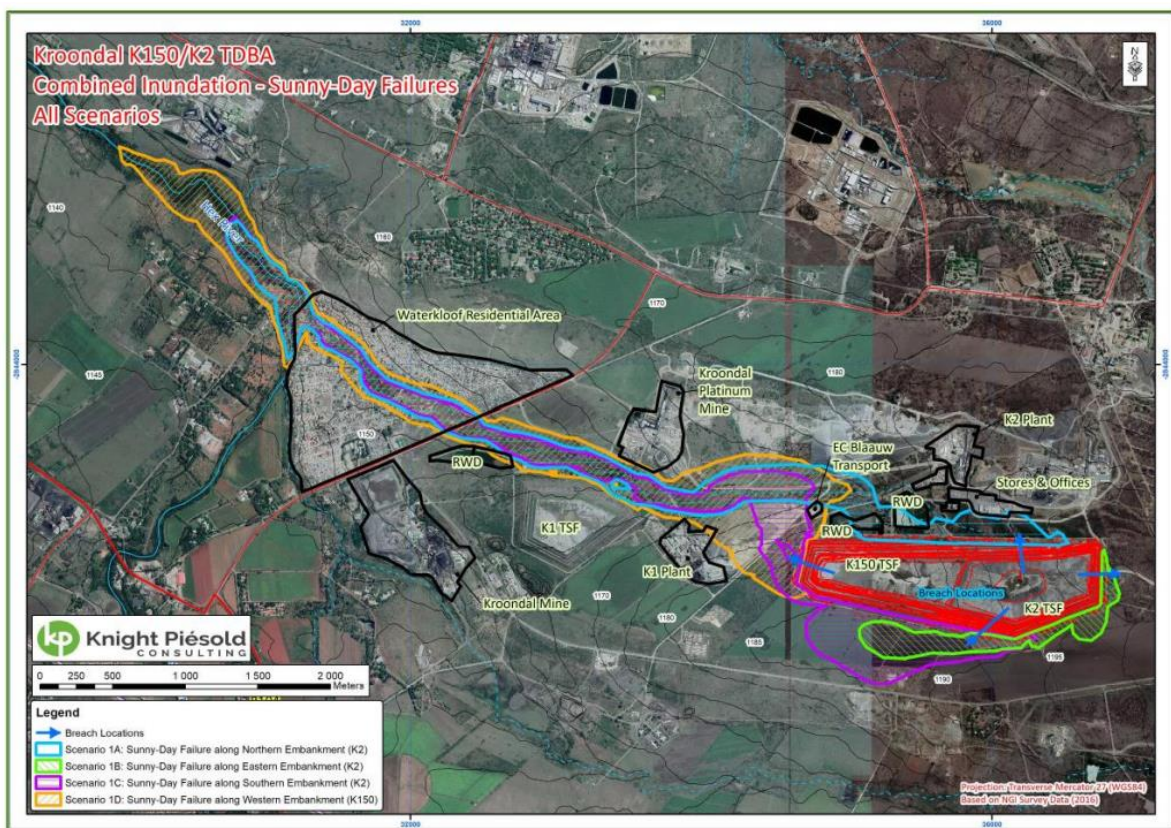


Figure 5: Consolidated view of the sunny-day failure scenario inundation boundaries (K2 and K150)