


External Water Use License Audit Report

Licensee	New Kleinfontein Gold Mine (Pty) Ltd
Report Type	External Audit Report
Water Use License Reference	Licence No: 08/C21D/ADJ/796



Site Assessment: 7 November 2023

Report Finalized: 20 November 2023

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DECLARATION OF INDEPENDENCE

I, Marli Burger (820903 0245 087) declare that I:

- am subcontracted as specialist consultant for the project described in this report
- am committed to a balanced socio-economic and environmental approach to environmental management and recognize the principles of sustainable resource utilization
- abide by the Code of Ethics of the S.A. Council for Natural Scientific Professions
- abide by the Code of Ethics of the Environmental Assessment Practitioners Association of South Africa
- have no financial interest in the proposed development other than remuneration for work performed
- have or will not have any vested or conflicting interests in the proposed development
- undertake to disclose to the project manager and client as well as the competent authority any material information regarding impacts, mitigation measures, non-compliance with the relevant authorizations and any other duty or function required in terms of the National Environmental Management Act (Act 107 of 1998), the Environmental Impact Assessment Regulations, 2014 (as amended 2017), the National Water Act (Act 36 of 1998) and relevant regulations and guidelines.



Marli Burger
SACNASP Reg. No: 115534
EAPASA Reg. No: 220/2019

DISCLAIMER

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ACRONYMS:

BEE	Black Economic Empowerment
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DWAF	Department of Water Affairs and Forestry (now known as DWS)
DWS	Department of Water and Sanitation
EA	Environmental Authorisations
EE	Employment Equity
EIS	Ecological Importance and Sensitivity
ELU	Existing Lawful Use
EMPr	Environmental Management Programme report

GA	General Authorisation
GNR	Government Notice Regulation
HRD	Human Resources Development
HSEC	Health, Safety, Environment and Community
I&AP	Interested and Affected Parties
IWWMP	Integrated Water and Waste Management Plan
LOM	Life of Mine
MAE	Mean Annual Evaporation
mamsl	meters above mean sea level
MAP	Mean Annual Precipitation
MAR	Mean Annual Run-off
mbgl	meters below ground level
ML	Megalitre
MPRDA	Mining and Petroleum Resources Development Act (Act No. 28 of 2002)
MQA	Mining Qualifications Authority
MSDS	Material Safety Data Sheet
mtpa	Megatonnes per annum
NEM;WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NGO	Non-Governmental Organisation
NQF	National Qualifications Framework
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWRS	National Water Resource Strategy
PCD	Pollution Control Dam
PES	Present Ecological State
PPE	Personal Protective Equipment
ROD	Record of Decision
ROM	Run of Mine
RQO	Resource Quality Objectives
RSIP	Rehabilitation Strategy and Implementation Programme
RWD	Return Water Dam
SACNASP	South African Council of Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SAWIC	South African Waste Information Centre
SHE	Safety, Health and Environment
SLP	Social and Labour Plan
SWMP	Storm Water Management Plan
tpa	Tonnes per annum
TSF	Tailings Storage Facility
TWQR	Target Water Quality Range
WBD	Water Balance Diagram
WC/WDM	Water Conservation and Water Demand Management
WMA	Water Management Area
WML	Waste Management Licence
WUA	Water Use Authorisation
WUL	Water Use License
WULA	Water Use License Application
WWTWs	Wastewater Treatment Works

1. Introduction

1.1. Scope of work

AquaStrat Solutions Pty Ltd was appointed to conduct the 2023 External Water Use License (WUL) audit on the Remaining Extent of the Farm Cloverfield 75 IR, as per conditions of the **WUL 08/C21D/ADJ/796**.

The frequency of this audit is indicated in the abovementioned license as **annually**, and is intended to guide the license holder by verifying compliance with the license conditions. This report is circulated to the Department of Water and Sanitation (DWS) for record purposes and must be kept on site in the WUL file for purposes of auditing by the DWS.

1.2. Project Background

- a. License issued: 04-01-2011
- b. Amendments issued: 24-04-2012
- c. Amendments submitted: April 2011; August 2013; October 2019 & Sept 2022
- d. Validity: 04-01-2021
- e. Specific Monitoring implemented in 2021:
 - i. Monthly BH levels
 - ii. Daily Plant flow meter readings
 - iii. Monthly BH WQ
 - iv. Monthly Surface WQ
 - v. Bi-annual IHAS & SASS
 - vi. Quarterly toxicity testing
 - vii. Monthly TSF deposition, freeboard, stability



Figure 1: Layout of the New Kleinfontein Gold mine (2022 IWWMP).

1.3. The Auditing Process

1.3.1. Audit approach

This audit is for the period of November 2022 – October 2023 and does not include assessment of historical requirements of conditions, such as submissions that were required within 6 months of issuance of the WUL.

External audits aim to identify non-compliances with license conditions. Any discrepancies between the license conditions and physical conditions on site, in supporting documentation, or in specialist reports, are identified and reported on for purposes of record keeping for the DWS audit. If license conditions have been met, and additional actions are required for the sustainable use and protection of the aquatic ecosystem or resource, these actions will be reported on and brought to the licensee's attention. It is recommended that the internal audit take place annually 6 months following the annual external audit to ensure compliance is checked every 6 months by either the internal- or external auditor.

1.3.2. Audit Assessment Categories

In order to provide clarity on non-compliance of specific conditions and actions required, the DWS has advised against the use of “partial compliance” as an auditing category.

An additional auditing category included for this WUL audit encompasses the consideration of the latest WUL Amendment Application, submitted in October 2019 by Prime Resources (additional uses listed in Table 1), as well as the updated IWWMP of September 2022 with newly added Watercourse Rehabilitation Report, Hydropedology Assessment and Landscape plan as annexures to the WUL Amendment Application. The 2012 WUL includes S.21 (a), (g) and (j) water uses and the 2019 amendment, and the 2022 IWWMP, includes the updated volumes for the water uses of the 2012 WUL and additionally includes S.21 (c) & (i) and (f) water uses.

Table 1. Water Uses included in the Amendment Application (from IWWMP 2022)

Section 21	Description	Project reference
Section 21(a)	Taking of water from a water resource	<ul style="list-style-type: none"> Use of 572 485 m³/annum of abstracted groundwater for gold processing Use of 182 500 m³/annum for potable requirements
Section 21(c) and 21(i)	Impeding the flow of water in a watercourse / Altering the characteristics of a watercourse	Activities occurring within the regulated area of a wetland: <ul style="list-style-type: none"> Discharge point located within 500 m of a wetland Discharge pipeline located within 500 m of a wetland Underground mining within 500 m of the Blesbokspruit Underground mining within 500 m of the Blesbokspruit tributary (Cowles Stream) Underground mining within 500 m of Cowles Dam Rehabilitation of artificial wetland within 500 m of a natural wetland
Section 21(f)	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit	<ul style="list-style-type: none"> Discharge of 7 897 915 m³/annum of treated excess mine water
Section 21(g)	Disposal / handling of waste or water containing waste that may potentially impact on a water resource	<ul style="list-style-type: none"> Waste rock dump – 114 803 m³/annum RWD1 - 0 m³/annum (emergency storage capacity) Disposing of water onto a TSF - 1 931 670 m³/annum Ore stockpile – 900 000 m³/annum Plant PCD – 18 357 m³/annum RWD2 – 1 119 944 m³/annum Dust suppression - 81 845 m³/annum Disposing of underground water into an evaporation dam – 8 820 400 m³/annum
Section 21(j)	Dewatering of mine workings for the safety of men, materials and to ensure the efficiency of mining	<ul style="list-style-type: none"> Dewatering of 9 134 710 m³/annum of groundwater

Criteria for inclusion in the additional auditing category includes:

- full implementation of amended condition
- the condition that is amended is dependent on determining environmental factors, i.e., water volumes removed from underground is based on specialist calculations and monitoring

Criteria for exclusion from the additional auditing category:

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- if the activity still requires recommendation by the Instream Use division of DWS as part of the WULA
- management has indicated that implementation will only take place once the amendment is authorised

Table 2. WUL Audit 2023 Assessment Categories

	Non-compliant: If activities (construction and/or rehabilitation) are incomplete, the specific WUL condition is marked as non-compliant and assigned to a non-compliance category as indicated in Table 3 below.
	Compliant with 2011/12 WUL: means 100% compliance with the specific license condition at the time the audit was conducted.
	Compliant with Amendment Application: means 100% compliance with the specific license condition at the time the audit was conducted, as per IWWMP 2022.
	Not applicable to the score of this audit report: conditions listed for applicant to take note.

1.3.3. Non-compliance analysis

This section provides an overview of the reasons behind the different non-compliances of 2023, and is aimed at mobilizing the recommendations by identification of common challenges to achieving compliance.

The following non-compliance categories relevant to the 2023 audit, were identified:

Table 3. Non-compliance categories for 2023 audit

Non-compliance category	Category description	Action required
A	Outstanding authorization of the amendment	Engagement with DWS on assessment continues
B	Life of mine is approximately 5 years	Condition should be re-considered in future amendment; implement minimum requirement recommended in this audit
C	Ongoing non-compliance requiring specialist input	Requires discussion with management for implementation
D	No reasonable explanation provided for non-compliance	Requires discussion with management for implementation

The actions required are discussed further in the Results section.

2. Audit findings

2.1. Summary

The total compliance with the 2011/12 WUL was 69%, which excludes conditions that have historically been complied with. The latter is categorized as not being relevant to 2023 audit score and is not included in the totals.

If the conditions that meet the criteria for inclusion in the additional auditing category as mentioned in the “Audit Assessment Categories” (Section 1.3.2) are considered, i.e., inclusion of the amendment application conditions, the overall compliance score is elevated to 73%.


The following representatives participated in the collection of information for the WUL audit:

Athabile Mrubata; New Kleinfontein Modder East Mine – Environmental Officer

Khensani Mhlanga; New Kleinfontein Modder East Mine – Environmental Officer

2.2. Summary of action steps required

- Verify groundwater volume used in mining process, as volume indicated in the underground water balance is higher than volume applied for in the amendment application
- Verify sludge disposal volumes, as the volume in the IWWMP 2022 was exceeded already in the period Jan – Sept 2023.
- Confirm the bund capacity of the fuel storage facility at the workshop.
- Old vehicles/machinery on site must be provided with drip trays.
- Implement groundwater discharge through pipeline and treatment wetland as soon as approval is granted by the DWS.
- Implement SWMP where not currently implemented
- Flow meter/s monitoring the discharge of groundwater into the environment must be calibrated to ensure accurate monitoring of volumes.
- Records of discharge of TSF water to the RWD must be kept
- RSIP to be updated with latest Watercourse Rehabilitation plan info included
- Financial provisioning must be discussed with relevant specialists and implemented; long-term management of the TSF must be further investigated by the relevant specialists - start to plan on post-closure treatment requirements
- Line all wastewater containing dams that receive wastewater that exceed the LCT 0 limit. This includes RWD1, Evaporation Dam (which is indicated in the IWWMP as Emergency Containment Dam), and TSF paddocks (refer to Figure 1 in this report for localities of these facilities). The waste rock dump is classified as a Type 3 waste that may be disposed of in accordance with the requirements for a GLB+ landfill as specified in Chapter 8 of the Minimum Requirements for Waste Disposal by Landfill (DWAF, 1998).

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- Implement temporary storage of groundwater discharge in Evaporation Dam, to be lined to serve as Emergency Dam.

2.3. Compliance Assessment

The table below includes all license conditions, compliance, comments and evidence references. License conditions were shortened in this document to only include essential terms and original phrasing of each condition should be referred to from the license document. The compliance column is categorised in sub-columns according to the assessment categories as included in Table 2 in this report and the non-compliance sub-column categorises non-compliances according to Table 3 in this report.

Non-compliant aspects of each condition is specified in the last column, Comments and Evidence. Recommended actions for each non-compliance is provided in Table 5 under the Results section in this report, as well as in the Comments and Evidence column below next to relevant license conditions as **REC. Green highlighted** items indicate proposed amendments that can be considered for the next amendment application.

Instances where partial compliance with a specific condition has been achieved, the overall compliance of the condition is indicated as a non-compliance, however the aspects that were implemented are indicated in the last column as "Implemented", followed by a brief description of the specific aspects implemented.

Compliant conditions are not described in detail under the Comments and Evidence column, however is motivated by means of reference to evidence attached as appendices corresponding with the licence condition number.


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Table 4: License conditions audit

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
Appendix I:1-10	1 – 2, 7 – 10. License Holder to take note: responsibility & adjustments/amendments. 3 - 4. Name/address/premises/legal status/subdivision/consolidation changes? 5. Water user association 6. Water use charges	-					1 – 2, 7 - 10. License Holder noted. 3 – 4. No name/detail changes 5. Blesbokspruit Forum attendance 6. Charges implemented	App I No 5 – Blesbokspruit Forum discussion points in EIAR App I No 6 – DWS charges mail and link
Appendix I:11	Internal audit	Annual					Completed and submitted.	App I No 11 – Internal audit 2022 App I No 11 – PoD of Internal Audit to DWS
Appendix I:12	External audit	Annual					Completed and submitted. This audit is the eleventh annual external audit.	App I No 12 – External audit 2022 App I No 12 – PoD of External Audit to DWS
Appendix I:13	Flow metering maintenance & calibration every 2 years	Bien			B		Partially implemented: Flow meters inside the plant are calibrated.	App I No 13 – Flow meter calibration certificate 2023

License condition no	Description of conditions	Frequency	Compliance with:				Evidence
			2011/12	2022	NCC	N/A	
						<p>•2011/12 = WUL</p> <p>•2022 = Amendment app</p> <p>•NCC = non-compl. category (Table 3)</p> <p>•N/A = na to score</p>	
						<p>Comments</p>	
						<p>Non-compliance: Calibration of meters outside the plant area has not taken place since installation due to the difficulty and cost of installing standby or backup meters while the original meters are sent for calibration.</p> <p>REC: Validation method recommended by technical staff:</p> <ul style="list-style-type: none"> (a) Divert abstraction to container/tank of predetermined size (b) Fill container/tank (c) Compare flow meter reading before and after filling container/tank and compare with container/tank size. (d) Record validation method on a data sheet as proof (e) If validation method reveals meter failure, obtain and install a spare meter, remove the faulty meter and send to manufacturer for calibration. <p>In the very least, the flow meter/s monitoring the discharge of groundwater into the environment must be calibrated to ensure accurate monitoring of volumes.</p>	
Appendix I:14	Incidents to be reported to DWS					<p>Minor incidents are recorded, major incidents are reported to DWS as per Emergency Incidents Reporting Procedure of Sept 2022 and incident log kept.</p>	<p>App I No 14 – Environmental Incidents log</p> <p>App III No 8.3 – Emergency Incidents Reporting Procedure Sept 2022.</p>
Appendix II:1 (amended WUL)	<p>Volume authorized 21(a): 46 154 m³/month</p> <p>IWWMP 2022: 572 485m³/annum at 47 707m³/month for gold processing</p> <p>182 500m³/annum for potable water</p>			D		<p>Flow meter records of Jan – Sept 2023 indicate that the total volume of groundwater abstracted for use in processing consists of:</p> <p>Service water Mine: 472762m³ over 9 months, i.e., average monthly = 52529m³</p> <p>Service water Plant: 114895m³ over 9 months, i.e., average monthly = 12766m³</p>	<p>App II No 1 – Underground water use record 2023 –</p>

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
							•2011/12 = WUL •2022 = Amendment app •NCC = non-compl. category (Table 3) •N/A = na to score	
							Dust control: 17076m ³ over 9 months, i.e., average monthly = 1897m ³ Fissure water: 4507703m ³ over 9 months, i.e., average monthly = 500956m ³ From the above it seems that the total volume for 2023 is non-compliant with the IWWMP 2022, total of 754 985m ³ /a, as the average annual abstraction (“service water mine”, “service water plant”, “dust control” and “fissure water”), calculated from the Jan – Sept 2023 records, is 777 769m ³ .	
Appendix II:2	Quantity may not be exceeded	.					Noted; implied by App II:1	
Appendix II:3	No guarantee of availability	.					Noted	
Appendix II:4	Volume may be reduced when reviewed	.					Noted	
Appendix II:5	Investigate technologies & implement devices to reduce or re-use/conserve water	Ad hoc					Water from the RWD is still being circulated for reuse in the processing plant (IWWMP, 2022).	
Appendix II:6	DWS not responsible for loss/shortage	.					Noted	

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
Appendix II:8	Awareness: water conservation & demand management	Unspecifi					Employees are updated on WUL related concerns by means of the monthly newsletter.	App II No 8 – Newsletter Jan - Oct 2023
Appendix III:1.1	Technical reports & designs of 2006 to implement: 1. Tech report Jul 2. Design report (TSF) 3. Surface water impact assessment 4. Groundwater Impact Assessment	Historical					Fraser-Alexander is still responsible for monitoring and maintenance of the TSF and Greenline Projects audits the implementation.	App III No 1.1 – TSF Designs
Appendix III:1.2	Construction of TSF & RWD constructed under professional Engineer supervision	Historical					Condition for the establishment of the dams, historically complied with.	App III No 1.1 – TSF Designs
Appendix III:1.3	Emergency spillway from RWD will only spill in events >1:50 year, 24hr flood event.	Unspecifi					RWD 2 has 15m wide emergency spillway; RWD 1 has 5m wide spillway with reno mattress. Both RWDs receive excess water from TSF as result of 1:50 year 24hr storm event. The RWDs discharge into the central channel.	App III No 1.3 - SWMP 2022
Appendix III:1.4	Approval of TSF and RWD construction	Histo					Condition for the establishment of the dams, historically complied with.	App III No 1.4 – TSF Expansion EIAR and EMPR
					A		New expansion of the TSF (TSF 2) has not been applied for in the 2022 amendment application.	
Appendix III:1.5	As-builts of TSF, RWD and Settling ponds submitted to DWS	Historical					Condition for the establishment of the dams, historically complied with.	

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
					A		New expansion of the TSF (TSF 2) has not been applied for in the 2022 amendment application.	
Appendix III:1.6	Disposal of waste slurry, operation & maintenance according to Report.						Fraser-Alexander is still responsible for monitoring and maintenance of the TSF, weekly inspections of valves and paddocks are done, and Greenline Projects audits the implementation. The WUL refers to 2006 EIR, however this condition is evaluated based on EMPr 2012 condition relating to Management of Mining Waste and Contaminated Water.	App III No 1.6 – EMPr 2012. App III No 1.6 – EMPr Audit report 2021
Appendix III:1.7	TSF & RWD must have min freeboard of 0.8m above full supply level; capacity for 1:50 year flood additional to operating level						Freeboard of the RWD2 is considered sufficient. TSF report of September 2023 indicates sufficient freeboard, ranging from 1.69 – 2.69 from Nov 2022 to Sept 2023. Seepage issues dealt with by underdrains (Jul 2023) and buttress project is on hold.	App III No 1.7 – TSF monitoring report Sept 2023
Appendix III:1.8	Correct sampling methods						Sampling methods implemented correctly and the Annual report 2022 – 2023 by Groundwater Square. Note: Lab accreditation was not included in report.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:2.1 (amended)	Volume authorized 21(g): 1 330 000m ³ /annum into TSF from CIL at max 110 000m ³ /month IWWMP 2022: 1 833 435m ³ /annum	Monthly			C		Sludge records are measured in tons and the conversion factor was confirmed to be based on the average of 46% solids. The current annual tonnage was indicated in the September 2023 TSF report from Jan – Sept 2023 was 1129389 tons, which is 2 455 193m ³ . This is higher than the volume of 1 931 670m ³ included in the IWWMP 2022.	
Appendix III:2.2	Dispose of wastewater from TSF to RWD: 114 084m ³ IWWMP 2022: 1 119 944m ³ /annum to RWD 2.				D		Flow meter records for effluent discharge at the workshop to ERWAT are available. No disposal records of water from the TSF to RWD were available for 2023.	App III No 2.2 – Workshop effluent to ERWAT

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix III:2.3 (amended)	RWD to be lined with 2mm HDPE geomembrane	.					Lining done as per designs. Lining is inspected every 90 days, i.e. quarterly.	App III No 1.2 – Design report RWD
Appendix III:2.4	Emergency spill dam for RWD spill: capacity of 163 506m ³	.					The currently unlined RWD (as per Figure 1 of this report) is indicated in the SWMP 2022 as having a capacity of 123 000m ³ and RWD 2 is lined and has a capacity of 112 000m ³ . RWD spillways discharge into central channel for discharge into the environment.	App III No 1.2 – Design report RWD
Appendix III:2.5 (amended)	Store water from underground for re-use in 2 settling dams collectively 17 820m ³ and in clear water dam with capacity of 12 960m ³ IWWMP 2022: Return water dam 2 (RWD2) – 1 119 944 m ³ /annum; Disposing of underground water into an evaporation dam - 9 101 085 m ³ /annum	.					The settling dams that are authorized are no longer in use. Updated volumes are included in the latest WUL Amendment Application and IWWMP 2022.	
Appendix III: 2.6 (amended)	Dispose of 365 416m ³ waste rock on dump IWWMP 2022: 114 803m ³ /annum	.					Volumes have reduced since the 2012 WUL, and disposal is therefore still within the limits of the 2011/12 WUL. Reduced volume was included in latest Amendment Application & IWWMP 2022 and Aug 2022 – Sept 2023 volume was 84 614.89 tons.	App III No 2.6 - Waste rock dump record
Appendix III:2.7	No other waste water disposed of in TSF and RWD	.					Sludge is disposed of in TSF and dirty stormwater into Evaporation dam and RWDs. Other waste is handled separately.	Verbal confirmation

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix III:2.8	Geohydrological concept model for linkage between TSF and Karoo/Syenite dolomitic aquifer	.					A Numerical Groundwater Flow and Transport Model was done, refer to 2018 report.	Available on request.
Appendix III:2.9 (amended)	TSF liner needs to prevent vertical infiltration to groundwater system regardless of Karoo/Syenite barrier.	.					<p>The TSF is a historic unlined facility. Tailings is deposited as a slurry with the TSF being constructed in an upstream day wall manner. The maximum acceptable rate of rise of the TSF is 2.5 m/year. At end of life the TSF will be 73 ha and 32 m high. The IWWMP indicate that the “existing solution trenches are to be upgraded with a dedicated buried pipeline and manhole system” (IWWMP, 2022), which the plant manager indicated will not be implemented.</p> <p>The legislative changes over time of liner requirements, as well as the fact that the current licensee inherited the liner system from the previous proprietors play a role in this requirement. Due to the volume of the current tailings, many conventional or pre-construction options may not be viable. This condition is therefore considered to be not applicable to this audit, as the licensee must commission a relevant specialist to investigate and confirm the specific technical requirements.</p> <p>At the moment contaminated groundwater from the TSF is mostly migrating vertical downward, mitigation measures and long-term scenarios are discussed in the Groundwater Report, 2018.</p> <p>REC: Discussion with appropriately qualified engineer to determine a way forward for future pollution prevention/minimization measures and/or closure planning. Keep in mind legislative requirements of GN 632 of 2015 as amended in 2018, as well as the related DWS Guideline for Pollution Control Barrier System Design, 2021.</p> <p>Amend: include specific mitigation measures following discussion between independent specialist and DWS specialist.</p>	App III No 1.5 – TSF 2 designs

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
Appendix III:2.10	Quantity of water disposed into settling dam not changed without authorisation	.					Noted	
Appendix III:3.1 (amended)	Table 3.1: Quality of water to be disposed:				C		<p>Implemented: Monitoring of groundwater is completed as required: parameters for mine water, groundwater and surface water are compared to relevant WUL limits, and the implications of this comparison (vs SANS guideline previously used) is summarized in the annual groundwater monitoring report.</p> <p>Non-compliance: The Annual WQ Monitoring report 2023 notes various exceedances with the WUL Compliance indicators with some BHs displaying improvement and some deteriorating in terms of Sulphate concentrations.</p> <p>REC: Groundwater quality concerns is expected to be partially addressed by discharging into the Evaporation dam and discharging via a pipeline through a treatment wetland (as soon as the WUL Amendment is approved).</p>	App III No 1.8 – Annual Surface & Ground WQ report July 2023
	Substance / parameter	Limit						
	pH	6.5 - 9						
	EC in mS/m	<70						
	TDS in mg/l	<450						
	Chlorides (Cl) in mg/l	150						
	Sulphate (SO ₄) in mg/l	<300						
	Sodium (Na) mg/l	100						
	Calcium (Ca) in mg/l	150						
	Nitrate (NO ₃) in mg/l	3						
	Magnesium (Mg) in mg/l	30						
	Potassium (K) in mg/l	1						
	Aluminium (Al) in mg/l	1						
	Arsenic (As) in mg/l	<0.05						
	Chromium (Cr) in mg/l	1						
Copper (Cu) in mg/l	0.2							
Iron (Fe) in mg/l	0.5							
Manganese (Mn) in mg/l	0.4							
Zinc (Zn) in mg/l	1	.						
Appendix III:3.1 (amended)	Line facilities with 3mm HDPE geomembrane	.			D		Implemented: The RWD2 and discharge channel from the Plant to the RWD2, as well as the PCD, are lined.	App III No 1.2 – Design report RWD

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
							Compliance with: •2011/12 = WUL •2022 = Amendment app •NCC = non-compl. category (Table 3) •N/A = na to score Comments	
							Non-compliance: The Emergency RWD, Evaporation dam and TSF are not lined (refer to Figure 1 for localities of the above facilities). REC: Investigate lining of facilities as per legislation and guideline referred to in App. III condition 3.1.	
Appendix III:4.1	Monitor WQ at: Table 4.1.1: Monitoring Points: Blesbokspruit-under N12 Eastvale Dam Alexander Dam-exit water Cowles Dam Blesbokspruit-downstream WWTP Blesbokspruit Bird Sanctuary	.					The average SO4 concentration for the full dataset in the Blesbokspruit, upstream and downstream from the Cowles Dam tributary, indicated a 28mg/L increase in SO4 concentration. The increase at the downstream point for the Mar'2023 sampling run was 54mg/L."	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:4.2	Surface & Groundwater Monitoring Programme implementation	.					Report provides sampling localities and WQ sampling is done for surface, mine and groundwater.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:4.3	Additional monitoring boreholes (quarterly monitoring): a) Below settling pond b) West of evaporation dam	Quarterly					Additional boreholes form part of the monitoring network and are indicated in the groundwater monitoring report.	App III No 1.8 – Annual Surface & Ground WQ report

		Table 4.1.2: Groundwater Monitoring Stations:						
		Site name	Description					
Appendix III:4.3	Existing	GW2-B1	situated east of Decline					
		GW2-B2	situated south of proposed dams/ponds/dumps					
		GW2-B3	situated central of proposed dams/ponds/dumps					
		GW2-B4	situated northeast of the site					
		Geol1857	situated south of the site, To be sampled at 20m and 100m depths.					
	Newly drilled	GW2-B5D	70m deep. At waste dump and Portal dewatering					
		GW2-B6	30 deep. Upstream of Tailings					
		GW2-B7	30 deep. Downstream of Tailings					
		GW2-B8	30m & 70m deep. Downstream of settling ponds and mine dewatering					
		GW2-B8D						
		GW2-B9	35m and 150m deep. South of Tailings Dam; also hydraulic properties of North Branch Dyke preferential flow and monitor mine dewatering					
		GW2-B9D						
	Newly drilled	GW2-B10D	To monitoring the dewatering impact as mining develops					
		GW2-BS1	Shallow holes around the Tailings Dam, Return Water Dam, Emergency Dam and as per the requirements / guidelines provided by the DWA					
		GW2-BS2						
		GW2-BS3						
		GW2-BS4						
		GW2-BS5						
		GW2-BS6						
		GW2-BS7						
GW2-BS8								
Mine Water	MW-1	Lined settling ponds						
	MW-2	Evaporation Dam						
	MW-4	Permanent Water supply (Rand water)						
	MW-5	Tailings Return Water Supply						
	MW-6	Plant storm water return Dam						
		ERWAT	Private/external user (water treatment works) east of site (sample from tank).					
	Farmhouse	Private/external user (farmer) east of site (sample from tank)						

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix III:4.4	18 months monthly monitoring for unlined RWD	Historical					Historical requirement.	
Appendix III:4.5	TSF monitoring boreholes	.					These form part of the monitoring network.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:4.6	Monitoring boreholes establishment	.					Condition complied with historically, refer to Umhlaba WUL audit 2020.	
Appendix III:4.7	Proof of quarterly submission of monitoring programme	Quarterly:					Proof of submissions of monitoring reports on quarterly basis and programme on an annual basis. REC: Amend: submissions to take place annually to simplify coordination of reporting to DWS.	App III No 4.7 PoS of Annual monitoring reports
Appendix III:4.8	Monitoring data quarterly submission	Quarterly:					Quarterly submission proof received. REC: Amend: submissions to take place bi-annually to simplify coordination of reporting to DWS.	App III No 4.8 – PoS for quarterly submissions 2023
Appendix III:4.9	If surface water contamination indicated: collection drains and/or abstraction boreholes to intercept	.			A		Non-compliance: exceedances were observed for the surface water sampling localities in the monitoring report. REC: The Amendment Application includes the proposed S.21(f) discharge of intercepted groundwater, reducing the contact time with pyrite- rich Black Reef areas; Amendment Application also includes underground water treatment facility with Cold Lime Softening treatment, as well as treatment wetland.	App III No 1.8 – Annual Surface & Ground WQ report

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix III:4.10	Alternative water source provided to water users if fitness for use impacted	.					The licensee is not aware of any impacts on other water users water sources and keeps a Complaints register, which would include this concern.	Verbal confirmation
Appendix III:4.11	Date, time & monitoring point recorded with analysis	.					Recorded on spreadsheets by specialist.	Verbal confirmation.
Appendix III:4.12	Monitoring points not changed without approval	.					Noted	
Appendix III:4.13	Monitor impact along preferential pathways for contaminant transport	.					The intermediate deep boreholes mostly displayed a mining influence. o The deep dolomite boreholes displayed intermittent mining-related SO4 impacts for 3 boreholes; Borehole GW2-B11D shows the greatest impact in terms of Nitrate (ERWAT irrigation impact), with lesser intermittent influences for the rest.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:4.14	Monitor direct impact of waste disposal	.					Monitoring of surface and groundwater, includes: GW2-B6 & GW2-B7: upstream and downstream of tailings. GW2-B9 & GW2-B9D: South of the tailings dam. GW2-BS1, GW2-BS2, GW2-BS3 & GW2-BS8: shallow holes around the tailings.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:4.15	Monitor impact on downstream groundwater users at monitoring points	.					Monitoring included Farmhouse monitoring point until it was discontinued; WUL criteria exceedances are monitored and recorded.	App III No 1.8 – Annual Surface & Ground WQ report

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
Appendix III:4.16	Provide updated monitoring programme: BH reference, location, coordinates, monitoring frequency and variables	.					Annual reports are submitted and includes the updated monitoring programme.	App III No 4.7 PoS of Annual monitoring reports
Appendix III:4.17	Acknowledged methods for borehole sampling and include the date, time, sampler and borehole number	.					Repeat of Appendix III:4.11. REC: Amend: Remove	
Appendix III:4.18	IHAS & SASS in summer & winter annually upstream and downstream	Biannually					Implemented biannually as required.	App III No 4.18 – Annual Biomonitoring, WQ and Toxicity report 2022
Appendix III:4.19	Toxicity tests on TSF monitoring boreholes quarterly and reported annually to DWS	Quarterly					Quarterly Toxicity tests are conducted and proof of submission to DWS was provided.	App III No 4.18 – Annual Biomonitoring, WQ and Toxicity report 2022 App III No 4.7 PoS of Annual monitoring reports App III No 4.19 – PoS of Quarterly Tox tests
Appendix III:4.20	Toxicity testing must be conducted quarterly on the wastewater stream from the tailings disposal compartments when returned back to the mine for use as process water.	Quarterly					Refer to 4.19 above. Map of sample localities was included in report.	

License condition no	Description of conditions	Frequency	Compliance with:				Evidence																																				
			2011/12	2022	NCC	N/A																																					
Appendix III:4.21	DEEEP to determine toxicity (acute and chronic on 3 taxonomic groups) of tailings discharge	.					Three taxonomic groups are tested as required, however only acute toxicity assessment is undertaken, and no chronic toxicity is not assessed. The DEEEP assessment is not included in the report.	App III No 4.18 – Annual Biomonitoring, WQ and Toxicity report 2022																																			
Appendix III:4.22	Analysis: SABS	.					Waterlab (WQ) and Golder Associates Research Lab (Tox testing) are SANAS accredited.	App III No 4.18 – Annual Biomonitoring, WQ and Toxicity report 2022																																			
Appendix III:4.23	Analysis methods not changed without approval	.					Analysis methods have not changed.																																				
Appendix III:5.1	Impact on Suikerbosrand River, Blesbokspruit and tributaries not to exceed in-stream RQOs:	.			C		Implemented: monitoring of impacts. Non-compliance: Limits exceeded at surface sample locations: the average SO4 concentration for the full dataset in the Blesbokspruit, upstream and downstream from the Cowles Dam tributary, indicated a 28mg/L increase in SO4 concentration. The increase at the downstream point for the Mar'2023 sampling run was 54mg/L. REC: Measures included in the Wetland rehabilitation plan, as well as improved waste water management as included in the IWWMP 2022, are expected to improve water quality conditions of the discharge water. Ongoing monitoring will show whether these measures are effective.	App III No 1.8 – Annual Surface & Ground WQ report																																			
	<table border="1"> <thead> <tr> <th>VARIABLE</th> <th>UNIT</th> <th>WATE</th> </tr> </thead> <tbody> <tr> <td>Sulphate (SO₄)</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Dissolved Oxygen saturation</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Sodium (Na)</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Ammonia (NH₃)</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Total Inorganic Nitrogen:</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Soluble phosphorus Ratio</td> <td></td> <td></td> </tr> <tr> <td>Phosphate (PO₄)</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Magnesium</td> <td>mg/l</td> <td></td> </tr> <tr> <td>pH</td> <td>pH units</td> <td></td> </tr> <tr> <td>Chloride</td> <td>mg/l</td> <td></td> </tr> <tr> <td>Calcium</td> <td>mg/l</td> <td></td> </tr> </tbody> </table>	VARIABLE	UNIT	WATE	Sulphate (SO ₄)	mg/l		Dissolved Oxygen saturation	mg/l		Sodium (Na)	mg/l		Ammonia (NH ₃)	mg/l		Total Inorganic Nitrogen:	mg/l		Soluble phosphorus Ratio			Phosphate (PO ₄)	mg/l		Magnesium	mg/l		pH	pH units		Chloride	mg/l		Calcium	mg/l		.					
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Calcium	mg/l																																										

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
Appendix III:5.2	ID all possible impacts on groundwater	-					Annual WQ Report reflects and describes impacts on groundwater.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:6.1	Update water & salt balance annually and co-operate with other water users in catchment to determine mass balance for water resource reserve compliance point.	Annually					Updated in January 2023. Fissure water decreased by 15% (total discharge decrease of 19%), rainfall increased by 25%, increase in sodium content of 24%, increase of sulphate of 14% despite gypsum saturation and precipitation.	App III No 6.1 – Annual update to Water and Salt Balance.
Appendix III:6.2	Submit analysis bi-annually to DWS	Bi-					Proof of submission of analyses for monitoring requirements.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix III:7.1	Stormwater leaving premises may not be contaminated	-			A		The following are noted to be implemented: <ul style="list-style-type: none"> - Cut-off drains around waste rock dump implemented - Stormwater management at the workshop is ongoing - SWMP has been developed 	App III No 1.3 - SWMP 2022
Appendix III:7.2	Increased runoff, bank instability and siltation to be managed	-			A		Non-compliance: impacts of current groundwater discharge is visible on Google Earth images where some erosion and siltation can be seen. REC: Improved runoff control and siltation management will be achieved with the implementation of the proposed removal of groundwater via a pipeline that will discharge into a “Discharge	

License condition no	Description of conditions	Frequency	Compliance with:				Evidence
			2011/12	2022	NCC	N/A	
							wet response area” as per Rehabilitation Plan, included in the 2022 IWWMP submitted to DWS.
Appendix III:7.3	Stormwater diverted away from mine and dispersed				C		Although clean stormwater is diverted away from the TSF and plant by means of paddock walls and a trench, clean storm water is not released separately from the current underground discharge and is concentrated at the outlet, not dispersed. REC: Improved runoff control through dirty and clean water separation will be achieved with the implementation of the SWMP and implementation of groundwater discharge following the authorisation of the amendment.
Appendix III:7.4	Stormwater attenuated to protect watercourse banks				A		Non-compliance: clean stormwater is not attenuated separately however it is the current groundwater discharge causing erosion and siltation at the discharge point. REC: The proposed removal of groundwater via a pipeline that will discharge into a “Discharge wet response area”, will fulfil this requirement.
Appendix III:7.5	Stormwater control constructed, operated and maintained sustainably				C		Non-compliance: clean stormwater to be attenuated and released separately from dirty water. REC: Improved runoff control will be achieved with the implementation of the groundwater discharge included in the amendment application – awaiting approval.
Appendix III:7.6	Increased runoff, bank instability and siltation to be managed						Repeat of App III:7.2 REC: Amend: Remove
Appendix III:7.7					D		

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
	Dirty stormwater diverted via channels and trapezoidal drains designed to contain 1:50						<p>Compliance with: •2011/12 = WUL •2022 = Amendment app •NCC = non-compl. category (Table 3) •N/A = na to score</p> <p>Comments</p> <p>Implemented: Dirty stormwater at the Plant drains into the PCD, waste rock dump cut off drains separates dirty runoff from that area. Non-compliance: dirty stormwater from Evaporation dam is released into environment REC: Discharge of water from underground is contaminated and must be retained in evaporation pond, and/or treated before discharging into the environment.</p>	
Appendix III:7.8 (amended)	Dirty stormwater pumped to process water treatment plant for reuse – N/A (amended)						N/A	
Appendix III:8.1	Spills from conveyances prevented through maintenance and protective measures near stream crossings						The plant area runoff (including spills) is contained in the lined PCD; runoff from the TSF is captured in surface paddocks and settlement dams from which fines material is removed when required.	
Appendix III:8.2	Reagent storage tanks and reaction units supplied with bund, sump and pump and standby						The reagent storage tanks are within adequately sized bunded areas, sump and pump.	
Appendix III:8.3	Hazardous substances handling						<p>Implemented according to Emergency Incidents Reporting Procedure. Hazardous waste contractor, BJB Scrap & Waste Projects, is permanently on site and handles all spills, clean-ups and disposal.</p>	App III No 8.3 – Emergency Incidents Reporting Procedure Sept 2022.
Appendix III:8.4.1	Access roads or crossings to be non-erosive, stable, not flooding or safety hazard						No roads on site were noted to have stability, erosion or safety hazard.	

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix III:8.4.2	Access roads or crossings to be repaired immediately	.					Noted	
Appendix III:9.1	Access procedures	.					Stringent access procedures are followed.	
Appendix III:9.2	Notices prohibiting unauthorised access	.					Strict access control is implemented with notices at entrances to the mine and plant are displayed.	
Appendix III:10.1	Records of system malfunctions resulting in non-compliance	.					All malfunctions and incidents are reported to the Asset Management and Maintenance Systems (AMMS) from where the incident is routed to the appropriate department..	App I No 14 – Environmental Incidents log
Appendix III:10.2	Notification in 24hrs of DWS of pollution incident	.					Noted, no reportable incidents took place in 2023.	
Appendix III:10.3	Action plan in 14 days	.					Noted.	

License condition no	Description of conditions	Frequency	Compliance with:				Evidence	
			2011/12	2022	NCC	N/A		
Appendix III:11.1	Annual internal audit and submit to DWS	Annual					Latest Internal audit report and proof of submission to DWS were provided.	App I No 11 – Internal audit 2023 App I No 11 – PoD of Internal Audit to DWS
Appendix III:11.2	Annual independent external audits to DWS	Annual					Latest External audit report and proof of submission to DWS were provided.	App I No 12 – External audit 2022 App I No 12 – PoD of External Audit to DWS
Appendix III:12.1	IWWMP and RSIP	Annual					IWWMP was updated in 2022. TSF 2 info not included.	App III No 12.1 – IWWMP 2022
Appendix III:12.2	IWWMP and RSIP to be updated and submitted annually	Annual			C		Implemented: latest IWWMP is dated Sept 2022. Non-compliance: latest RSIP is dated Oct 2019. REC: RSIP to be updated to include latest Wetland Rehabilitation measures.	App III No 12.2 – RSIP 2019
Appendix III:12.3	Closure plan and updated IWWMP & RSIP 180 days prior to closure.	6 Months					Noted. Life of mine is approximately 3 years.	
Appendix III:12.4	Financial provision for water treatment plant as a long-term water management strategy				C		Non-compliance: The construction of an appropriate water treatment facility for water being discharged is currently deemed uneconomical. The proposed RO Plant will treat fissure water removed underground for (a) domestic use, (b) Process water at plant and (c) underground process water and drinking water.	App III No 12.4 – Financial Provision 2023 App III No 12.4 – Proposed RO plant report

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix IV:1	21(j): Remove volume: 1 596 000m ³ with average daily vol: 4 433m ³ IWWMP 2022: 9 134 710m³/annum	.					The volume removed from underground was 5 091 027m ³ from Jan – Sept, and is within the volume indicated in the IWWMP 2022 submitted as part of the amendment application.	App II No 1 – Underground water use record 2023
Appendix IV:2 (amended)	Dispose of underground water into Settling dam	.			D		Non-compliance: Discharge is taking place directly into the manmade wetland northeast of Cowles dam. REC: Amendment Application includes the alternative to discharge of groundwater into the Evaporation dam before discharging through a pipeline into a “Discharge wet response area”. Implement as soon as amendment is authorized.	
Appendix IV:3	Settling dam locality	.					See Appendix IV:2 comments.	
Appendix IV:4	Quantity not exceeded prior to authorisation	.					Amendment Application (IWWMP 2022) captures updated quantity. Add TSF 2 and associated structures info.	
Appendix IV:5	Supply affected water users with potable supply	.					Repeat of Appendix III:4.10 REC: Amend: Remove	
Appendix IV:6	Quantity metered and recorded daily	Daily					Records provided.	App II No 1 – Underground water use record 2023
Appendix IV:7	Groundwater levels monitored every 6 months (seasonally)	Biannual					Records provided.	App III No 1.8 – Annual Surface & Ground WQ report
Appendix IV:8	Self-registering flow meters near dewatering points	.			D		Although not self-registering, readings are taken on a monthly basis: Flow meter records of 2023 indicate the total volume of underground water abstracted for use in processing. No records were available for flow meter at dewatering point to RWD.	App II No 1 – Underground water use record 2023

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix IV:9	Calibration certificates every 2 years & repair	Biennial					Repeat of Appendix I:13 REC: Amend: Remove	
Appendix IV:10	Calibration certificates submitted to DWS every 2 years	Biennial					Repeat of Appendix I:13 REC: Amend: Remove	
Appendix IV:11	Date & time of monitoring recorded	.					Repeat of Appendix III:4.11. REC: Amend: Remove	
Appendix IV:12	Analysis according to SABS	.					Repeat of Appendix III:4.22 REC: Amend: Remove	
Appendix IV:13	Analysis methods not changed without approval	.					Repeat of Appendix III:4.23 REC: Amend: Remove	
Appendix IV:14	Incident of disposal: report to DWS	.					Latest Amendment Application addresses the updated discharge to be implemented when approved (IWWMP 2022).	

License condition no	Description of conditions	Frequency	Compliance with:				Comments	Evidence
			2011/12	2022	NCC	N/A		
Appendix IV:15	Practices to ensure consistent, effective, safe performance of groundwater removal system	.					The actions taken by the licensee in this regard is reactive, in that incidents are dealt with when required. The audit site inspection did not include underground activities.	
Appendix IV:16	Provision for failure/malfunction of groundwater removal system	.					Reporting to AMMS and routing of the incident to the relevant department is done, following which repairs/mitigation takes place.	Verbal confirmation.
Total			50	3				
					A = 6			
					B = 1			
					C = 7			
					D = 6			
					Total = 20			
Total %			69	4	27			

3. Results

3.1. WUL Compliance for 2023

The total compliance with the 2011/12 WUL was 69%, which excludes conditions that have historically been complied with. The latter is categorized as not being relevant to 2023 audit score and is not included in the totals.

If the conditions that meet the criteria for inclusion as mentioned in the “Audit Assessment Categories”, the overall compliance score is elevated to 73%.

The visual representation of non-compliance scores for each category below shows that 36.36% of the non-compliances must be discussed with management for purposes of implementation. The percentage of non-compliances that require specialist input in order to devise measures to attain compliance was 31.82%. Only one condition requires reconsideration in terms of the life of mine timeframe, that can be motivated by specialists to amend with the next round of WUL amendments. The compliance score is likely to improve overall by 4% once the WUL is approved and the non-compliance category A activities, that constitute 27.27% of non-compliances, can be implemented.

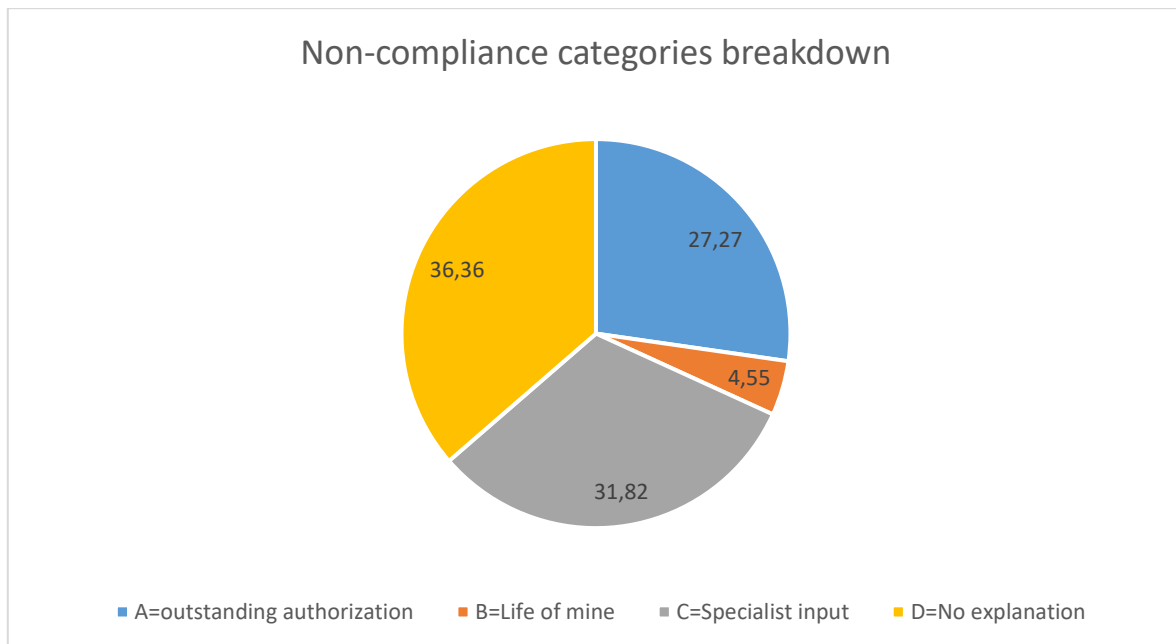


Figure 2. Breakdown of the non-compliance categories of 2023

The compliance score for 2023 reflects a similar score to the recent internal and external audits.

Furthermore, it must be noted that the WUL audit score does not reflect the level of impact on the water resources or watercourses. In order to achieve an auditing model that reflects environmental impact, an individual weighting or ranking must be assigned to each condition. Since this is not within the scope of this audit, ranking was not implemented for this audit.

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3.2. Action steps for non-compliances

The following table indicates each individual non-compliance in the non-compliance categories and describes recommended actions.

Table 5. Actions required for each non-compliance summarized per category

Non-compliance category	Category description	Action required for individual non-compliances
A	Outstanding authorization of the WUL amendments	Appendix III:4.9: implement groundwater discharge through pipeline and treatment wetland, as well as SWMP.
		Appendix III:7.1, 7.2 & 7.4: implement groundwater discharge through pipeline and treatment wetland, as well as SWMP.
		Appendix III:1.4: Approval of TSF and RWD construction – TSF 2 and associated structures should be included in WUL application/amendment.
		Appendix III:1.5: As-builts of TSF 2 to be submitted to DWS.
B	Life of mine is approximately 5 years	Appendix I:13: flow meter/s monitoring the discharge of groundwater into the environment must be calibrated to ensure accurate monitoring of volumes.
C	Ongoing non-compliance requiring specialist input	Appendix III:2.1 The disposal of slimes from Jan – Sept 2023 was 2 455 193m ³ and the volume included in the IWWMP 2022 needs to be updated.
		Appendix III:3.1 (amended): surface water quality concerns are expected to be mostly addressed following implementation of discharge and stormwater management practices included in the Amendment Application. Groundwater quality concerns is expected to be partially addressed by discharging into the Evaporation dam and discharging via a pipeline through a treatment wetland (IWWMP 2022). However, the licensee must start to focus on post-closure treatment requirements, which requires input from the relevant specialist.
		Appendix III:5.1: see Appendix III:2.1 comments above.
		Appendix III:7.3: clean storm water is not released separately from the current underground discharge and is concentrated at the outlet, not dispersed.
		Appendix III:12.2: RSIP to be updated to include latest Wetland Rehabilitation measures.
		Appendix III:12.4: Financial provision to be made for post-closure water treatment, to be discussed with relevant specialists.

D	No reasonable explanation provided for non-compliance	Appendix II: 1: Verify total volume of groundwater used in processes and amend WUL accordingly.
		Appendix III: 2.2: disposal records of water from the TSF to RWD must be recorded from flow meter (readings) monthly
		Appendix III:3.1 (amended): not all wastewater containing dams are lined. This includes RWD1, Evaporation Dam (which is indicated in the IWWMP as Emergency Containment Dam), and TSF paddocks.
		Appendix III:7.7: implement temporary storage of groundwater discharge in Evaporation Dam, to be lined to serve as Emergency Dam.
		Appendix IV:2 (amended): see Appendix III:7.7 comment above.
		Appendix IV:8: Flow meter readings at discharge points, i.e. to RWD must be recorded

3.3. Additional recommendations

- Stormwater drainage is actively managed at the workshop during rainfall events to avoid spills from bunds not covered by a roof structure. Assess the value of installing roof structures over the exposed bunds.
- Sedimentation needs to be removed from the PCD at the plant to ensure sufficient capacity is available to capture a major rainfall event (1:50).
- Old vehicles/machinery on site must be provided with drip trays.

3.4. Photographic record



Figure 3. Lined spillway of RWD2 on the eastern side of the dam.



Figure 4. Freeboard of the RWD2 is sufficient; more than 0.8m.


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Figure 5. Confirmation of bund capacity of fuel storage facility required.



Figure 6. Old vehicles/machinery on site must be provided with drip trays.

4. Assumptions and limitations

This report should be treated as a part of the fulfilment of WUL conditions and needs to be distributed to all relevant staff members and the relevant authorities (DWS).

AquaStrat Solutions cannot accept responsibility for conclusions and mitigation measures made in good faith based on information available. This report should therefore be viewed and acted upon with these limitations in mind.

5. Important contact details

Regional official: Khathu Mudau

Department Of Water and Sanitation

Upper Vaal Region

285 Francis Baard Street

Bothongo Plaza

Pretoria


Email: MudauK@dws.gov.za

6. References

New Kleinfontein Modder East Gold One: Water Use License no **08/C21D/ADJ/796** and relevant monitoring information and records, specialist reports and other supporting documentation.

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