



## water affairs

Department:  
Water Affairs  
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria, 0001, Sedibeng Building, 185 Schoeman Street, Pretoria, Tel: (012) 336-7500, Fax: (012) 326-4472/ (012) 326-2715

### LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998 (ACT NO 36 OF 1998) (THE ACT)

I, **Trevor Balzer**, in my capacity as Director General (Acting) in the Department of Water Affairs and acting under authority of the powers delegated to me by the Minister of Water and Environmental Affairs, hereby authorises the following water uses in respect of this licence.

SIGNED: \_\_\_\_\_

DATE: \_\_\_\_\_

LICENCE NO:

FILE NO: 27/2/2/C423/1/1

1. Licensee: **Mintails Mining SA (Pty) Ltd: Mogale Gold**  
Postal Address: P.O. Box 803  
Krugersdorp  
1740
2. Water uses
  - 2.1 Section 21(a) of the Act: Taking of water from a water resource, subject to the conditions set out in Appendices I and II.
  - 2.2 Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource, subject to the conditions as set out in Appendices I and III.
  - 2.3 Section 21(i) of the Act: Altering the bed, banks, course or characteristics of a watercourse, subject to the conditions set out in Appendices I and IV.

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**3. Properties on which the use will be exercised**

- 3.1 Section 21(a) of the Act: Portion 90 of the farm Waterval .174, IQ
- 3.2 Section 21(g) of the Act: Portion 73 of the farm Waterval .174, IQ  
Portion 136 of the farm Luipaardsvlei .246, IQ  
Portion 94 of the farm Waterval . 174, IQ
- 3.3 Section 21(i) of the Act: Portion 209 of the farm Luipaardsvlei 246 IQ

**4. Registered owner of the Properties**

- 4.1 Mintails Mining SA Pty Ltd: Mogale Gold.

**5. Licence and Review Period**

- 5.1 This licence is valid for a period of seventeen (17) years from the date of issuance and it may be reviewed every five (5) years.

**6. Definitions**

"Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998) shall bear the same meaning when used in this licence."

"The Regional Head" means the Regional Chief Director: Gauteng, Department of Water Affairs, Private Bag X 995, PRETORIA, 0001.

"Report" refers to the report entitled "Updated Integrated Water Use Licence Application for Mogale Gold (Pty) Ltd dated 03 November 2010 compiled by MSA Group; "Mogale Gold (Pty) Groundwater Impact Assessment dated January 2008 compiled by Aqua Earth Consulting cc", West Wits Pit Tailings Disposal Revision 1 and 2 (Referenced FA/BR/019/2007) West Wits Pit (WWP) Filling Motivation (referenced FA/BR/021/2009), WWP Assessment of Modifications to the Division Wall Development (Referenced FA/BR/015/2009), Lancaster Dam Wetland Assessment July 2013 and other related documentations and communication (emails, letters, verbal, etc).

**7. Description of the activity**

Mogale Gold is a Gold mine operation involved in reclamation of old tailings facilities located on portions 66 and 99 of the farm Waterval 174 IQ and portions 136 and 209 of the farm Luipaardsvlei 246 IQ within the Upper Vaal and Crocodile West and Marico Water Management Areas, in the quaternary drainage catchment C23D and A21D. This licence authorizes Mogale Gold for section 21(a), (g) and (i) water uses in terms of section 40 of the National Water Act, 1998 (Act 36 of 1998).

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## APPENDIX I

### PART A: GENERAL CONDITIONS FOR THE LICENCE

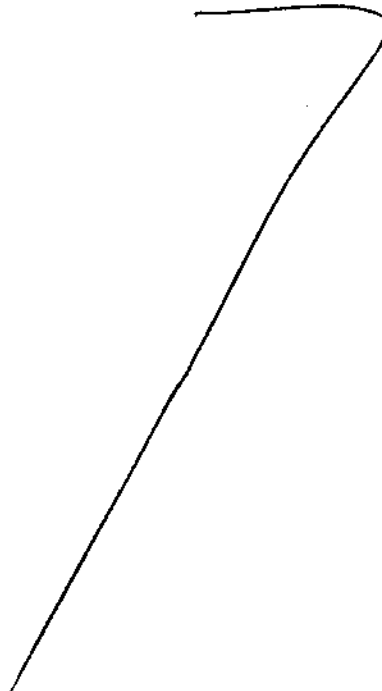
1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).
2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.
3. The Licensee must immediately inform the Regional Head of any change of name, address, premises and/or legal status.
4. If the properties in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Regional Head of the Department within 60 days of the said change taking place.
5. If a water user association is established in the area to manage the resource, membership of the Licensee to this association is compulsory.
6. The Licensee must be responsible for any water use charges or levies imposed by a responsible authority.
7. While effect must be given to the Reserve as determined in terms of the Act, where a desktop determination of the Reserve has been used in issuance of a licence, when a comprehensive determination of the Reserve has finally been made; it shall be given effect to.
8. The licence must not be construed as exempting the Licensee from compliance with the provisions any other applicable Act, Ordinance, Regulation or By-law.
9. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other applicable provisions of the Act, as amended from time to time.
10. The Licensee must conduct an annual internal audit on compliance with the conditions of licence. A report on the audit shall be submitted to the Regional Head within one month of the finalisation of the audit.
11. The Licensee shall appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this licence. The first audit must be conducted within 3 (three) months of the date this licence is issued and a report on the audit shall be submitted to the Regional Head within one month of finalisation of the report.
12. Flow metering, recording and integrating devices must be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than

two years. Calibration certificates must be available for inspection by the Regional Head or his representative upon request.

13. If the water use described in this licence is not exercised within 3 years of the date of the licence, the authorization will be withdrawn.
14. The water may not be used for another purpose than the purpose in this licence.
15. The Licensee shall continually investigate new and emerging technologies and put into practice water efficient devices or apply techniques for the re-use of water containing waste, in an endeavor to conserve water at all times.
16. The Licensee shall establish and implement a continual process of raising awareness amongst itself, its workers and stakeholders for the need for Water Conservation/Water Demand Management.
17. The Licensee shall ensure that all measuring devices are easily accessible.
18. Where applicable flow metering devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than once in two years. Calibration certificates shall be available for inspection by the Responsible Authority or his/her representative upon request
19. Notices prohibiting unauthorized persons from entering water use premises must be displayed.

#### **PART B: SITE SPECIFIC CONDITION**

1. The licensee must submit the new order mining right to the Regional Head in terms of Mineral and Petroleum, Resources Development Act, 2002 (Act 28 of 2002) prior to the implementation of this licence.



**APPENDIX II****Section 21 (a) of the Act: Taking water from a water resource****1. ABSTRACTING WATER**

1.1 This licence authorises the abstraction of volume of water from the abstraction point indicated on Table 1 for use in the processing plant.

**Table 1: Water abstraction point.**

<b>Abstraction point</b>	<b>Farm No</b>	<b>Volume</b>	<b>Purpose</b>	<b>Co-ordinates</b>
Old mine Voids (West Wits Pit, 17 WINZE, 9 East shaft and 8 shaft)	Portion 90 of the Farm Waterval 174 IQ	6 205 000 m <sup>3</sup> /a	For use in the reclamation process	E26°07'35.2" S25°38'16.6"

1.2 The quantity of water authorised to be taken in terms of this licence may not be exceeded without prior authorisation by the Minister.

1.3 This licence does not imply any guarantee that the said quantities and qualities of water will be available at present or at any time in the future.

1.4 The above mentioned volume may be reduced when the licence is reviewed.

1.5 The Licensee shall continually investigate new and emerging technologies and put into practice water efficient devices or apply technique for the efficient use of water containing waste, in an endeavour to conserve water at all times.

1.6 The Licensee shall be responsible for any water use charges or levies, which may be imposed from time to time by the Department or responsible authority in terms of the Department's Raw Water Pricing Strategy.

1.7 The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of:

- 1.7.1 Shortage of water
- 1.7.2 Inundations or flood
- 1.7.3 Siltation of the resource; and
- 1.7.4 Required reserve releases.

1.8 The Licensee must develop a groundwater monitoring programme to monitor and report on associated impacts of the proposed groundwater abstraction activity. The programme must include amongst other things the following:

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- 1.8.1 Reporting on abstracted groundwater quantities at the respective voids, this will be done by means of installing flow measuring devices which will be calibrated from time to time by a competent person to ensure acceptable accuracy levels.

**APPENDIX III**

**Section 21 (g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource**

**1. CONSTRUCTION AND OPERATION**

- 1.1 The Licensee shall carry out and complete all the activities, including the construction and operation of the facilities as indicated in Table 2, according to the Report and according to the final plans submitted with the Integrated Water Use Licence Application as approved by the Regional Head.

**Table 2: Geographical positions of all the waste and water management facilities**

Facility/Activity	Farm Name	Geographic Position
Backfilling of the West Wits Pit (mined out) with tailings	Portion 73 of the farm Waterval 174 IQ	S26°07'33.70" E27°43'54.88"
Lancaster Dam	Portion 209 of the farm Luipaardsvlei 246 IQ	S26°08'19.15" E27°45'05.44"
Dust suppression on the mine gravel roads plant and pit mine workings	Portion 90 of the farm Waterval 174 IQ Portions 136, 209 of the farm Luipaardsvlei 246 IQ Portion 68 of the farm Luipaardsvlei 246 IQ	Various Properties

- 1.2 The Licensee must ensure that the disposal of the waste water and the operation and maintenance of the system are done according to the provisions in the Report.

**2. WASTE WATER TO BE DISPOSED**

- 2.1 The Licensee is authorised to dispose of a maximum quantity in cubic meters (m<sup>3</sup>/a) per annum of water containing waste into the waste management facilities on the property described in Table 3.

**Table 3: Disposal of waste/ water containing waste**

Facilities/Activity	Volume	Waste Description	Property Name
Backfilling.	6 600 000 tons/a	Backfilling of the West Wits Pit (mined out) with tailings	Portion 73 of the farm Waterval 174 IQ
Lancaster Dam.	1 708 m <sup>3</sup> /a	Lancaster Dam containing the surface runoff from the tailings reclamation area	Portion 209 of the farm Luipaardsvlei 246 IQ
Dust suppression.	558 720 m <sup>3</sup> /a	Dust suppression using water from Western Basin old mine void on the mine gravel roads plant and pit mine workings.	Portion 90 of the farm Waterval 174 IQ Portions 136, 209 of the farm Luipaardsvlei 246 IQ Portion 68 of the farm Luipaardsvlei 246 IQ

- 2.2 The method of disposal shall be conducted in manner contemplated in the Report.
- 2.3 Pit deposition may only continue until the existing ground level is attained. Excessive tailings deposition may lead to an increase in pore pressure and low shear strength, which may induce static liquefaction and subsequent tailings containment failure.
- 2.4 The Licensee must within three months of issuance of the licence investigate fissures or cracks around the walls of the WWP and if found measures must be put in place to ensure that no ingress of polluted materials likely to impact on groundwater aquifers and ensure that the stability of the WWP is not compromised. A report on the abovementioned investigation must be submitted to the Regional Head within three months of issuance of the Licence.

### 3. MONITORING

- 3.1 The Licensee must monitor on monthly basis the water resources at surface water monitoring point and quarterly on groundwater monitoring points to determine the impact of the facilities and other activities on the water quality by taking samples at the monitoring points.
- 3.2 Proper ground and surface water monitoring network should be established to monitor the quality and quantity of ground and surface water as per the report recommendation and ensuring that water used by other water users are safeguarded in accordance to chapter 14 of the National Water Act, 1998.
- 3.3 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of the analysis.



- 3.4 Monitoring points shall not be changed prior to notification to and written approval by the Regional Head.
- 3.5 The Licensee shall participate in any initiative such as Direct Estimation of Ecological Effect Potential (DEEEP) to determine the toxicity of complex tailings waste discharges. Both acute and chronic toxicity must be addressed and at least three taxonomic groups must be present when toxicity tests are performed.
- 3.6 Analysis shall be carried out in accordance with methods prescribed by and obtainable from the South African Bureau of Standards (SABS), in terms of the Standards Act, 1982 (Act 30 of 1982).
- 3.7 The methods of analysis shall not be changed without prior notification to and written approval by the Minister.

#### 4. WATER RESOURCE PROTECTION

- 4.1 The impact(s) of mine activities on the groundwater quality must not exceed the following limits as indicated on the Table 4.

**Table 4: Groundwater quality limits**

Parameters	Groundwater Quality Limits
pH	9.5-10
Electrical conductivity(mS/m)	150
Calcium (mg/l)	150
Chloride (mg/l)	200
Fluoride (mg/l)	1.0
Magnesium (mg/l)	100
Nitrate (mg/l)	15
Sodium (mg/l)	200
Sulphate (mg/l)	400

#### 5. REPORTING

- 5.1 The Licensee shall update the water balance annually and calculate the loads of waste emanating from the activities. The Licensee shall determine the contribution of their activities to the mass balance for the water resource and must furthermore co-operate with other water users in the catchment to determine the mass balance for the water resource reserve compliance point.
- 5.2 The Licensee shall submit the results of analysis for the monitoring requirements to the Regional Head on a bi-annual basis under Reference number 27/2/2/C423/1/1.

## 6. STORMWATER MANAGEMENT

- 6.1 Stormwater leaving the Licensee's premises shall in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises.
- 6.2 Increase runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the stream.
- 6.3 Stormwater shall be diverted from the mine complex site and roads and shall be managed in such a manner as to disperse runoff and concentrating the storm-water flow.
- 6.4 Where necessary works must be constructed to attenuate the velocity of any storm-water discharge and to protect the banks of the affected watercourses.
- 6.5 Stormwater control works must be constructed, operated and maintained in a sustainable manner throughout the impacted area.
- 6.6 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the streams.
- 6.7 All stormwater that would naturally run across the pollution areas shall be diverted via channels and trapezoidal drains designed to contain the 1:50 year flood.
- 6.8 Polluted stormwater system shall be designed and implemented to provide suitable routing and pumping capacity for contaminated stormwater from the individual facilities to the respective stormwater dams in accordance with the design specifications as contained in the Integrated Water Use licence Application report.
- 6.9 Polluted stormwater captured in the stormwater control dams must be pumped to the process water treatment plant for reuse and recycling.

## 7. PLANT AREAS AND CONVEYANCES

- 7.1 Pollution caused by spills from the conveyances must be prevented through proper maintenance and effective protective measures especially near all stream crossings.
- 7.2 All reagent storage tanks and reaction units must be supplied with a bunded area built to the capacity of the facility and provided with sumps and pumps to return the spilled material back into the system. The system shall be maintained in a state of good repair and standby pumps must be provided.
- 7.3 Any hazardous substances must be handled according to the relevant legislation relating to the transport, storage and use of the substance.
- 7.4 Any access roads or temporary crossings must be:



- 7.4.1 non-erosive, structurally stable and shall not induce any flooding or safety hazard and
- 7.4.2 be repaired immediately to prevent further damage.

## **8. ACCESS CONTROL**

- 8.1 Strict access procedures must be followed in order to gain access to the property. Access to the pollution control dams, must be limited to authorised employees of the Licensee and their Contractors only.
- 8.2 Notices prohibiting unauthorised persons from entering the controlled access areas as well as internationally acceptable signs indicating the risks involved in case of an unauthorised entry must be displayed along the boundary fence of these areas.

## **9. CONTINGENCIES**

- 9.1 Accurate and up-to-date records shall be kept of all system malfunctions resulting in non-compliance with the requirements of this licence. The records shall be available for inspection by the Regional Head upon request. Such malfunctions shall be tabulated under the following headings with a full explanation of all the contributory circumstances:
  - 9.1.1 operating errors
  - 9.1.2 mechanical failures (including design, installation or maintenance)
  - 9.1.3 environmental factors (e.g. flood)
  - 9.1.4 loss of supply services (e.g. power failure) and
  - 9.1.5 Other causes.
- 9.2 The Licensee must, within 24 hours, notify the Regional Head of the occurrence or potential occurrence of any incident which has the potential to cause, or has caused water pollution, pollution of the environment, health risks or which is a contravention of the licence conditions.
- 9.3 The Licensee must, within 14 days, or a shorter period of time, as specified by the Regional Head, from the occurrence or detection of any incident referred above, submit an action plan, which must include a detailed time schedule, to the satisfaction of the Regional Head of measures taken to:
  - 9.3.1 correct the impacts resulting from the incident
  - 9.3.2 prevent the incident from causing any further impacts and
  - 9.3.3 prevent a recurrence of a similar incident.

## **10. AUDITING**

- 10.1 The Licensee shall conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit shall be submitted to the Regional Head within one month of finalisation of the report, and shall be made available to an external auditor should the need arise.



**11. INTEGRATED WATER AND WASTE MANAGEMENT**

- 11.1 The Licensee must update an *Integrated Water and Waste Management Plan (IWWMP)*, which must together with the updated *Rehabilitation Strategy and Implementation Programme (RSIP)*, be submitted to the Regional Head for approval within one (1) year from the date of issuance of this licence.
- 11.2 The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head for approval, annually.
- 11.3 The Licensee must, at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Regional Head of such intention and submit any final amendments to the IWWMP and RSIP as well as a final *Closure Plan*, for approval.
- 11.4 The Licensee shall make full financial provision for all investigations, designs, construction, operation and maintenance for a water treatment plant should it become a requirement as a long-term water management strategy.

**12. FURTHER STUDIES AND INFORMATION REQUIREMENTS**

- 12.1 Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognized sampling procedures. Samples should be analyzed for both organic as well as inorganic pollutants, as mining activity often lead to hydrocarbon spills in the form of diesel and oil. At least the following water quality parameters should be analyzed for (as indicated on Table 5)

**Table 5: Groundwater quality monitoring variables**

Variable
pH
EC (mS/m)
TDS (mg/L)
SS (mg/L)
CN (mg/L)
SO4 (mg/L)
Mn (mg/L)
U (µg/L)
Ca (mg/L)
Mg (mg/L)
Na (mg/L)
Cl (mg/L)
Alkalinity (mg/L)
B (mg/L)
Al (mg/L)
F (mg/L)
Cd (mg/L)
Pb (mg/L)
Ni (mg/L)
Cu (mg/L)
Zn (mg/L)
Fe (mg/L)

Variable
Toxicity (NTU)
Total Hardness
Total Petroleum Hydrocarbon (TPH)

- 12.2 These should be recorded on a data sheet. It is proposed that the data should be entered into an appropriate computer database and reported to the Department of Water Affairs.
- 12.3 The final backfilled opencast topography should be engineered such that runoff is directed away from the opencast areas.
- 12.4 The final layer should be as clayey as possible and compacted if feasible, to reduce recharge to the opencasts.
- 12.5 Quarterly groundwater sampling must be done to establish a database of plume movement trends, to aid eventual mine closure.
- 12.6 The applicant must ensure in advance that alternative water supply for external water users is provided to these users should groundwater resources be impacted by this mine operation.
- 12.7 The pollution control dam must be designed in such a manner that any spillage can be contained and reclaimed without any impact on the surrounding environment, a plan must be in place to stop overflowing in a dam in case of rainy seasons.
- 12.8 Geochemical assessment should be done on the discard material during the Reclamation processes.
- 12.9 The Licensee shall attend and actively participate in the Wonderfontein/Loospruit catchment forum to which the Licensee must report and present all aspects of water management as contained in the conditions of this licence such as compliance with the licence conditions and progress with all investigations in terms of this licence or related studies.
- 12.10 The Licensee shall identify all possible impacts of the discharging of water containing waste on the natural water resource including diffuse sources, such as seepage and polluted underground water, which impact on the water resources, surface and groundwater (including water found and used underground in the mine), springs and eyes in the water resources in the following manner:
- 12.10.1 A Scope of Work (Investigation), which must include a plan with time lines and expected reports, to the Department within six (6) months after issuance of the Licence. The Scope of Works shall be approved by the Regional Head. In this Scope of Work the Licensee must:
- 12.10.1.1 Determine the Area of investigation (Surface and Underground);
- 12.10.1.2 Determine all possible impacts, which may originate as point sources (e.g. discharge of mine effluents via pipes



- and canals into water courses) and/or diffuse sources (e.g. uncontrolled release of seepage
- 12.10.1.3 from slimes dams, unlined dams etc. into groundwater / aquifers), on natural water resources by mining activities and other anthropogenic activities in the catchment that will help discern the impact that the mine has on the water resources;
  - 12.10.1.4 Provide schematic flow charts displaying the nature and location of impacts shall be developed;
  - 12.10.1.5 Provide data in form of aforementioned flow charts containing average (median) values as well as maxima and minima;
  - 12.10.1.6 Determine core water quality parameters to be measured in mine effluents as well as receiving water bodies up and downstream of the point of discharge/ impact, including but not limited to the following parameters:

pH-value;  
 Electrical conductivity (EC);  
 Sulphate ( $\text{SO}_4^{2-}$ );  
 Total Dissolved Solids (DS);  
 Nitrate ( $\text{NO}_3^-$ );  
 Uranium (as U238 e.g. by ICPMS, or 'chemical' U natural isotopic composition ( $\text{U}_{\text{nat}}$ );  
 Cyanide (CN); and  
 Iron (Fe Total).

- 12.10.2 Determine where and how flows should be measured;
- 12.10.3 Determine where and agree on a methodology to calculate loads with other dischargers in the catchment;
- 12.10.4 Identify Water Resources (Surface and Underground);
- 12.10.5 Identify Water Uses;
- 12.10.6 Identify Water Quality Requirements;
- 12.10.7 Refine a List of Interested and Affected Parties;
- 12.10.8 Refine Terms of Reference for the Investigation;
- 12.11 The Licensee shall submit a detailed, (covering each  $\text{m}^2$  of the Licensees property), rehabilitation and remediation plan to rehabilitate and to remediate all impacts, (surface and groundwater), on the Licensees property as well as on adjacent areas which are as a result of the mine's impact.
- 12.12 The Licensee must submit to the Department, water and salt balance analysis within six (6) months after issuance of the Licence. The water and salt balance must include, amongst others, water in the underground mining operations, all surface water including clean water, potable water, industrial water, process



- 12.13 Water, cooling water, dirty water systems, domestic effluent, diffuse seepages, slimes dams, etc.
- 12.14 The Licensee must sub-divide the total operational area into water-relevant sub-units as follows:
  - 12.14.1 Mining area (opencast and underground);
  - 12.14.2 Waste disposal areas (tailings dams, rock dumps, pollution control dams, etc);
  - 12.14.3 Surface infrastructure areas (metallurgical plant, ventilation shaft areas, etc); and
  - 12.14.4 Water management (domestic water supply to offices, change houses, hostels, residential areas, golf course, etc.) as well as all process water circuits.
- 12.15 The Licensee must provide a schematic flow diagram/chart describing the relation of sub-units in the total water cycle of the mine (type of connecting infrastructure and direction of flow). The Licensee shall provide this information to the Department for approval in unified/standardised manner as per the relevant Departmental guidelines to improve comparability between different mines in the catchment area.
- 12.16 For each identified sub-unit, the Licensee shall specify the in- and outflow volumes in cubic metres per day ( $m^3/day$ ).
- 12.17 The Licensee must use easy-to-update spreadsheets for the data requirements.
- 12.18 The Licensee must calculate the daily, monthly and annual loads based on the water balance diagrams for the following dissolved variables of concern:
  - Total Dissolved Solids (TDS) ( $mg/l$ );
  - Sulphate ( $SO_4$ ) ( $mg/l$ );
  - Nitrate ( $NO_3/NO_4$ ) as N;
  - Uranium;
  - CN; and
  - Total Iron (as Fe).
- 12.19 The Licensee must at all times together with the conditions of this licence adhere to the Regulations on use of water for mining and related activities aimed at the protection of water resources (GN 704, 4 June 1999).
- 12.20 The Licensee must ensure that in the event of unacceptable decrease of the yield of any affected boreholes, alternative water supplies are provided to the affected parties until such time it recovers following the mine closure.
- 12.21 The Licensee must ensure that a suitable qualified engineer inspect the final void to ensure that there is no subsidence or slipping of the pit walls. The report of inspection must be submitted to the Department within thirty days (30) of inspection.



- 12.22 The Licensee must ensure that the management measures are put in place to address plume migration. The revised conceptual groundwater model to investigate the source and extent of plume shall be submitted within six months of the issuance of this Licence.
- 12.23 The Licensee must ensure that backfill materials are checked for quality purpose before using to avoid further groundwater contamination.
- 12.24 The Licensee shall ensure that all the mitigation measures are implemented as committed in the backfill motivational report.
- 12.25 The Licensee must ensure that monitoring continues to take place at both surface and groundwater networks so as to control and maintain the water resources.
- 12.26 The Licensee must within three (3) months assess the ingress rate of seepages into the mining voids as a result of disposal of mine tailings into the WWP and pump water from the WWP to ensure that there is a net zero effect of water ingress into the Western Basin mining voids. The water level in the pits should be monitored and kept to a minimum level as possible in order to reduce the amount of water ingress into the mine void.
- 12.27 The Licensee must within one month conduct hydrocensus within 1 km radius of the mine operation and identify surface and groundwater users.
- 12.28 The tailings facility is a major pollution source which contributes to ingress of water into the mine void and eventually resulting in acid generating. During the operational phase ensure aquifer is not artificially recharged by the seepage emanating from the pit. If groundwater becomes polluted within the area due to seepage emanating from the pit, emergency action procedures should be adhere to protect groundwater quality from degradation and a plan for remediation must be developed. Monitoring should also continue during decommissioning and post closure phases.
- 12.29 The Licensee shall submit a Master plan within six months after issuance of the Licence, outlining the following:
- 12.29.1 Future land Use Development Plan;  
Plan to shape all cut and fill areas, slopes and earthworks to 1:3 (v:h) to protect slopes against erosion and re-vegetation;  
The rehabilitation of the Wonderfonteinspruit, its origin and other impacted wetland areas to resemble the historic natural conditions;  
Maintenance of the ecological system and the rehabilitation plan must be compiled detailing the plan, programme, resources and cost.



**APPENDIX IV**

**Section 21(i) of the Act: Altering the bed, banks, course or characteristics of a watercourse**

**1. GENERAL**

- 1.1 This licence authorizes Mintails Mining SA (Pty) Ltd: Mogale Gold for the construction of a dam wall of Lancaster dam for the Section 21 (i) water use activity, construction of a dam wall next to the Wonderfonteinspruit and altering the bed, banks, course or characteristics of the Wonderfonteinspruit, as set out in Table 6 and in the water use licence application reports submitted to the Regional Head (refer to condition 1.2) for:

**Table 6: Water Use Activity**

Activity	Property	Description/Name of Watercourse	Co-ordinates
Construction and operation of Lancaster dam wall	Portion 209 of the farm Luipaardsvlei 246 IQ	Wonderfonteinspruit	26°07'49.6" S 27°46'38.7" E and 26°07'48.5" S 27°46'35.2" E

- 1.2 The Licensee must carry out and complete all the activities listed under condition 1.1 according to the following:

- 1.2.1 Reports submitted to the Department or the Responsible Authority, specifically:

- 1.2.1.1 Water Use Licence Application
- 1.2.1.2 Application forms
- 1.2.1.3 Designs
- 1.2.1.4 Summary of Engineering Feasibility Study
- 1.2.1.5 Environmental Impact Assessment Report
- 1.2.1.6 Environmental Management Plan
- 1.2.1.7 Ecological Report
- 1.2.1.8 Socio-Economic Impact Assessment Report

- 1.3 No activity must take place within the 1:100 year flood line or the delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised by this licence.

- 1.4 The conditions of the authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of these activities and the Licensee must take such measures that are necessary to bind such persons to the conditions of this licence.

- 1.5 A copy of the water use licence and reports set out under condition 1.2. must be on site at all times.

- 1.6 A suitably qualified person(s), appointed by the Licensee, and approved in writing by the Regional Head, must be responsible for ensuring that the activities are undertaken in compliance with the specifications as set out in reports submitted to the Department or the Responsible Authority and the conditions of this licence.

## 2 FURTHER STUDIES AND INFORMATION REQUIREMENTS

- 2.1 For water use activities (Section 21 (i) ) set out in Table 6 and environmental audit addressing how the characteristics of the watercourses have been affected must be submitted to the Regional Head for written approval within one (1) month after the date of issuance of this licence. The audit must be accompanied by a remediation plan and programme for any post construction impacts identified in the audit.
- 2.2 For water use activities Section 21 (i) in Table 6:
- 2.2.1 Work method statements, site plan(s) and detailed design drawings for the construction of all infrastructure impeding and/or diverting flow of watercourses as well as alterations to watercourse(s) on the property(ies) must be submitted to the Regional Head: Gauteng for written approval before construction and implemented as directed. The foregoing must indicate the regulated activities, marking the limits of disturbance in relation to the impacted watercourse(s); morphology of the watercourse(s); site specific impacts; and environmental management, particularly erosion and sediment, controls and measures;
- 2.2.2 No fundamental alterations of the work method statements, site plan(s) and drawings are allowed, unless a modification is requested and granted by the Regional Head: Gauteng in writing; and
- 2.2.3 No site activities must occur beyond the proposed site location of the erosion and sedimentation controls and marked limits of disturbance.
- 2.3 If the Licensee is not the end user/beneficiary of the water use related infrastructure and will not be responsible for long term maintenance and management of the infrastructure, the Licensee must provide a programme for hand over to the successor-in-title including a brief management/maintenance plan and the agreement for infrastructure along with allocation of responsibilities, within three (3) months of the date of issuing of this licence.
- 2.4 For water use activities Section 21 (i) in Table 6 the following information must be submitted to the Regional Head: Gauteng for written approval before these activities commence:
- 2.4.1 A site level environmental impact assessment (EIA) addressing how the characteristics of the watercourses must be affected by the impeding and diverting the flow ; and
- 2.4.2 An environmental management plan (EMP) including rehabilitation strategies.

- 2.5 An EMP and rehabilitation plan for the decommissioning of any of the water use activities listed in Table 6 must be submitted five (5) years before commencing with closure to the Regional Head: Gauteng for written approval.
- 2.6 For all the activities listed under condition 1.1, Table 6, "as-built" plan(s) and engineering drawing(s) prepared by a registered professional engineer, must be submitted to the Regional Head: Gauteng within six (6) months of completion of new activities and for existing water uses within six (6) months of the date of issuing of this licence. These plan(s) and drawing(s) must indicate the watercourse(s) including wetland boundaries and layout and structure location(s) of all infrastructure impeding and/or diverting flow of watercourses as well as alterations to watercourse(s) on the property(ies).
- 2.7 A Stormwater Management Plan must be compiled and submitted to the Regional Head: Gauteng for written approval before construction may commence.
- 2.8 The stormwater management plan should be designed in a way that aims to ensure that post-development run-off does not exceed pre-development values in:
- 2.8.1 Peak discharge for any given storm,
  - 2.8.2 Total volume of run-off for any given storm,
  - 2.8.3 Frequency of run-off volumes,
  - 2.8.4 Pollutant and debris concentrations reaching watercourses, and
  - 2.8.5 Increase in run-off due to a higher water table resulting from tree clearing practices.
- 2.9 The Licensee must on a monthly basis monitor and submit a surface water quality monitoring programme of the Wonderfontein spruit, down stream of the mining activities. The monitoring programme must ensure that diffuse sources from Lancaster dam and other containment facilities with potential to impact the water resource are detected, identified and remediated.
- 2.9.1 The monitoring programme shall ensure the following variables and frequencies are implemented as indicated on Table 7.

**Table 7 : Surface Water Monitoring Variables**

Variable	Frequency
PH	Monthly
EC (mS/m)	Monthly
TDS (mg/l)	Monthly
SS (mg/l)	Monthly
CN (mg/l)	Monthly
SO <sub>4</sub> (mg/l)	Monthly
Mn (mg/l)	Monthly
U (µg/l)	Monthly
Ca (mg/l)	Monthly

Variable	Frequency
Mg (mg/l)	Monthly
Na (mg/l)	Monthly
Cl (mg/l)	Monthly
NO <sub>3</sub> / NO <sub>2</sub> as N (mg/l)	Monthly
NH <sub>4</sub> as N (mg/l)	Monthly
PO <sub>4</sub> as P (mg/l)	Monthly
<i>E. coli</i>	Monthly
Alkalinity (mg/l)	Monthly
B (mg/l)	Monthly
Al (mg/l)	Monthly
F (mg/l)	Monthly
Cd (mg/l)	Monthly
Pb (mg/l)	Monthly
Ni (mg/l)	Monthly
Cu (mg/l)	Monthly
Zn (mg/l)	Monthly
Total Hardness	Monthly
Fe (mg/l)	Monthly

### 3 PROTECTIVE MEASURES

#### 3.1 Stormwater Management

3.1.1 Stormwater management practices must be constructed, operated and maintained in a sustainable manner throughout the project and for the water use activities set out in condition 1.1 and must include but are not limited to the following:

3.1.1.1 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the watercourse(s);

3.1.1.2 Stormwater must be diverted from the Boston Hydro Power Plant and must be managed in such a manner as to disperse runoff and to prevent the concentration of stormwater flow;

3.1.1.3 The velocity of stormwater discharges must be attenuated and the banks of the watercourses protected; and

3.1.1.4 Stormwater leaving the Licensee's premises must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or

a combination thereof which is produced, used, stored, dumped or spilled on the premises,

3.1.1.5 Sheet runoff from paved surfaces and access roads need to be curtailed.

### **3.2 Structures, Construction Plant and Materials**

- 3.2.1 The necessary erosion prevention measures must be employed to ensure the sustainability of all structures
- 3.2.2 The height, width and length of structures must be limited to the minimum dimension necessary to accomplish the intended function.
- 3.2.3 Structures must not be damaged by floods exceeding the magnitude of floods occurring on average once in every 100 years.
- 3.2.4 Structures must be non-erosive, structurally stable and must not induce any flooding or safety hazard.
- 3.2.5 Structures must be inspected regularly for accumulation of debris, blockage, erosion of abutments and overflow areas - debris must be removed and damages must be repaired and reinforced immediately.
- 3.2.6 The construction camp, plant and material stockpiles must be located outside the extent of the watercourse(s) and must be recovered and removed one (1) month after construction has been completed.
- 3.2.7 During construction erosion berms should be installed to prevent gully formation, according to the slope.
- 3.2.8 All areas affected by construction should be rehabilitated upon completion of the construction phase of the development. Areas should be reseeded with indigenous vegetation species as required, and the use of seednets is recommended to prevent erosion.
- 3.2.9 During the construction phase no vehicles shall be allowed to indiscriminately drive through any wetland areas.
- 3.2.10 No construction is allowed within the 1:100 year floodline and/or delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised in this Licence.
- 3.2.11 The conveyor belt shall be fully (100%) enclosed within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest, or wetland to prevent spillages into the watercourse.
- 3.2.12 The conveyor belt crossings over watercourses shall coincide with road crossings.
- 3.2.13 Any access roads or crossings should be:
- 3.2.14 Non-erosive, structurally stable and should not induce any flooding or safety hazard;
- 3.2.15 Any damage is repaired immediately to prevent further damage;
- 3.2.16 Non-polluting with respect to silt and litter that can be deposited into a watercourse.

### **3.3 Flow**

- 3.3.1 The Licensee must determine flood lines (1:50 and 1:100 year) prior to construction to ensure risks are adequately managed. Flood lines must be clearly indicated on the site plan(s) and drawings along with all wetland boundaries.
- 3.3.2 The activities must be conducted in a manner that does not negatively affect catchment yield, hydrology and hydraulics. The Licensee must ensure that the overall magnitude and frequency of flow in the watercourse(s) does not



decrease, other than for natural evaporative losses and authorised attenuation volumes.

- 3.3.3 Appropriate design and mitigation measures must be developed to minimise impacts on the natural flow regime of the watercourse i.e. through placement of structures/supports and to minimise turbulent flow in the watercourse.
- 3.3.4 Structures to be designed in a way to prevent the damming of stream/river water and not impact on the flow of the water, during the construction and operational phases of all developments.
- 3.3.5 The development may not impede natural drainage lines.
- 3.3.6 The diversion structures may not restrict river flows by reducing the overall river width or obstructing river flow.
- 3.3.7 Place infrastructure below calculated bank full flow scour depths and allow a safety margin.
- 3.3.8 Bank filling must restore the channel shape and bed level to pre-construction condition.
- 3.3.9 Where flow in watercourse is permanent, the trench must be staged across part of the channel to maintain flows. Flows must not be stopped.

#### **3.4 Riparian and Instream Habitat (Vegetation and Morphology)**

- 3.4.1 Activities (including spill clean-up) must start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream works.
- 3.4.2 Operation and storage of equipment must not take place within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest unless authorised in this Licence.
- 3.4.3 Activities must not occur in sensitive riffle habitats.
- 3.4.4 Indigenous riparian vegetation, including dead trees, outside the limits of disturbance indicated in the site plans must not be removed from the area.
- 3.4.5 Alien and invader vegetation must not be allowed to further colonise the area, and all new alien vegetation recruitment must be sustainably eradicated or controlled.
- 3.4.6 Existing vegetation composition must be maintained or improved by maintaining the natural variability in flow fluctuations. Rehabilitated areas shall have a vegetation basal cover of at least 15% at all times.
- 3.4.7 Recruitment and maintaining of a range of size classes of dominant riparian species in perennial channels must be stimulated.



- 3.4.8 Encroachment of additional exotic species and terrestrial species in riparian zones must be discouraged.
- 3.4.9 Accumulation of woody debris on terraces by periodic flooding must be discouraged.
- 3.4.10 Existing flood terraces and deposition of sediments on these terraces to ensure optimum growth, spread and recruitment of these species must be maintained.
- 3.4.11 All reasonable steps must be taken to minimise noise and mechanical vibrations in the vicinity of the watercourses.
- 3.4.12 The necessary erosion prevention mechanisms must be employed to ensure the sustainability of all structures and activities and to prevent instream sedimentation.
- 3.4.13 Soils that have become compacted through the water use activities must be loosened to an appropriate depth to allow seed germination.
- 3.4.14 Slope/bank stabilisation measures must be implemented with a 1:3 ratio or flatter and vegetated with indigenous vegetation immediately after the shaping.
- 3.5.15 Stockpiling of removed soil and sand must be stored outside of the 1:100 flood line or delineated riparian habitat, whichever is the greater, to prevent being washed into the river and must be covered to prevent wind and rain erosion.
- 3.5.16 The indiscriminate use of machinery within the instream and riparian habitat will lead to compaction of soils and vegetation and must therefore be strictly controlled.
- 3.5.17 The overall macro-channel structures and mosaic of cobbles and gravels must be maintained by ensuring a balance (equilibrium) between sediment deposition and sediment conveyance maintained. A natural flooding and sedimentation regime must thus be ensured as far as reasonably possible.
- 3.5.18 As much indigenous vegetation growth as possible should be promoted within the proposed development area in order to protect soil and to reduce the percentage of the surface area which is paved.
- 3.5.19 Run-off from paved surfaces should be slowed down by the strategic placement of berms.

### **3.5 Biota**

- 3.5.1 The Licensee must take all reasonable steps to allow movement of aquatic species, including migratory species.
- 3.5.2 All reasonable steps must be taken not to disturb the breeding, nesting and/or feeding habitats and natural movement patterns of aquatic biota.



- 3.5.3 The current level of diversity of biotopes and communities of animals, plants and microorganisms must be maintained.

#### **4 REHABILITATION AND MANAGEMENT**

- 4.1 The Licensee must embark on a systematic long-term rehabilitation programme to restore the watercourse(s) to environmentally acceptable and sustainable conditions after completion of the activities, which must include, but not be limited to the rehabilitation of disturbed and degraded riparian areas to restore and upgrade the riparian habitat integrity to sustain a bio-diverse riparian ecosystem.
- 4.2 All disturbed areas must be re-vegetated with an indigenous seed mix in consultation with an indigenous plant expert, ensuring that during rehabilitation only indigenous shrubs, trees and grasses are used in restoring the biodiversity.
- 4.3 An active campaign for controlling invasive species must be implemented within disturbed zones to ensure that it does not become a conduit for the propagation and spread of invasive exotic plants.
- 4.4 Rehabilitation must be concurrent with construction.
- 4.5 Topsoil must be stripped and redistributed.
- 4.6 Compacted and disturbed areas must be shaped to natural forms and to follow the original contour. In general cut and fill slopes and other disturbed areas must not exceed 1:3 (v:h) ratio, it must be protected, vegetated, ripped and scarified parallel with the contour.
- 4.7 The Regional Head: Gauteng must sign a release form indicating that rehabilitation was done satisfactory according to specifications as per this Licence.
- 4.8 A photographic record must be kept as follows and submitted with reports as set out in section 5:
- 4.8.1 Dated photographs of all the sites to be impacted before construction commences;
- 4.8.2 Dated photographs of all the sites during construction on a monthly basis; and
- 4.8.3 Dated photographs of all the sites after completion of construction, seasonally.
- 4.9 Rehabilitation structures must be inspected regularly for the accumulation of debris, blockages instabilities and erosion with concomitant remedial and maintenance actions.
- 4.10 A comprehensive and appropriate rehabilitation and management programme to restore the watercourse(s) to environmentally acceptable and sustainable conditions after construction must be developed and submitted to the Regional Head: Gauteng for written approval within one (1) month from the date of issuance of this licence.





- 4.11 The rehabilitation and management programme must in particular address remedies for surface cracks and settlement and must be submitted to the Regional Head: Gauteng for written approval within one (1) month of issuing of this licence or otherwise agreed in writing with the Responsible Authority.
- 4.12 A Wetland Management and Rehabilitation Plan must be compiled by a wetland specialist when wetlands are affected and submitted to the Regional Head: Guteng for written approval.
- 4.13 Wetland crossing(s) must be visited by a wetland specialist prior to construction to determine baseline conditions. This should be repeated during and after rehabilitation measures have been implemented to assess the success of rehabilitation and erosion control measures.

## **5 MONITORING AND REPORTING**

- 5.1 The Responsible Authority must be notified in writing one week prior to commencement of the Licenced activity(ies) and again upon completion of the activity(ies).
- 5.2 A comprehensive and appropriate environmental assessment and monitoring programme (including bio-monitoring) to determine the impact, change, deterioration and improvement of the aquatic system associated with the activities listed under condition 1.1 as well as compliance to these water use licence conditions must be developed and submitted to the Regional Head: Gauteng for written approval before commencement and must subsequently be implemented as directed.
- 5.3 Six (6) monthly monitoring reports must be submitted to the Responsible Authority until otherwise agreed in writing with the Regional Head: Gauteng.
- 5.4 A qualified and responsible scientist must be retained by the Licensee who must give effect to the various licence conditions and to ensure compliance thereof pertaining to all activities impeding and/or diverting flow of watercourses as well as alterations to watercourses on the property(ies) as set out in condition 1.1.
- 5.5 The Licensee must conduct on a two yearly basis an internal audit on compliance with the conditions this licence. A report on the audit must be submitted to the Responsible Authority within one month of the finalisation of the audit. A qualified independent auditor must undertake this audit.
- 5.6 The audit reports must include but are not limited to:
  - 5.6.1 Reporting in respect of the monitoring programme referred to in condition 5.2 above;
  - 5.6.2 A record of implementation of all mitigation measures including a record of corrective actions; and
  - 5.6.3 Compensation measures for damage where mitigation measures have failed to adequately protect the in-stream and riparian habitat or any other characteristic of the watercourses.



- 5.7 The Licensee must apply in writing to the Regional Head: Gauteng for alternative reporting arrangements for which written approval must be provided.

## **6 OTHER WATER USERS**

- 6.1 The Licensee must attempt to prevent adverse affect on other water users. All complaints must be investigated by a suitable qualified person and if investigations prove that the Licensee has impaired the rights of other water users, the Licensee must initiate suitable compensative measures.

## **7. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS**

- 7.1 Pollution incidents shall be dealt with in accordance with Section 19 and 20 of the Act.
- 7.2 Any incident that may cause pollution of any water resource shall immediately be reported to the Responsible Authority.
- 7.3 If surface and/or groundwater pollution has occurred or may possibly occur, the Licensee must conduct, and/or appoint specialists to conduct the necessary investigations and implement additional monitoring, pollution prevention and remediation measures to the satisfaction of the Responsible Authority.
- 7.4 The Licensee shall keep all records relating to the compliance or non-compliance with the conditions of this licence in good order. Such records shall be made available to the Responsible Authority within 14 (fourteen) days of receipt of a written request by the Department for such records.
- 7.5 The Licensee shall keep an incident report and complaints register, which must be made available to any external auditors and the Department.

## **8 BUDGETARY PROVISIONS**

- 8.1 The water user must ensure that there is a budget sufficient to complete and maintain the water use and for successful implementation of the rehabilitation programme as set out in this Licence.
- 8.2 The Department may at any stage of the process request proof of budgetary provisions for rehabilitation and closure of project.

**[END OF LICENCE]**