



the federation for a sustainable environment

# Cradle of Humankind World Heritage Site Presentation

Selected extracts from South Africa's environmental  
Legislation and current Situation within the West Rand gold  
fields

Mariette Liefferink

## Legal Matrix

Responsibilities, liabilities and duties for remediation and mine closure under the NWA, the NEMA and the EIA Regulations

## Responsibilities, liabilities and duties for remediation and mine closure under the NWA, the NEMA and the EIA Regulations

- One of the most critical issues is post-mining land-use: While communities may benefit during the life-time of the project, future generations may have their livelihood opportunities and their quality of life, reduced by a lack of post-closure land-use planning.

### Section 28 of NEMA: **Duty of care and remediation of environmental damage**

(1) *“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take **reasonable measures** to prevent such pollution or degradation from occurring, continuing or recurring...”*

# Responsibilities, Liabilities and Duties for Remediation and Mine Closure under the NEMA (S28)

## Who is responsible/liable?

- Section 34 of NEMA makes provision for:
  - both ‘**firms**’ (including companies and partnerships) and their ‘**directors**’ (including board members, executive committees or other managing bodies or companies or members of close corporations or of partnerships) to be held liable, in their personal capacities, for environmental crimes.
  - This personal liability also applies to **managers, agents or employees** who have done or omitted to do an allocated task, while acting on behalf of their employer.

# Responsibilities, Liabilities and Duties for Remediation and Mine Closure under the NWA (S19)

## Who is responsible/liable?

19 (1) An owner of land, a person in control of land or a person who occupies or uses the land on which-

- (a) Any activity or process is or was performed or undertaken; or
- (b) Any other situation exists, which causes, has cause or is likely to cause **pollution\*** of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.

**\*Pollution means the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful to the welfare, health or safety of human beings, aquatic or nonaquatic organisms, resource quality or property**

CLOSURE

A closure plan must contain the information set out in **Appendix 5 to these Regulations**

**Content of closure plan**

1. (1) A closure plan must include-

(a) details of -

(i) the **EAP** who prepared the closure plan; and

(ii) the expertise of that EAP;

(b) **closure objectives;**

(c) proposed mechanisms for **monitoring compliance** with and performance assessment against the closure plan and reporting thereon;

**(d) measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity and associated closure to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development,** including a handover report, where applicable;

(e) information on any proposed **avoidance, management and mitigation measures** that will be taken to address the environmental impacts resulting from the undertaking of the closure activity.

# National Environmental Management Act (107/1998): Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations

## Scope of financial provision

5. An applicant or holder of right or permit must make financial provision for—

(c) remediation and management of latent or residual environmental impacts which may **become known in future, including the pumping and treatment of polluted or extraneous water.**

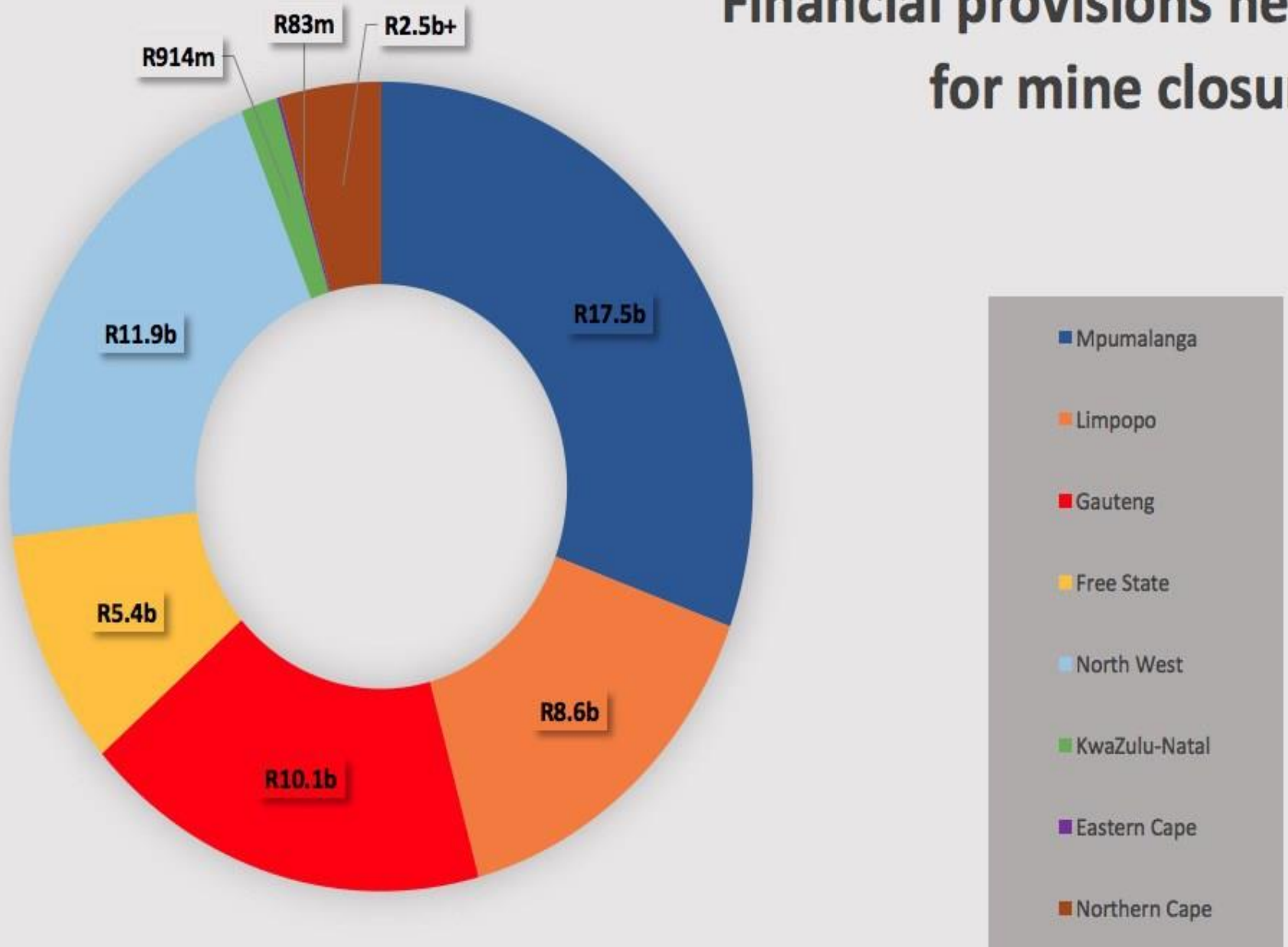
8. (1) An applicant or holder of a right or permit must make financial provision by one or a combination of a—

(a) **financial guarantee** from a bank registered in terms of the Banks Act, 1990 (Act No. 94 of 1990) or from a financial institution registered by the Financial Services Board as an insurer or underwriter;

(b) deposit into an account administered by the Minister responsible for mineral resources; or

(c) contribution to a **trust fund** established in terms of applicable legislation (conditions)

# Financial provisions held for mine closure



National Environmental Management Act (107/1998): Regulations pertaining to the  
Financial Provision for Prospecting, Exploration, Mining or Production Operations  
(Continue)

**Responsibility of holder of a right or permit**

13. (1) The holder of a right or permit must make an **environmental management programme** submitted in terms of section 24N of the Act and any approved amendment thereof required in terms of the Environmental Impact Assessment Regulations, 2014 —

- (a) available on a publically accessible website** of the holder of a right or permit, if such holder of a right or permit has such a website;
- (b) available at the site office** of the prospecting, exploration, mining or production operation;  
and
- (c) accessible to the public on request.**

# Legacy Issues

# Gold-mining Areas of the Witwatersrand gold fields

RADIOACTIVITY MONITORING PROGRAMME (01/97-12/97)

MOOI RIVER CATCHMENT  
(WONDERFONTEINSPRUIT)

Mooi River Catchment

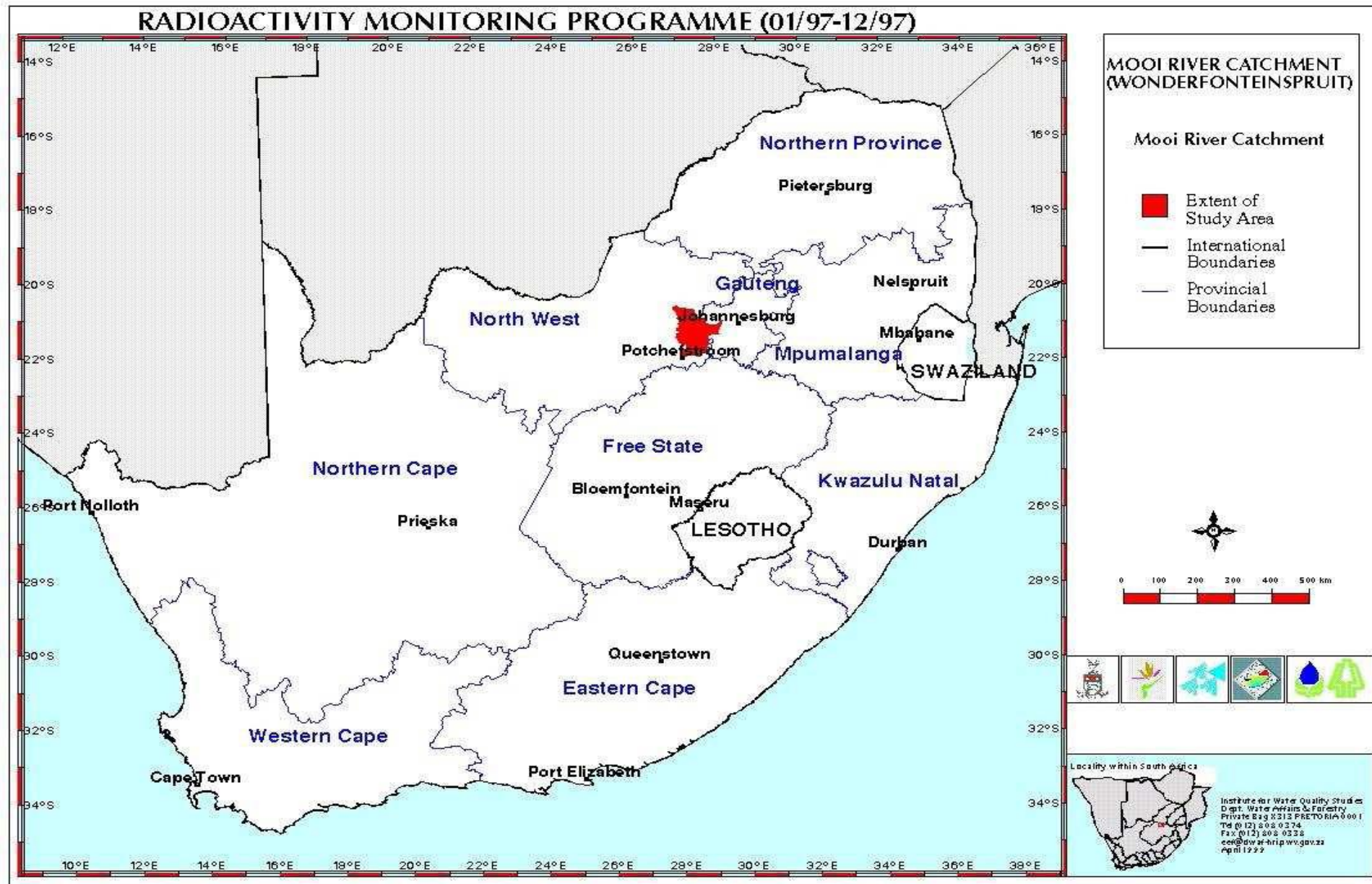
- Extent of Study Area
- International Boundaries
- Provincial Boundaries



Locality within South Africa



Institute for Water Quality Studies  
Dept. Water Affairs & Forestry  
Private Bag 6313 PRETORIA 0001  
Tel (012) 208 0374  
Fax (012) 208 0338  
en@dwaf-wrip.wa.gov.za  
April 1997



# Witwatersrand Mining Basin\*

- Having yielded more than one third of all the gold ever produced on the planet, the Witwatersrand Basin held **the world's largest gold reserves** (Tucker et al 2016).
- The Witwatersrand has been **mined for more than a century**.
- It is the world's **largest gold and uranium mining basin** with the extraction, from more than **120 mines**,
- of **43 500 tons of gold** in one century and **73 000 tons of uranium** between 1953 and 1995.
- The basin covers an area of 1600 km<sup>2</sup>, and led to a legacy of some 400 km<sup>2</sup> of mine tailings dams (**270 tailings dams and 380 MRDs**) containing
- **6 billion tons of pyrite tailings** and **600 000 t** of low-grade **uranium**.
- It is estimated that **6000 km<sup>2</sup>** of soils are significantly impacted by gold mining on the Witwatersrand Basin alone (Weiersbye and Witkowski, 2003).

\* The Witwatersrand Mining Basin is composed of the Far East Basin, Central Rand Basin, Western Basin, Far Western Basin, KOSH and the Free State gold mines

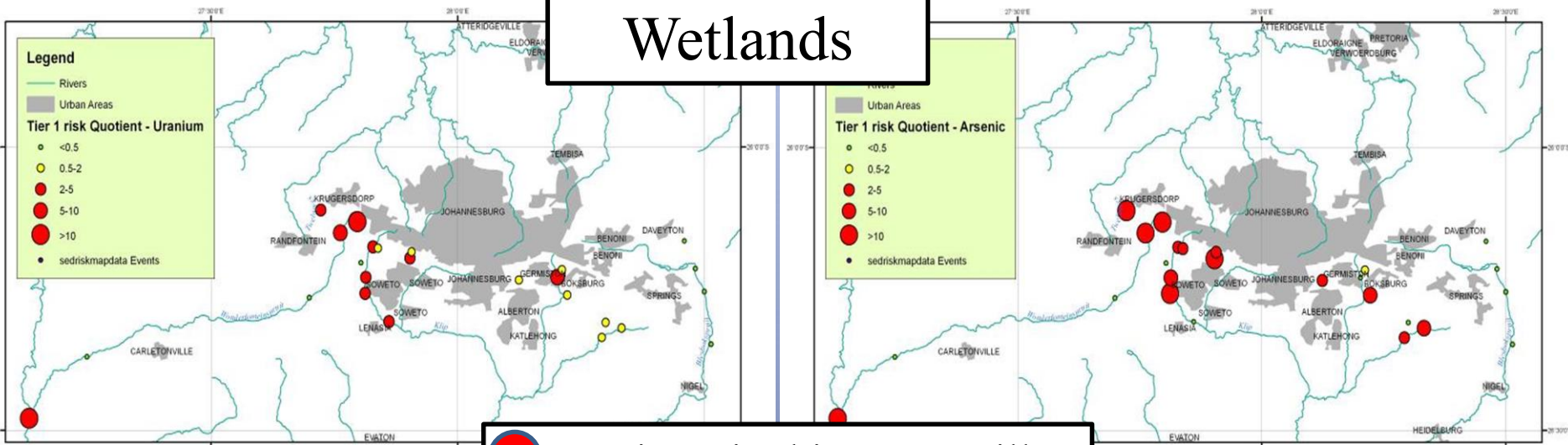
## Waste

- As early as 1987, the US Environmental Protection Agency recognised that “.....problems related to mining waste may be rated as **second only to global warming** and stratospheric ozone depletion in terms of ecological risk. The release to the environment of mining waste can result in **profound, generally irreversible destruction of ecosystems.**”
- Waste from gold mines constitutes **the largest single source of waste** and pollution in South Africa and there is wide acceptance that Acid Mine Drainage (AMD) is responsible for the most costly environmental and socio-economic impacts.).
- Gold mining waste was estimated to account for 221 million tons or **47 % of all mineral waste produced in South Africa, making it the largest, single source of waste and pollution (DWAF, 2001).**

References: CSIR. Briefing Note August 2009. Acid Mine Drainage in South Africa. Dr. Pat Manders. Director, Natural Resources and the Environment.

European Environmental Bureau (EEB). 2000. The environmental performance of the mining industry and the action necessary to strengthen European legislation in the wake of the Tisza-Danube pollution. EEB Document no 2000/016.

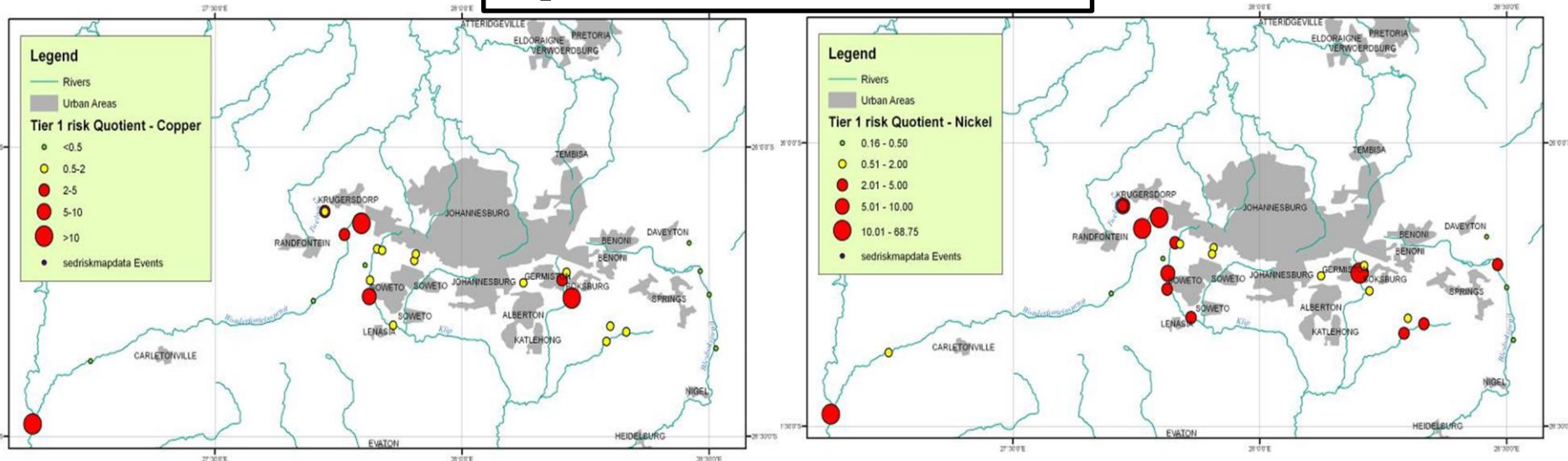
# Wetlands



Uranium

Quotients in this range will represent an environmental risk

Arsenic



Copper

Nickel

Contamination of wetlands by Witwatersrand gold mines – processes and the economic potential of gold in wetlands. Council for Geoscience Report No. 2005-0106

# Wetlands

*“The heron that laid the golden egg: metals and metalloids in ibis, darter, cormorant, heron, and egret eggs from the Vaal River catchment, South Africa”* (V. van der Schyff & R. Pieters & H. Bouwman)

- Elements of concern are Al, Cr, Cu, Bi, Sr, Sb, Au, Hg, Pb, and U.
- The rivers draining Gauteng and the gold mining areas remain an area of concern.
- Found high concentrations of gold (Au), uranium (U), thallium (Tl), and platinum (Pt) and mercury (Hg) in eggs.
- Based on these high concentrations, human health might be at risk as humans share similar food and are therefore exposed to the same contaminants.



# “A holistic view on the impact of gold and uranium mining on the Wonderfonteinspruit”

David Hamman 2012

- The comparison between cattle tissue samples from the experimental and control group revealed that nickel, zinc, selenium, lead and uranium concentrations all reveal a practically significant difference.
- The uranium concentration in the cattle samples from the experimental group was 126.75 times higher in the liver, **4350 times higher in the kidney**, 47.75 times higher in the spleen, 31.6 times higher in the muscle tissue, 60 times higher in the bone and 129 times higher in the hair than that of the cattle samples from the control group.

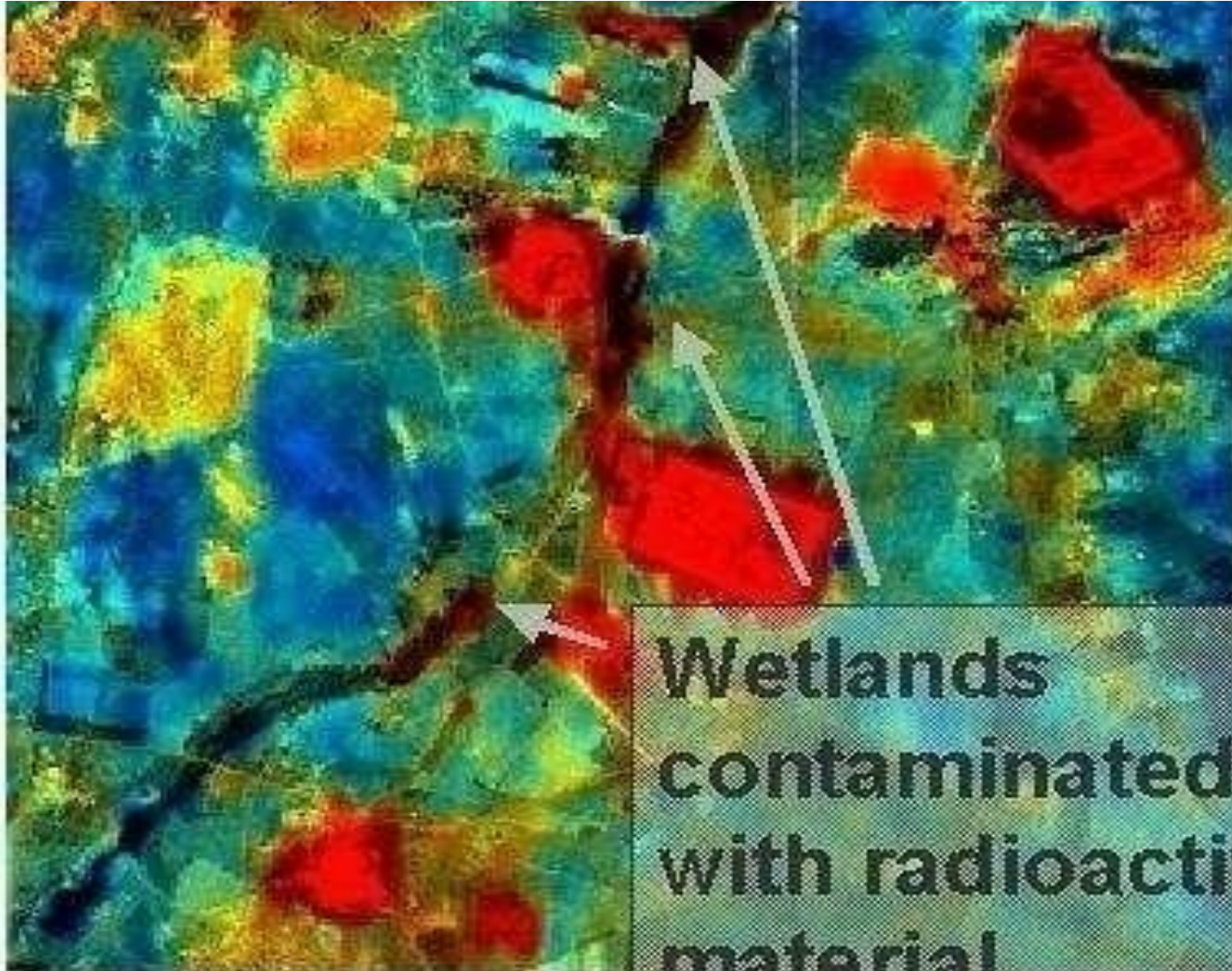
# Uranium and Radioactivity

- As a consequence of the uraniferous nature of the ore, Witwatersrand tailings and other mining residues often contain significantly elevated concentrations of uranium and its daughter radionuclides, with the decay series of  $^{238}\text{U}$  being dominant.
- Significant radiation exposure can occur in the surroundings of mining legacies, due to:
  - Inhalation of Rn-222 daughter nuclides from radon emissions of desiccated water storage dams and slimes dams.
  - The inhalation of contaminated dust generated by wind erosion from these objects, and
  - The contamination of agricultural crop (pasture, vegetables) by the deposition of radioactive dust particles, which can cause considerable dose contributions via ingestion.

Reference: Institute for Water Quality Studies, 1995; Institute for Water Quality Studies, 1999, Department of Water Affairs and Forestry, 2003. *Radiometric Surveying in the Vicinity of Witwatersrand Gold Mines*. H. Coetzee. Mine Closure. 2008

Reference: NNR Report – TR-RRD-07-0006 – “Radiological Impacts of the Mining Activities to the Public in the Wonderfonteinspruit Catchment Area.” 12 July 2007

Airborne gamma ray survey data collected by the Council of Geoscience identified areas of elevated radioactivity. Elevated radioactivity levels were recorded over mining areas, in particular mine residue deposits.



Reference: WRC  
1214/1/06

**Wetlands  
contaminated  
with radioactive  
material**



- There has been a historical migration of generally elevated radioactive levels to the urban areas of Johannesburg central business district (CBD) indicating the use of dump and waste material for building purposes as well as downstream plumes in wetlands areas.

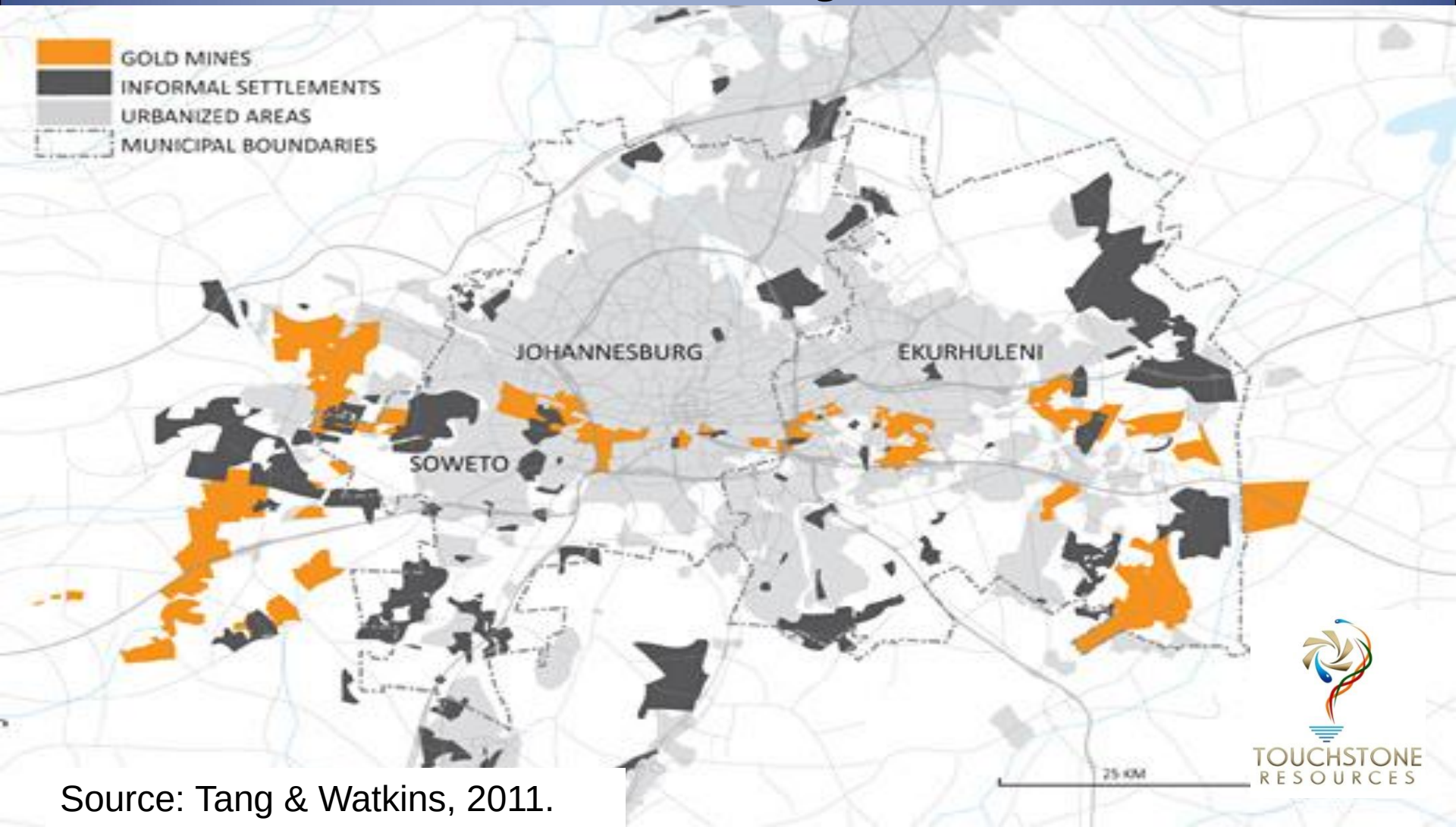
Reference: Department of Mineral Resources. Regional Mine Closure Strategy for the Central Rand Goldfield. 2008.

Tudor Shaft Informal Settlement  
13,14mSv/a





400 000 people live in informal settlements close to radioactive mine residue areas. The majority of MRAs are radioactive because the Witwatersrand gold-bearing ores contain almost ten times the amount of uranium than gold.



Source: Tang & Watkins, 2011.

# Acid Mine Drainage (AMD)

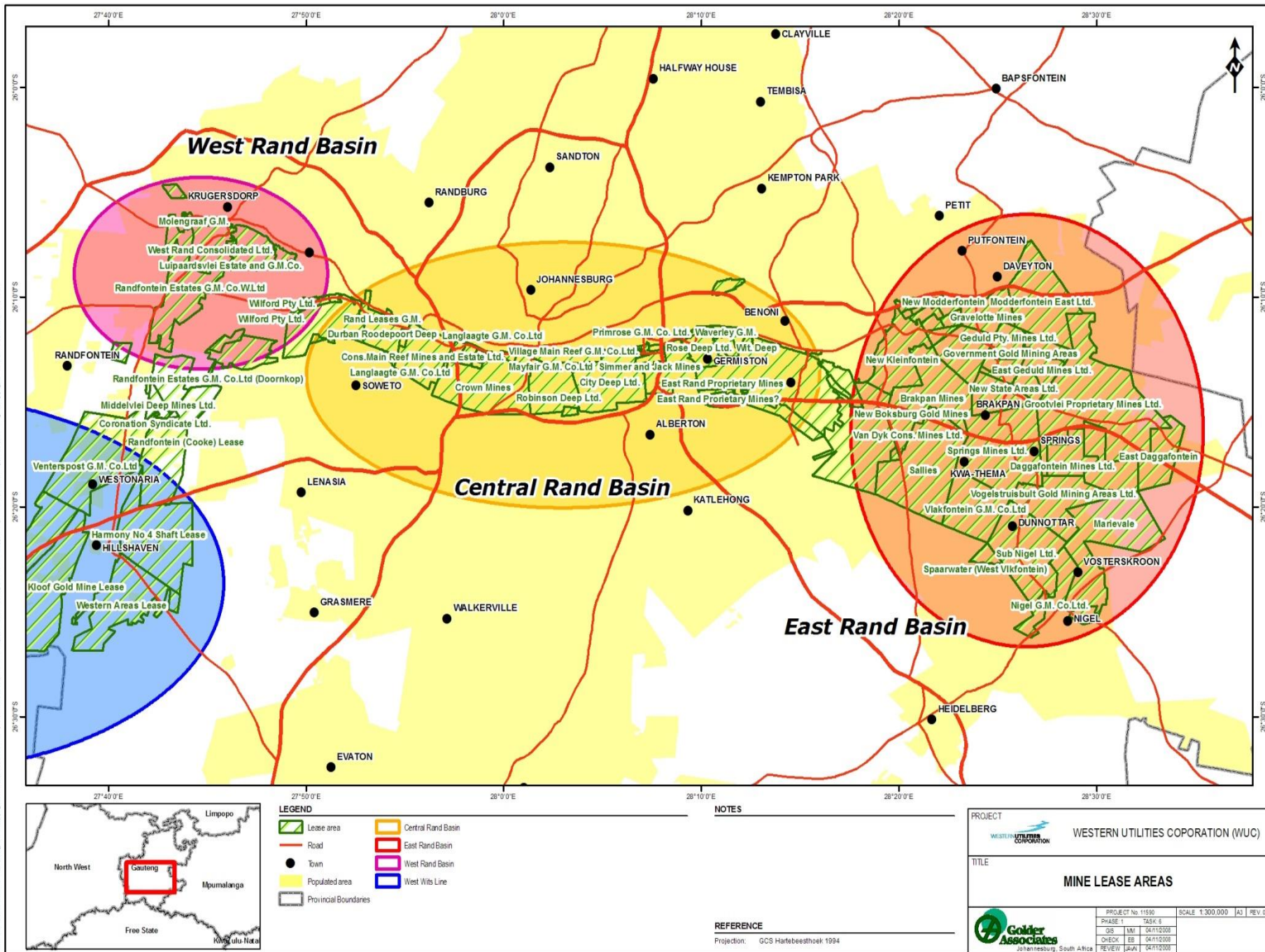


- AMD – established phenomenon in Witwatersrand since 1903.
- The potential volume of AMD for the Witwatersrand Goldfield alone amounts to an estimated 350ML/day (1ML = 1000m<sup>3</sup>).
- This represents 10% of the potable water supplied daily by Rand Water to municipal authorities for urban distribution in Gauteng province and surrounding areas, at a cost of R3000/ML.
- The gold mining industry in South Africa (principally the Witwatersrand Goldfield) is in decline, but the post-closure **decant of AMD** is an **enormous threat**, and this could become worse if remedial activities are delayed or not implemented.

*Reference: R Scott. WRC Report No 486/1/95*

*CSIR. Briefing Note August 2009. Acid Mine Drainage in South Africa. Dr. Pat Manders. Director, Natural Resources and the Environment.*

Information contained on this drawing is the copyright of Colider Associates Pty. Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Colider Associates Pty. Ltd.



Robinson Lake  
U Levels – 16mg/l (40 000 times higher than background U  
levels in freshwater



Ref. Coetzee, H. (compiler) 2004: An assessment of sources, pathways, and potential future pollution of water and sediments in gold-mining area catchment. WRC Report No 1214/1/06, Pretoria, 266 pp.

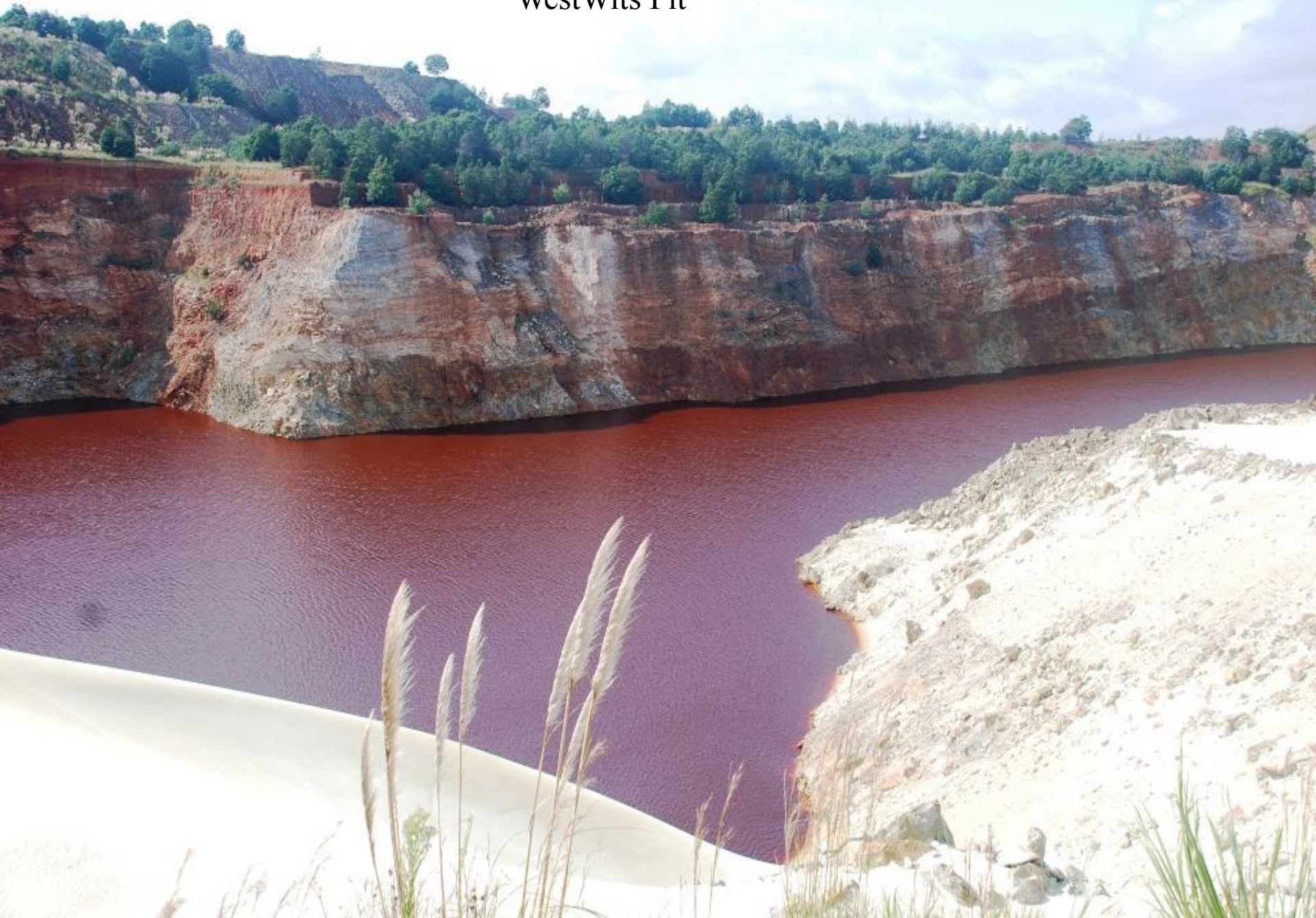
# Acid Mine Drainage

- AMD is associated with surface and groundwater pollution, degradation of soil quality, for harming aquatic sediments and fauna, and for allowing heavy metals to seep into the environment.
- Long-term exposure to AMD **polluted drinking water may lead to increased rates of cancer, decreased cognitive function and appearance of skin lesions.**
- Heavy metals in drinking water could compromise the neural development of the fetus which can result in mental retardation.

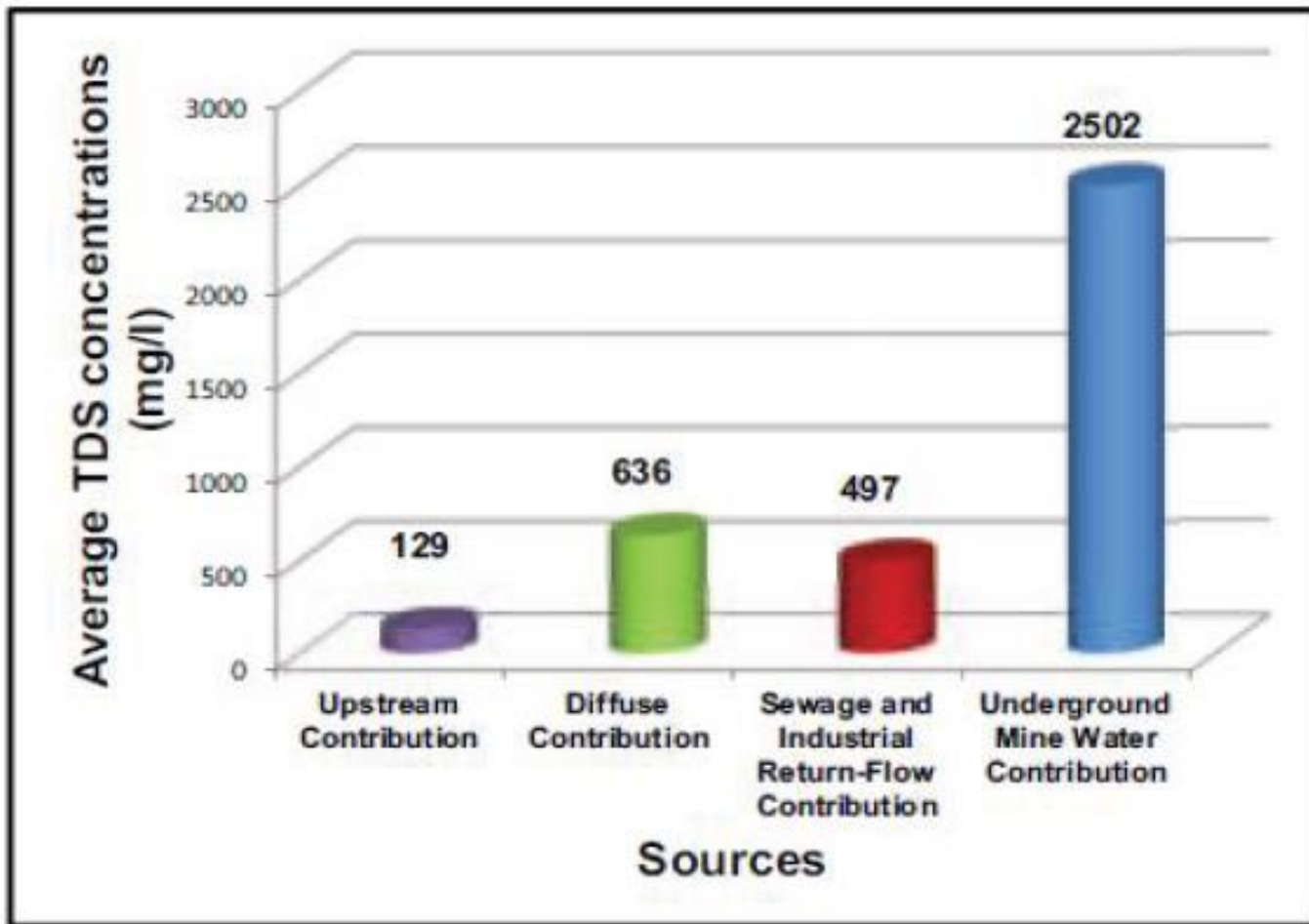
# The current (immediate and short-term) treatment of AMD

- The current (immediate and short-term) treatment of AMD is by means of neutralisation or a pH adjustment.
- In most cases, metals will precipitate out of solution if the pH is adjusted upwards, i.e. the water is made more alkaline.
- It should be noted that the metals do not simply disappear but change to a different oxidation state, which change them from a soluble form to a solid form.
- The metals are still there, in the area where the precipitation has occurred in the first place. The process can be reversed and the contaminants mobilised, should the water become acidic (Fourie 2006).

## WestWits Pit



## MOST CONCENTRATED SALT STREAM (2009)



**Average daily TDS concentrations of partially treated AMD:  
(Oct 2017 to Oct 2018)**

**Central Basin: 4 019 mg/l**

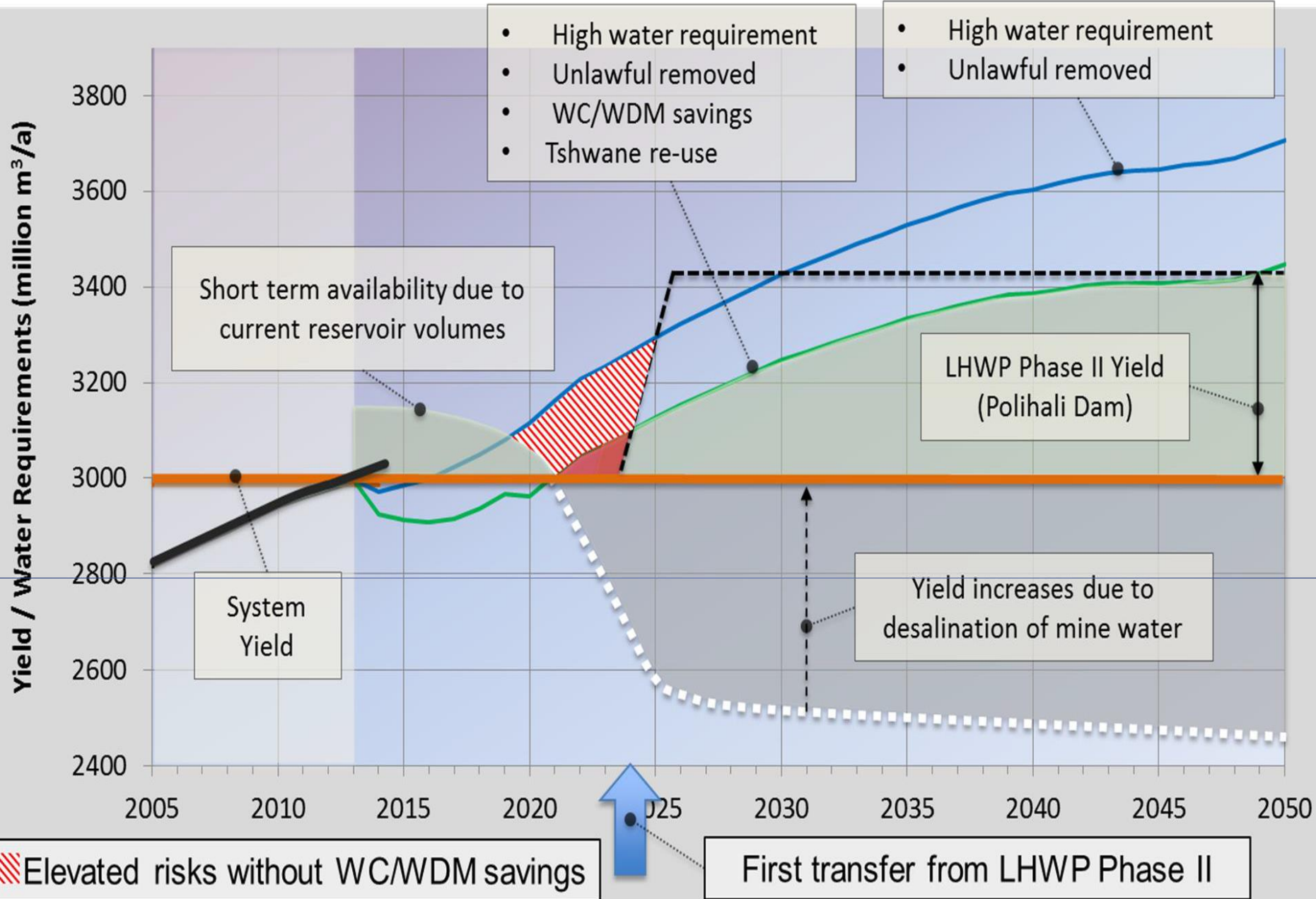
**Eastern Basin: 2 300 mg/l**

High with target WC/WDM

Desalination for urban use

Unlawful removed

Re-use (Tshwane)



Tweelopiespruit





Dump Reclamation  
and  
Unscheduled Closure

# Case Study

## Mintails

### How not to close a mine

- Australian listed company
- Three mining rights (132MR, 133MR, 206MR)
- In liquidation
- Unfunded environmental liability of R460 367 811.07
- *“The DMR allowed Mintails to operate between 2012 and 2018, despite the fact that the Department had never approved the environmental management plans of the mine and had never issued the company with a mining right under the law”.*

(Ref. Parliament: Announcements, Tablings and Committee Reports. 22 November 2018)



# Lancaster Dam: Headwaters of the Wonderfonteinspruit



# Tudor Dam

Uranium 238 in the soils and sediments behind the dam are high, 8000-10000 Bq/kg with radium 226 at 1700-2800 Bq/kg (Ref. WCA: RAP. 2009)



**Regulatory Limit: 500Bq/kg**



CAMS DUMP (Headwaters of the Wonderfonteinspruit): Unrehabilitated footprint

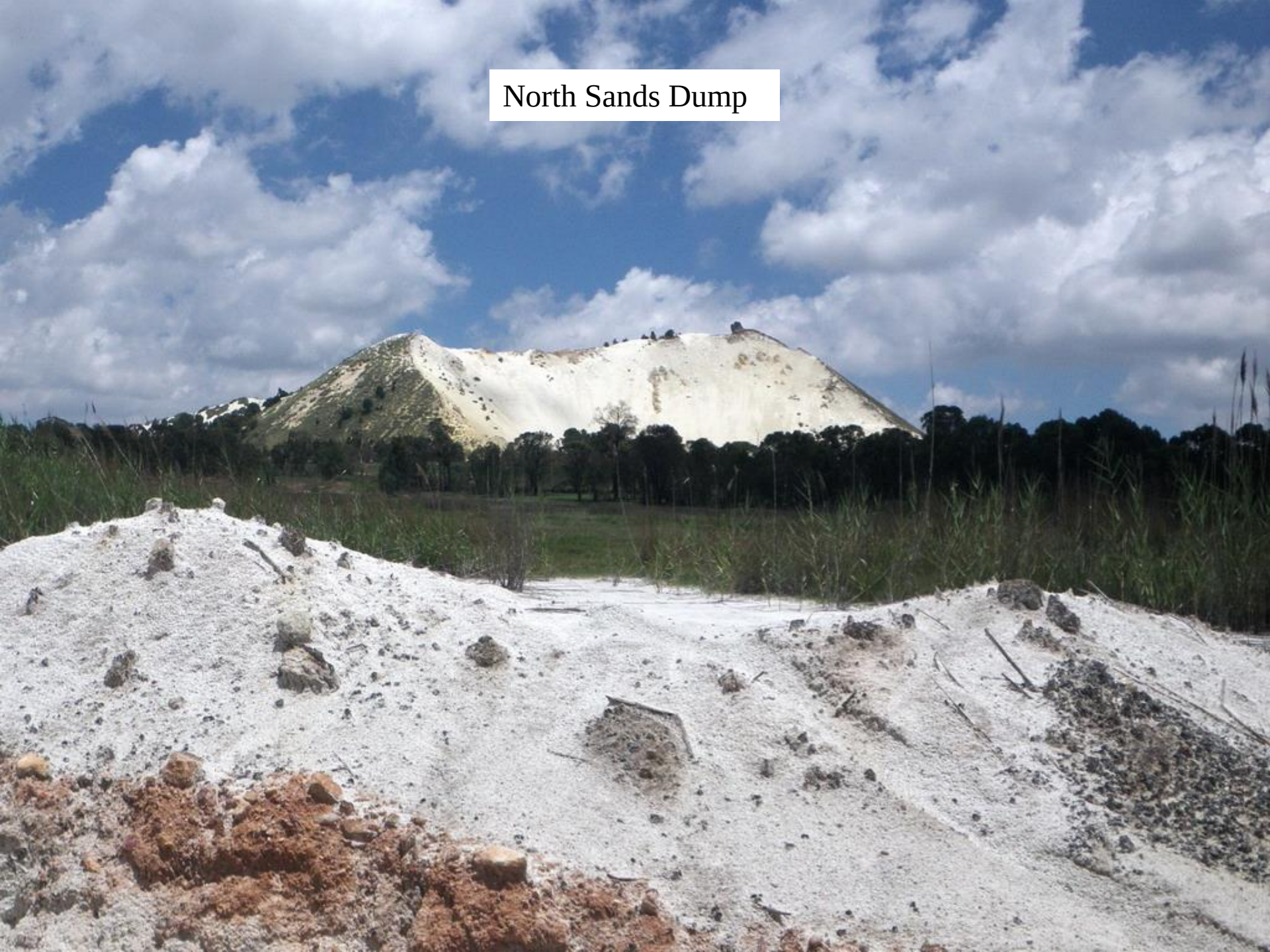




# Eskom Dump (1L 8 Dump)



North Sands Dump





Courtesy: WGFilm

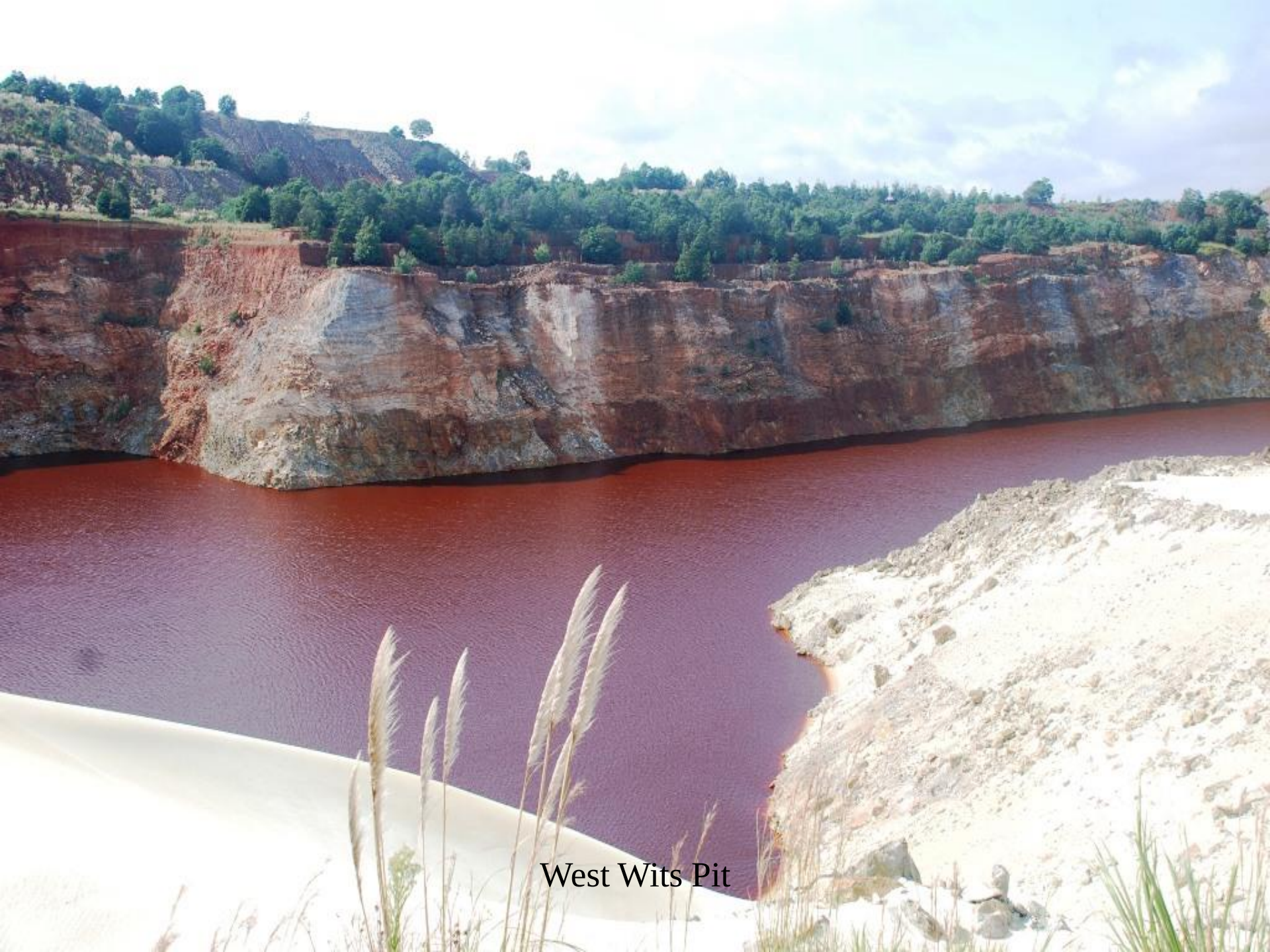
## North Sands Dump



PHOTO BY FRANCOIS VAN VUUREN

# Open Pits Emerald/Monarch Cluster





West Wits Pit

## 1L13 – 1L 15

No erosion control; no or inadequate stormwater management; no alien or invasive species control; no cut off trenches; no access control; the dam is not fenced off so as to restrict access thereto; no cut off trenches or toe paddocks which allows for the migration of material (fines) into the drainage lines



## Mindalore .

Intervention by South African Human Rights Commission; reclamation operations have ceased; footprint and diggings remain unrehabilitated



Photograph: Courtesy Michael Harris.  
31 January 2017

Pipeline Route  
5 November 2011



Pipeline Route – 12/13 September 2013



## Boltonia Pipeline Route





foreign servers, in a bid to boost cybersecurity.

The move was labelled by critics as the latest attempt to control online content under President Vladimir Putin, with some fearing the country is on track to completely isolate its network, as in North Korea.

Previously, trying to block for many months, had called on its users to attend the rally.

A message on its account said the internet bill aims to "cut off Russia from the rest of the world, after which they can block foreign social networks and messengers". -AFP

years in an enormous democratic undertaking.

From April 8 to May 19 voters will elect 341 legislators to India's lower house of parliament, the Lok Sabha, which governs from New Delhi, the electoral commission said.

Counting will be completed

23, 8  
"I  
Elect  
on 1  
thru  
turn  
fre  
hills  
M

## FOR SALE BY TENDER

  
**MINTAILS MINING**  
SOUTH AFRICKA (PTY) LTD

**(IN LIQUIDATION)**

**MINTAILS MINING SA (PTY) LTD**

Refers to: 0244/2018

**MINTAILS SA RANDFONTEIN CLUSTER (PTY) LTD**

Refers to: 0243/2018

**MINTAILS GOLD SA (PTY) LTD**

Refers to: 0243/2018



## GOLD TAILINGS TREATMENT OPPORTUNITY

Combination of Mineral & Deposition Rights, Plant and Property.

Data room available.

WH Auctioneers has been duly instructed by the Joint Provisional Liquidators to proceed via public tender to sell the assets and property existing in the estate of Mintails Mining SA (Pty) Ltd (in liquidation) and all subsidiary companies falling under the Mintails umbrella either in liquidation or not, holding various assets, mineral and deposition rights.

WH is calling for expressions of interest (EOI) for the sale of Mintails Mining SA. The Joint Liquidators reserve the right not to accept the highest or any offer(s).



**TENDER CLOSES: THU 4 APRIL 2019 @ 12PM**

**TENDER DOCUMENTS: [joshua@whauctions.com](mailto:joshua@whauctions.com)**

VIEW by appointment • 30PMET JARVIS (unfunded) • 30YENI RSE 10%

Joshua: 072 536 5482 • Tim: 082 371 1060

**[whauctions.com](http://whauctions.com)**

WH Auctioneers (Pty) Ltd • 375 16th Road, Midrand • Tel: 011 874 5700



Mining is like a search and destroy mission

**STEWART UDELL**  
American politician



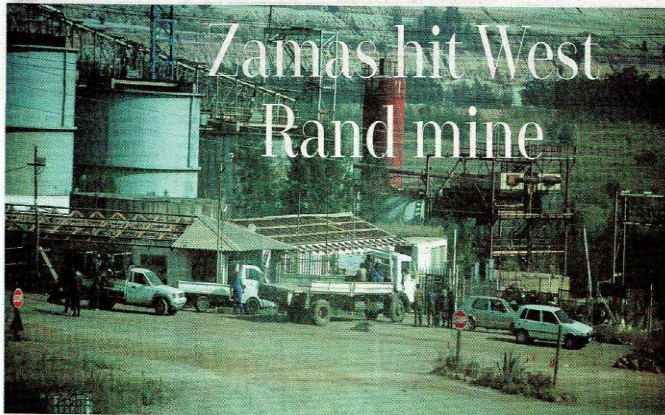
ICYMI | IOL.CO.ZA

## R79 MILLION LOTTO WINNER

**NATIONAL** lottery operator Itluba announced that a LOTTO winner has bagged over R79 million. The winner purchased her ticket in Ottery, Cape Town and used the Quick Pick selection with a R30 wager on May 4.

## ■ ENVIRONMENT

# Zamas hit West Rand mine



MINTAILS' gold treatment plants and infrastructure on the West Rand are being plundered by hundreds of illegal miners who scavenge for copper cables, metal and gold dust. This includes the electrical cable which supplies power to Shaft 9, from where acid mine drainage is pumped from the Western Basin. | NOKUTHULA MBATHA African News Agency (ANA)

*Ransacking the now-liquidated Mintails' mine area may have dire consequences*

SHEREE BEGA

THE armoured vehicle could go no further. It idled tentatively, a few hundred metres from a devastating scene: scores of illegal miners were stripping the Mintails gold treatment plants and infrastructure in Randfontein.

A line of vehicles were parked outside, where the security arm of the Zama Zamas ostensibly demanded payment from other illegal miners to enter the beleaguered premises.

"They first have to pay before they can enter to go and steal," said Mariette Loeffler, the chief executive of the Federation for a Sustainable Environment (FSE), seated inside the vehicle, which was guarded by three heavily armed security personnel.

"What we see here is the wholesale looting and scavenging of whatever has value, whether it's copper cables, gold dust or steel."

Last Wednesday, liquidators for Mintails, a gold mining and tailings processing company listed on the Australian Stock Exchange, terminated the services of security personnel.

What unfolded was a free-for-all. "It opened the way for hundreds of looters to loot Mintails' infrastructure and the gold treatment plants," she said.

"It appears the Hawks seems also

to be fearful to get involved. This is a free-for-all, the looting is continuing with impunity and no enforcement."

Over the weekend, 70 to 80 vehicles at a time entered the premises to scavenge copper cables, metal and gold dust.

"There will only be scrap left," said Liefferink, of the Mogale Gold facilities, the only asset left in the liquidated group of companies.

But the illegal miners have already pilfered the electrical cable, which supplies power to 9 Shaft, where acid mine drainage (AMD) from the flooded Western Mining Basin is pumped.

"They're already making big money - and once they've taken everything there, the worry is they will come for 9 Shaft and neighbouring mines" said Tiefferink.

Since last week Friday, the pumping of AMD has halted. Usually up to 40 million litres is pumped each day.

"The water level is increasing by about 110mm a day. If nothing is done, it will decant in three months. This is a serious situation because when we last had an AMD decant in 2002, it had devastating impacts on



Mariette Liefferink, chief executive of the Federation for a Sustainable Environment

the surrounding environment."

The Tweelopiespruit and the Wonderfonteinpruit were left poisoned by the acidic, toxic and radioactive water, which affected downstream water users and posed risks to the Cradle of Humankind.

"The people in the Swartkrans compartment, which hosts the sensitive Cradle of Humankind, rely on this water for drinking purposes and for irrigation."

Sputnik Ratau, the spokesperson for the Department of Water and Sanitation, said: "There is no immediate risk of raw AMD decanting. The water level in the void is around 9m below surface and this is considered ample buffer capacity for now."

station is near the Mintals' office block and the cable was sabotaged and stolen on May 24. Power to the Western Basin AMD pump station (on Mintals' property) and the AMD treatment plant (some distance away on the property of Sibanye Stillwater) is thus compromised and the facility is currently not operational," he said.

The Western Basin plant had been affected by cable theft and damage to the electricity switch, she said.

"The cable comes from the Eskom substations and runs through the Mintails security area. The plant has

been shut down since then.

"Due to increased theft and damage to the Mintails gold treatment plant area it was decided that it would be risky to repair the current power line as it will be vulnerable to ongoing cable theft, increasing repair costs and unprecedented downtime on the plant."

"To reduce downtime the option of installing a generator was considered, however, due to the power needs of the plant it was ascertained that the size of the generator is not readily available and would be costly.

"In the interest of speed and safety TCTA with Sibanye Gold took a decision to install an overhead power supply, which is due to be completed by Tuesday."

Ratau said the AMD treatment plant had permanent security and was "not at risk from the *zamas* plundering" the Mintals infrastructure.

"There is prolific *zama zama* activity in the area of the now-liquidated (and abandoned) Mintails' mine. *Zamas* are heavily armed and are stripping metal, electrical cables, gold-bearing waste, etc. on the property of Mintails."

Ratau said armed security personnel would be permanently deployed at the pump station to deter attempts of cable theft or other damage to the pump station, including the stripping of metal.

The Department of Mineral Resources said it was aware of the situation and "working with all relevant stakeholders to mitigate any damage to the environment".

Minimals applied for business rescue in October 2015, but was liquidated in September last year. It has an unfunded environmental liability of R485 million, but only around R25m financial provision in its environmental rehabilitation funds.

"We've seen in the Blyvoor case, in the Grootvlei case and now in the Mintails case, that besides the environment and future generations carrying the risks, impact and costs, neighbouring mines also have to cover the costs," said Lijfferink.

In recent months, the FSE has sent urgent and final letters of demand to several key government departments including Water and Mineral Resources for allowing Mintails to operate from 2012 to 2018 without a mining right, an approved environmental management programme report and adequate financial provisions and has threatened legal action.

She described a "total paralysis" of government departments to take action. "Last Thursday, the same departments conducted another site visit of Mintails operations, which showed... flagrant failure in duty of care, non-compliance with environmental legislation and non-enforcement of non-compliance, environmental degradation and pollution. Numerous letters of demand have been written. No action has been taken."

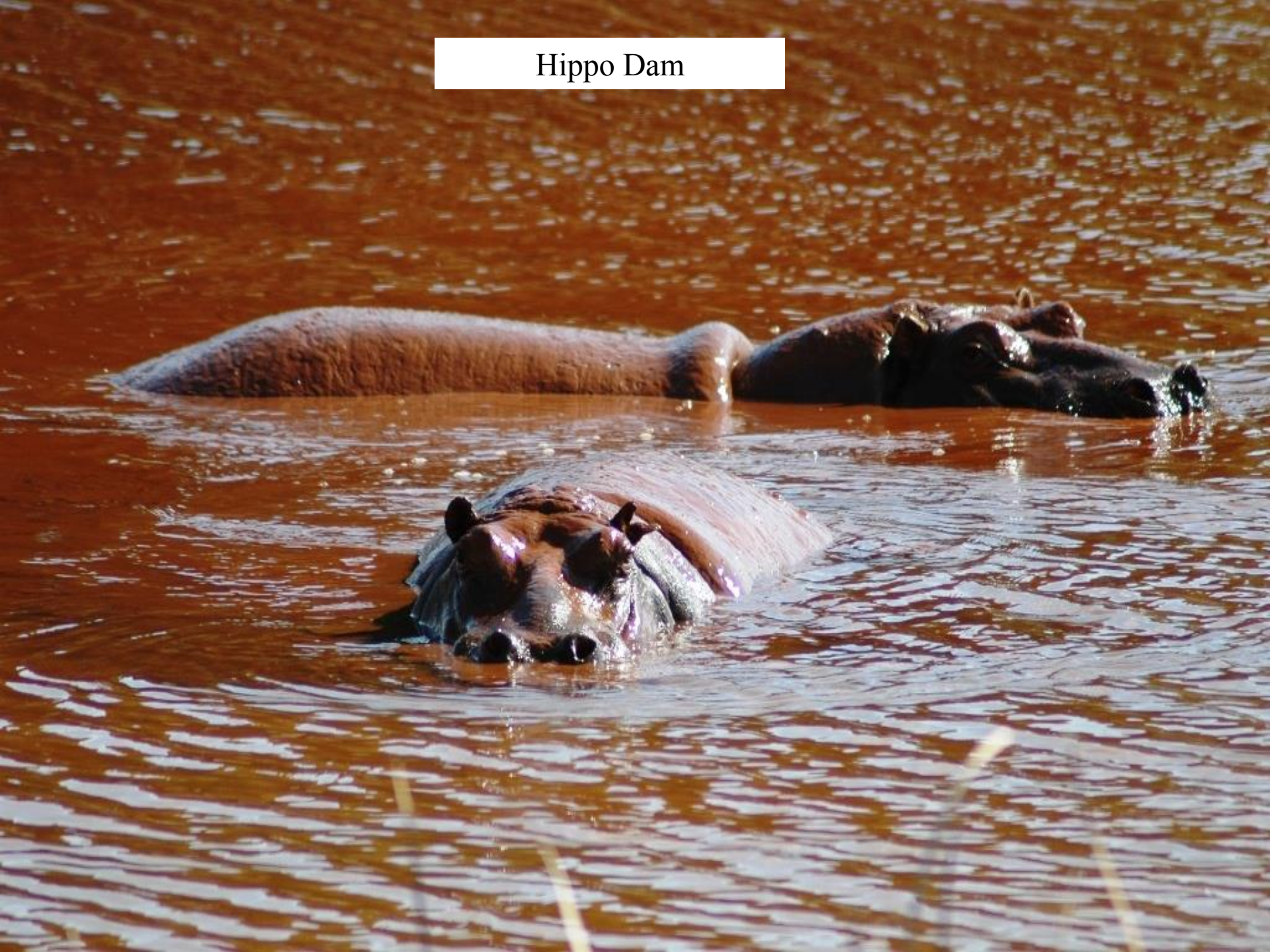
- *The Trans-Caledon Tunnel Authority (TCTA) says that its acid mine drainage (AMD) water treatment plant in the Western Basin couldn't be re-opened as planned on 4 June 2019 due to an escalating security threat in the Mintails Gold Treatment plant area.*
- *The AMD Western Basin has been out of commission since 24 May 2019 due to cable theft and general vandalism caused by illegal miners in the neighbouring Mintails Gold Treatment plant area.*
- *The theft and vandalism led to a power failure at the pump station on 9 Shaft, leading to the shutdown.*
- *The situation arose when illegal miners took possession of the Mintails mining site, adjacent to 9 Shaft which houses the AMD pump station. The Mintails site was previously secured, however, when it was placed under business rescue the appointed liquidators withdrew the security services, paving the way for illegal miners to step in.*

- *The Eskom substation which supplies power to the pump station is located on the Mintails site.*
- *TCTA reported through a local newspaper on Saturday 1 June 2019, that it expected to have the plant re-opened by 04 June 2019. TCTA, in collaboration with Sibanye-Stillwater, at the time had been in the process of rerouting the cable line through an overhead power line, meant to make the cables inaccessible to cable thieves and as a means to speed up the repair process.*
- *However, as of Monday 3 June 2019, the solution had to be abandoned due to the deteriorating safety situation in the neighbouring area.*
- *Contractors working on the line could not complete the work as a result of the rapid and drastic escalation of crime activity in the area. Most of the connection points at the Eskom substation had also been vandalised during this period, further placing doubt on the sustainability of the proposed solution.*

- *“The area has become extremely dangerous for contractors and security personnel, with armed and dangerous illegal miners (zama-zamas) running unhindered in the area and out-numbering the security personnel on the ground. The place is like a warzone”, says TCTA Executive Manager: Project Management and Implementation Johann Claassens,*
- *A new proposed plan is to draw electricity from an identified substation that is 3.7 km from the pump station.*
- *“It is expected that this solution will take approximately three to four weeks to be fully implemented, due to the distance and the virgin territory that must be prepared for the purposes of the new power line,” says Claassens.*
- *TCTA and Sibanye-Stillwater management had also looked at the possibility of installing a generator in order to reduce downtime, however, due to the power needs of the AMD plant and pump station this was considered unviable in the short to medium-term as the size of the generator required is not readily available and would be costly.*

- *The water table is currently at approximately 8 600 mm below surface, rising at an average of 100 mm/day. It is expected that by the time of operation the water level will have risen by about 2 100 mm putting it at approximately 5 860 mm below surface. This would still be within the safe margins.*
- *However, with the water table rising there is a risk of limited seepage of acid mine water into the wetland area downstream of the abstraction point due to the pumps located in the wetland also being impacted by the power outage.*
- *Of the three basins managed by the TCTA (AMD Eastern, AMD Central and AMD Western Basins) the Western Basin remains the most vulnerable due to the closing of the Mintails mines and the growing security threat posed by the illegal gold mining activities in the area.*
- *TCTA says that it is working closely with Sibanye-Stillwater and Eskom to speed up the process of restoring power to the AMD Western Basin plant.*
- *“We continue to strictly monitor the water levels during this period and will implement all possible measures necessary to prevent decant of AMD into the environment,” Claassens concludes.*

## Hippo Dam



## Hippo Dam

- *Lack of flow going through the Hippo dam could possibly result in oxidation of historically contaminated material in the dam, and a subsequent increase in iron contamination which could result in the red colour.*
- *This would require sampling and tests to confirm as a possible reason.*

Gerardo Pretorius (Pr. Eng.)

Environmental • Process Engineer

Sibanye-Stillwater

- *It is likely that the iron-calcium-sulphate complexes deposited in the sediment during the initial high-volume decant episodes ca. 2010 are now undergoing oxidation. The shallower water & colder conditions allows better oxygenation of the sediment zone promoting the oxidation reaction. Organic factors could also contribute to the observed red colour.*

Bashan Govender

DWS. Directorate: Mine Water Management

# Conclusions

# Parliamentary Portfolio Committee on Mineral Resources

## Findings

- It is clear that some mining companies are still operating without adequate financial provision for repairing damage caused to the environment by mining activities, if they suddenly close.
- Neither Shiva Uranium (Pty) Ltd and Mintails Mining SA (Pty) Ltd has saved all the money they were supposed to set aside under the law to pay for environmental rehabilitation. The shortfalls are R36.6-million for Shiva and R460-million for Mintails.
- The state will inherit these liabilities if the mines are finally liquidated.
- The DMR has failed to implement effectively and carry out the intentions of Parliament to ensure that all mines rehabilitate the damage they cause.
- Changes to the mining law were made by Parliament after 2002 to ensure that in mining, as elsewhere, the polluter must pay.

Ref. 22 November 2018: ANNOUNCEMENTS, TABLINGS AND COMMITTEE REPORTS NO 174—2018. No 174—2018, FIFTH SESSION, PARLIAMENT. Pages 39 – 52.

# Parliamentary Portfolio Committee on Mineral Resources

## Findings (Continue)

- The new laws have not proven effective in avoiding this situation where the state and the taxpayer still ends up paying for the environmental harm caused by mining.
- There is a lack of clarity on the rules for the Department of Mineral Resources when it comes to Business Rescue Practitioners. It seems there is non-application of the law resulting in a free for all.
- The DMR allowed Mintails to operate between 2012 and 2018, despite the fact that the Department had never approved the environmental management plans of the mine and had never issued the company with a mining right under the law.
- There is a huge regulatory gap regarding the financial provision of environmental rehabilitation of a mine during the process of business rescue.
- There is a lack of standardization by the DMR on how to relax environmental obligations of a mine during the business rescue stage.

Ref. 22 November 2018: ANNOUNCEMENTS, TABLINGS AND COMMITTEE REPORTS NO 174—2018. No 174—2018, FIFTH SESSION, PARLIAMENT. Pages 39 – 52.

# Parliamentary Portfolio Committee on Mineral Resources

## Recommendations

- The DMR must identify clearly and specifically the gaps between mining, insolvency and company law that have led to this ongoing situation, where the polluter does not pay, it is the state that ends up paying.
- DMR should get specific legal opinion on these complex issues.
- The DMR must report to the Committee in Parliament on what it will do [or needs to do] differently in future to ensure that this situation does not continue.
- DMR must report on what efforts they have made to hold directors and shareholders of Shiva and Mintails liable for the environmental debts of these failed ventures.
- The DMR must actively ensure that the licensing of mines goes with responsibility and accountability.
- The DMR should further explore the regulatory gaps resulting from the business rescue process and come up with regulations that will ensure full environmental compliance during the period when a mine is experiencing financial distress.
- The DMR should design and implement standardized approaches when dealing with the relaxation of environmental financial provisions for mines that are undergoing business rescue process.

# South African Human Rights Commission

## Directives

- The **DMR together with the DEA** must jointly report on the measures taken to **streamline the control of the cumulative air pollution impacts on mining operations**. This report must outline the mechanisms that have been put in place for collation, verification and dissemination of information between stakeholders in relation to impacts reported and/or interventions undertaken in relation to air quality.

# South African Human Rights Commission

## National Hearing on the Underlying Socio-Economic Challenges of Mining-Affected Communities in South Africa

### Findings

- The SAHRC found that the DMR has not taken adequate steps to secure financial provision for rehabilitating damage to the environment and water resources and there is an immediate need for all EIAs and EMPRs to clearly detail land quality and potential post closure land use.
- Licences should not be granted where long term sustainable land use cannot be guaranteed.
- DMR is not the appropriate authority for granting and enforcing environmental authorisations with respect to mining.

# South African Human Rights Commission

## Directives

- The DMR is directed to consider legislative reform to address the gaps in partial and full mine closures. Specifically, the DMR must:
  - **Provide clarity on the process for closure, including all processes followed by the DMR prior to issuing of closure certificates, such as the need to ensure community participation, and monies set aside;**
  - **Provide a detailed list of all mines under care and maintenance. The list should include monitoring measures undertaken by the DMR; and**
  - **Consider the establishment of a trust account where mining companies deposit funds, which the State can access to remedy water and other impacts caused by unrehabilitated, abandoned or derelict mines.**
  - **The DMR must develop a Regional Master Plan aimed at addressing environmental rehabilitation and remediation of derelict and ownerless mines.**
  - **The DMR is directed to report on the progress and anticipated timelines for the finalisation of the National Closure Strategy**

# South African Human Rights Commission

## National Hearing on the Underlying Socio Economic Challenges of Mining Affected Communities in South Africa

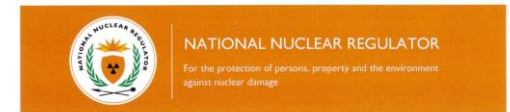
13-14 September; 26 and 28 September; 3 November 2016

### Conclusion

- Overall **the mining sector is riddled with challenges** related to land, housing, water, the environment and the absence of sufficient participation mechanisms and access to information
- **Non-compliance, the failure to monitor compliance, poor enforcement, and a severe lack of coordination amongst especially government stakeholders exacerbate the socio-economic challenges** faced by mining-affected communities
- It is crucial that government ensures that communities are able to participate meaningfully in mining-related activities and influence decisions that detrimentally impact their enjoyment of constitutionally guaranteed rights and general well-being
- The State must do more to include communities in reporting and monitoring mechanisms

# Radiological Impacts of Mine Water Discharges and Radioactive Mine Residue Sites

1. The publication of the National Nuclear Regulator (NNR) and the Department of Water Affairs and Forestry's Wonderfonteinspruit Catchment Area: Remediation Action Plan. 2009.
2. The National Nuclear Regulator's (NNR) independent assessment of the radiological impacts of the mine water discharges on the local population in the Far West Rand's Wonderfonteinspruit catchment. The report titled "Assessment of the Radiological Impact of the Mine Water Discharges to Members of the Public Living around Wonderfonteinspruit Catchment Area" was produced where a number of pathways that could lead to significant radiological risks to the general public were identified.
3. The NNR's "Status Report on the Actions Arising from the Study of Radiological Contamination of the Wonderfonteinspruit Catchment Area (WCA)"
4. The NNR's Draft "Plan for the Remediation of Contaminated Sites" (2016) followed.



Position Paper

REMEDIATION CRITERIA AND REQUIREMENTS

PP-0018

September 2015

Rev. 0

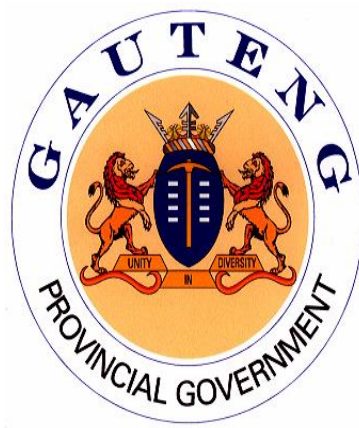


UNRESTRICTED

## Acid Mine Drainage



- The appointment of a Section 5 Advisory Committee on AMD by the South African Human Rights Commission.
- The appointment of a Task Team on AMD.
- The appointment of the Inter-ministerial Committee on AMD followed.
- The construction of neutralization plants within the West-, East and Central Rand and the short term treatment of AMD.
- The launch of the long term treatment of AMD.
- The Department of Water and Sanitation's Management of Mine Water Policy.
- The establishment of the Department of Water and Sanitation's Directorate of Mine Water Management.
- The development of the Department of Mineral Resources' Regional Closure Strategies for the Witwatersrand goldfields.
- The Regulations for the Financial Provision of Latent and Residual Impacts and the pumping and treatment of extraneous or polluted water

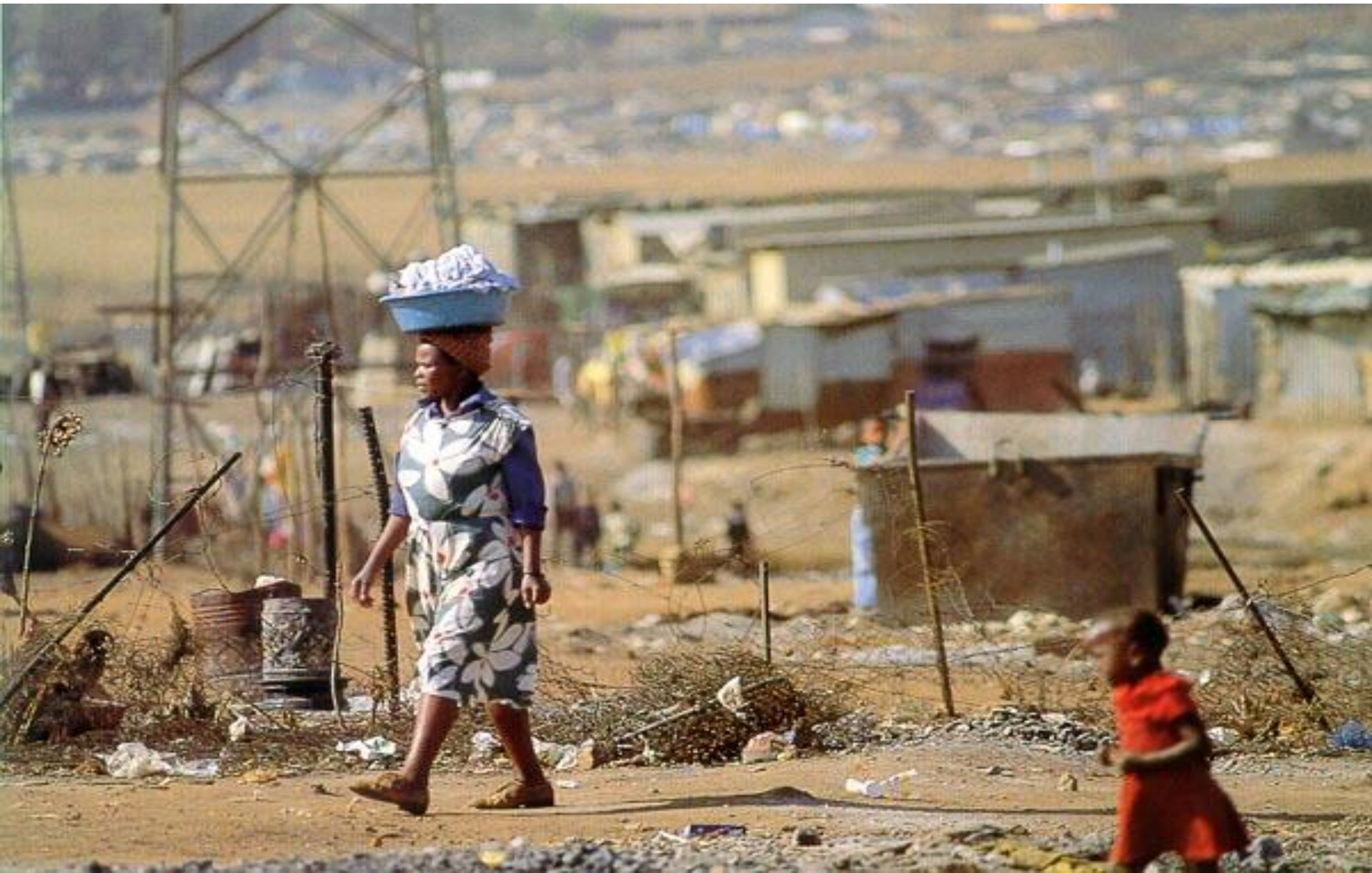


**Gauteng Department of Agriculture, and Rural Development**

**Feasibility Study on Reclamation of Mine Residue  
Areas for Development Purposes:  
Phase II**

**Strategy and Implementation Plan**

*“It is as unacceptable for companies, when they move on, to leave great holes in the earth and polluted rivers as it is to leave disrupted or unenriched communities....”*  
(quoted in Anglo America 2002b:3)



# The Externalization of Costs Model

Our national economic growth has been driven by an **externalized cost model** and **this can no longer be sustained**

