



the federation for a sustainable environment

(Reg. No. 2007/003002/08)
NPO NUMBER 062986-NPO
PBO No. (TAX EXEMPT) 930 039 506
Postnet Suite 87
Private Bag X033
RIVONIA
2128

PRELIMINARY COMMENTS ON DRAFT 2.6: NATIONAL WATER AND SANITATION MASTER PLAN (NW&SMP)

The following preliminary comments on the National Water and Sanitation Master Plan (NW&SMP) are submitted on behalf of the Federation for Sustainable Environment (FSE).

The FSE is a federation of community based civil society organisations committed to the realisation of the constitutional right to an environment that is not harmful to health or well-being, and to having the environment sustainably managed and protected for future generations. Their mission is specifically focussed on addressing the adverse impacts of mining and industrial activities on the lives and livelihoods of vulnerable and disadvantaged communities who live and work near South Africa's mines and industries.

In accordance with the above-mentioned mission, the FSE's comments are limited to matters pertaining to the mining industry. The FSE's comments will be substantiated by real examples within the scope of the FSE's experience and our active participation in a significant number of environmental impacts assessments, environmental management programme reports, water use license applications, environmental authorisations, steering committees, forums, task teams, teams of experts, academic research groups, boards, etc. over a period of 15 (fifteen years).

The FSE, with the support and representation of the Legal Resource Centre (LRC), is currently in the process of preparing additional comments on the NW&SMP. In view of the aforesaid, we respectfully request allowance to refine and augment our preliminary comments.

Our preliminary comments pertain to certain statements in the National Water and Sanitation Master Plan. For ease of reading we have grouped certain statements together under the same section. We shall comment on each of these sections. We furthermore request that our comments be read in conjunction with the SAWC's State of the Department of Water and Sanitation's Report.

We express the hope that our comments will not be passed over since it has been compiled with considerable effort and with no financial remuneration.

We now refer to the following statements in the NW&SMP:

1. "You cannot drink paper **plans**."

2. “The NW&SMP forms part of a suite of initiatives led by the DWS in conjunction with other government departments and agencies, the private sector and **civil society** to ensure that we avoid this crisis”. “Collaboration and partnerships between the DWS and various other state institutions (e.g. **CMAs**) across all three spheres of government, the private sector and organised civil society.” “Enabling actions for implementation: formalise governance frameworks to support **non-governmental engagements.**” “Effective communication and stakeholder engagement is essential to all key decisions of government.” “In addition to the MOUs with government, DWS will formalise partnerships with the private sector, civil society, NGO’s and CBOs to assist in the effective implementation of the plan.” “The role of civil society in the strategic context of partnerships will be enhanced by giving NGOs a role to play in driving controversial agendas and debates, including the effective implementation of some of the advocacy agendas.”
3. “Potential water crisis exacerbated by poor management, aging infrastructure and lack of skills in the right places”.
4. “Water is an important catalyst and driver of **socio-economic development**; deteriorating water quality has the potential to significantly limit the economic growth potential of the country;” “the protection of the ecological infrastructure of our natural aquatic ecosystems is crucial for economic development;” “river ecosystems are vital for supplying fresh water;” “**high water yield areas** are the water factories of the country;” “**wetlands** are exceptionally high value eco-systems and filter pollutants from the surrounding landscape;” “managing **FEPAs** in a good condition should be regarded as a comprehensive approach to sustainable and equitable development of water resources;” “**healthy tributaries** can improve water quality by flushing pollutant when they join their main stem rivers”.
5. “**Lack of data** and information resulting from weak monitoring systems.”
6. “Desalination of AMD from the Wits mining basins in Gauteng (~150Ml.day);” “**disposal of bane and salts** removed in the treatment process,” “legacy issues of **abandoned, derelict** and/or ownerless mines, which contribute to the AMD problem.” “Major impacting sources include mining (acids, salts, metals and **radioactivity**).” South Africa must balance supply and demand by the development of **reconciliation strategies.**” “**LHWP Phase 2** is already overdue.”
7. “**Scarcity of water and competition** for water across sectors. The development of **new mines in water scarce areas.**” “Water quality and water quantity are inextricably linked.”
8. “Deteriorating water quality reduces the amount of water available for use as more water must be retained to maintain the **dilution capacity** in our river systems.” “Improve water quality by reducing **pollution**, eliminating dumping and minimizing release of hazardous chemicals.” “All waste shall be disposed of /discharged lawfully and safely.” “Degradation of wetlands and water resources.” “South Africa must restore raw water quality”.

1.

“You cannot drink paper plans”

Notwithstanding the large number of research and water treatment projects, policies, plans, agendas, strategies and regulations of the Department of Water Affairs and Forestry (DWAFF), Department of Water Affairs (DWA) and Department of Water and Sanitation (DWS)¹ over the years, as well as the Resource Quality Objectives, conditions in Water Use License Authorisations (WULAs), etc. these policies, plans, strategies, etc. have **failed to blossom into action and enforcement**. These projects, policies, strategies, regulations, etc. as well as the National Water Act (36 of 1998) exist in vain if the recommendations and findings are not implemented, and if the conditions in the WULA are not enforced.

The failure to implement and enforce the findings and recommendations of reports, plans, strategies, regulations, policies, etc. has led us into a cul-de-sac of theory and action.

To exemplify:

The Wonderfonteinspruit has been the subject of a large number of studies. The documents that hold the history of the Wonderfonteinspruit would exceed 5 m if stacked. The bibliography of relevant literature that has been compiled would, if printed, extend to nearly one hundred and twenty pages. Much of the data that was generated and recorded produced overwhelming evidence² of elevated levels of cobalt, zinc, arsenic, cadmium and uranium in the catchment.

Notwithstanding the inordinate amount of evidence of the concentrated metals including uranium in the fluvial sediments of the river system and within the local groundwater systems and the risks to water users in the catchment area due to uranium's chemical toxicity, and the urgency of the situation³, it is business as usual.

The recent water quality results from the DWS show uranium levels of 3100µg/l; sulphate levels of 6986, manganese levels of 3535µg/l, and a pH of 2.42 within the headwaters of the Wonderfonteinspruit. This is supported by the water quality results of Mintails Mining SA (Pty) Ltd which recorded a pH of 2; conductivity of 796 mS/m, TDS of 9 250mg/l; manganese levels of 55 000 µg/l; sulphate levels of 6230 mg/l; uranium levels of 580µg/l; aluminium levels of 431 mg/l; nickel levels of 16mg/l; copper levels of 20mg/l and zinc levels of 16mg/l.

These levels not only notably exceed regulatory limits but pose significant chronic and acute health risks to communities. The Wonderfonteinspruit valley is densely populated because of its agricultural value and presence of gold mines. Potchefstroom is located downstream of

¹ The National Water and Sanitation Master Plan (page 9-82) advises us that there are currently 18 strategies and policies which have been compiled or are in various stages of completion.

² Coetzee, H. (compiler) 2004: An assessment of sources, pathways, mechanisms and risks of current and potential future pollution of water and sediments in gold-mining areas of the Wonderfonteinspruit catchment WRC Report No 1214/1/06, Pretoria, 266 pp.

³ Report to Contract No RRD/RP01/2006 titled "Assessment of the Radiological Impact of the Mine Water Discharges to Members of the Public Living around Wonderfonteinspruit Catchment Area". BSA-Project-No. 0607-03 prepared on behalf of the National Nuclear Regulator (NNR) April 09, 2007; 1. Department of Water Affairs and Forestry and the National Nuclear Regulator. Wonderfonteinspruit Catchment Area: Remediation Action Plan. Radioactive Contamination Specialist Task Team Report on Site Visits and Recommended Actions. April 2009.

the Wonderfontein spruit, from which more than 400 000 people derive their drinking water via the Boskop Dam.

It follows hence that while the proposed actions and targets in the National Water and Sanitation Master Plan are laudable, grounded upon our past and current experiences, they will remain aspirations unless the lack of political will and political interference are not decisively addressed.

2.

“The NW&SMP forms part of a suite of initiatives led by the DWS in conjunction with other government departments and agencies, the private sector and civil society to ensure that we avoid this crisis.” “Collaboration and partnerships between the DWS and various other state institutions (e.g. CMAs) across all three spheres of government, the private sector and organised civil society.” “Enabling actions for implementation: formalise governance frameworks to support non-governmental engagements.” “Effective communication and stakeholder engagement is essential to all key decisions of government.” “In addition to the MOUs with government, DWS will formalise partnerships with the private sector, civil society, NGO’s and CBOs to assist in the effective implementation of the plan.” “The role of civil society in the strategic context of partnerships will be enhanced by giving NGOs a role to play in driving controversial agendas and debates, including the effective implementation of some of the advocacy agendas”.

The above-mentioned objectives of the DWS to collaborate with civil society in addressing the water crisis, supports the National Development Plan, which states that *“active citizenry and social activism is necessary for democracy and development to flourish, to raise the concerns of the voiceless and marginalised and hold government, business and all leaders in society accountable for their actions”* (The National Development Plan 2030); Chapter 7 of the NWA which requires the Minister to establish CMAs – *“to involve local communities in the decision making process”* (Vaal Regional Steering Committee Meeting – 25 February 2014) and section 9.4.9 of the National Water Resource Strategy -2 NWRS, which encourages *“civil society ...to play a watchdog role in supporting compliance by water users with water regulation at all levels.”*

However, the current initiatives and decisions by the honourable Minister of Water and Sanitation, namely to centralised the 9 Catchment Management Agencies (CMAs) into one CMA and to discontinue the Water Tribunal will frustrate the above-mentioned objectives of the National Water and Sanitation Master Plan, the NWA, the NWRS-2 and the National Development Plan. Instead of supporting civil society these decisions by the Minister will disempower communities.

It is furthermore disheartening and discouraging that preference is given to powerful well-funded NGOs⁴ in the DWS’ collaboration and partnerships with civil society while the comments and concerns of grassroots level civil society organisations and local NGOs, who for years – at significant financial and opportunity costs – actively participate in Catchment

⁴ In the Reference Source (Annexure 2) reference is made to World Wide Fund – South Africa on pages 145 and 147 with no reference made to any reports of local NGOs and community based organisations, or their comments.



Management Forums (CMF), steering committees, task teams, etc. are ignored and overlooked. This has resulted in either apathy or escalation of conflicts.

4.

“Water is an important catalyst and driver of socio-economic development”; “deteriorating water quality has the potential to significantly limit the economic growth potential of the country.” “The protection of the ecological infrastructure of our natural aquatic ecosystems is crucial for economic development”.

Water use- and environmental authorisations are given for mining within legally protected areas (including Nature reserves, Protected Environments), where mining is prohibited, and in areas of highest biodiversity such as critically endangered and endangered ecosystems, river and wetland Freshwater Ecosystem Priority Areas (FEPAs) and Ramsar Sites. The likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services⁵.

We are not aware of “no go” recommendations for mining and prospecting applications in FEPAs or critically endangered biodiversity areas or high water yield areas neither by the Environmental Impacts Practitioners (EAPs), because of their notional “independence”⁶ nor are we aware that the DMR and the DWS refuse to authorise these applications. If “off-sets” or conditions are imposed on the Applicants, there is inadequate monitoring of compliance.

The mining industry enjoys an elevated and preferential status in political opinion based on the benefits, which extend beyond cost/benefit, which mining brings to South Africa.

The economic benefits of mining, which by its definition is unsustainable since it depletes a non-renewable resource, are argued on the basis of short term employment of skilled or semi-skilled workers during the life of the mine without internalising the long term (latent and residual) environmental and socio-economic consequences after mine closure (the negative externalities). There is the near certainty of contaminated water, which will require some form of decontamination treatment for many years, after mine closure. The release to the environment of mining waste can result in profound, generally irreversible destruction of ecosystems.⁷

The above-mentioned impacts and risks are not considered or quantified when determining the need and desirability of a mine or if approved, when determining the financial provision. Neither is adequate consideration given to the post closure land use with associated resources such as water. While a community may benefit during the life-time of a mining project, future generations may well have their livelihood opportunities and their quality of life reduced or destroyed because of unsustainable post mining land use.

⁵ Department of Environmental Affairs and Department of Mineral Resources’ Mining and Biodiversity Guideline.

⁶ Earthlife Africa v DG of DEAT and ESKOM Holdings Ltd Case No 7653/03, the CPD. Judgment: 26-1-2005.

⁷ 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. 32 p



To exemplify: Environmental authorisation was recently given for the Doornhoek Fluorspar Mine project.

The project lies in:

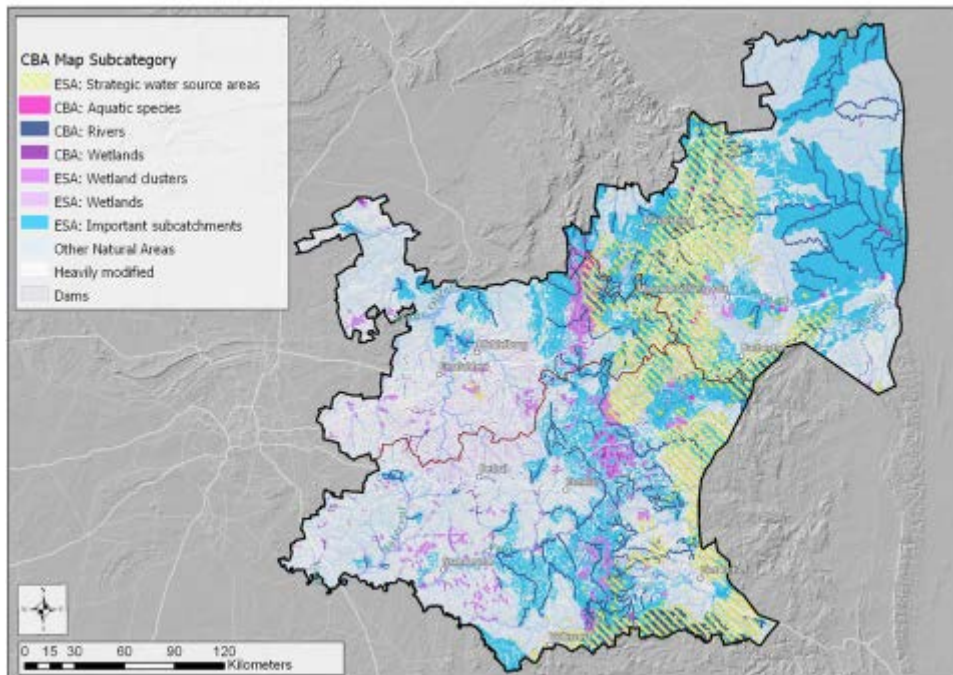
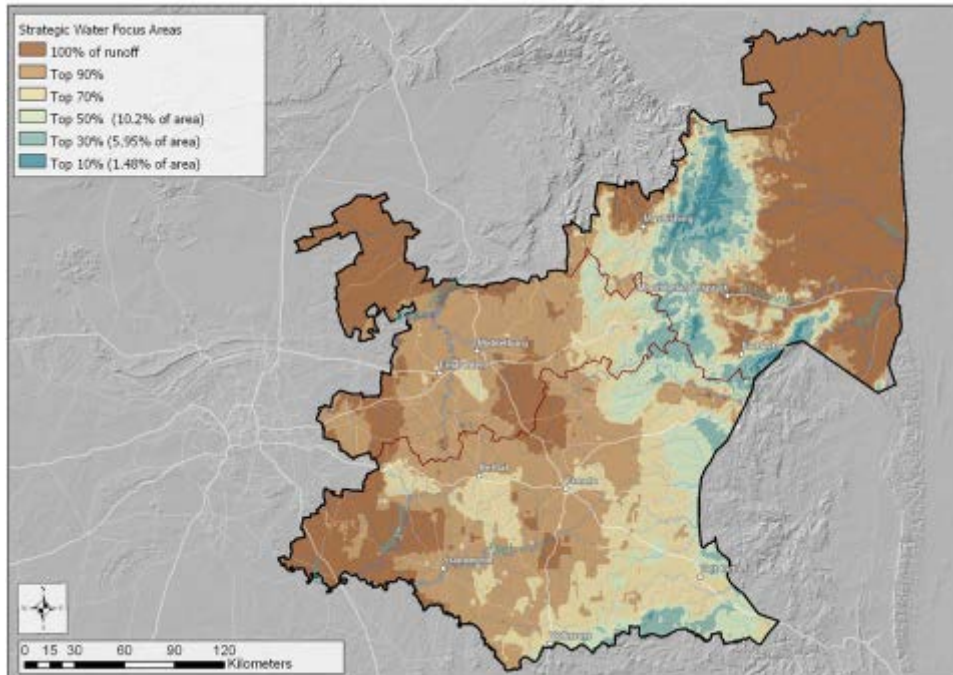
- Greenfields;
- An important ecotone with high species richness, a unique species combination, genetically unique populations and high intra-species genetic diversity;
- A highly ecologically significant aquatic ecosystem, a designated priority river system (FEPA Rivers);
- An aquatic Critical Biodiversity Area (CBA2) with the presence of the Vulnerable Marico Barb and the Near Threatened Waterberg Barb which is considered near threatened;
- The upper reaches of the Marico River, which are in a natural or near natural ecological state;
- The upper Groot Marico River and Tributaries are Fish Sanctuary Areas, which support three genetically distinct populations of the vulnerable Marico barb;
- The Klein-Marico River, which present ecological status is categorised as a Class B: Largely Natural;
- Five major wetland types;
- The Groot Marico River, which is fed by a number of springs (eyes) within the Groot Marico Dolomitic Aquifer Compartment, an which are highly sensitive from an ecological point of view considering that many red data fauna utilize this area as a source of water and habitat.

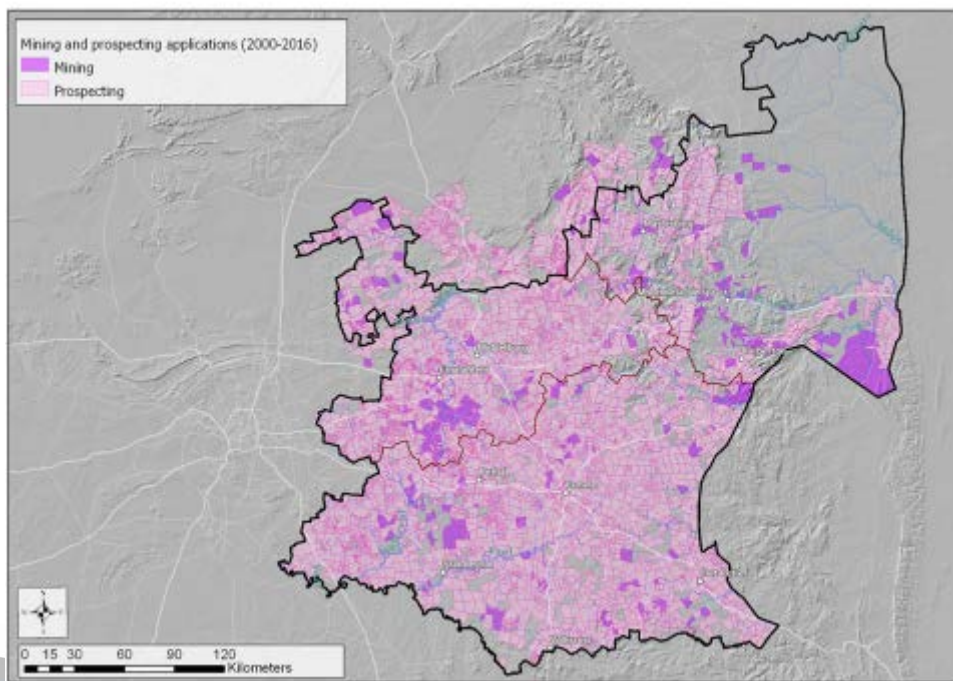
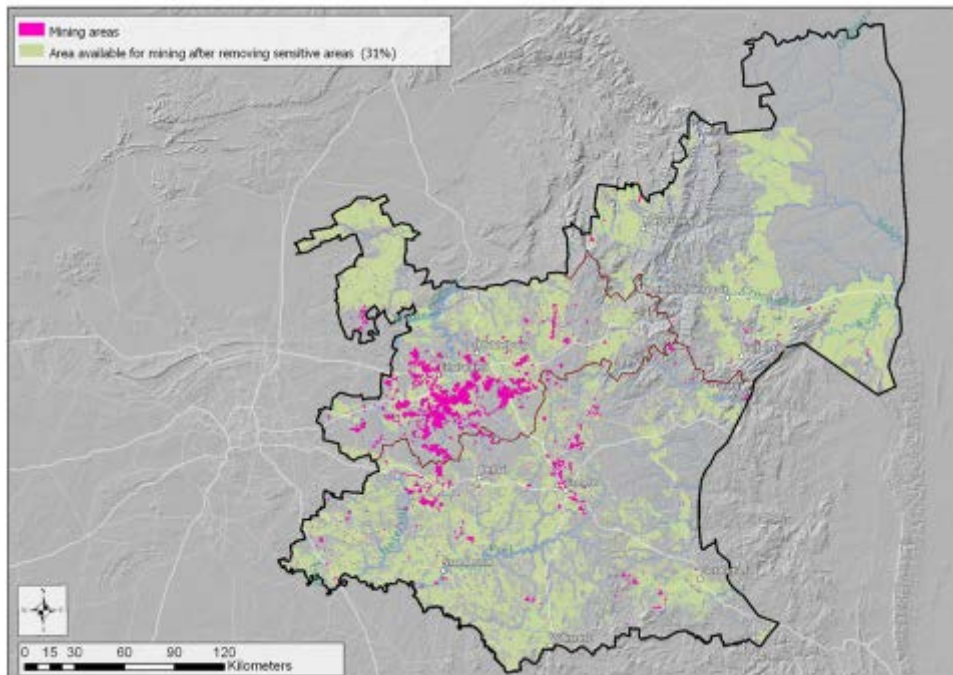
Another example is the authorisation of water use license applications and environmental applications within Mpumalanga, a region with high agricultural potential, the highest rainfall, lowest evaporation and highest precipitation in South Africa and the source of 4 major rivers except the Limpopo. The entire Upper Vaal WMA is underlain by coal with significant acid producing potential.

The subjoined maps show the strategic water focus areas and strategic water source areas within Mpumalanga. If these areas are declared as “no go” areas because of its water yield potential, a large area of Mpumalanga still remains to be mined (31% of the province). Please see the third subjoined map in this regard.

Notwithstanding these considerations, the fourth subjoined map shows the number of mining and prospecting applications between 2000 and 2016. It can logically be inferred from this map that the entire Mpumalanga is under either mining or prospecting applications.

The goal of the Master Plan to protect and sustainably and equitably develop water resources and “water factories” can only be realised if the DWS, in collaboration with the DEA and the DMR declare the strategic water focus and source areas within Mpumalanga as no-go areas.





5.

Lack of data and information resulting from weak monitoring systems.



Notwithstanding the fact that mine water and in particular AMD contains a wide spectrum of metals, the DWS because of capacity constraints, only tests a few variables. The DWS tests routinely for TDS, EC, pH, sulphate, iron and manganese but fails to test for metals such as aluminium, cobalt, copper, uranium, the metalloid arsenic, cyanide, lead, etc. This may result in an inaccurate assessment of the risks, including the health risks associated with mine water.

It should furthermore not be omitted that the DWS failed to do water monitoring of the Vaal River System from August 2013 to April 2016 because of the expiring of its laboratory contract.

The DWS routinely samples water once a month. In view of frequently drastic short-term fluctuations of pollution levels caused by day-night rhythms of discharging mine effluents, natural diurnal fluctuations of water chemistry as well as events such as rainstorms and spillages weekly sampling intervals are inadequate. This is illustrated by the fact that uranium-levels in samples used in IWQS (1999) from identical sites (normally sampled at the same day of the week and the more or less the same time of the day) at some locations fluctuate by up to a factor of 1000 (i.e. 100000%). In view of such fluctuations the temporal representativity of the data used is insufficient.

Unless the above-mentioned insufficiencies are urgently addressed, long-standing water management and pollution issues will remain unresolved and risks will go undetected.

6.

Major impacting sources include mining (acids, salts, metals and radioactivity) “Desalination of AMD from the Wits mining basins in Gauteng (~150Ml/day);” “disposal of bine and salts removed in the treatment process, legacy issues of abandoned, derelict and/or ownerless mines, which contribute to the AMD problem.”

The National Water and Sanitation Master Plan acknowledges challenges associated with Acid Mine Drainage, such as the disposal of salts removed in the treatment process.

The FSE was actively involved in raising public awareness of AMD for more than a decade and participated in the feasibility study for the long term treatment of AMD. Based on these experiences, we recommend that the following issues be addressed in the NW&SMP:

Impact Assessment and Public Participation

The current treatment of AMD by means of the high energy/high cost “pump and treat” neutralisation method was decided upon by the DWS without public participation and an environmental impact assessment.

It is common cause that the current treatment of AMD, which commenced in 2012 after 10 years of decant of raw AMD within the West Rand, is resulting in the discharge of 150Ml/day of highly saline water (between 1 500mg/l – 3 000mg/l sulphate), which is unfit for any use⁸, into the Vaal River and Crocodile West River Systems. **The impacts of the high salinity and the disposal of metals in unlined open pits (West Wits Pit) and old shafts (Grootvlei) on groundwater and downstream water users ought to be assessed as a matter of urgency.**

Salinity and Water Shortages

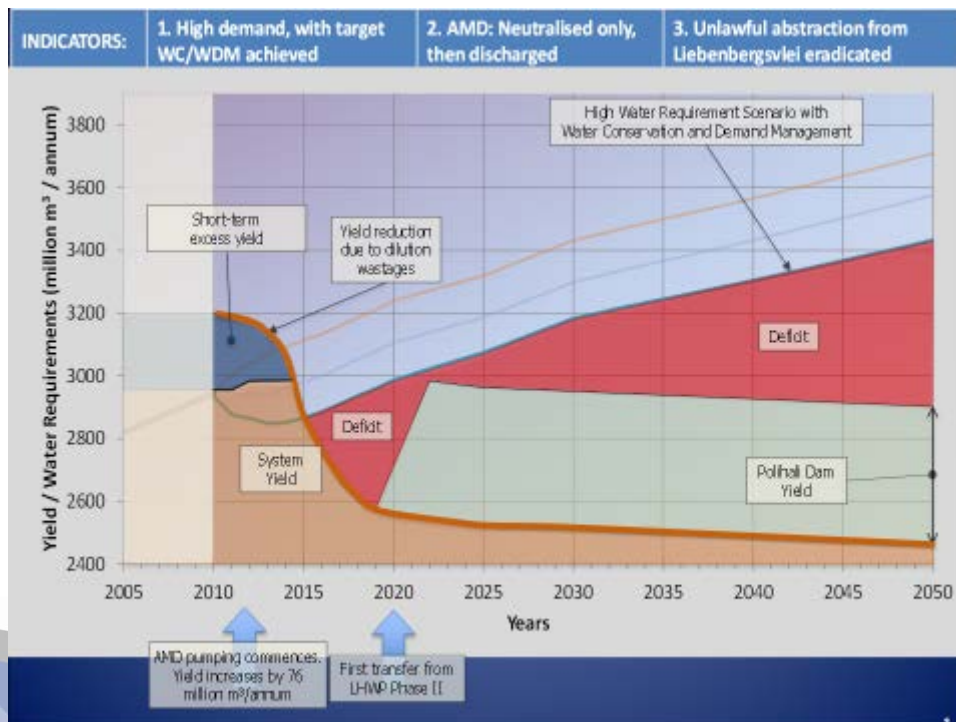
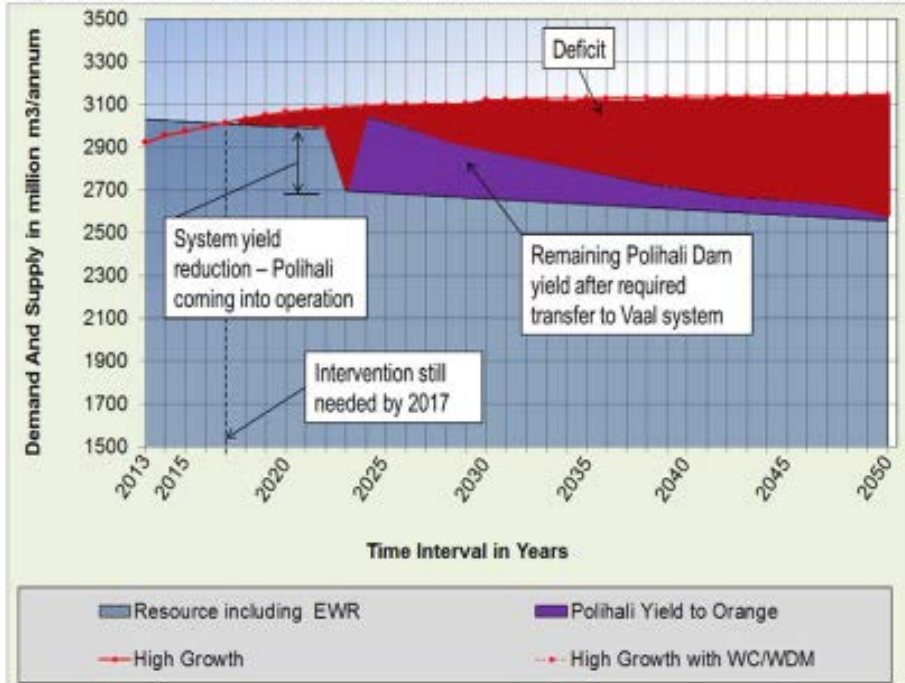
It is furthermore common cause that the additional salinity as a result of the current treatment of AMD and discharge of neutralised AMD creates water security risks. In order to comply with the regulatory limit of 600 mg/l sulphates, good quality water has to be released from the Vaal Dam in order to ensure that the water below the Vaal Barrage is fit for use, that is, by means of dilution.

The projected demand for increased releases from the Vaal Dam of expensive Lesotho water will increase the stress upon the water supply. In terms of the Reconciliation Strategies for the Orange River and the Integrated Vaal River System (prepared in 2014) water supply shortages will be experienced by 2014. It will have significant cost implications. Please see subjoined graphs.

⁸ In livestock watering, it was found that sulphate levels above 250 mg/l sulphate suppress copper and selenium in livestock, which result in poor fertility and condition. Sulphate concentrations of 600 mg/l and more cause diarrhoea in most individuals and adaptation may not occur. Eskom's Requirements are water with levels of 15 – 40mg/l sulphate. The DWS' Water Resource Quality limit is 600mg/l sulphate. Elevated sulphate concentrations increase the corrosion rate of metal fittings in water distribution systems. When there are metals dissolved in the water in excessive concentrations, the corrosion and scaling effects would be increased.

References: Harmony Environmental Impact Document titled "Impact of the discharge of Treated Mine Water, via the Tweelopies Spruit, on the receiving Water body Crocodile River System, Mogale City, Gauteng Province" (DWA 16/2/7/C221/C/24) (3 December 2006; Conservation Medicine: Toxicology. Is there a connection between acid mine drainage, acid rain, trace element nutrition of livestock and HIV / AIDS in humans on the eastern Transvaal Highveld? Jan Myburgh, Faculty of Veterinary Science University of Pretoria, Onderstepoort.

- Increasing salinity in the **Orange River** – growing water shortages as illustrated. (Ref. DWS Reconciliation Strategies For Large Bulk Water Supply Systems: Orange River Final Reconciliation Strategy (November 2014))



In order to address the growing water deficit in the Vaal River System, which supplies water to 60% of the economy and 45% of the population and to ensure that sufficient water of good



quality is available to supply the future requirements of this important area, it was advised in the Reconciliation Strategies for the Vaal River System (last compiled in 2014) and the Orange River System that AMD be desalinated (long term treatment) by 2014/2015 and that the Lesotho Highlands Water Project (Phase II) be constructed by 2020.

At the recent launch of the long term treatment (desalination) by the honourable Minister of Water and Sanitation, the long term treatment of AMD, the Minister announced that the long term treatment of AMD has been delayed to 2020/2021. The Lesotho Highlights Water Project (LHWP) (Phase II) has been delayed to 2025 as a result of alleged corruption.

In order to mitigate the growing deficit in the Integrated Vaal River System as a result of the increasing salinity⁹, the long term treatment of AMD and the construction LHWP Phase II ought to be expedited and political interference in these projects must be curtailed.

Since the highest cost burden of combating salinity is currently being carried by the household sector and the “last men standing”, the NW&SMP should include a section on the apportionment of liability in terms of Section 19 of the NWA, Section 28 of the NEMA and the current¹⁰ and proposed¹¹ regulations pertaining to financial provision for prospecting, mining, exploration and production operations, which 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 the treatment of AMD. 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.

The polluter pays principle is based on the internalisation of externalities and there is central to the equitable resolution of pollution costs currently being borne by the end user.¹²

Diffuse- and Newly Identified Sources of AMD

The NW&SMP in its discussing of AMD, is silent on the diffuse- and newly identified sources of AMD and how it will be managed or mitigated. These sources include:

- Tailings Storage Facilities: There are 270 tailing storage facilities within the Witwatersrand gold fields, which contain 6 billion tons of iron pyrite tailings. Since these facilities cannot be maintained in a reducing or oxygen free environment, it will continue to produce AMD for centuries.

⁹ AMD contains the most concentrated salt stream.

¹⁰ 20 November 2015.

¹¹ Published for comment on 10 November 2017 in Government Gazette 41236 under GN R1128 (Draft Regulations).

¹²R Pilson, HL van Rensburg, CJ Williams. WRC Report No 800/1/00. “An Economic and Technical Evaluation of Regional Treatment Options for Point Source Gold Mine Effluents Entering the Vaal Barrage Catchment.”

- Open Pits: The numerous open pits in the West Rand Goldfield have been identified as a source of ingress, by a study commissioned by the mining industry estimating that they contribute approximately 30% of the total ingress.
- Rock Dumps: It appears to be quite widely assumed that the larger particle size of waste rock dumps makes them a minor pollution risk. This view is erroneous as the waste rock dumps have very large inventories of fine material and they are much more permeable to oxygen than tailings dams. The secondary source of contaminants that remain in the soil after a dump has been removed appears to be universally ignored and it is assumed that removal of the dump removes all potential for pollution from that site. (WRC 2015. Pulles W et al)
- Reclamation: The associated contribution to ingress is likely to be considerable as old tailings are hydraulically mined using high-pressure cannons containing partially treated acid mine drainage water (Winde et al. 2011). This practice introduces air and water into anaerobic tailings, which not only contributes to acid mine drainage formation but there is also evidence for the remobilization of contaminants such as uranium and cyanides during disturbance of old tailings deposits. (Sutton & Weiersbye 2007; Winde et al. 2011).
- Unrehabilitated remaining footprints of re-processed tailings storage facilities Radiometric surveys confirm elevated levels of residual radioactivity. There is also the near certainty of long-lived cyanide metal complexes, sulphate and metal contamination of the soils and sediments.

Metals

The following determinants in the mine void water exceed the Maximum Allowable Limits (Class II) of the SABS 241 Drinking Water Standard, in many cases by several orders of magnitude: pH, EC, TDS, So₄, Fe, Mg, Ca, Mn, Al, Pb, Co, U and Ni. It can be assumed with a reasonable amount of certainty that most of the other metals would also be present in elevated concentrations.¹³

The current treatment of AMD does not remove the metals. It merely changes the metals into a different oxidation state, which change them from a soluble form to a solid form. The process could be reversed and the contaminants mobilised, should the water become acidic.¹⁴

The MW&SMP does not address the removal of these metals from wetlands, dams, rivers and rivulets (such as the Tudor Dam, Grootvlei wetland, the Lancaster Dam, the Robinson Lake, Tweelopiespruit, Blesbokspruit, the Wonderfonteinspruit and sediments in the Witwatersrand wetlands¹⁵ downstream of historic and current mining activities). Wetlands have a finite capacity to assimilate pollution, and this capacity is being exceeded as a result of metal contamination.

¹³ Harmony Environmental Impact Document titled “Impact of the discharge of Treated Mine Water, via the Tweelopies Spruit, on the receiving Water body Crocodile River System, Mogale City, Gauteng Province” (DWAf 16/2/7/C221/C/24) (3 December 2006)

¹⁴ Ibid

¹⁵ Henk Coetzee, Jaco Venter & Gabriel Ntsume. Contamination of wetlands by Witwatersrand gold mines – processes and the economic potential of gold in wetlands. Council for Geoscience Report No. 2005-0106



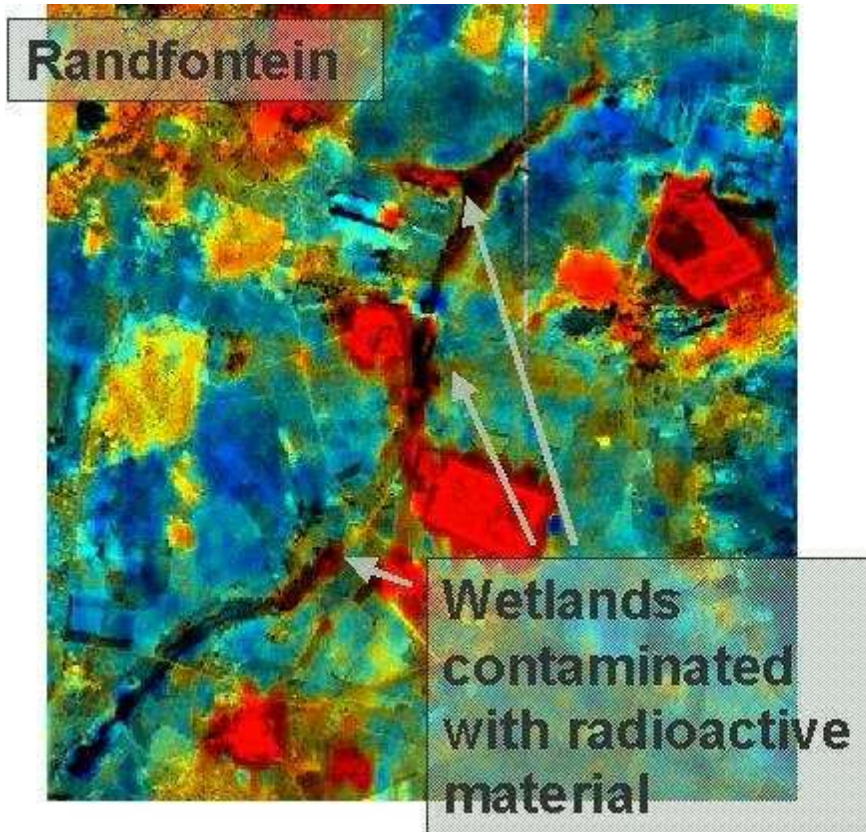
Of relevance are the recent findings of the ORASECOM Report: ORASECOM/004/2015 titled ORANGE-SENQU WATER RESOURCES QUALITY JOINT BASIN SURVEY 2 (JBS 2) – FINAL REPORT: PERSISTENT ORGANIC POLLUTANTS AND METALS SURVEY IN 2015. It was found that:

- The rivers draining Gauteng and the gold mining areas remain an area of concern.
- The strong indications of bio-accumulation of POPs and some heavy metals (the elements of concern are Al, Cr, Cu, Bi, Sr, Sb, Au, Hg, Pb, and U) is very concerning as the biota in the arid regions of the basin is almost entirely dependent on the riverine water, and any impacts from long-range transport is a major issue.
- The high concentrations of pollutants in birds and fish may affect sustainability and ecosystem function.
- Many people depend on their food and water directly from the rivers, and may be exposed to pollutants that may be harmful.

Radioactivity

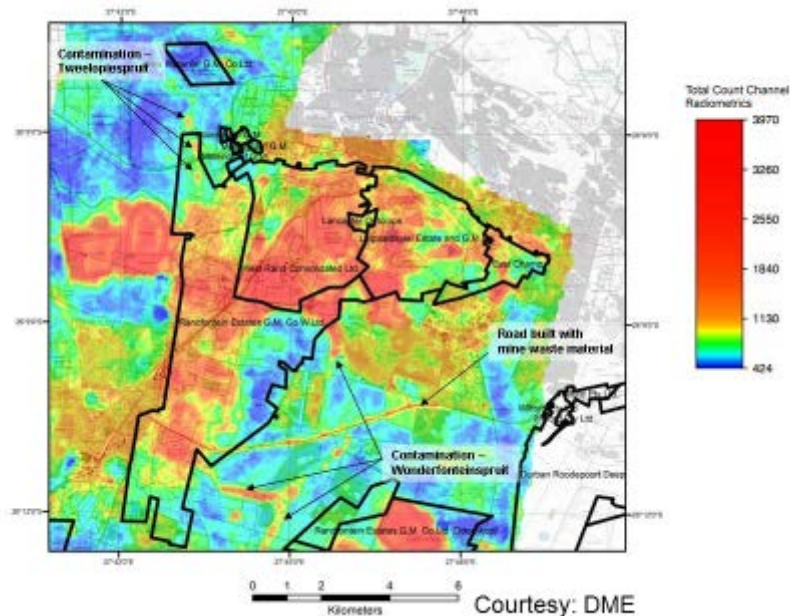
Radioactivity has become an area which requires special mention in the NW&SMP since as a consequence of the uraniferous nature of the ore, Witwatersrand tailings and other mining residues often contain significantly elevated concentrations of uranium and its daughter radionuclides, with the decay series of U238 being dominant¹⁶. See subjoined images.

¹⁶ 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. Coetsee. Mine Closure. 2008.



Total count radiometric image of a portion of the Wonderfonteinspruit catchment, over a Landsat image background. Red areas indicate elevated radioactivity levels. Note the elevated radioactivity in the wetlands downstream of mining areas. The presence of uranium series radionuclides implies that other metals associated with the mining waste stream are probably also present.¹⁷

¹⁷ Coetzee, H. (compiler) 2004: An assessment of sources, pathways, mechanisms and risks of current and potential future pollution of water and sediments in gold-mining areas of the Wonderfonteinspruit catchment. WRC Report No 1214/1/06, Pretoria, 266 pp



An airborne radiometric survey of the WR and FWR was done for DWAf. Interpretation of the data show many of the residential areas fall within areas of high risk of radioactivity contamination. Ref. DMR. RMCS. 2008

The risk posed by uranium, occurs due to both radiotoxicity and chemical toxicity with in some cases, the chemical toxicity dominating over the radiotoxicity. **It is therefore necessary that an integrated approach be adopted for the management of radioactive and chemical contamination and that this be facilitated by the different government agencies and regulators involved.**

The NW&SMP makes no mention of collaboration with the National Nuclear Regulator (NNR). It is important that the DWS establishes a partnership with the NNR to remediate sites which contain elevated levels of uranium such as:

- Tudor Dam (the activity concentration of uranium 238 in the soils and sediments behind the dam are high, 8000-10000 Bq/kg with radium 226 at 1700-2800 Bq/kg)¹⁸,
- the wetlands downstream of Tudor Dam (uranium and radium activity concentrations are high, at 2000 Bq/kg for uranium and 1200 Bq/kg for radium)¹⁹,
- Tudor Shaft Informal Settlement, which is within the headwaters of the Wonderfonteinspruit,

¹⁸ Department of Water Affairs and Forestry and the National Nuclear Regulator. Wonderfonteinspruit Catchment Area: Remediation Action Plan. 2009

¹⁹ Ibid

- **Robinson Lake (Coetzee et al., 2003 report a uranium concentration of 16 mg/l after underground mine water decanting into the Tweelopiespruit was pumped into the lake)²⁰,**
- **The 380 Mine Residue Areas, which were identified in the Gauteng Department of Agriculture and Rural Development's Report (2011).**

And to recover the costs from the mining companies responsible for the pollution.

Abandoned Mines (including Closure-, Care and Maintenance-, and Liquidation Issues

In accordance with applicable legislative requirements²¹, a holder must apply for a closure certificate upon lapsing or abandonment of his right/permit; cessation of mining operations or relinquishment of any portion of land to which right/permit/permission relates.

Only after the Chief inspector and DWS confirmed in writing that the provisions have been complied with pertaining to health and safety; management of potential pollution to water resources; may a closure certificate be issued; and may the financial contribution/ part thereof be returned.

Notwithstanding these legal obligations, a number mining companies, at cessation of their operations (e.g. Blyvooruitzicht Gold Mining Company, Galabyte, Pamodzi Gold, Mintails SA (Pty) Ltd), instead of applying for closure, simply abandon or "warehouse" the mines. These mining companies leave in their wake un-rehabilitated footprints, tailings storage facilities where the reclamation has not been completed, polluted wetlands and rivulets,

²⁰ Coetzee, H. (compiler) 2004: An assessment of sources, pathways, mechanisms and risks of current and potential future pollution of water and sediments in gold-mining areas of the Wonderfontein spruit catchment. WRC Report No 1214/1/06, Pretoria, 266 pp

²¹ 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;

(f) a description of the manner in which it intends to-

- (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation during closure;
- (ii) remedy the cause of pollution or degradation and migration of pollutants during closure;
- (iii) comply with any prescribed environmental management standards or practices; and
- (iv) comply with any applicable provisions of the Act regarding closure;



radioactive mine residue areas, open pits, tailings storage facilities without onramps, penstocks, stormwater management, cut-off trenches, toe paddocks, piezometers²², etc.

The rehabilitation funds are mostly inadequate to address the current as well as the long term latent or residual impacts, including the pumping and treatment of extraneous or polluted water.

To exemplify:

- Mintails' life of mine will end in 2020. Its current environmental liabilities according to its Closure Plan and Associated Closure Costs (Report Number 1417897) (February 2016) amount to R340 million. It has in trust R25 million for rehabilitation and is currently in business rescue.
- On the 6th of August 2013 a provisional winding-up order was granted to the Blyvooruitzicht Gold Mine Company (BGMC) of which DRD Gold was the majority shareholder. BGMC left in its wake a number of un-rehabilitated footprints of reclaimed tailings storage facilities, containing toxic and radioactive water and soil, radioactive infrastructure, tailings storage facilities without vegetation, retainer walls and functional toe paddocks and penstocks, and total environmental liabilities of R891 098 234. R43 007 932 is held in trust for rehabilitation. DRD Gold EMPR 2007 promised: *"The site would be left ecologically and geophysically stable and would not pose an economic, social or environmental liability to the local community and the state now or in the future."*

Of particular relevance to the DWS is the fact that since the winding up operations of BGMC, the mine terminated its water supply to the Blyvoor Villages and the treatment of sewage from these Villages. For more than 7 years raw sewage is flowing into the Wonderfonteinspruit. The DWS argues that since BGMC is in the process of liquidation, the DWS is not in the position to hold any person or persons responsible or liable.

There is a systemic failure by both the DWS and the DMR to enforce non-compliances by mining companies in this regard. We have been credibly informed that there has been no closure certificates issued for any mining company within the Witwatersrand gold fields.

The above-mentioned matters ought to be addressed in the NW&SMP.

The impacts and costs of these abandoned mines, which include polluted water, are carried by neighbouring mines, a mute environment, communities who had no share in the pollution and who did not benefit from the polluting activities, financially beleaguered local municipalities and future generations.

²²Regulations regarding the safety of dams in terms of section 123(1) of the NWA provides a clear basis for the operation and maintenance of all structures utilised to store water, with the primary objective of ensuring the safety of people and the environment down-stream of the dam.



7.

Scarcity of water and competition for water across sectors

It is common cause that by 2025 all four international river basins transition into Absolute Water Scarcity, which may result in economic stagnation and potential social decay (without taking into account global climate change).

The Limpopo River Basin, is already over-allocated by about 120% and is facing a 241% increase in demand by 2025. (Ref. Ashton 2009)

It is foreseen that there will be a dramatic increase in water demands²³ within the Crocodile West/Limpopo WMA as a result of:

- Current mining activities and proposed mining activities
- Sasol's proposed Maphuta coal to liquid fuel projects
- The exploitation of the vast coal reserves in the Waterberg;
- The expansion of the Grootegeluk mine to supply the new Medupi Power Station with coal; and
- Matimba and Medupi - three new Eskom power stations in the future
- Implementation of the Reserve is expected to result in serious deficits in some of the main river catchments.

19 WMAs in terms of the NWRS-2 require intervention.

Notwithstanding the fact that the water demand exceeds the water supply in a number of WMAs including the Olifants, the DWS continues to authorise water use license applications.

Mining and prospecting applications abound in areas of water scarcity where water is already 'flowing' from agriculture to mining.

The NW&SMP lists mining's use of water as only 2% but overlooks the fact that the biggest impact of the mining industry is on water quality – "a threat to the resource that cannot be brushed away."²⁴

In Fuel Retailers the Constitutional Court laid a solid foundation for an integrated understanding of the right to development-in-environment protected by s 24 of the Constitution, the givenness and vulnerability of the environment, the potential of irreversible and profound impacts upon eco-systems and the need to consider future generations, the recognition of ecological and developmental thresholds and imposing positive obligations on the State to take reasonable legislative and other measures to prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development.

²³ DWS' Classification of Significant Water Resources in the Crocodile (West) Marico WMA and Matlabas and Mokolo Catchments: Limpopo WMA (WP 10506) Classification Report.

²⁴ DWS Business Case for the Limpopo CMA. September 2013) DWS' NWRS-2 Overview 2014 (Seef Rademeyer, Niel van Wyk – Eskom/NGO Presentation.



8.

“Deteriorating water quality reduces the amount of water available for use as more water must be retained to maintain the dilution capacity in our river systems.” “Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals.” “All waste shall be disposed of /discharged lawfully and safely.” “Degradation of wetlands and water resources.” “South Africa must restore raw water quality”.

Pre-Directives, Directives and Criminal Prosecutions

The Master Plan is mostly silent on enforcement and criminal prosecution.

The above-mentioned goal can only be achieved if the DWS diligently and consistently enforces the non-compliance by mining companies with pre-directives and directives. Grounded upon our experience, the DWS at times issues a notice to issue a directive for pollution incidents. The pre-directive or notice infrequently translates into a directive.

If a directive is issued and there is non-compliance or partial non-compliance with the directive, there is no further action taken by the DWS notwithstanding the fact that the NWA allows for criminal prosecution.

In substantiation: The DWS has had zero convictions for criminal offences and has suspended only one water use licence since the 1st of January 2008.

Retrospective Application of the Polluter Pays Principle

Furthermore, there is a reluctance on the part of the NWA and the honourable Minister of Water and Sanitation to enforce the retrospective application of the polluter pays principle. We refer e.g. to the public statement by the honourable Minister during the launch of the long term treatment of Acid Mine Drainage (AMD) that the DWS will not go on a “*witch hunt*” of the historic polluting mining companies²⁵. (Interpolation: AMD has been a long recognised problem. In 1903 it was already referred to as an established phenomenon concerning pumped water on the Witwatersrand. The Council of Geosciences holds a comprehensive data base of historic and current South African mining companies.)

There is no ambiguity in the Act: The NWA holds a wide pool of persons responsible and liable for pollution. Subsection (1)(c) of the NWA imposes an obligation on owners (when the pollution or potential pollution occurred or that owner’s successor-in-title); persons in control of or persons who occupy the land, persons who directly or indirectly contributed to the pollution or the potential pollution; the person in control of the land or any person who has a right to use the land at the time when the activity or the process is or was performed or undertaken, or the situation came about.

²⁵ <http://www.risefm.co.za/water-consumers-mines-to-cover-costs-of-new-acid-mine-drainage-project/>

In the Gauteng High Courts, a judicial pronouncement was made in *Harmony Gold Mining Co. Ltd. v Regional Director, Free State, Department of Water Affairs and Forestry (2006) JDR 0465 (SCA)* namely that a directive issued to persons whilst they were a landholder remains valid even after such landholder has severed its ties to the land. All arguments raised by the applicant on the basis of perpetuity liabilities and unreasonableness, amongst others, were rejected.

It is clear that the prevention and remedying effects of pollution (duty of care) applies to pollution that might arise at a different time from the actual activity that caused the contamination and to pollution that may arise following an action that changes pre-existing contamination. It is therefore no defence to say that the pollution is historic, indirect or underlying – the responsibility to take reasonable steps remains.

The NWA makes provision for a CMA or the DWS to take the measures it considers necessary to remedy the effects of pollution, or to contain or prevent the movement of pollutants or to eliminate the source of pollution, and to recover the costs from polluters jointly and severally if the polluter fails to comply or inadequately comply with a directive.

The above-mentioned options, which are available to the DWS in terms of the NWA ought to be employed to reduce pollution, eliminate unlawful dumping and minimizing release of hazardous chemicals.

Remedying effects of pollution

The NWA does not prescribe specific remediation standards. This ought to be addressed in the Master Plan. In the interim, confusion on the part of the DWS and polluters and other responsible parties will remain. What is clear is that our law imposes obligations to remove pollution from the environment, and to rehabilitate affected areas

Regulations of Use of Water for Mining and Related Activities aimed at the Protection of Water Resources

The Regulations call for *inter alia* the confinement of unpolluted water to a clean water system, away from a dirty area and the collection of water arising within any dirty area, including water seeping from mining operations, outcrops or any other activity, into a dirty water system; prevention of erosion or leaching of materials from any residue deposit or stockpile; fencing-off of any impoundment or dam containing poisonous, toxic and injurious substances and the erection of warning notice boards at prominent locations.

The Regulations furthermore call for the ensuring that all pollution control measures are designed, modified, constructed and maintained at either the temporary or permanent cessation of operations.

The above-mentioned Regulations are routinely contravened with impunity. In substantiation we refer to e.g. the operations of Mintails SA (Pty) Ltd's and the Blyvooruitzicht Gold Mining Company.



The Master Plan is mostly silent on the above-mentioned Regulations and their enforcement.

SUBMITTED BY:

Mariette Liefferink

CEO: FEDERATION FOR A SUSTAINABLE ENVIRONMENT

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