

DIGBY WELLS

ENVIRONMENTAL

BACKGROUND INFORMATION DOCUMENT

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED SLUDGE DISPOSAL FACILITY AND PIPELINE ASSOCIATED WITH THE TREATMENT OF ACID MINE DRAINAGE IN THE EASTERN BASIN OF THE WITWATERSRAND GOLDFIELDS, GAUTENG PROVINCE

March 2014

Internal Project Number:
AEC2588

DEA Reference Number:
14/12/16/3/3/3/111

Prepared for:
Trans-Caledon Tunnel Authority (TCTA)

For any project related information please contact:

Digby Wells Environmental – Stakeholder Engagement Office

Steve Horak or Vanessa Viljoen
Tel: (011) 789 9495 or Fax: 086 583 5715

Email:
steve.horak@digbywells.com or vanessa.viljoen@digbywells.com

Website: www.digbywells.com (Public Documents)

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359
Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J
Leaver*, GE Trusler (C.E.O)
*Non-Executive

1 PURPOSE OF DOCUMENT

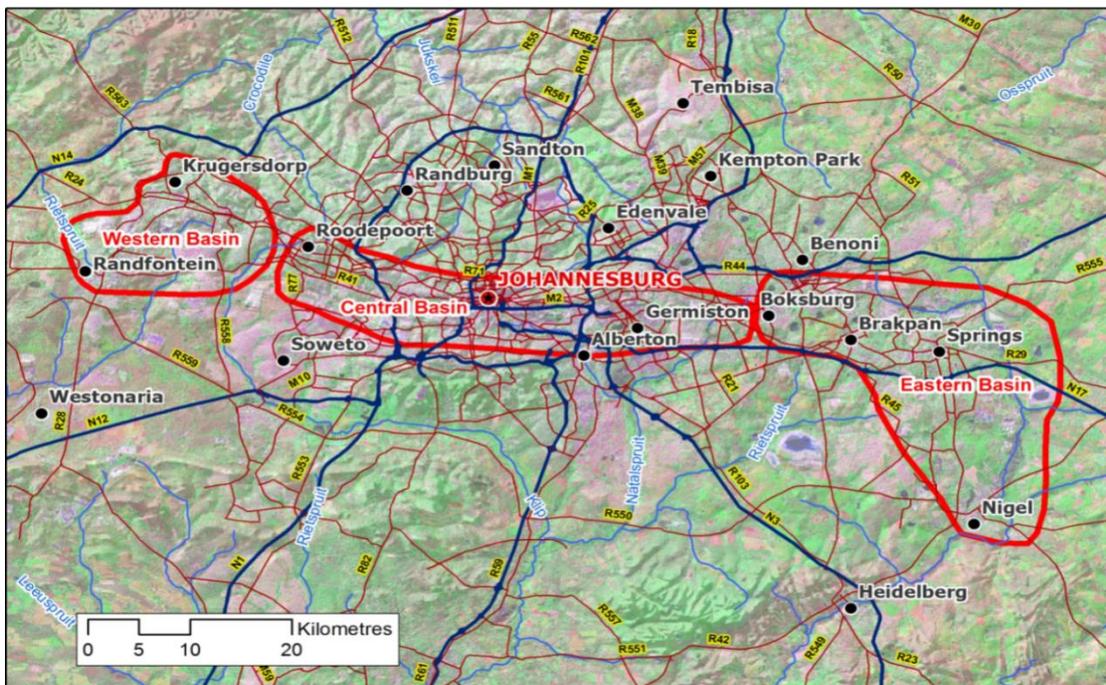
The Trans Caledon Tunnel Authority (TCTA) was instructed by the National Government, through the Minister of Water and Environmental Affairs, to manage Acid Mine Drainage (AMD) generated in the Western, Central and Eastern Basins of the Witwatersrand Gold Field in Gauteng Province. Engineering and environmental solutions for the Western and Central Basins are underway and now management of AMD emanating from the Eastern Basin is required. AECOM South Africa (Pty) Ltd (AECOM) has been appointed by the TCTA as the Principal Consultant in respect to the implementation of the Short Term Intervention (STI) measures for the management of AMD in the Eastern Basin. The Eastern Basin Project will entail a regulatory Environmental Impact Assessment (EIA) process for the construction of a sludge disposal facility and pipelines associated with the treatment of AMD in the Eastern Basin of the Witwatersrand. The EIA process will be conducted according to the National Environmental Management Act, Act 107 of 1998 (NEMA) and a waste management licence application process in terms of the National Environmental Management: Waste Act, Act 59 of 2008 (NEM:WA).

This Background Information Document (BID) has been developed in order to:

- Provide background about the project;
- Share information about the proposed STI measures;
- Provide details about the Public Participation Process (PPP) which will be followed;
- Provide stakeholders the opportunity to become involved in the project; and
- Provide information about the specialist assessments that will be undertaken as part of the EIA.

2 PROJECT BACKGROUND

The Witwatersrand gold mining area is divided into three basins: the Western Basin, Central Basin and Eastern Basin (refer to Plan 1 below). The Eastern Basin is the focus of this project and covers the East Rand area, which includes the towns of Boksburg, Brakpan, Springs and Nigel. The mine lease areas in the Eastern Basin extend over 768 km². The Western Basin covers the Krugersdorp, Witpoortjie and Randfontein areas and extends over 57 km², while the Central Basin extends from Durban Roodepoort Deep (DRD) in the west to the East Rand Proprietary Mines (ERPM) in the east, extending over 251 km².



Plan 1: Locations of the Western, Eastern and Central basins in the Witwatersrand

After more than 120 years of deep level gold mining in the Witwatersrand, mining and dewatering has stopped due to the exhaustion of gold resources. The cessation of dewatering has resulted in progressive flooding of the mine voids since 1997. AMD occurs when ore and/ or waste material, containing sulphides, (e.g. pyrite) are exposed to water and oxygen and thereby increasing the acidity of the water. In order to prevent decant of AMD from these three basins, water levels need to be kept below an Environmental Critical Level (ECL), which are represented as meter above mean sea level (mamsl) and are as follows:

- Western Basin: 1,550 mamsl;
- Central Basin 1,467 mamsl; and
- Eastern Basin: 1,280 mamsl.

Through intervention by the Department of Water Affairs, the capacity of the AMD water treatment facility in the Western Basin was increased in 2013. The Central Basin is expected to decant in 2014, and engineering and environmental solutions for the Central Basin are underway and it is anticipated that treatment of AMD in the Central Basin will commence in April / May 2014. It is now required to commence with treatment of AMD emanating from the Eastern Basin. The Eastern Basin is not decanting but is expected to reach the ECL in 2015. Similar measures for AMD treatment, as per the Central and Western Basins are envisaged, that is, the construction of High Density Sludge (HDS) treatment plant where acid water is treated with lime and neutralised water discharged, with the residual sludge pumped to a storage facility. The primary sludge stream is expected to contain a metal hydroxide sludge, with some gypsum.

In January 2012, the Department of Environmental Affairs (DEA) granted exemption for the abstraction of AMD from Grootvlei Shaft 3, the construction and operation of the HDS Plant and neutralised water pipeline for discharge into the Blesbokspruit. This exemption did not include for the construction of a new sludge disposal site and associated pipeline. As a result, a full environmental authorisation process will need to be followed for the construction of the sludge disposal facility in the Eastern Basin and aligned with the requirements of the NEMA and NEM:WA regulatory process.

3 PROJECT DESCRIPTION

This proposed Project is limited to the consideration of the sludge disposal site and associated pipeline for STI measures required for the management of AMD within the Eastern Basin of the Witwatersrand. Although the scope of this project is limited to the sludge disposal method for the STI measures for the Eastern Basin, consideration will be given to the land requirements for the disposal of sludge and brine associated with the Long Term Intervention (LTI) measures. The STI measures are described below.

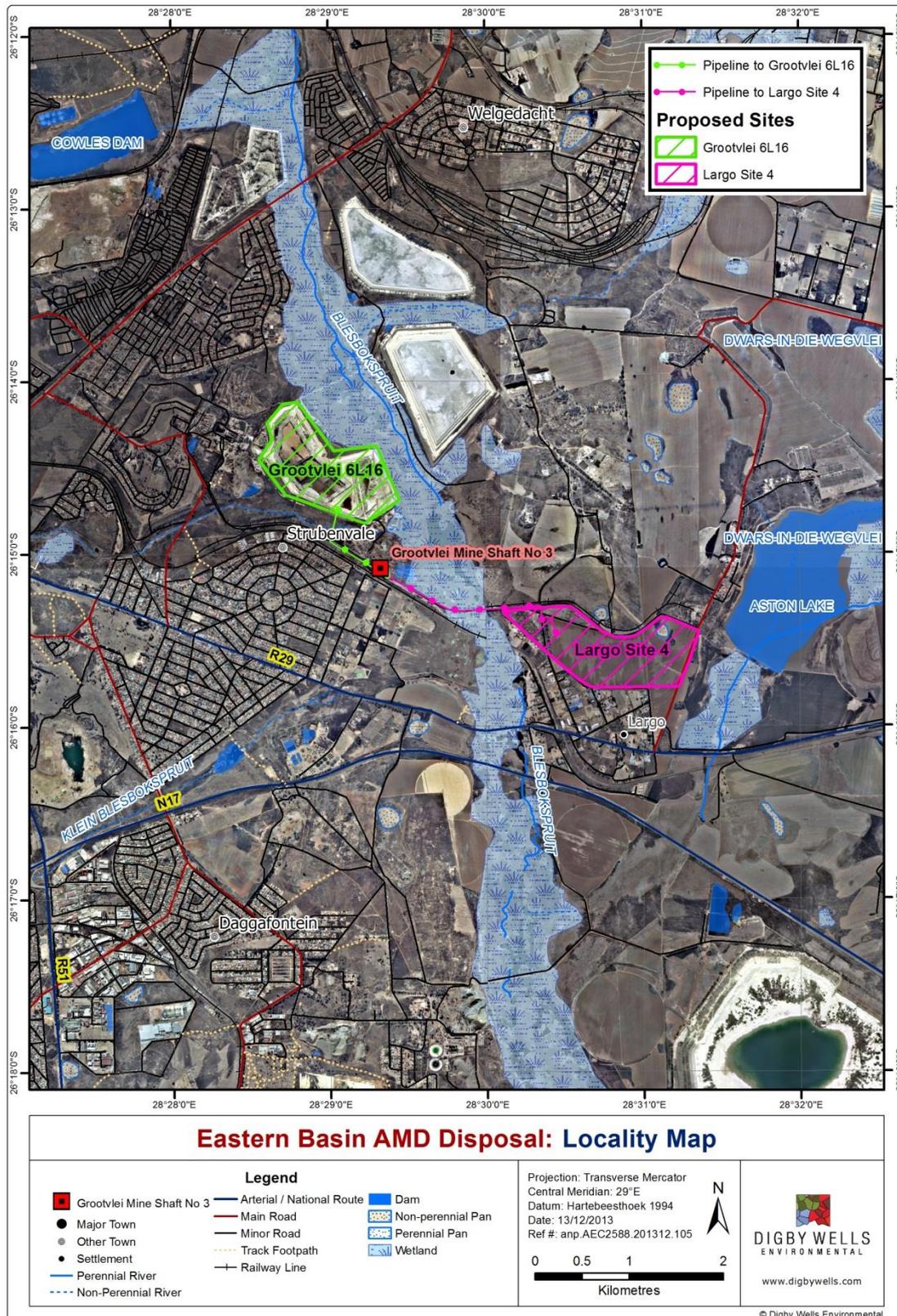
3.1 Short Term Intervention Measures for the Eastern Basin

The proposed HDS plant for the treatment of AMD generated from the Eastern Basin will be constructed at the Grootvlei Mine Shaft No. 3 about 4.6 km east of the Springs Central Business District (CBD). The site is accessible via the R29 Ermelo Road and Grootvaly Road through the suburb of Casseldale (refer to *Plan2*). The activities associated with the STI measures will include:

- Abstraction of AMD via installed pumps in the Grootvlei No. 3 shaft at a pump depth to achieve the ECL level outlined above;
- Construction of a new HDS treatment plant adjacent to the Grootvlei No. 3 shaft;
- Construction of a neutralised water pipeline to a suitable discharge point along the Blesbokspruit; and
- Construction of a waste sludge pipeline to link the proposed HDS plant to preferred new sludge disposal site.

As indicated above, in light of the exemption issued, the scope of this EIA process is limited to the construction of the proposed sludge disposal site and associated pipelines. The following two potential sludge disposal sites (as reflected in Plan 2 below), are being considered for detailed impact assessment:

- Grootvlei 6L16;and
- Largo Site 4.



Plan 2: Potential Sludge Disposal Sites in the Eastern Basin: Locality Map

The EIA will entail the following:

- Compilation of an integrated Application Form;
- Detailed specialist studies on the preferred and alternative sites;
- Conduct a Scoping and EIA process (in terms of the NEMA and NEM:WA); and
- All necessary public participation.

Detailed Project Description for EIA Process

The focus of this EIA process is limited to the construction of a sludge disposal facility and associated underground pipelines. A total extent of 30 hectares will be required to dispose of the 1.75 million m³ of STI sludge over a maximum of 8 years. The total height of the proposed sludge disposal facility is not expected to exceed 14 m.

Two underground pipelines will be constructed, adjacent to and parallel to each other, and extend from the proposed HDS Plant to the sludge disposal facility, within the same pipeline corridor. The pipelines will have an internal diameter of no more than 300 mm. The one pipeline will be used for the pumping of sludge from the HDS Plant to the proposed sludge disposal site, whereas the second pipeline will be used as a return water pipeline. The return water pipeline will send excess water from the proposed sludge disposal site back to the HDS plant. The proposed pipelines are expected to run, where possible, in existing pipeline servitudes or alternatively land will be expropriated in a servitude width of approximately 10 m. The detailed description of the proposed sludge disposal sites and associated pipelines is presented below.

Grootvlei 6/L/16

The proposed Grootvlei 6/L/16 sludge disposal site is located on an existing tailings facility. A pipeline length of approximately 1 km will be constructed from the HDS plant proposed at Grootvlei Shaft 3 to the proposed Grootvlei 6/L/16 disposal site. The proposed pipelines will run parallel to existing railway servitudes and towards the Grootvlei 6/L/16 Site. The return water pipeline will follow the same pipeline corridor.

Largo Site 4

The proposed Largo Site is located between the Blesbokspruit and Aston Lake, on an area zoned as agricultural land. A pipeline length of approximately 2 km will be constructed from the HDS plant proposed at Grootvlei Shaft 3 to the proposed sludge disposal site. From the Grootvlei Mine Shaft No. 3, the proposed pipelines will run parallel along Van Niekerk Road in an easterly direction, crossing the Blesbokspruit on an existing bridge structure until it reaches the proposed sludge disposal facility. The return water pipeline will follow the same pipeline corridor.

3.2 Long Term Intervention Measures for the Eastern Basin

The LTI measures for the Eastern Basin will likely include a desalination process to treat AMD emanating from region. The process of desalination would likely result in the production of brine, and will thus require evaporation dams for associated treatment and management. It must be noted that the LTI measures do not form part of this Project, but rather cognizance is taken (where possible) of its land requirements for disposal of sludge for long term integrated planning purposes.

4 LEGISLATION

For the proposed project, the following needs to be completed in order to adhere to the required legislation:

- Environmental Authorisation process in terms of the NEMA; and
- A Waste Management Licence Application process in terms of the NEM:WA.

An integrated application in terms of the listed activities has been compiled and submitted to the National DEA for review and to issue an EIA Reference Number to officially commence with the regulatory process.

4.1 Project listed Activities

For the proposed STI measures, the NEMA and NEM:WA listed activities applicable to the proposed project are presented in the tables below.

Table 1: NEMA Listed Activities

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per the detailed project description (and not as per wording of the relevant Government Notice):
GN R544 – Listing Notice 1: List of Activities Identified in Terms of Sections 24(2) and 24D for which a Basic Assessment Process is required.	9: The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water – <ul style="list-style-type: none"> i. With an internal diameter of 0.36 metres or more; or ii. With a peak throughput of 120 litres per second or more, Excluding where: <ul style="list-style-type: none"> a) Such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b) Where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse. 	Pipelines will be constructed for the transportation of sludge from the proposed HDS plant to the proposed sludge disposal site and a return water pipeline will be constructed.
	11: The construction of: <ul style="list-style-type: none"> i. Canals; ii. Channels; iii. Bridges; iv. Dams v. Weirs vi. Bulk storm water outlet structures; vii. Marinas; viii. Jetties exceeding 50 square metres in size; ix. Slipways exceeding 50 square metres in size; x. buildings exceeding 50 square meters in size; or xi. Infrastructure or structures 	The proposed pipeline route will cross watercourses on route to the proposed sludge disposal site.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per the detailed project description (and not as per wording of the relevant Government Notice):
	<p>covering 50 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	
<p>GN R545 - Listing Notice 2: List of Activities Identified in Terms of Sections 24(2) and 24D for which Scoping and an Environmental Impact Assessment is Required.</p>	<p>5:</p> <p>The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p>	<p>The disposal of sludge will require a license in terms of the NEM:WA</p>

Table 2: NEM:WA Listed Activities

Description of NEMWA Notice	Activity No (s) (in terms of the relevant notice):	Description of Activity
<p>GN R912 - Category B: List of waste activities identified in terms of Section 24 (5) for which an Environmental Impact Assessment is Required.</p>	<p>Activity No.8:</p> <p>The disposal of general waste to land covering an area in excess of 200m² and with a total capacity exceeding 25 000 tons.</p>	<p>The disposal of general waste of approximately 208.5 tons of general waste per day on the proposed sludge disposal site, which is greater than 200 m².</p>

5 SPECIALIST STUDIES

The specialist assessments proposed for the EIA process will cover the following disciplines:

- Air Quality Assessment
- Groundwater Assessment
- Fauna and Flora Assessment
- Heritage Assessment

- Social Assessment
- Surface Water Assessment
- Wetlands and Aquatics Assessments
- Legal Review
- Soil Assessment
- Topography and Visual Assessment
- Noise Assessment
- Stakeholder Engagement

6 PUBLIC PARTICIPATION PROCESS

All stakeholders who may be affected by or interested in the proposed project should formally register as an Interested and Affected Party in order to become involved in the EIA and PPP. The following anticipated dates are important to note for the PPP going forward:

- Availability of Draft Scoping Reports for public comment: July / August 2014
- Stakeholder meetings to be held during the public comment period: July 2014
- Availability of Final Scoping Report for public comment: September 2014
- Availability of Draft EIA Report for public comment: November / December 2014
- Stakeholder meetings to present the findings of the Draft EIA Report: November 2014
- Availability of Final EIA Report for public comment: December / January 2014

Registered I&APs will be informed about availability of reports and scheduled stakeholder meetings by preferred means of communication (email, post or fax). Contributions from stakeholders will assist in informed decision-making for authorities and provides information to be considered by the project team and specialists conducting studies. All comments can be submitted using the contact details which appear on the cover page or as part of the Comment and Registration Sheet.