

## Appendix 1-7 Written comments received to date

**APPLICATION FOR AMENDMENT TO MINING RIGHT, ENVIRONMENTAL AUTHORISATION  
AND ENVIRONMENTAL MANAGEMENT PROGRAMME  
STAKEHOLDER REGISTRATION AND COMMENT FORM**

**Public Participation Office: Tel: 012 543 9093; Fax: 086 460 6243 or**

|  |   |      |             |           |              |               |
|--|---|------|-------------|-----------|--------------|---------------|
| Title  | Mr.                                     | Name | Boetie      | Surname   | Gani         |               |
| Farm Name<br>(if applicable)   | Grootpan 7                              |      |             |           | Portion      | GED 51        |
| Company  | Ogies Township Company (1961/002443/07) |      |             |           |              |               |
| Designation  | C.E.O.                                  |      |             |           |              |               |
| Address  | 786 Van Riebeeck street                 |      |             |           |              |               |
|  | Ogies, Mpumalanga                       |      |             |           | Postal Code  | 2230          |
| Tel. No.   | 013 643 2073                            |      |             | Fax No.   | N/A          |               |
| E-Mail   | info@ganbrogroup.co.za                  |      |             | Cell. No. | 063 786 0015 |               |
| Preferred method of communication:   |   |      |             |           | 083 786 0015 |               |
| Land Line  | Cellular<br>phone                       | Fax  | E-Mail<br>✓ | SMS       | Post         | Hand delivery |
| <b>Comments (feel free to attach additional pages):</b><br>Please take note that we are the land owners on the eastern and western side of the road (P53-1)  |   |      |             |           |              |               |
| <b>Indicate any direct business, financial, personal, or other interest which you may have in the amendment application:</b><br>Please take note that we are the land owners on the eastern and western side of the road (P53-1) |   |      |             |           |              |               |
| <b>If you know of anyone who should be informed about the amendment application, please provide their contact details:</b>   |   |      |             |           |              |               |
| Name   |   |      |             | Tel. No.  |              |               |
| Organisation / Farm  |   |      |             |           |              |               |



**GLENCORE OPERATIONS SA (PTY) LTD: GOEDGEVONDEN COMPLEX**  
**APPLICATION FOR AMENDMENT TO MINING RIGHT, ENVIRONMENTAL AUTHORISATION**  
**AND ENVIRONMENTAL MANAGEMENT PROGRAMME**  
**STAKEHOLDER REGISTRATION AND COMMENT FORM**

To register as an Interested and Affected Party, thereby ensuring that you are given an opportunity to comment on the documents and receive updated project information, please complete the form below and send your registration form with comments back to: **Lizinda Dickson / Fransis de la Rosa:**

**Public Participation Office: Tel: 012 543 9093; Fax: 086 460 6243 or**

**ggvamendment@participation.co.za**

|  |  |      |  |             |               |
|--|--|------|--|-------------|---------------|
| Title  | MR                                     | Name | THEMBISILE                                 | Surname     | SILANELE      |
| Farm Name<br>(if applicable)   | MAFUFELA KLIPPORTJIE FARM              |      |  | Portion     | 17            |
| Company  | SGESQEGE FARM (NON PROFIT COMPANY)     |      |  |             |               |
| Designation  | CHAIRMAN                               |      |  |             |               |
| Address  | PORTION 17, MAFUFELA, KLIPPORTJIE FARM |      |  |             |               |
|  | 091ES                                  |      |  | Postal Code | 2230          |
| Tel. No.   |  |      |  | Fax No.     |               |
| E-Mail   | thembsilanele@gmail.com                |      |  | Cell. No.   | 082 754 8535  |
| Preferred method of communication:   |  |      |  |             |               |
| Land Line  | Cellular<br>phone                      | Fax  | E-Mail <input checked="" type="checkbox"/> | SMS         | Post          |
|  |  |      |  |             | Hand delivery |
| Comments (feel free to attach additional pages):   |  |      |  |             |               |
| CHANGIN ROAD AFFECT FARM COMMUNITY AND OTHER ROAD USING THIS R545, R547, R555  |  |      |  |             |               |
| I ATTACHE THE FULL COMMENT ABOUT THE PROPOSAL ON THAT ATTACHMENT I EXPLAIN HOW COMMUNITY WILL BE AFFECTED.   |  |      |  |             |               |
|  |  |      |  |             |               |
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| Indicate any direct business, financial, personal, or other interest which you may have in the amendment application:  |  |      |  |             |               |
| GOEDGEVONDEN NEED TO EMPOWERING LOCAL FARM COMMUNITY THEY MUST INVOLVE FARM COMMUNITY TO BUSINESS THEY ARE DOING, THEY MUST ASSIST THIS FARM COMMUNITY TO OPEN THEIR BUSINESS IN ORDER TO SUPPORT THEIR FAMILY. BUSINESS OPPORTUNITY ITS WHAT WE WANT TO SEE HAPPENING |  |      |  |             |               |
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| Organisation / Farm  |  |      |  |             |               |

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 HAVE ANY QUESTION AND/OR SUGGESTIONS

Siyabonga one for the unemployed  
S27 siyabonga section phola  
Ogies  
2233

The regional manager  
Department of mineral resources and energy  
Saveway crescent center  
Mandela drive  
Mpumalanga province

Good morning all

Dispute their upgrade and renewal of their license due to the following facts that have been identified as possible impacts:

°first of all we must remind ourselves that water is only one natural resource that we left with as a community and the fact that it is also a scarcity in this region it must be protected with all costs.

°Glencore especially Goedgevonden operation has drastically failed our community, they did all with all their powers to infringe the rights of the people previously

°as the community we like also to reserve our land that we left with as heritage sites, grazing fields and agricultural space hence we all aware of the fact that mining is no longer favorable to our economy and it does not guarantee us a better life as affected families.

°it not give direct benefits for the owners of this land, families that depends on those forms which they extract minerals from it they are not even prioritize.

°no plan for future food security.

- Potential negative impact on ambient air quality as a result of increased nuisance dust and fine particulate levels, likely to occur as a result of materials handling activities (tipping, loading and unloading), vehicle entrainment of dust on unpaved roads, and wind erosion from open/ exposed areas; natural water stream line are being contaminated; reduce the capacity of grazing land for life stock.

- Spontaneous combustion on the discard facility resulting in:  
Increased levels of fugitive emissions (i.e. air pollution) and non-compliance with the NEM: All when the ambient air quality standards are exceeded;  
Increased occupational exposures to the combustion gasses;  
Instability within the discard facility and an increased risk of collapses due to voids being formed as the discard burns within the facility; and  
Increased risk of occupational injuries and/or losses of equipment due to burns, smoke inhalation, and/or collapse.

- Potential negative impact on visual aesthetics of the broader region, particularly since the discard facility will remain a permanent visible feature of the landscape.

- Potential negative impact on noise levels resulting from site preparation, ground excavation and materials handling activities.



# **GLENCORE OPERATIONS SA (PTY) LTD: GOEDGEVONDEN COMPLEX**

## **APPLICATION FOR AMENDMENT TO MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME**

### **STAKEHOLDER REGISTRATION AND COMMENT FORM**

To register as an Interested and Affected Party, thereby ensuring that you are given an opportunity to comment on the documents and receive updated project information, please complete the form below and send your registration form with comments back to: **Lizinda Dickson / Fransis de la Rosa:**

**Public Participation Office: Tel: 012 543 9093; Fax: 086 460 6243 or**

**ggvamendment@participation.co.za**

|  |  |      |             |           |              |               |
|--|--|------|-------------|-----------|--------------|---------------|
| Title  | MR   | Name | BAREND      | Surname   | DRY          |               |
| Farm Name<br>(if applicable)   | N/A  |      |             |           | Portion      |               |
| Company  | CAZ DRY ATTORNEYS INC.   |      |             |           |              |               |
| Designation  | DIRECTOR   |      |             |           |              |               |
| Address  | OFFICE 85, FIRST FLOOR, BUILDING 11, SONPARK<br>BUSINESS CENTRE, NELSPRUIT |      |             |           | Postal Code  | 1201          |
| Tel. No.   | 013 492 1529   |      |             | Fax No.   | 086 243 9604 |               |
| E-Mail   | admin@cdlow.co.za  |      |             | Cell. No. | N/A          |               |
| Preferred method of communication:   |  |      |             |           |              |               |
| Land Line<br>X   | Cellular<br>phone  | Fax  | E-Mail<br>X | SMS       | Post         | Hand delivery |
| Comments (feel free to attach additional pages):   |  |      |             |           |              |               |
| NONE AT THIS STAGE, WE WILL COMMENT ONCE WE HAVE<br>REVIEWED THE DOCUMENTS.  |  |      |             |           |              |               |
| KINDLY INCLUDE OUR OFFICE IN THE FOCUS GROUP MEETINGS.   |  |      |             |           |              |               |
| PLEASE PROVIDE THE DRAFT BAR AND OTHER STUDIES TO BE<br>CONDUCTED.   |  |      |             |           |              |               |
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| KINDLY REGISTER OUR OFFICE AS AN IAP ON BEHALF OF OUR<br>CLIENTS.  |  |      |             |           |              |               |
|  |  |      |             |           |              |               |
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| Organisation / Farm  |  |      |             |           |              |               |

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**ggvamendment@participation.co.za**

|   |                           |      |             |           |              |               |
|---|---------------------------|------|-------------|-----------|--------------|---------------|
| Title   | MRS                       | Name | HELENA      | Surname   | DE CORT      |               |
| Farm Name<br>(if applicable)  | GROOTPAN 715              |      |             |           | Portion      | 39            |
| Company   | COUNTRY GARDEN GUESTHOUSE |      |             |           |              |               |
| Designation   | OWNER                     |      |             |           |              |               |
| Address   | GROOTPAN FARM             |      |             |           |              |               |
|   | OGIES                     |      |             |           | Postal Code  | 2230          |
| Tel. No.  | 082 572 5971              |      |             | Fax No.   | 086 544 0441 |               |
| E-Mail  | countrygardenguesthouse   |      |             | Cell. No. | 082 572 5971 |               |
| Preferred method of communication: @ gmail . com  |                           |      |             |           |              |               |
| Land Line   | Cellular<br>phone         | Fax  | E-Mail<br>X | SMS       | Post         | Hand delivery |
| Comments (feel free to attach additional pages):  |                           |      |             |           |              |               |
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| Organisation / Farm   |                           |      |             |           |              |               |

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## GLENCORE OPERATIONS SA (PTY) LTD: GOEDGEVONDEN COMPLEX

### APPLICATION FOR AMENDMENT TO MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME

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**ggvamendment@participation.co.za**

|  |                        |             |               |                  |                    |                      |
|--|------------------------|-------------|---------------|------------------|--------------------|----------------------|
| <b>Title</b>   | MR                     | <b>Name</b> | ADRIAAN       | <b>Surname</b>   | MULLER             |                      |
| <b>Farm Name (if applicable)</b>   |                        |             |               |                  | <b>Portion</b>     |                      |
| <b>Company</b>   | ANEMERSKA GUESTHOUSE   |             |               |                  |                    |                      |
| <b>Designation</b>   | OWNER                  |             |               |                  |                    |                      |
| <b>Address</b>   | MALAN STR 38 OGIES     |             |               |                  |                    |                      |
|  |                        |             |               |                  | <b>Postal Code</b> | 2230                 |
| <b>Tel. No.</b>  | 0724510310             |             |               | <b>Fax No.</b>   |                    |                      |
| <b>E-Mail</b>  | amuller@cozamail.co.za |             |               | <b>Cell. No.</b> | 0724510310         |                      |
| <b>Preferred method of communication:</b>  |                        |             |               |                  |                    |                      |
| <b>Land Line</b>   | <b>Cellular phone</b>  | <b>Fax</b>  | <b>E-Mail</b> | <b>SMS</b>       | <b>Post</b>        | <b>Hand delivery</b> |
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| <b>Name</b>  |                        |             |               | <b>Tel. No.</b>  |                    |                      |
| <b>Organisation / Farm</b>   |                        |             |               |                  |                    |                      |

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- Potential negative impact on pit water quality due to the additional acid-generating discard that will be placed on top of the pit, and subsequent decant of mine affected water once mining and operational
- dewatering ceases and the pit fill up, impacting on downstream water resources.
- Potential negative impact on the quality of downstream water resources resulting from spillage of contaminated storm water runoff emanating from the discard facility,
- Potential negative impact on pit water quality and acceptability for treatment at our wetlands
- Potential impact on volume of contaminated mine affected water requiring management/treatment.
- Potential negative impact on downstream aquatic ecosystems resulting from the above-mentioned impacts on water quality.
- Potential negative impact on the current wetland offset strategy for the site.
- Potential positive impact on employment safety of permanent employees, continued skills transfer, and local economic development; and
- Potential negative impact on water supply of local water users.

The potential issues identified in the report are exactly issues that the community is already experiencing due to the current operations. Similar impacts were identified during the initial environmental studies for the facility and the same mitigation measures were identified and recommended. When the mine started to operate there has been serious negative impacts as a result of dust, water contamination, blasting and As the community we are the recipient of the environmental impacts leading to the environmental degradation of our community.

We would like to raise specific issues on environmental impact:

- **Blasting:** Blasting is done randomly, and we do not have a platform to participate views on timing for blasting. We acknowledge Glencore also sits on stakeholder forums where it is stated that there are several homeowners whose houses were damaged by blasting and so far nothing was done by either of the mining houses. If a Glencore stands for ethical business and morally sound decision, they would have raised concerns over non-compliance but nothing was done. We cannot forget the issues raised by (Siyabonga one for the unemployed) the issue of graveyard which is not even entertained any, where Indian and black African families have never been compensated.

We need a detailed dust management plan so we can contribute our views

- **Water Shortages:** It is well known water is a scarce resource in the area and whenever Glencore does its application, it is noted there are water challenges for residents and Glencore still believe they can increase their water consumption without providing details of community support on scarce water resources. An alternative water supply for the community must be provided and accepted by the community

- Water Pollution: Glencore operate close to klipoortjespruit stream that is highly contaminated and invaded by alien species and still the company believed possible water impact as a results of internal water management which may cause cumulative impacts. As a results water must be tested and community must be made aware of the contamination level.

- Waste Management: Management of mining waste is done accordingly at current facility however the mine does not participate in ensuring the surrounding is free of litter

- Biodiversity: Continuous removal of plants and displacing natural habitats for animals will leave with out grazing land and People without biodiversity. Biodiversity is the food we eat, the water we drink, and it is also the air we breathe. More than that, biodiversity is part of us, as we humans are part of nature.

- Why should anyone care about the loss of nature? Why should the country take drastic steps, to halt the decline in biodiversity? South Africa's economy is still very reliant on mining resources. While many livelihoods depend on this sector, for many communities living close to mines, it means facing the adverse health impacts that stem from a heavily degraded environment.

- We do not want our Biodiversity to be damaged further more. We need a detailed plan for rehabilitation of the damaged areas with proper vegetation

- Health and Safety: health and safety of our people have been ignored for several years and when we raise health concerns no one responds. We have evidence of people who eyes are damaged from dust and those whose health has been affected by inhaling dust from the mine.

CSI

Since the start of Goedgevonden operation, there has never been a specialised Corporate Social Investment especially for the host community. Last year community hosted clean-up campaign for waste and there was not even one contribution from Goedgevonden. People that work in those programmes do not even engage with communities or just make a strategic visit. We want to have clear commitment for Goedgevonden on CSI for the area in the next 2 years.

Each mining application goes with Social Labour Plan. We would like to access the SLP with out paying so we can hold Goedgevonden accountable for the implementation of programmes ( Profit Sharing): Subject for later discussion

On the bases of the above, We are hereby objecting Environmental Approval and approval for Water use licence for the application as the commitments made before were neglected and now we cannot trust the mine in the projects activities they are proposing. The mine must come clear with plans for local investment and support and participate in Environmental programmes using local NPOs, small companies and cooperatives. A long term rehabilitation plan for the mine should be provided to locals and local empowerment strategy on greeting, waste management and recreational parks must be used for social investment.

Kind regards

Francisco vilanculo

0784039940

Siyabonga one for the unemployed

[Franciscovilanculo636@gmail.com](mailto:Franciscovilanculo636@gmail.com)







Sgesgede Farm (NON-PROFIT COMPANY)

Portion 17

Maufela, Klipportjie Farm

Ogies

2230

15 June 2022

**TO WHOM IT MAY CORNCERN**

Dear Sir/Madam

**Comments**

Thank you for the opportunity given to us to comment on the new road proposal. At first let me start by saying the following:

- Glencore Operations SA (Pty) Ltd: Goedgevonden Complex, is not the first time they propose road change, they did this when the mine start operation, what they did which even today we are not happy about it
- 1. They build railway line going to the mine silo, the railway line pass to the gravel road that was using by people reach R545 road which go to Ogies and Bethal.
- 2. The build road that joins R545 going to Leandra, for get about people who was using gravel road to joint R545.
- 3. The family who was using the gravel road must change to new road that they build, that join R545, but the entry to that family is very very bad and dangerous to the traffic till today that entry is bad, Goedgevon concentrate on mining forget about community.
- 4. Goedgevonden don't care about farm community.

Now they propose to change road again at the expense of poor farm community, who can't even fight for them self, one family (Nhlapo family) is affected by all this changes, they go and bought farm to the farm owners after that forget about what this community what.

I want to say this Mine Goedgevonden must come out and solved the problem left behind before they can start proposing to change road again, because now other community will be affected again, even the very same family will also be affected by this proposal,

Goedgevonden must know that everything they do affect the farm community, affect their livestock, affect their living (e.g., they used to get water from the farm and borehole) but now borehole is no more operating, because of the mining activities, they used to plant vegetable but now they can't of which no assistance from the mine, it must come to an end.

**TAKE NOTE: WE USE OUR LAND TO HAVE LIVESTOCK, PLANT VEGETABLES AND OTHER FRUITS TO SUPPORT OUR FAMILIES CHANGING OF ROAD IT AFFECT US, SPECIALS ON SELLING OUR PRODUCTS.**

Thank you



## GLENCORE OPERATIONS SA (PTY) LTD: GOEDGEVONDEN COMPLEX

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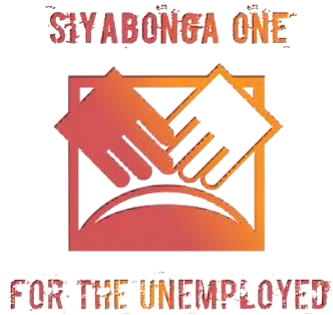
**Public Participation Office: Tel: 012 543 9093; Fax: 086 460 6243 or**

**ggvamendment@participation.co.za**

|  |                           |             |               |                  |                |                           |      |
|--|---------------------------|-------------|---------------|------------------|----------------|---------------------------|------|
| <b>Title</b>   | MR                        | <b>Name</b> | BLACKY        | <b>Surname</b>   | SWART          |                           |      |
| <b>Farm Name (if applicable)</b>   |                           |             |               |                  | <b>Portion</b> |                           |      |
| <b>Company</b>   | RAINBOW GENIES PRE SCHOOL |             |               |                  |                |                           |      |
| <b>Designation</b>   | MANAGER                   |             |               |                  |                |                           |      |
| <b>Address</b>   | MALAN STR 5 OGIES         |             |               |                  |                | <b>Postal Code</b>        | 2230 |
| <b>Tel. No.</b>  | 0761502541                |             |               | <b>Fax No.</b>   |                |                           |      |
| <b>E-Mail</b>  | rainbowgenies@gmail.com   |             |               | <b>Cell. No.</b> | 0761502541     |                           |      |
| <b>Preferred method of communication:</b>  |                           |             |               |                  |                |                           |      |
| <b>Land Line</b>   | <b>Cellular phone</b>     | <b>Fax</b>  | <b>E-Mail</b> | <b>SMS</b>       | <b>Post</b>    | <b>Hand delivery</b><br>x |      |
| <b>Comments (feel free to attach additional pages):</b>  |                           |             |               |                  |                |                           |      |
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**SIYABONGA ONE FOR THE UNEMPLOYED (NPC)**

**2019/563864/08**

**110 SIYABONGA SECTION  
PHOLA, OGIES  
2233**

**078 403 9940 / 079 717 0525**

**franciscovilanculo636@gmail.com**

Re :acknowledgement of the Goedgevonden EA Amendment (focus group meeting)

Date 05/09/2022

Att: CEO Gary Nagle

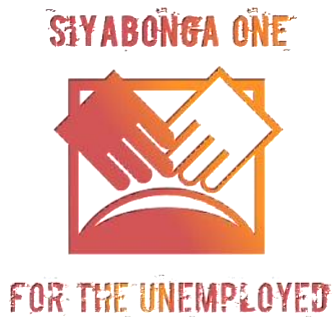
We have gone through the document which was afforded to us as community stakeholder date 24/08/2022 with understanding that it serves as a primary engagement and information sharing of which we appreciate it

We therefore wish to put in record that an open door policy should be an anchor for our discussions which will yield good results to all parties concerned and we propose an objectivity in all aspects which will be having cordial operation relations as we are the beneficiary custodian (communities in a mining zones)

Our primary submission to this primary level informed by this amendment document proposed by yourselves with date mentioned above as follows

- We are of the view that you have made your informed decision through a research which might be a qualitative research to detect your information at hand which is good and give guarantees to your intentions for progressive mining operations

Our humble submission on this one is make request community participation desk to afford us a research which might apply a quantitative research through us as a community stakeholders to



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satisfy our point of departure inline with the findings listed in your document which will cultivate an equal footing to these new developments and sundry

We will give more of our position after we were afforded a presentation which cattail the operation framework with us the community representation with further engagement should there be a need in future informed by the above open policy working relation

NB all the enlisted findings will find expressions after we have been furnished with all the duely requested research information which will coupled with the one at hand

We could be very appreciating in case we could be responded in time atleast 7 (seven)working days from 06/09/2022

Kind regards

Francisco vilanculo

Siyabonga one for the unemployed

067 762 7526

**DIPHORORO DEVELOPMENT (PTY) LTD  
PUBLIC PARTICIPATION OFFICE**

**ATTENTION: ME. L. DICKSON**

**PER E-MAIL:** [ggvamendment@participation.co.za](mailto:ggvamendment@participation.co.za)  
CC: [marietjie@jacanacc.co.za](mailto:marietjie@jacanacc.co.za)

Dear Sir/Madam

**GLENCORE OPERATIONS SA: COMMENTS ON GOEDGEVONDEN COMPLEX DRAFT BASIC  
ASSESSMENT REPORT**

We act herein on behalf of MMS Masakhane Mining Supply & Construction CC, herein represented by Mr. Boetie Gani as well as the Ogies Muslim Jamaat and Ogies Township Company (Pty) Ltd ("our clients").

**1. OGIES MUSLIM JAMAAT**

- 1.1. We request that the Imaam and/or Jamaat members should be consulted regarding blasting schedules occurring within 1,000 (one thousand) meters of the Mosque and graveyard.
- 1.2. That a comprehensive photographic record be compiled by the applicant regarding the structural status and integrity of all structures inclusive of the graveyard, boundary walls, Mosque and Madressah, in order to compile a comprehensive, detailed report for future references of any possible damage caused through the applicants mining operations.

**2. MMS MASAKHANE MINING SUPPLY & CONSTRUCTION CC & OGIES TOWNSHIP  
COMPANY (PTY) LTD**

- 2.1. Our client is the registered owner of the following properties which is affected by the proposed amendments:



- 2.1.1. Remaining Extent of Portion 1 of the Farm Grootpan 7 IS;
- 2.1.2. Portion 28 of the Farm Grootpan 7 IS;
- 2.1.3. Portion 51 of the Farm Grootpan 7 IS.
- 2.2. All blasting scheduled within 1,000 (one thousand) meters of the aforementioned properties, should be conducted between the hours of 10h00 and 16h00.
- 2.3. That a comprehensive photographic record be compiled by the applicant regarding the structural status and integrity of all farmhouses, outbuildings, dams, swimming pools and related infrastructure, in order to compile a comprehensive, detailed report for future references of any possible damage caused through the applicants mining operations.
- 2.4. Our client's properties and agricultural activities are supplied with water through boreholes situated within the mining area.
- 2.5. All boreholes should, on a quarterly basis, be monitored and evaluated for any possible reduction of yield and/or contamination by the applicant and provided to our client. These boreholes supply drinking water to not only the human occupants of the farmhouses, but also to the livestock and other agricultural activities.
- 2.6. In the event that the supply boreholes, in any way whatsoever, is affected by either reduction and/or contamination through the mining activities of the applicant, same should be replaced by the applicant at their costs and/or suitable alternative fresh water supply should be provided by the applicant.
- 2.7. We attach hereto five water borehole certificates with co-ordinates which is located within the mining area of the applicants.

Should you require any further information, kindly do not hesitate to contact writer hereof.

Yours faithfully



**BM DRY**  
**CAZ DRY ATTORNEYS INC**

No 1 hole

# WATER BOREHOLE CERTIFICATE

## WATERBOORGATSERTIFIKAAT

Test No/ Toets Nr 161031CH01 Test Date/ Toetsdatum 31-10-2016

Borehole Location Boorgatlugging BH3 Units

Lat 26.04770 S Lon 029.06552 E Datum WGS84

Casing Diameter/ Voering Deursnit 145 mm Steel/Pvc/No casing Staal/Pvc/Geen voering Depth/ Diepte 135 Meter

Static Water Level Statiese Watervlak 49 from above m van bo af

Water level during test Watervlak tydens toets 134 m Pump depth during test Pompdiepte tydens toets 134 m

During continuous test of Gedurende aaneenlopende toets van 2 hours uur

Maximum Test Pump Capacity Maksimum Toetspomp Kapasiteit 7 m<sup>3</sup> per hour per uur

Maximum constant yield Maksimum konstante lewering 300 liters per hour per uur

Three hundred liters per hour

Remarks/ Opmerkings

Testing Official / Toetsbeampte  
CHRISTO BOEGMAN

BOEGMAN BOREHOLE TESTING  
www.boegmanboreholetesting.co.za  
083 653 6109  
PLOT 54  
KAMEELDRIFT  
PRETORIA



# WATER BOREHOLE CERTIFICATE

## WATERBOORGATSERTIFIKAAT

Test No/  
Toets Nr. 130415C-1 Test Date/  
Toetsdatum 15-4-2013

Borehole Location  
Boorgatliggering Ogies

Lat. 26,05077°S Lon. 029,06745°E Datum N6384

Casing Diameter/  
Voering Deursnit 170 mm Steel/Pvc/No casing  
Staal/Pvc/Geen voering Depth/  
Diepte 153 (DRILLED) Meter

Static Water Level  
Statiese Watervlak 63,3 from above  
m van bo af

Water level during test  
Watervlak tydens toets 120 m Pump depth during test  
Pompeptepte tydens toets 120 m

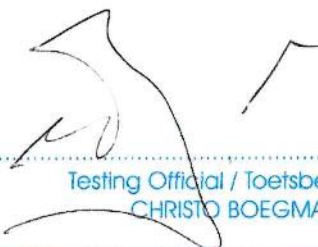
During continuous test of  
Gedurende aaneenlopende toets van 4 1/2 hours  
uur

Maximum Test Pump Capacity  
Maksimum Toetspomp Kapasiteit 10 m<sup>3</sup> per hour  
per uur

Maximum constant yield  
Maksimum konstante lewering 2400 l per hour  
per uur

Two thousand four hundred  
liters per hour

Remarks/  
Opmerkings



Testing Official / Toetsbeampte  
CHRISTO BOEGMAN

BOEGMAN BOREHOLE TESTING  
[www.boegmanboreholetesting.co.za](http://www.boegmanboreholetesting.co.za)

083 653 6109  
PLOT 54  
KAMEELDRIFT  
PRETORIA





# WATER BOREHOLE CERTIFICATE

## WATERBOORGATSERTIFIKAAT

Test No/ Toets Nr 110214 L1 Test Date/ Toetsdatum 14-2-2011

Borehole Location Boorgatligging Ogie

Lat. 26,0512°S Lon 29,0681°E Datum WGS84

Casting Diameter/ Voering Deursnit 170 mm Steel/Pvc/No casing/ Staal/Pvc/Geen voering Depth/ Diepte 101,7 Meter

Static Water Level Statiese Watervlak 49,5 from above m van bo af

Water level during test Watervlak tydens toets 100 m Pump depth during test Pompdiepte tydens toets 100 m


During continuous test of Gedurende aanenlopende toets van 1 hours uur Kort toets en skryfopn

Maximum Test Pump Capacity Maksimum Toetspomp Kapasiteit 10 m<sup>3</sup> per hour per uur

Maximum constant yield Maksimum konstante lewering 200 L per hour per uur

3 we condensed liter  
per uur

Remarks/ Opmerkings

  
Testing Official / Toetsbeampte  
CHRISTO BOEGMAN

BOEGMAN BOREHOLE TESTING

(012) 808-1262  
083 653 6109  
PLOT 54  
KAMEELDRIFT  
PRETORIA



# WATER BOREHOLE CERTIFICATE

## WATERBOORGATSERTIFIKAAT

Test No/ Toets Nr. 70314C1 Test Date/ Toetsdatum 14-3-2007

Borehole Location Boorgatligging Ogies

Lat 26°03,270'S Lon 029°03,860'E Datum Cape

Casting Diameter/ Voering Deursnit 170 mm Steel/Pvc/No casing/ Staal/Pvc/Geel voering. Depth/ Diepte 103,9 Meter

Static Water Level Statiese Watervlak 48,9 from above m van bo af

Water level during test Watervlak tydens toets 102 m Pump depth during test Pompdiepte tydens toets 102 m

During continuous test of Gedurende aaneenlopende toets van 4 hours uur

Maximum Test Pump Capacity Maksimum Toetspomp Kapasiteit 7 m<sup>3</sup> per hour per uur

Maximum constant yield Maksimum konstante lewering 950L per hour per uur

nine hundred and fifty liters per hour.

Remarks/ Opmerkings

Testing Official / Toetsbeampte  
CHRISTO BOEGMAN

BOEGMAN BOREHOLE TESTING

(012) 808-1262  
083 653 6109  
PLOT 54  
KAMEELDRIFT  
PRETORIA





# WATER BOREHOLE CERTIFICATE

## WATERBOORGATSERTIFIKAAT

Test No/ Toets Nr ..... 3082202 ..... Test Date/ Toetsdatum ..... 22-8-2003 .....

Borehole Location Boorgatligging ..... Open .....

Lat. 26°03'07.3" S Lon 29°04'10.6" E Datum CAPE .....

Casting Diameter/ Voering Deursnit ..... 170 ..... mm Steel/ Staal ..... No Casting/ Geen voering ..... Depth/ Diepte ..... 91.1 ..... Meter

Static Water Level Statiese Watervlak ..... 32.7 ..... m from above van bo af

Water level during test Watervlak tydens toets ..... 37 ..... m Pump depth during test Pompdiepte tydens toets ..... 8.7 ..... m

During continuous test of Gedurende aaneenlopende toets van ..... 2 ..... hours uur

Maximum Test Pump Capacity Maksimum Toetspomp Kapasiteit ..... 12 ..... m<sup>3</sup> per hour per uur

Maximum water delivered Maksimum water gelever ..... 12000 ..... per hour per uur

Een duisend twee honderd liter per uur.

Remarks/ Opmerkings .....

Testing Official / Toetsbeampste  
CHRISTO BOEGMAN

BOEGMAN BOREHOLE TESTING

(012) 808-1262  
083 653 6109  
PLOT 54  
KAMEELDRIFT  
PRETORIA







Enquiries: Natasha Higgitt  
Tel: 021 462 4502  
Email: [nhiggitt@sahra.org.za](mailto:nhiggitt@sahra.org.za)  
CaseID: 19308

Date: Friday September 09, 2022  
Page No: 1

## **Interim Comment**

**In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)**

Attention: Mrs Tebogo Chauke  
Glencore Operations South Africa (Pty) Ltd

**Amendment for mine and layout optimisation: 1) Introduce limited additional mining areas (underground) that have now become economically viable 2) Change the mining methodology in certain areas, from opencast to underground 3) Include some limited additional infrastructure requirements for the underground mining 4) Slightly revise the re-alignment of P53-1 on portions of Goedgevonden 10 IS, Zaaiwater 11 IS, Grootpan 7 IS and Kleinzuikerboschplaat 5 IS in Nkangala District, Mpumalanga.**

Jacana Environmentals CC has been appointed by Glencore Operations South Africa (Pty) Ltd to conduct an Environmental Authorisation (EA) Amendment Application for proposed amendments to the approved Goedgevonden Colliery, near Ogies, Mpumalanga Province (MP 30/5/1/2/2/169 MR).

A draft Amendment Report has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2014 EIA Regulations for activities that trigger the Mineral and Petroleum Resources Development Act, 2002 (MPRDA)(As amended). The proposed amendments include limited additional underground mining areas, limited additional infrastructure requirements for the underground mining and re-alignment of the P53-1 road.

APelser Archaeological Consulting has been appointed to provide heritage specialist input into the EA process as required by section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

*Pelser, A. 2022. HIA Report for the New Incline Shafts & P53-1 Road Alignment Development Goedgevonden Colliery, near Ogies, Mpumalanga.*

Two heritage resources were identified as part of the HIA. This includes a burial ground near proposed Incline Shaft 3 (Site MHC031), which was not visited by the heritage specialist and therefore the state of the site is unknown, and a burial ground (GY16) in close proximity to the new road realignment. The ruined structure identified at Shaft 2 is not a heritage resource and will not be discussed.



Enquiries: Natasha Higgitt  
Tel: 021 462 4502  
Email: [nhiggitt@sahra.org.za](mailto:nhiggitt@sahra.org.za)  
CaseID: 19308

Date: Friday September 09, 2022  
Page No: 2

Recommendations provided in the report include the following:

- Site MHC031 to be left in-situ and not disturbed by future mining operations;
- Care should be taken that there is no accidental damage to or negative impacts to the site and graves at Site GY16;
- A Chance Finds Procedure is recommended.

The Amendment report references a Cultural Heritage Management Plan (CHMP), however, this has not been submitted on the application.

#### **Interim Comment**

The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit requests that a field-based Palaeontological Impact Assessment (PIA) be conducted as part of the EA process as the development footprint is located in an area of very high sensitivity for palaeontological resources as per the SAHRIS PalaeoSensitivity map. The report must comply with the 2012 Minimum Standards: Palaeontological Components of Heritage Impact Assessments.

Additionally, the HIA must be revised to address the following:

- The results of the Blasting report must be including in the impact assessment of the heritage resources;
- The impact of the new proposed underground mining areas and potential subsidence on heritage resources (including palaeontological resources) must be assessed;
- The location and status of site MHC031 must be verified;
- A full description of the site GY16 must be provided.

Finally, the CHMP must be submitted for review. The applicant is advised to extend the EA process in terms of section 32(1)b of the NEMA EIA Regulations in order to address this comment. Further comments will be issued upon receipt of the above requested reports.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

# Goedgevonden Colliery EA Amendment: Underground inclines and Roads Realignment

Our Ref:



an agency of the  
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: [info@sahra.org.za](mailto:info@sahra.org.za)  
South African Heritage Resources Agency | 111 Harrington Street | Cape Town  
P.O. Box 4637 | Cape Town | 8001  
[www.sahra.org.za](http://www.sahra.org.za)

Enquiries: Natasha Higgitt  
Tel: 021 462 4502  
Email: [nhiggitt@sahra.org.za](mailto:nhiggitt@sahra.org.za)  
CaseID: 19308

Date: Friday September 09, 2022  
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Natasha Higgitt  
Heritage Officer  
South African Heritage Resources Agency

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Phillip Hine  
Manager: Archaeology, Palaeontology and Meteorites Unit  
South African Heritage Resources Agency

## ADMIN:

Direct URL to case: <https://sahris.sahra.org.za/node/603213>  
(DMR-MP, Ref: MP 30/5/1/2/2/169 MR)





## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

### MPUMALANGA

Private Bag X 11259, MBOMBELA, 1200 Prorom Building, Cnr Brown and Paul Kruger, MBOMBELA, 1200, Tel: 013 759 7300

**ENQUIRIES:** Zintle Mbeka    **TELEPHONE:** 013 591 8944    **REFERENCE:** 27/2/2/B11F/C87/02

Glencore Operations South Africa (Pty) Ltd: Goedgevonden Complex  
P/Bag X17,  
**LERAATSFONTEIN,**  
1038

**For Attention:** Ms. M. Eksteen.

**NOTIFICATION OF AVAILABILITY OF THE DRAFT BASIC ASSESSMENT REPORT FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME BY GLENCORE OPERATIONS SA (PTY) LTD GOEDGEVONDEN COMPLEX FOR MINING SEAM 2, SEAM 4, AND SEAM 5 COAL ON PORTIONS OF THE FARMS GOEDGEVONDEN 10 IS, ZAAIWATER 11 IS AND KLEINZUIKERBOSCHPLAATS 5 IS SITUATED UNDER EMALAHLENI LOCAL MUNICIPALITY OF THE NKANGALA DISTRICT MUNICIPALITY, MPUMALANGA PROVINCE.**

The Department of Water and Sanitation (DWS) acknowledges receipt of the above-mentioned report dated August 2022 and received by the Department on August 2022, prepared by Jacana Environmentals cc. on behalf of Glencore Operations South Africa (Pty) Ltd: Goedgevonden Complex and wish to comment as follows:

1. The Applicant shall conduct a preliminary legal assessment to identify all the water use activities associated with the proposed project that will require authorisation by the DWS. Furthermore, the applicant shall take note of section 22(1) of the National Water Act, 1998 (Act No. 36 of 1998):

*"Permissible water use", a person may only use water-*

- a) *without a licence-*
  - i. *if the water use is permissible under Schedule 1;*
  - ii. *if that water is permissible as a continuation of an existing lawful use (section 32); or*
  - iii. *if that water use is permissible in terms of general authorisation issued under section 39;*
- b) *if the water use is authorised by a licence under this Act; or*
- c) *if the responsible authority has dispensed with a licence requirement under subsection (3), (of the same Act).*



**NATIONAL DEVELOPMENT PLAN**  
Our Future - make it work

**NOTIFICATION OF AVAILABILITY OF THE DRAFT BASIC ASSESSMENT REPORT FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME BY GLENCORE OPERATIONS SA (PTY) LTD GOEDGEVONDEN COMPLEX FOR MINING SEAM 2, SEAM 4, AND SEAM 5 COAL ON PORTIONS OF THE FARMS GOEDGEVONDEN 10 IS, ZAAIWATER 11 IS AND KLEINZUIKERBOSCHPLAATS 5 IS SITUATED UNDER EMALAHLENI LOCAL MUNICIPALITY OF THE NKANGALA DISTRICT MUNICIPALITY, MPUMALANGA PROVINCE.**

2. Any other water use related activities associated with this project that are not permissible as indicated under section 22(1) of the National Water Act, 1998 (Act No. 36 of 1998) shall have to be authorised by the DWS prior to such water use activities taking place and the applicant is requested to liaise with the DWS for guidance on the requirements for such an authorisation.
3. **Flood-lines:** The applicant shall note that no activities should occur within a 100m or within the 1:100 year floodline or whichever is the greatest, unless authorised.
4. **Stormwater Management:** The applicant shall ensure that clean stormwater is diverted away from all the working areas and stormwater leaving the construction areas must not be contaminated by any substance, whether that substance is a solid, liquid, vapour or any combination thereof. Should there be impacts on stormwater, adequate mitigation measures must be implemented as soon as possible. Furthermore, the applicant should note that stormwater control and management must be undertaken in accordance to the prescribes of Government Notice 704 of 04 June 1999 (GN 704) Regulation.
5. **Wetlands and streams:** If the activity or placement of the new structures will cross the river or will be within 500 metres of the regulated area (wetland), it constitutes a Section 21 (c) and (i) water use which requires authorisation in terms of the National Water Act, 1998 (Act 36 of 1998). A wetland study should also be conducted.
6. **Storage of oil, diesel, hydraulic fluids and grease:** It is recommended that the storage areas for these fluids be bunded with cement and in such a manner that any spillages can be contained and reclaimed without causing any pollution to the ground and surface water resources.
7. **Public Participation:** The applicant shall note that this is one of the critical requirements when processing a water use authorisation application and it must be done as per "Regulations Regarding Procedural Requirements for Water Use Licence Applications and Appeals."
8. **Potable water:** The applicant shall note that taking water from a water resource either through a borehole or any other means, is a water use in terms of Section 21(a) of the National Water Act, 1998 (Act 36 of 1998) and must be authorised by the DWS.
9. **Storing water:** The storing of clean water into a dam will constitute a water use in terms of section 21(b) of National Water Act, 1998 (Act 36 of 1998) which refers to "storing water" and must be authorised by the DWS.
10. **Discard Dump, Run-of-Mine (RoM) and Overburden Stockpiles:** The applicant shall note that the establishment and usage of a discard dump, RoM and overburden stockpiles are regarded as water use activities in terms of Section 21 (g) of the National Water Act, 1998 and authorisation thereof is required prior to commencement.

**NOTIFICATION OF AVAILABILITY OF THE DRAFT BASIC ASSESSMENT REPORT FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME BY GLENCORE OPERATIONS SA (PTY) LTD GOEDGEVONDEN COMPLEX FOR MINING SEAM 2, SEAM 4, AND SEAM 5 COAL ON PORTIONS OF THE FARMS GOEDGEVONDEN 10 IS, ZAAIWATER 11 IS AND KLEINZUIKERBOSCHPLAATS 5 IS SITUATED UNDER EMALAHLENI LOCAL MUNICIPALITY OF THE NKANGALA DISTRICT MUNICIPALITY, MPUMALANGA PROVINCE.**

11. **Construction of Pollution Control Dam and Slurry Dam:** The lined Pollution Control Dam and Slurry Dams to be constructed shall be authorised prior to construction. In an event that the capacity of the dams be more than 50 000 m<sup>3</sup> and 5 metres in height, the Dam Safety Regulations must be followed. Furthermore, the dams must be designed by a qualified professional engineer. It shall also be noted that such an activity is regarded as a water use activity in terms of Section 21 (g) of the National Water Act, 1998 and authorisation thereof is required prior to commencement.
12. **Dust suppression:** The applicant shall note that the usage of dirty water for dust suppression is regarded as a water use activity in terms of Section 21 (g) of the National Water Act, 1998 and authorisation thereof is required prior to commencement of said activity.
13. **Dewatering of adit and underground workings:** The applicant shall note that the removal of water found underground for continuation and/or safety of people is regarded as a water use activity in terms of Section 21 (j) of the National Water Act, 1998 and authorisation is required prior to commencement of activity.
14. **Sanitation:** There is no indication of type of ablution facility that will be used. The applicant shall note that the use of septic tanks is regarded as a water use in terms of Section 21 (g) of the National Water Act, 1998 and authorisation is required prior to commencement of the activity. The applicant shall also ensure that no sanitary system is located within a horizontal distance of 100 metres from any watercourses. Thus, reasonable measures shall have to be taken to prevent the potential pollution of the ground and surface water resources due to the proposed onsite sanitation facilities. The applicant shall note that the French drains are not allowed since they pollute and an environmental friendly mode should be used.
15. **Pollution:** The applicant is referred to Section 19(1) of the National Water Act, 1998 (Act No. 36 of 1998) and to report any pollution incidents originating from the proposed project to the relevant Regional Office of the Department of Water and Sanitation within twenty-four (24) hours.

Should you have any queries, kindly contact Ms Zintle Mbeka on the email [MbekaZ@dws.gov.za](mailto:MbekaZ@dws.gov.za).

Yours faithfully



PROVINCIAL HEAD: MPUMALANGA

DATE: 12/9/22



**From:** A Muller

**Sent:** 12 September 2022 11:55 AM

**To:** [marietjie@jacanacc.co.za](mailto:marietjie@jacanacc.co.za)

**Subject:** COMMUNITY INPUT REGARDING ggv UNDERGROUND MINING AND ROAD CLOSURE

**Importance:** High

ONLY OGIES RESIDENTS / COMMUNITY

Good day , I hereby need know why there was **NO** community meeting for the OGIES residents and business owners as for the new mining underground activities behind our properties in OGIES. We see that the cutoff date is today 12 SEPT 2022 for our input.

**YOU NEED TO take note that there is a HIGHCOURT ruling granted in favor of the Distressed Mining Forum Ogies .. Lawyers was and still is**  
**Mr. ZEHIR OMAR and YASMIN OMAR 0829206922**  
**OR [YASMINOMAR@VODAMAIL.CO.ZA](mailto:YASMINOMAR@VODAMAIL.CO.ZA)**

Concerns for us as a guesthouse **ANEMERSKA GUEST LODGE:**

How will the dust be monitored .... AS PER AIRPLAIN 1.5 / 2 km in the air BUT THE MAIN PROBLEM IS 500 meters to ground level?

How will this influence our boreholes and buildings.

How will you manage the re-routing of the road, so that business will NOT BE AFFECTED by less traffic?

How will the vibrations of machines be handled?

No links can be opened as per the website and visiting the GGV / OGIES office they ONLY give us the link ...

Please take note that this will not be taken as a joke just to mine as wish .... Glencore operations is BULLYING US AS Ogies community...

We may be small as a town but this will be taken up and we demand a meeting for the OGIES community and all explanation needed to this new operation.

Glencore did not even comply with the first EIA of 1000 meters from houses and people.

**THANK YOU**

**ANEMERSKA GUESTHOUSE / LODGE**

**MALAN STR 38 / 5**

**OGIES**

**CELL NR : 0724510310**

**[WWW.ANEMERSKA.CO.ZA](http://WWW.ANEMERSKA.CO.ZA)**

**[amuller@cozamail.co.za](mailto:amuller@cozamail.co.za)**

**From:** Rainbow Genie's Pre-School & Day Care  
**Sent:** 12 September 2022 11:18 AM  
**To:** [marietjie@jacanacc.co.za](mailto:marietjie@jacanacc.co.za)  
**Subject:** Community concern GGV Underground Mining

Hallo Marietjie

AS principal of Rainbow Genie's Pre-School I understand that the closing date for concerns regarding the GGV Underground Mining Project are today.

Up until today no formal Ogies Town Community was held.  
I have the following concerns:

1. How will this Impaq the borehole water at the school? When the open cast was started at the back off the school high levels off sulphur was detected in borehole water and GGV installed a filter system.
2. How will dust be monitored on ground level? And not +-2Km up in the air by plane.
3. How will this impaq the live term off the school?
4. How will this impaq the lives off our school children?
5. How will this impaq the health off the children?
6. Will the moving of the road linking the old Ogies- Witbank road with the Ogies-Bethal have any impaq on the pre-school life cycle and the transportation of the school children?
7. As far as I understand there was a North Gauteng High Court Ruling that the above road are not be closed, moved, redirect or changed by GGV.

Hope to receive feedback in person and not per letter or email.

Have a blessed day.

*Rainbow Genie's Pre-School & Day Care*

*Malan str. 5 , Ogies , 2230*

*Landline: 013 492 1970*

*Email: [rainbowgenies@gmail.com](mailto:rainbowgenies@gmail.com)*



**From:** Nenqe Advanced PTY LTD  
**Sent:** 12 September 2022 08:53 AM  
**To:** [marietjie@jacanacc.co.za](mailto:marietjie@jacanacc.co.za)  
**Subject:** Community insets regarding GGV underground mining

Hi Marietjie  
Hope all is still well

I am the owner of Nenqe Advance in Ogies town  
As far as I know the closing date for comment on the propose GGV underground mining in Ogies are today.

Up to today no community meeting was held with the Ogies town community.  
Only links for comment was sent out.

In the propose document it is said that the road linking the old Ogies Witbank road with the Ogies Bethal road will be redirect, as far as I know the Ogies distress community group won a case in the North Gauteng high court where by GGV are not allowed to touch , close or redirect the said road.

When can a physical meeting be held with the Ogies Town community self

Some of our concerns are that the said underground activities will be behind the Ogies combined school, and part of the houses, and preschool in the same line,

How will the dust be monitored?  
How will this influence the residence Life style?  
How will this impact the current houses?  
Will dust monitoring be done on ground level and not only by plane +- 2km above ground?  
How will this impact the current business in town?  
When will a personal survey be done?

Can feedback been done in person and not only per email letters

Regards

## OFFICE OF THE CEO



**Ref:** LUA 22/3143  
**Unit:** LUA/SS  
**Enquiries:** F.N. Krige  
**Email:** [frans@mtpa.co.za](mailto:frans@mtpa.co.za)  
**Tel:** 013- 0650286

Ms. Lizinda Dickson  
Jacana Environmentals CC  
P. O. Box 31675  
Dickson  
**POLOKWANE**  
0759

E mail: [ggvamendment@participation.co.za](mailto:ggvamendment@participation.co.za)

Dear Ms. Dickson

**THE MTPA COMMENTS ON THE DRAFT BAR AMENDMENT OF THE MINING RIGHT FOR ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME; GLENCORE COAL OPERATIONS GOEDGEVONDEN COMPLEX, EMALAHLENI DISTRICT IN MPUMALANGA PROVINCE, DMR REFERENCE MP 30/5/1/2/2/169 MR.**

Your Draft BAR, Jacana received in August 2022, refers.

The application was assessed using the Mpumalanga Biodiversity Sector Plan (MBSP). The sensitivity was assessed in terms of MBSP Terrestrial Biodiversity and Freshwater sensitivity assessments, and concerns were indicated on both assessment maps:

- a) The MBSP Terrestrial assessment map, Figure 1, indicates that the proposed amendment area overlaps with MBSP *Critical Biodiversity Areas irreplaceable* (CBA irreplaceable) areas.
- b) The MBSP Freshwater assessment map, Figure 2, indicates that the proposed amendment area overlaps with *Ecological Support Area Wetlands* (ESA).

The MTPA has no objection to the proposed amendment provided that:

- The MBSP is used as a guideline for the avoidance of ecologically sensitive areas that are left in this amendment area;
- All the negative impacts on the downstream water users are mitigated and effective water purification methods are designed and implemented.



## OFFICE OF THE CEO

The MTPA has the following concerns:

- Regarding the overlaps with CBA irreplaceable areas and ESA wetlands, would you please forward a map indicating where mining has already taken place?
- The MTPA is concerned that mining activities might impact on the remaining CBA areas. The EMP should ensure that the natural state of the CBA areas is maintained.
- The Ecological Support Area Wetlands (ESA wetlands) should also be maintained in a natural state, with no loss of ecosystem services.
- In the event that the mine plan is going to affect these wetlands through undermining, and dewatering, the company should invest in an offset strategy. And subsidence the mitigation measures should be indicated.
- The critically endangered terrestrial orchid, , *Brachycorythis conica subsp. transvaalensis*, might occur within this mining right area. (Flowers from January to February).

### Recommendations:

1. The MTPA recommends that a thorough flora study is done during the growing season over these farms.
2. Wetland delineation is done in order to establish the required buffer zone of 100 metres, as well as a determination of the size in hectares of these sensitive areas.
3. If the mentioned orchid species is found, the MTPA Scientific Services should be notified.
4. That the flora study must include all exotic plants that need to be removed and a long term maintenance plan is included in the EMP.
5. Planning for active water purification should form part of the EMP, as well for the next 100 years after mining.

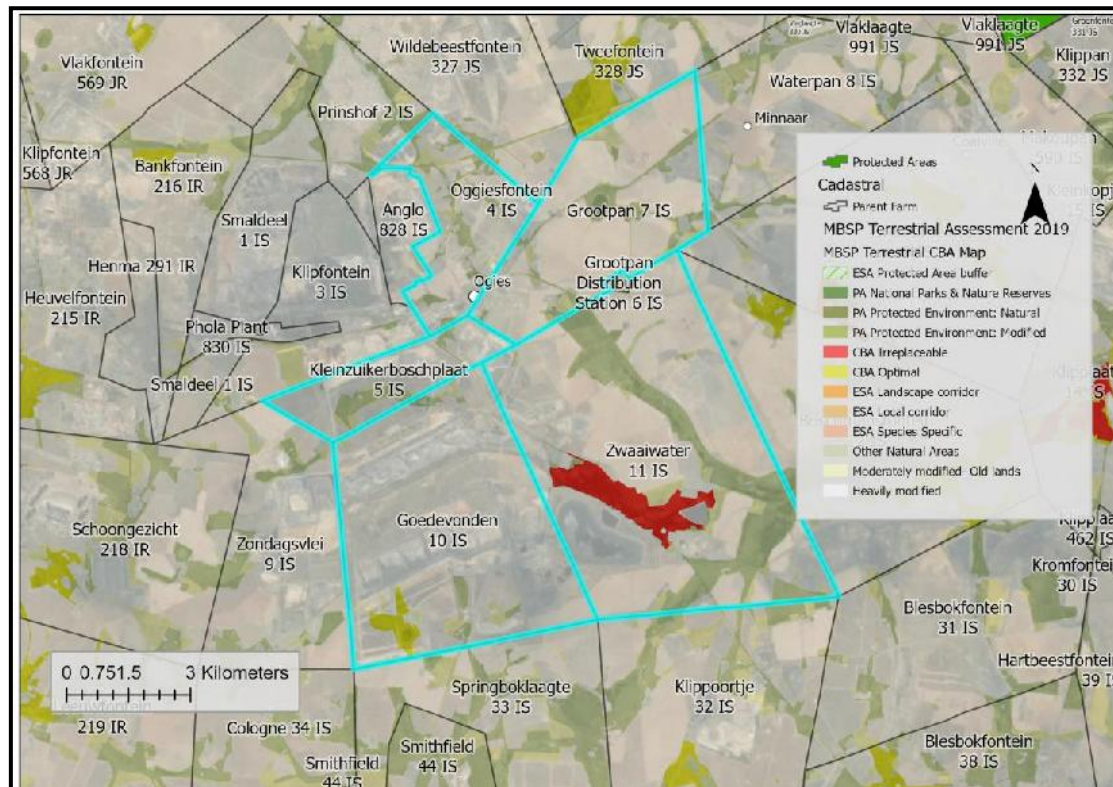


Figure 1: MBSP Terrestrial biodiversity assessment map of the mining right area.

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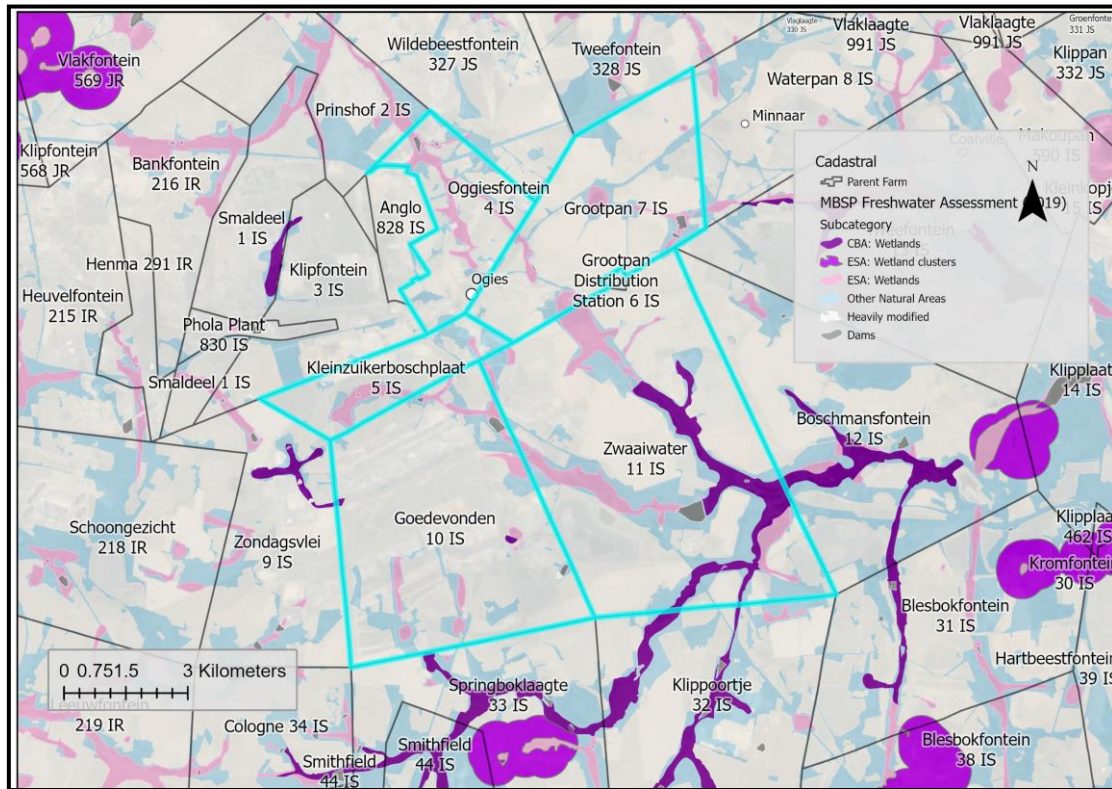


Figure 2: MBSP freshwater assessment map of the mining right area.

Please do not hesitate to contact this office if there are any enquiries.

Kind regards



**MR MH VILAKAZI**  
**ACTING CHIEF EXECUTIVE OFFICER**  
**DATE:** 15 / 09 / 2022





agriculture, rural development,  
land & environmental affairs

**MPUMALANGA PROVINCE**  
REPUBLIC OF SOUTH AFRICA

Cnr Ryan and Rosemead Street  
Klipfontein  
eMalahleni  
1035  
Mpumalanga Province

NKANGALA DISTRICT

Litiko Letekulima, Kutfufukiswa  
Kwetindzawo Tasemakhaya, Temhlaba  
Netesimondzawo

Departement van Landbou,  
Landelike Ontwikkeling,  
Grond en Ongewing Sake

umNyango weZelimo  
UkuThuthukiswa kweeNdawo zemaKhaya,  
iNarha neeNdaba zeBhoduluko

Enquiries: Dineo Tswai, Cnr Rosemead & Ryan Str, Klipfontein Witbank, 1035, Tel: 013 692 6300/5848  
Email: [dtswai@mpg.gov.za](mailto:dtswai@mpg.gov.za)  
Reference: 1/3/1/16/2N-77

**Marietjie Eksteen**  
**Jacana Environmentals cc**  
**P.O. Box 31675**  
**Superbia**  
**0759**

**Tel: 012 543 9093**

**Email: [marietjie@jacanacc.co.za/ggvamendment@participation.co.za](mailto:marietjie@jacanacc.co.za/ggvamendment@participation.co.za)**

**COMMENTS FOR THE DRAFT BAR AND ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME: GLENCORE COAL OPERATIONS SOUTH AFRICA: GOEDGEVONDEN COMPLEX: DMR REF MP30/5/1/2/2/169 MR, EMALAHLENI LOCAL MUNICIPALITY, MPUMALANGA PROVINCE.**

The Department has received the draft BAR for the abovementioned project on 11 August 2022. Based on the information supplied, this Department has no objections to the proposed amendment and development. You may proceed with the submission of the final BAR with the consideration of the comments below:-

1. Vegetation clearance must be limited to the proposed development footprint on the new areas identified for the extension of the mine.
2. MTPA comments must be sourced and recommendations thereof must inform the proposed development areas and the protection of any identified endangered species if any on the areas not previously affected by mining activities.
3. Applicable licenses must be obtained before the commencement of the activity.
4. Applicable municipal By-Laws must be considered and adhered to at all times throughout the lifespan of the project.
5. All recommendations, key findings and conditions made in the specialist studies must be adhered to.
6. Complaints received from the public must be attended to as soon as possible and addressed to the satisfaction of all concerned.
7. The applicant is responsible for the compliance with the provisions for "Duty of Care" and remediation of damage contained in Section 28 of the National Environmental Management Act, (Act 107 of 1998).

Your cooperation will be highly appreciated.

Yours faithfully,

  
**Dineo Tswai**

**Deputy Director (Environmental Impact Management)**

  
**Date**



**IN THE APPLICATION FOR AMENDMENT OF THE MINING RIGHT,  
ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT  
PROGRAMME**

DMR REF NO: MP 30/5/1/2/2/169 MR

In the matter between:

**DISTRESSED MINING COMMUNITY OF OGIES**

**FIRST IAP**

**SAVE THE MAIZE BELT SOCIETY**

**SECOND IAP**

**ANNE MARIE BEATRIX MULLER  
ID NO: 6403100034081**

**THIRD IAP**

and

**GLENCORE OPERATIONS SA (PTY) LTD  
REG NO 1997/017998/07**

**APPLICANT**

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**OBJECTION BY FIRST, SECOND & THIRD INTERESTED & AFFECTED  
PARTIES**

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1. The First Interested & Affected Party is the **DISTRESSED MINING COMMUNITY OF OGIES**, an unincorporated voluntary association consisting of members who are residents of the town of Ogies, Mpumalanga.
2. The Second Interested & Affected Party is **SAVE THE MAIZE BELT SOCIETY**, an unincorporated association not for gain. The objects under its constitution are to assist members, to protect and maintain for present and future generations the environmental integrity of an area described as the "maize

belt", and its environs which includes the area between Delmas through to Ogies, Mpumalanga.

3. The Third Interested & Affected Party is **ANNE MARIE BEATRIX MULLER**, with ID 6403100034081, an adult female residing at 38 Malan Street, Ogies. The Third Interested and Affected Party also carried on business in Ogies, Mpumalanga.
4. The First, Second & Third Interested & Affected Parties are hereinafter referred to as "**the IAPs**".
5. The IAPs hereby note their objection to the application by the Applicant for the amendment of the Environmental Authorization and Environmental Management Programme relating to the coal mine, Goedgevonden Complex ("**GGV**"), which is located in Ogies, Mpumalanga.

REPORT ON THE RESULTS OF CONSULTATION FOR THE AMENDMENT TO ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME

6. Paragraph 4.2 refers to the aspects concerning interested and affected persons or stakeholders. It states that due to past public participation processes, an existing list of interested and affected persons exists and thereafter reference is made to Appendix 1.



7. Despite previous litigation with Glencore, the First IAP is not specifically listed as an interested and affected party or stakeholder. However, certain individuals, as members of the First IAP, are named at items 45-47 of Appendix 1.
8. The First IAP, on behalf of its members, previously confronted the Applicant concerning the air pollution, water pollution and damage to the property of the First IAP's members and of the community of Ogies. These complaints culminated into litigation before the High Court in Johannesburg. In addition, the First IAP secured an interdict preventing the closure of the provincial road P 53-1 between R555 and R 545.
9. The IAPs support the letters of objections submitted by Francisco Vilanculo of 'Siyabonga one for the unemployed' and 'Sgesgede Farm'. These letters pertinently raised issues regarding:
  - i. the scarcity of fresh water;
  - ii. security of food supply;
  - iii. poor air quality as a result of dust and fine particulate in the air;
  - iv. dust from unpaved roads;
  - v. erosion;
  - vi. contamination of natural water sources;
  - vii. reduction of grazing land for livestock;
  - viii. that ambient air quality is already below acceptable standards;
  - ix. deterioration in the visual aesthetics of the broader region around the current mining operation (i.e. GGV);
  - x. the impacts of blasting on homes;
  - xi. water shortages;
  - xii. continuous eradication of plants and natural habitats for animals;

- xiii. adverse medical conditions of people around GGV including inhalation of dust and damage to eyes;
- xiv. the impact of changing, diverting or closing existing roads on existing users of land including on their livestock, planting of vegetables for self-sustenance and on the informal traders and small businesses.

#### PRE-APPLICATION NOTICES

10. The IAPs are concerned that the notifications published by the Applicant are inadequate to draw the attention of affected persons including:

- i. those directly affected immediately around the proposed project; and
- ii. other organizations which are concerned with the impact associated with mining of non-renewable resources such as coal, on the environment and the economy.

11. Emalahleni is located 50 km from GGV. Delmas which situated in the Victor Khanye Local Municipality, is situated in closer proximity. Despite this, advertisements were placed in the Witbank News, 50 km away. What this means is that notices put up by the Applicant were not appropriately tailored to elicit a *bona fide* two-way engagement between the Applicant and those interested and affected by the Applicant's conduct.

12. It is submitted that the advertisement is inadequate on this ground, and that the advertisements enclosing the notification should be placed in national

newspapers in light of the far reaching impacts of coal mining on the environment, including on air quality, the economy, climate change and international law obligations.

13. The Applicant is intentionally avoiding the involvement of organizations that have publicly taken steps against the establishment and/or expansion of harmful coal mines.

14. If advertisements were distributed widely - both in the district, the region and nationally - as the law requires them to be, then the consultation process would be more likely to yield meaningful results, fulfilling the objectives of the consultation process and protecting the affected constitutional rights.

#### THE 30 DAY TIME PERIOD AFFORDED FOR COMMENT

15. The draft BAR and eMPR, being made available to all registered interested and affected persons or stakeholders for a mere 30 calendar days is wholly inadequate.

16. The inadequate time period undermines the magnitude of the expansion proposed the constitutional rights of the IAPs.

17. The documents requiring consideration are lengthy and complex. They require assistance not only by experienced legal representatives but experts in aspects



concerning the economy, water resources, noise pollution, dust pollution and coal mining.

18. Since the proposed project relating to GGV is situated in a rural area which is plagued by poor infrastructure and a significant portion of people who are unemployed or indigent, the distribution of notices for download off the internet, is likely to be inadequate.

19. People would require not only internet connection but mobile or computer devices which connect to the internet and which are able to view and store large data files containing complex information.

20. The suggestion in paragraph 4.6.3 that free Wi-Fi hotspot situated in the town section remedies this difficulty is unhelpful, and does not cure the problem of access, because not everyone is in possession of devices that can access the internet. Further to this, the majority of the population of Ogies live in the nearby township or residential areas, which are out of range of any free Wi-Fi areas.

21. Noteworthy is the absence of any report concerning the number of downloads on the free Wi-Fi hotspots and/or the number of persons who possess suitable devices.

22. The placement of hardcopies at "central public places" is similarly inadequate because a significant portion of the population in Ogies is either unemployed, indigent and unable to read or understand the documents. Further noteworthy is the absence of any study in the Socio Economic Impact Assessment

concerning the number of persons who are literate or likely to understand the documents, their affected rights and the applicable procedures.

23. Whilst paragraph 4.6.2 conveys the alleged percentage of persons who speak certain languages, that they speak the language does not necessarily mean they are literate or able to read in that language.

24. Lastly, neither the draft EMPR or notifications explain what "stakeholder analysis" denotes. There is no evidence that the interested and affected persons were involved in the dearth of studies conducted which underpin the notification or the documents requiring comment.

25. The consultation process appears to be a mere ticking of a checklist. As a result, the interested and affected persons have not been consulted in a *bona fide* substantive two-way process which is aimed at achieving consensus especially in relation to what the process entails and the import thereof.

#### AIR QUALITY IMPACT ASSESSMENT ("AQIA")

26. The AQIA report has not been prepared independently of the Applicant neither has information been secured by the experts themselves. It appears that the Report is prepared based on unverified third party information obtained from the Applicant itself.

27. For this reason, the disclaimer in the AQIA specifically notes that the drafters do not stand by the accuracy of the information received, on which the report was prepared.
28. The disclaimer goes further by affirming that the report is not a complete identification of the risks associated with the project and the study conducted, are should not be accepted as the only risks.
29. Most concerning is that the report has been prepared on a specific and agreed basis. The nature and extent of this basis has not been disclosed. To this extent, the IAPs are obviously prejudiced in that they are unable to meaningfully engage and consult in a two-way process, impugning the integrity of this stage of the process as well.
30. The drafters have specifically stated that the report should not be relied on by any other entity.
31. Therefore, the AQIA is neither an accurate assessment based on reliable information concerning the air quality associated with the project relating to GGV, nor can it be a source of reference.
32. There is therefore no proper air quality impact assessment and the application concerning the amendment of the Environmental Authorization and eMPR should be refused on this basis alone.

## HIGHVELD PRIORITY AREA ("the HPA")

33. As part of the terms of reference, paragraph 1.2 states that the baseline assessment involved, allegedly, review of applicable legislation and policies relating to air quality management which are applicable to the proposed operations, review of potential health effects associated with emissions released from the proposed operations, assessment of the baseline air quality using available ambient air quality monitored data, comparison of modelled results to the national ambient air quality standards to determine compliance and to provide recommendations for the implementation of appropriate mitigation measures and the monitoring program.
34. With reference to paragraph 2.3, it is important to note that for the purpose of the HPA, there are no stations monitoring the location or area surrounding GGV in Ogies, which is the subject of the amendment applications. The closest monitoring station is 50 km- in other words, 50 000 m - away from the area concerned.
35. There is therefore no data concerning the direct impact of the existing GGV mine on the data collected relating to the HPA. Other than acknowledging the existence of the HPA, the AQIA is hopelessly sparse as far as the HPA is concerned.
36. In paragraph 2.1.3, the guideline and number of exceedances allowed for PM 10 and PM 2.5 is listed. However, no further information regarding the extent of PM10 and PM2.5 emitted or associated directly or indirectly with the current GGV mine or that will be potentially associated with the proposed expansion, is explained.



37. The absence of any further elaboration on PM 10 and PM 2.5 in this regard is more problematic having regard to the fact that PM 10 and PM 2.5 are listed as pollutants which are measured as part of the monitoring process relating to the HPA. Having regard to the AQIA, it is uncertain whether monitoring pollutants from 50 km away is effective or of any use. In any event, the IAPs assert that the gravity of the poor air quality problem in the HPA, and the seriousness of the impacts associated with the HPA, is undermined by both the Applicant and the existing monitoring measures.

38. To this extent, there is clearly inadequate consideration for the HPA and the application for amendment of the environmental authorization and environmental monitoring program should be refused on this basis alone.

39. The meteorological data obtained from the South African Weather Services is for the moment unreliable. It is unclear whether the South African Weather Services has provided data relating to Emalahleni or Ogies. In fact, the average relative humidity data is provided for Emalahleni, which is 50km away from Ogies.

40. The report is unhelpful in regard to other pollutants in the area which is the subject of this application. Paragraph 2.5 notes that the detailed emissions inventory for the area is not available. For this reason, there is obviously no accurate consideration for the cumulative impacts of pollution and other polluters in the area. Noteworthy is the comments relating to the coal-fired power stations referred to in paragraph 2.5.2 as the "major contributors" to poor air quality in the region.

41. It is critical that there has not been consideration for the cumulative impacts of GGV and the proposed expansion, on the general air quality of Ogies, the surrounding areas, Delmas, and on the HPA.

42. The IAP's require the detailed emissions inventory referred to herein in order to meaningfully comment and secure the services of their own experts to comment in this regard.

#### AIR QUALITY WITHIN THE PROJECT SITE OF GGV

43. As stated, the site of the project falls within a *priority* area, i.e. the HPA.

44. Mpumalanga accounts for about 83 percent of South Africa's coal production, and Eskom owns the 12 (of its 15) coal-fired power plants located in the area in and around the HPA.

45. The area has been plagued with deadly air quality for decades, with the high concentration of coal-fired power plants in the province, Sasol's coal-to-liquids plant located in Secunda, and the NatRef refinery in Sasolburg contributing large amounts of pollution.

46. In an independent study attached hereto, Dr Andy Gray, an expert in air and health risk modelling, found that these 14 facilities were responsible for the lion's share of air pollution in 2016. We request that this report be read as if specifically incorporated herein.

47. Human exposure to toxic chemical compounds emitted by the coal plants, such as sulphur dioxide, heavy metals like mercury, and fine particulate matter, results in chronic respiratory illnesses such as asthma, bronchitis, and lung cancer, and contributes to strokes, heart attacks, birth defects, and premature death.

48. Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (AQA) provides for the declaration of an area as a priority area if the MEC or Minister reasonably believes that:

- i. ambient air quality standards (AAQS) are being, or may be, exceeded in the area, or any other situation exists which is causing, or may cause, a significant negative impact on air quality in the area; and
- ii. the area requires a specific air quality management action to rectify the situation.
- iii. A priority area air quality management plan (AQMP) must be developed to coordinate air quality management (AQM) in the area; address air quality issues; and provide for its implementation by a committee representing relevant role players.
- iv. The aim of declaring priority areas is to target limited AQM resources to the areas that require them most. Once an AQMP is implemented, air quality in the area should - within agreed timeframes - be brought into sustainable compliance with AAQS.
- v. AQA provides that the Minister may withdraw the declaration of an area as a priority area if the area is in compliance with AAQS for a period of at least two years.

49. The air quality within the area falling within the Emalahleni, Victor Khanye Municipality and consequently within the project area, is a matter of serious concern, with industries, including coal-fired power stations, emitting pollutants such as sulphur dioxide (SO<sub>2</sub>), nitrous oxides (NO<sub>x</sub>), and particulate matter (PM). Coal-fired power stations such as Kendal Power Station, Duvha Power Station and Kusile Power Station, situated in close proximity to Ogies, also emit significant quantities of other harmful pollutants such as carbon dioxide (CO<sub>2</sub>) (which is also a greenhouse gas that contributes directly to global warming) and mercury.

50. Although the intended AQMP for the WBPA is still in draft format, its goals include:

- i. emission control and reduction across all sectors to ensure that there is compliance with the national AAQS in the WBPA;
- ii. addressing the shortcomings in cooperative governance by ensuring the appropriate structures and mechanisms are in place at the respective levels of governance for effective implementation of the AQMP; 18 and
- iii. that air quality decision making in the WBPA is informed by sound research. This requires that appropriate research establishes the health baseline, which improves the threat assessment and prioritises emission reduction interventions to inform air quality management and planning in the WBPA.

51. In addition, the draft WBPA AQMP Threat Assessment on the WBPA ("the threat assessment") stipulates that, "[t]he greatest potential threat to ambient air quality exists in the Victor Khanye Local Municipality through the planned expansion of energy-based projects and coal mining in the district. The planned development poses a threat to human and environmental health in the region and it poses challenges for air quality management in the region."



52. The ongoing addition and expansion of coal mines, that already permeate the HPA including Delmas, Arbor, Ogies and Witbank area, coupled with the close proximity of Kusile, Kendal and Duvha, coal-fired power stations, with all of their significant and harmful atmospheric emissions, will clearly be contrary to the air quality management intentions for the WBPA and the goals of the draft AQMP.

### CUMULATIVE IMPACTS

53. Glencore's application for the amendment of the environmental authorization and its draft environmental management program fails to acknowledge and/or consider:

- i. the existence or location of South 32, Zibulo Colliery, Seriti Klipspruit, Mbuyelo Colliery etc;
- ii. Environmental authorizations and water use licenses which may be granted and be in existence in respect of the mining operations mentioned above;
- iii. the overall impact on the environment, and of water use by the proposed project should it exist and operate simultaneously with the mining operations mentioned above.

54. In this regard, the Applicant nowhere addresses each identified potentially significant impact including the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources and the degree to which the impact can be mitigated.

55. The Applicant's failure to deal with the impact of its planned expanded mining activity, together with the mining activity of the other mining operations which began and/or expanded since the application for the environmental authorization was submitted and approved, would have on *climate change* is grounds relied upon to object to the approval of the application to amend the environmental authorization and eMPR.

FAILING TO TAKE INTO ACCOUNT FEASIBLE ALTERNATIVES AS OUTLINED IN SECTION 24O(1)(B)(IV) OF NEMA

56. Section 24O(1)(b)(iv) provides that a decision-maker must take into account "*where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment*".

57. It is submitted that a suitable alternative in the circumstances would be to abandon implementation of the proposed project entirely, otherwise known as the "no-go option" and referred to as a "do-nothing alternative". There is no need for the project on a national scale, and "the do nothing option will therefore not address this national need and may result in the electricity demands in the country not being met in the short term".

58. The Applicant failed to indicate why renewable energy sources cannot be used as a suitable alternative to the proposed expanded operation, and why it only considers coal as a source to mine and for power generation.

59. In light of the negative impacts associated with coal mines and coal-fired power stations and the dire shortage of water in the area - likely to worsen as a result of climate change within the timescale of this project - it is submitted that it is an unacceptable justification to rule out feasible alternatives; especially when the Applicant does not make any proper attempt to consider and evaluate these as is required by NEMA.
60. It is submitted that the proposed site of the project remains ideal for maize farming or could have potential as a site for solar power generation, or other renewable energy sources. Without the necessary technical data and research information, our clients are not in a position to make submissions on the suitability and generation capacity of the project site of for specific renewable energy generation through, for instance, coal or wind. However, it is submitted that the Applicant should have considered this possibility and required that feasibility studies for renewable energy sources - as an alternative to coal - be conducted as part of the EIA.
61. Given the scarcity of water resources in the area and the substantial water requirements of the project; the cumulative and other environmental impacts of the project, the related detrimental health impacts and the potential for renewable power generation on the site, it is submitted that it would be appropriate to consider both the 'no-go option', and the possibility of renewable energy as a feasible alternative to the project in the circumstances.
62. It must also be noted that African Rainbow Minerals and the Applicant portray and market themselves as having *unique expertise in ....renewable energy and energy efficiency*". In the circumstances, it can be assumed that Glencore have the resources, technological knowledge and experience at their disposal

to substitute the proposed coal mines for more than appropriate renewable alternatives, or continued maize farming.

63. Furthermore, the Applicant cannot feign ignorance of the dire need to shift the energy sector towards cleaner carbon-emission-free alternative energy sources.

64. In light of the above, it is submitted that the Applicant has failed to comply with Section 24O(1)(b)(iv) of NEMA. By doing so, it has also failed to take relevant considerations into account.

FAILURE TO CONSIDER APPLICABLE POLICIES RELEVANT TO THE APPLICATION, AS REQUIRED BY SECTION 24O(1)(B)(VIII) NEMA - NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER WHICH "PRESENTS THE SOUTH AFRICAN GOVERNMENT'S VISION

65. Section 24O(1)(b)(viii) NEMA provides that a decision maker must consider "any guidelines, departmental policies, and environmental management instruments that have been adopted in the prescribed manner by the Minister or MEC, with the concurrence of the Minister, and any other information in the possession of the competent authority that are relevant to the application".

66. It is submitted that the Applicant in applying to amend the authorisation, has failed to take into account the National Climate Change Response White Paper (the "White Paper") which "presents the South African government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower carbon economy and society."



67. It acknowledges, *inter alia*, that: "although there will be costs associated with South Africa's adaptation and GHG [greenhouse gas] emission reduction efforts, there will also be significant short and long term social and economic benefits ... "

68. Furthermore various economic studies have shown that the costs of early action will be far less than the costs of delay and inaction". In its objectives, it records that it will "effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity [and] make a fair contribution to the global effort to stabilise GHG concentrations in the atmosphere.

69. This White Paper confirms, among other things, that "South Africa is a water scarce country with a highly variable climate and has one of the lowest run-offs in the world – a situation that is likely to be significantly exacerbated by the effects of climate change."

70. The White Paper indicates clearly the intention of the government to take positive steps to address issues of air quality and climate change in South Africa. In applying to amend the environmental authorization and eMPR, to grant same to Glencore would directly contradict these intentions and consequently contravene section 24O(1)(b)(viii) NEMA.

71. Whilst paragraph four covers aspects relating to the potential impact of GGV, it is stated that the construction and decommissioning phases of the operation

can only qualitatively be addressed due to the variability and unpredictable nature of the construction operations on site. Accepting for the moment the impact assessment in this regard, paragraph 4.7 concludes that the daily limits of PM 10 and PM 2.5 are exceeded offsite at the road and rail siding and at the border of the town.

72. These exceedances require further investigation by experts including the impact on air quality, respiratory health and on the HPA. The Applicant should be required to conduct this study before proceeding further.

73. Of particular concern is the overall impact on the operational impact and disruption of daily living and movement patterns, deterioration of the local sense of place, operational work or health impacts and further entrenchment of dependence on mine operations for economic function. Continued engagement and establishment of consultative forms does not assist mitigate these issues. This proposal is simply inadequate and insensitive to the plight of the common population and IAPs.

#### THE DIVERSION OF THE P53-1 ROAD BETWEEN R555 & R545 IN OGIES

74. The first IAP secured an interim interdict against the Applicant on 30 March 2017, interdicting the closure of the provincial road P53–1 pending the allocation by the Deputy Judge President and hearing of the main application under case number 2017/10546.

75. This court order has not been taken into consideration in any of the studies or reports underpinning the applications for amendment.

76. A court order remains valid and binding until set aside.

77. Accordingly, the applications for amendment including the proposed expanded project must be held in abeyance until finalisation of the main application under case number 2017–10546, until such time that the interim interdict is no longer of force and effect.

78. The IAPs reserve their right to amend or vary these comments and objections upon receipt of the outstanding and/ or incomplete information referred to above and upon receipt of detailed information concerning the properties in Ogies, which have been damaged by the ongoing mining activity in Ogies.

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# **AIR QUALITY IMPACTS AND HEALTH EFFECTS DUE TO LARGE STATIONARY SOURCE EMISSIONS IN AND AROUND SOUTH AFRICA'S MPUMALANGA HIGHVELD PRIORITY AREA (HPA)**

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June 3 2019

## **SUMMARY**

I have been commissioned by the Centre for Environmental Rights to conduct an air-pollution dispersion model and health risk assessment for 14 industrial facilities (12 Eskom coal-fired power stations, the Sasol Synfuels chemical facility and the NatRef refinery), located in and around the Mpumalanga Highveld Priority Area (HPA) of South Africa.

Important results from the modeling and health risk assessment include:

1. Ambient PM<sub>2.5</sub> pollution from the 14 facilities **caused between 305 and 650 early deaths** in the area in 2016. The three worst offenders were Lethabo power station (57 to 122 early deaths), Kendal power station (46 to 99 early deaths), and Kriel power station (34 to 76 early deaths). If the 14 facilities were required to comply with the minimum emissions standards that will go into effect in 2020 (2020 MES), this would reduce early deaths by 60%, **preventing between 182 and 388 early deaths** in and around the HPA every year. (Tables 3 and 4)
2. Cumulative emissions from the 14 facilities created acute exposures in 2016 that **exceeded the World Health Organization's guidelines for daily or hourly averages for all pollutants**. The highest 24-hour average exposure of PM<sub>2.5</sub> was 45 µg/m<sup>3</sup>, nearly twice the WHO guideline of 25 µg/m<sup>3</sup>. (Table 2) These conditions occurred around Kendal, Kriel, and Duvha power stations. (Figure 5) The highest 24-hour average exposure of SO<sub>2</sub> was 241.4 µg/m<sup>3</sup>, over 1200% of the World Health Organization standard of 20 µg/m<sup>3</sup>. The highest NO<sub>2</sub> one-hour average was 2020 µg/m<sup>3</sup>, over 1000% of the one-hour average standard of 200 µg/m<sup>3</sup>. Implementing the 2020 MES would completely eliminate the WHO guideline exceedances for 24-hour average PM<sub>10</sub> and 24-hour average PM<sub>2.5</sub>, and would significantly reduce the number of exceedances for 24-hour average SO<sub>2</sub> and one-hour average NO<sub>2</sub> throughout the modeled area. (Table 2)
3. **All of the 120 sensitive sites** (primarily schools and hospitals) analyzed in the model exceeded the World Health Organization's 24-hour average SO<sub>2</sub> guideline (20 µg/m<sup>3</sup>) in 2016 due to emissions from the 14 facilities. The modeled average peak 24-hour SO<sub>2</sub> concentration across all 120 sensitive sites was 66.4 µg/m<sup>3</sup> in 2016, with a maximum of 178 µg/m<sup>3</sup> at Duvha Primary School. Under the 2020 MES, the average concentration at the sensitive sites would be reduced to 13.6



µg/m<sup>3</sup>. Implementing the 2020 MES at the facilities would bring SO<sub>2</sub> exposures at 93% of the sensitive sites (all but nine) to within the WHO guideline. (Appendix D)

4. **Unhealthy, acute exposures to NO<sub>2</sub> occurred at 28 of the 120 sensitive sites** in 2016, exceeding the WHO one-hour NO<sub>2</sub> guideline concentration of 200 µg/m<sup>3</sup>. The worst acute exposure was at Camden Combined School, at 1079 µg/m<sup>3</sup>. Under the 2020 MES, there would still be 14 sites in which the 200 µg/m<sup>3</sup> would be exceeded (led by Camden Combined School (588 µg/m<sup>3</sup>). The average peak one-hour average NO<sub>2</sub> concentration across all 120 sites was 191 µg/m<sup>3</sup> in 2016. Under the 2020 MES, the average of all 120 sites would be reduced to 115 µg/m<sup>3</sup>. (Appendix D)
5. The 14 facilities are responsible for the lion's share of air pollution allowed by national air quality limits. In 2016, emissions from the 14 facilities accounted for:
  - **92%** of the daily ambient SO<sub>2</sub> limit
  - **85%** of the hourly ambient SO<sub>2</sub> limit
  - **82%** of the hourly ambient NO<sub>2</sub> limit.
  - **68%** of the daily ambient PM<sub>2.5</sub> limit

These levels of contribution indicate that ambient air quality standards cannot be achieved without reducing pollution from these sources. Given the hundreds of other sources of air pollution in and around the HPA, particularly PM and NO<sub>2</sub>, these 14 facilities contribute alarmingly high — and relatively easily reducible — percentages of national limits.

If these sources were to comply with the 2020 MES, their contribution to ambient air pollution would substantially decrease, accounting for:

- **20%** of the daily ambient SO<sub>2</sub> limit (79% reduction from 2016)
- **21%** of the hourly ambient SO<sub>2</sub> limit (75% reduction from 2016)
- **53%** of the hourly ambient NO<sub>2</sub> limit (35% reduction from 2016)
- **28%** of the daily ambient PM<sub>2.5</sub> limit (59% reduction from 2016)

(Table 2)

6. **Major reductions of SO<sub>2</sub> emissions from the 14 sources are necessary to reduce the high levels of secondary PM<sub>2.5</sub>** (from sulfate particles) contributing to PM<sub>2.5</sub> NAAQS exceedances in and around the HPA. Compliance with the 2020 MES would result in SO<sub>2</sub> emissions from the facilities being reduced by **78%** relative to 2016 emissions. NO<sub>2</sub> emissions from the facilities would be reduced by **43%**. PM<sub>10</sub> emissions from the facilities would be reduced by **51%**. (Table 1)
7. The 14 modeled sources are responsible for substantial PM<sub>2.5</sub> exposures across at least 30% of the entire modeled area. If the sources complied with the 2020 MES, the area exposed to relatively high concentrations of PM<sub>2.5</sub> would be

completely eliminated, resulting in healthier air for the large populations in Johannesburg and Pretoria. (Figures 4 and 7)

## INTRODUCTION

The HPA has experienced non-compliant and dangerous ambient air pollutant concentrations for decades. The Department of Environmental Affairs estimates that power generation contributes 82% of SO<sub>2</sub>, 73% of NO<sub>x</sub>, and 12% of PM<sub>10</sub> in the HPA, while petrochemical facilities contribute 12% of SO<sub>2</sub>, 15% of NO<sub>x</sub>, and 3% of PM<sub>10</sub>.<sup>1</sup> In 2007, the Ministry of Environment designated the area as a "Priority Area".<sup>2</sup> Despite this, ambient air quality has remained poor and non-compliant with national air quality standards.<sup>3</sup>

There are adverse health effects associated with both short-term and chronic exposures to air pollutants. Though there is no threshold of safety below which no harm is caused,<sup>4</sup> ambient air pollution guidelines have been established in South Africa for various time frames for SO<sub>2</sub>, NO<sub>2</sub>, ozone, PM<sub>10</sub> and PM<sub>2.5</sub>. South Africa's National Ambient Air Quality Standards (SA NAAQS) are significantly weaker than those recommended by the United States or the World Health Organization (WHO).<sup>5</sup>

Short term exposures (i.e., on the order of one-hour) to elevated SO<sub>2</sub> and NO<sub>2</sub> levels have been associated with serious health consequences, including inflammation, irritation, and

<sup>1</sup> Department of Environmental Affairs, *Highveld Priority Area Air Quality Management Plan* (2011) at xi.

<sup>2</sup> Department of Environmental Affairs and Tourism, *The National Framework for Air Quality Management in the Republic of South Africa*, Government Gazette: 30284, 3-101, 2007.

<sup>3</sup> See, Department of Environmental Affairs, 2018 State of the Air Report (2 Oct. 2018), [http://www.airqualityilekgotla.co.za/assets/2018\\_1.3\\_2018\\_state\\_of\\_air\\_report.pdf](http://www.airqualityilekgotla.co.za/assets/2018_1.3_2018_state_of_air_report.pdf).

<sup>4</sup> United States Environmental Protection Agency, *Quantitative Health Risk Assessment for Particulate Matter*, Final Report, EPA-452/R-10-005 (Jun. 2010), [https://www3.epa.gov/ttn/naaqs/standards/pm/data/PM\\_RA\\_FINAL\\_June\\_2010.pdf](https://www3.epa.gov/ttn/naaqs/standards/pm/data/PM_RA_FINAL_June_2010.pdf). The US EPA's quantitative human health risk assessment (RA) for particulate matter clearly demonstrates that there are significant health effects associated with air quality below the levels of the NAAQS. For example, the RA pointed out that there are actually greater overall health impacts to an urban area due to days with 24-hour average PM<sub>2.5</sub> levels nearer to the annual average value rather than days with relatively higher PM<sub>2.5</sub> levels falling in the tail of the annual 24-hour PM<sub>2.5</sub> distribution. As explained by EPA (RA, page 3-11): "This finding reflects the fact that the number of deaths associated with short-term exposure to PM<sub>2.5</sub> depends both on the number of days at a given concentration and on the concentration itself. Because the urban areas considered . . . had 24-hour PM<sub>2.5</sub> distributions that were closer to normal or log-normal in form (i.e., not uniform), overall incidence of short-term exposure-related mortality was driven by the relatively large number of days near the center of the distribution, rather than the small number of days out at the tail." EPA makes it very clear that there are measurable health impacts, including the increased risk of mortality, associated with exposure to PM<sub>2.5</sub> even at average daily PM<sub>2.5</sub> concentration levels.

<sup>5</sup> World Health Organization, *Ambient (outdoor) air quality and health*, (2 May 2018). Because the standards are configured as averages over different time periods or as specific highest occurring values, the standards are not directly comparable.

infection of the respiratory system, destruction of lung tissue (especially in children), and increased asthma attacks and heart disease in sensitive groups.<sup>6</sup>

## DISPERSION MODELING

### A. Methodology

In order to quantify the health impacts of the air pollution from the largest stationary sources of air pollution in and around the HPA, I analyzed contributions to ambient air quality from 12 Eskom coal-fired power plants, the Sasol Synfuels facility and the Natref Refinery located within 50 km of the HPA boundaries (Figure 1).<sup>7</sup> The air pollution modeling area covers a total area of 147,312 square kilometers, including the highly populated metropolitan areas of Pretoria and Johannesburg. The total population within the modeled area was 20.62 million in 2016. Figure 1 illustrates the area, including the 14 facilities and the nearby major cities.

I compiled data from the United States National Climatic Data Center's Integrated Surface Database, the Global 30-Second Elevation Data Set, and the Africa Land Cover Characteristics Data Base (Version 2.0).<sup>8</sup> I used the US EPA-recommended CALPUFF dispersion model to assess two emissions scenarios: (1) the *actual* emissions released during 2016 by the 14 facilities, using data obtained through monthly reports to regulators; and (2) the *projected* emissions that would be released if these sources complied with the minimum emission standards that will go into effect in April 2020 (2020 MES). It should be noted that many of these sources, including the Eskom power plants, have sought postponements for compliance with the 2020 MES. If these postponements are granted, the emissions reductions achievable through compliance with the 2020 MES will not be achieved.

I also modeled exposure to the emissions from the 14 sources over various timeframes (hourly, daily, and annually) at 120 sensitive locations (primarily schools and hospitals) with particularly vulnerable populations.

Using the health impacts assessment from the World Health Organization's Global Burden of Disease, I modeled early deaths caused by exposure to primary and secondary

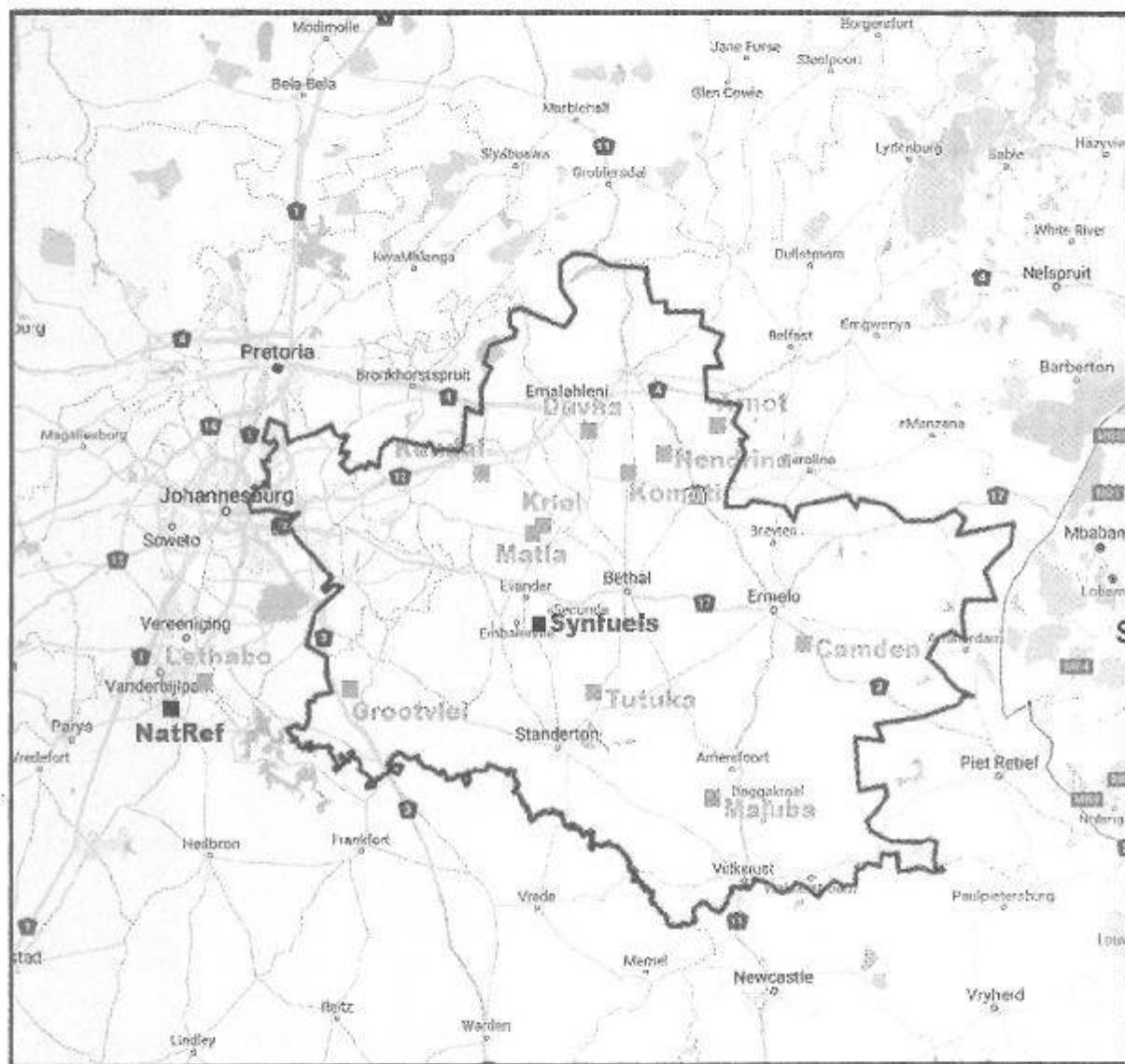
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<sup>6</sup> World Health Organization, *WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, Global update 2005, Summary of risk assessment* (2006).

<sup>7</sup> The Lethabo power station and the Natref refinery are located within 50 km of the HPA, and were also included in the current modeling analysis. Population centers of Johannesburg and Pretoria were also included.

<sup>8</sup> <https://www.usgs.gov/media/images/africa-land-cover-characteristics-data-base-version-20>;  
<https://www.usgs.gov/centers/eros/science/usgs-eros-archive-digital-elevation-global-30-arc-second-elevation-gtopo30>.

PM<sub>2.5</sub><sup>9</sup> from the 14 facilities on the population of the region, both from each facility and cumulatively. Finally, I calculated early deaths due to the 2016 emissions as well as under the 2020 MES scenario.



**Figure 1. Modeling Domain (HPA area boundary in pink; modeling domain boundary in red)**

<sup>9</sup> Ambient PM<sub>2.5</sub> forms in two ways: (1) through direct, or "primary" emissions of PM<sub>2.5</sub>; and (2) through emissions of SO<sub>2</sub> and NO<sub>x</sub>, which react in the air to form sulfate and nitrate particles known as "secondary" PM<sub>2.5</sub>.



I used the CALPUFF dispersion modeling system (version 6.262, 25 Jul. 2008),<sup>10, 11</sup> to simulate the emissions and regional transport of sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), particulate matter smaller than 10 microns (micrometers) in diameter (PM<sub>10</sub>), and particulate matter smaller than 2.5 microns in diameter (PM<sub>2.5</sub>) originating from the Eskom coal-fired power plant stacks, the Synfuels chemical facility, and the Natref Refinery located in and near the HPA region.

The CALPUFF model is a state-of-the-art air quality dispersion model that simulates the atmospheric transport of pollutants within a defined modeling domain by representing a source's plume as a continuous series of spreading plume segments or "puffs" which are tracked forward in time. The model considers the formation of "secondary" PM<sub>2.5</sub> caused by reactions of SO<sub>2</sub> and NO<sub>x</sub> emissions in the atmosphere, which accounts for the majority of the PM<sub>2.5</sub> attributable to the power stations. The CALPUFF model can be used to estimate the air pollutant concentration impacts that occur throughout the modeling domain due to each individual modeled source, as well as the combined (cumulative) impact of all the modeled sources.

The CALPUFF model was used to determine pollution concentrations due to emissions from 14 facilities during the calendar year 2016 (January to December). Meteorological data for every hour of 2016, including 3-dimensional wind fields, temperatures, and other atmospheric parameters, were combined with hourly surface data collected at 32 weather stations (typically located at regional airports) in and near the HPA. In addition to meteorological data, geophysical data were obtained in order to characterize the modeling domain, including terrain (elevation data), and other parameters related to the land surface. Further details regarding the meteorological and geophysical data that were used in the modeling can be found in Appendix A of this report.

The CALPUFF model is designed to estimate pollutant concentrations at a specified set of locations within the modeling domain, which are referred to as the modeled "receptors". For the current CALPUFF application, a large set of gridded receptors were defined, as well as a second smaller set of "sensitive" receptor locations. The gridded modeled receptors were defined to cover the entire modeling domain shown in Figure 1, using 4 km grid spacing, accounting for 9,207 virtual receptors (99 E/W x 93 N/S).

The modeled concentrations at the set of gridded receptors were used to: (1) determine the locations of maximum pollution concentrations from the modeled sources across the entire HPA; (2) compare those maximum concentrations against acceptable ambient air quality standard threshold levels; (3) develop spatial contour plots of pollutant

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<sup>10</sup> Scire, J.S., Strimaitis, D.G., Yamartino, R.J., *A User's Guide for the CALPUFF Dispersion Model (Version 5)*, Earth Tech, Inc., Concord, MA, 2000, [http://src.com/calpuff/download/CALPUFF\\_UsersGuide.pdf](http://src.com/calpuff/download/CALPUFF_UsersGuide.pdf).

<sup>11</sup> Scire, et al., *CALPUFF Modeling System, Version 6 User Instructions*, April 2011, [http://www.src.com/calpuff/download/CALPUFF\\_Version6\\_UserInstructions.pdf](http://www.src.com/calpuff/download/CALPUFF_Version6_UserInstructions.pdf).

concentrations; and (4) establish pollutant exposure levels across the modeling domain for the health effects analysis.

In addition to the gridded receptors, a set of 120 sensitive receptor locations were identified, which includes a number of schools, hospitals and other locations where children, the elderly, and other sensitive segments of the population may be exposed. The locations of the sensitive receptors are shown on a map of the modeling domain (and HPA area) in Figure 2, below. The list of modeled sensitive receptors appears in Appendix A (Table A-2). Dispersion model results for the sensitive receptors are presented in Appendices C and D.



**Figure 2. Sensitive Receptor Locations, with vulnerable populations in schools and hospitals. (HPA area boundary in pink; modeling domain boundary in red.)**

Two emission scenarios were modeled using the CALPUFF model: (1) Baseline: The Baseline scenario represents actual emissions rates (in grams of pollution per second) from each facility in 2016. Pollutant emission rates were obtained from monthly and annual reports to regulators for each facility. (2) 2020 MES: The 2020 MES scenario represents the projected emissions from the 14 sources if these sources were to comply with 2020 MES, and assuming that the plants were operating at the same annual average capacity (load) as in 2016.<sup>12</sup>

The modeled pollutant emissions rates for each modeled facility are summarized in Table 1, below, for the Baseline (2016 actual emissions) and the 2020 MES scenarios.<sup>13</sup>

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<sup>12</sup> The annual average capacity (load) ranged from 40 to 82 percent (of maximum) for the 12 Eskom power plants during 2016. Synfuels and Natref were assumed to be operating in 2016 at the same production rates as in 2014.

<sup>13</sup> The CALPUFF model was used to estimate impacts due to direct emissions of both PM<sub>10</sub> and PM<sub>2.5</sub>. It was assumed (conservatively) that 50% of the emitted PM<sub>10</sub> from all modeled sources was in the fine (PM<sub>2.5</sub>) fraction.

**Table 1. Emission Rates (g/s)**

| SOURCE        | BASELINE        |                 |                  | 2020 MES        |                 |                  |
|---------------|-----------------|-----------------|------------------|-----------------|-----------------|------------------|
|               | SO <sub>2</sub> | NO <sub>x</sub> | PM <sub>10</sub> | SO <sub>2</sub> | NO <sub>x</sub> | PM <sub>10</sub> |
| Arnot         | 2,447.14        | 1,305.45        | 46.03            | 661.84          | 992.76          | 66.18            |
| Camden        | 2,327.62        | 1,304.03        | 37.64            | 507.37          | 761.06          | 50.74            |
| Duvha         | 4,154.37        | 2,129.10        | 112.33           | 685.20          | 1,027.79        | 68.52            |
| Grootvlei     | 1,323.01        | 683.84          | 104.01           | 283.75          | 425.62          | 28.37            |
| Hendrina      | 1,795.77        | 1,099.00        | 23.74            | 523.43          | 785.15          | 52.34            |
| Kendal        | 5,953.07        | 2,349.79        | 346.27           | 1,319.07        | 1,978.60        | 131.91           |
| Komati        | 1,004.81        | 794.07          | 35.89            | 246.91          | 370.37          | 24.69            |
| Kriel         | 4,114.25        | 3,034.94        | 301.65           | 862.13          | 1,293.20        | 86.21            |
| Lethabo       | 5,477.43        | 3,171.11        | 269.70           | 1,804.89        | 2,707.34        | 180.49           |
| Majuba        | 4,601.49        | 3,698.54        | 80.35            | 1,218.40        | 1,827.60        | 121.84           |
| Matla Stack 1 | 2,778.16        | 992.14          | 68.05            | 250.79          | 376.19          | 25.08            |
| Matla Stack 2 | 2,891.73        | 992.14          | 75.20            | 250.79          | 376.19          | 25.08            |
| Tutuka        | 4,568.82        | 2,845.18        | 531.14           | 1,029.00        | 1,543.50        | 102.90           |
| Synfuels-ME   | 2,899.19        | 1,939.08        | 70.06            | 500.44          | 750.65          | 50.05            |
| Synfuels-MWE  | 2,578.74        | 1,725.55        | 62.32            | 445.18          | 667.69          | 44.51            |
| NatRef MS     | 286.11          | 46.39           | 30.56            | 10.30           | 20.83           | 5.95             |
| NatRef B14001 | 0.13            | 0.28            | 0.04             | 1.05            | 0.65            | 0.11             |
| NatRef B14002 | 0.13            | 0.05            | 0.03             | 0.48            | 0.30            | 0.02             |
| NatRef B14005 | 2.08            | 0.70            | 0.24             | 3.14            | 1.96            | 0.41             |
| NatRef B14006 | 0.58            | 0.27            | 0.09             | 0.90            | 0.56            | 0.10             |
| NatRef B17004 | 0.53            | 0.14            | 0.05             | 0.51            | 0.32            | 0.06             |
| NatRef B25001 | 5.60            | 3.19            | 0.57             | 8.08            | 5.05            | 0.82             |
| NatRef-CCU    | 55.00           | 10.08           | 2.20             | 16.50           | 3.30            | 1.10             |
| ALL           | 49,265.8        | 28,125.1        | 2,198.1          | 10,630.2        | 15,916.7        | 1,067.5          |

The 14 sources accounted for an average of 4,257 tonnes per day of SO<sub>2</sub> during 2016.<sup>14</sup> The sources also combined to emit 2,430 tonnes of NO<sub>x</sub> and 190 tonnes of PM<sub>10</sub> into the air each day, on average, in 2016.

### **B. 2020 MES Projections**

Compliance with the 2020 MES would result in significant reductions in pollutant emissions of all three pollutants at all facilities, especially for SO<sub>2</sub>; the total SO<sub>2</sub> emissions from all sources would be less than 920 tonnes per day, which represents a **78%** reduction relative to 2016 actual emissions. The 14 sources combined would emit 1,375

<sup>14</sup> The average modeled SO<sub>2</sub> emission rate from all sources during 2016 was 49,266 grams per second (as shown in Table 1), which is equivalent to 4,257 metric tonnes per day.

tonnes/per day of NO<sub>x</sub> and 92 tonnes per day of PM<sub>10</sub>, reductions of **43%** and **51%**, respectively, relative to 2016 actual emission rates.

The largest overall emitters in 2016 were Lethabo, Kendal, Majuba, Tutuka, Kriel, and Duvha. SO<sub>2</sub> emission reductions for the 2020 MES scenario range from 67% to 91% across the 14 facilities. Reductions in NO<sub>x</sub> emissions would range from 15% to 62%, and PM<sub>10</sub> emissions would be reduced by between 33% and 81% for the larger emitters of PM<sub>10</sub>.<sup>15</sup> (Table 1)

### C. Dispersion Model Results

The CALPUFF model was used to estimate the concentrations of SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub> at every receptor location for each hour of 2016. The predicted concentrations were compared to the SA NAAQS<sup>16, 17</sup> to determine the percentage of each standard that is “taken up” by the 14 sources.

Each ambient pollutant standard includes: (1) a specified *averaging time* (such as one-hour average, 24-hour average, or annual average), (2) a concentration *level*, and (3) a *form*, which defines the requirements for attainment/compliance. For example, the one-hour SO<sub>2</sub> SA NAAQS requires that the one-hour average (the *averaging time*) SO<sub>2</sub> concentration not exceed 350 µg/m<sup>3</sup> (the *level*), with 88 allowed exceedances per year at each location (the *form*). The form and averaging time for each standard can be combined to determine the *design value* metric (or statistic) that must be compared to the acceptable level to assess whether the region is in compliance with the standard. If the 89<sup>th</sup> highest one-hour average SO<sub>2</sub> concentration exceeds the standard level (350 µg/m<sup>3</sup>), then the area would not be in compliance with the one-hour SO<sub>2</sub> standard. Therefore, the design value (DV) for the one-hour SO<sub>2</sub> standard is the 89<sup>th</sup> highest one-hour average SO<sub>2</sub> concentration.

The design values for each emission scenario were extracted from the set of modeled hourly concentration data (for all sources combined) and compared to the acceptable standard level for each of the SA NAAQS, as shown in Table 2, below. As a comparison to the SA NAAQS, the modeled design values corresponding to US NAAQS levels were also measured against allowable levels for a few of the US standards.<sup>18</sup> For example, the US NAAQS requires that the 4<sup>th</sup> highest daily peak one-hour average SO<sub>2</sub> concentration is below 196 µg/m<sup>3</sup>, which is a much more stringent standard than the one-hour SO<sub>2</sub> NAAQS for SA, which requires that the 89<sup>th</sup> highest one-hour average

<sup>15</sup> Four of the smaller PM<sub>10</sub> emitters would have *increased* PM<sub>10</sub> emissions under the 2020 MES scenario, relative to the 2016 actual emission rates (as shown in Table 1).

<sup>16</sup> South Africa Department of Environmental Affairs, National Environment Management: Air Quality Act, 2004 (Act No. 39 of 2004): National Ambient Air Quality Standards. Staatskoerant No. 32816. 24 Dec. 2009, [https://www.gov.za/sites/default/files/gcis\\_document/201409/328161210.pdf](https://www.gov.za/sites/default/files/gcis_document/201409/328161210.pdf).

<sup>17</sup> South Africa Department of Environmental Affairs, National Environment Management: Air Quality Act, 2004 (Act No. 39 of 2004): National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter Less Than 2.5 Micron Metres (PM<sub>2.5</sub>). Staatskoerant No. 35463. 29 Jun. 2012.

<sup>18</sup> <https://www.epa.gov/criteria-air-pollutants/naaqs-table>



concentration is below  $350 \mu\text{g}/\text{m}^3$ . According to the model results shown in Table 2, the maximum 4<sup>th</sup> highest daily peak one-hour average  $\text{SO}_2$  concentration during 2016 ( $1,886 \mu\text{g}/\text{m}^3$ ) was almost **ten times** the acceptable US one-hour NAAQS level of  $196 \mu\text{g}/\text{m}^3$ . Even if the 2020 MES were met, the model indicates that the 14 sources would contribute enough  $\text{SO}_2$  to reach **twice** the acceptable levels of the US one-hour  $\text{SO}_2$  standard.

Emissions from these sources are substantially responsible for the ambient concentrations to exceed acceptable standards, because there is only a small percentage of the standard left for *all other sources*.

If the modeled sources were compliant with South Africa's 2020 MES, their contributions to ambient air pollution would substantially decrease.

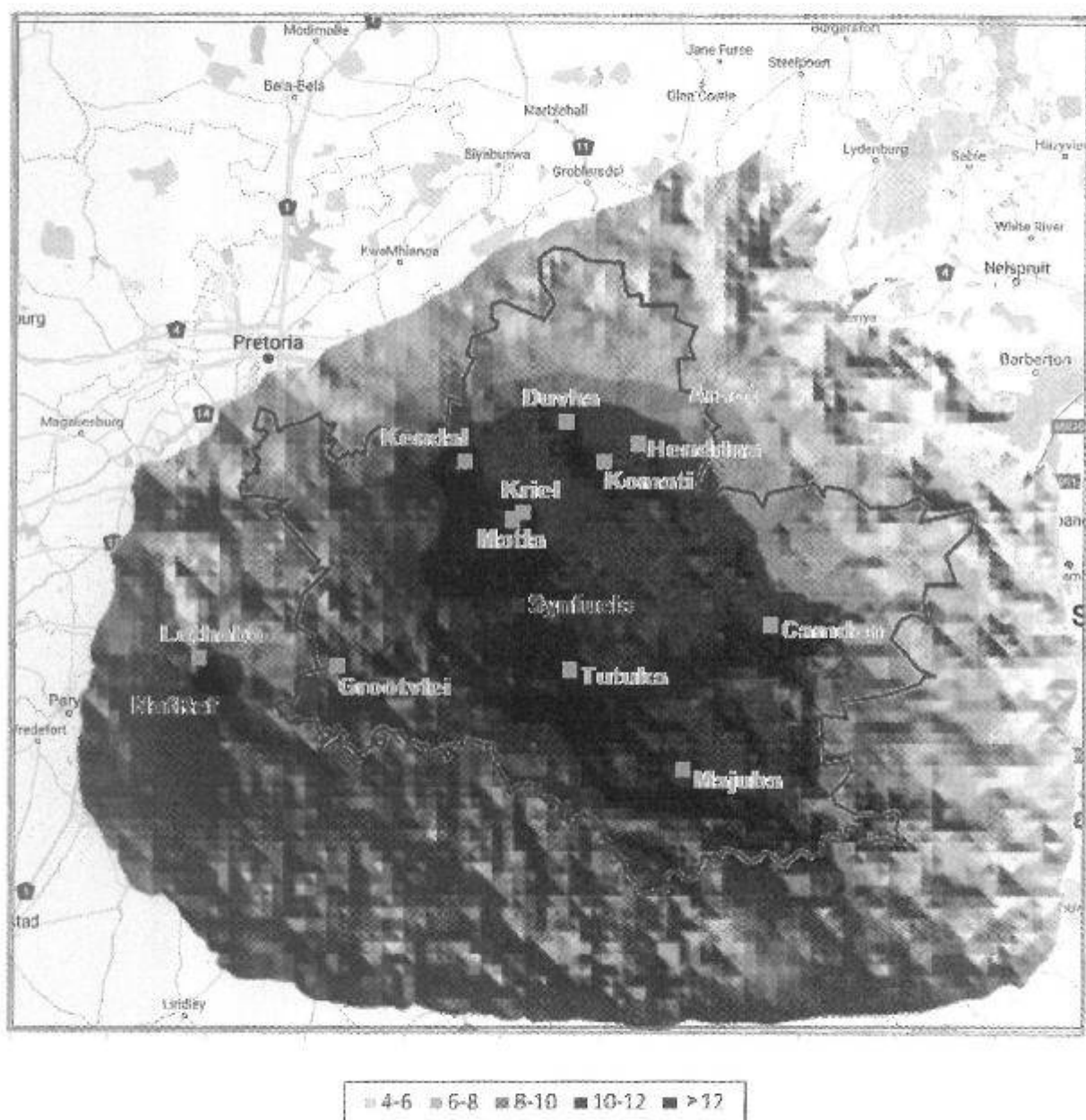
**Table 2. Modeled Design Value Concentrations.**

| Pollutant / Design Value                                      | Standard Level<br>( $\mu\text{g}/\text{m}^3$ ) | Modeled DV<br>( $\mu\text{g}/\text{m}^3$ )<br>Baseline<br>(2016) | Percent<br>of<br>Standard | Modeled DV<br>( $\mu\text{g}/\text{m}^3$ )<br>2020<br>MES | Percent<br>of<br>Standard | Percent<br>Reduction |
|---|--|--|---------------------------|---|---------------------------|----------------------|
| <b>SO<sub>2</sub></b>   |  |  |                           |   |                           |                      |
| <u>SA NAAQS</u>   |  |  |                           |   |                           |                      |
| SO <sub>2</sub> 1-hr average, 89 <sup>th</sup> high           | 350  | 296.8  | 85%                       | 73.6  | 21%                       | 75%                  |
| SO <sub>2</sub> 24-hr average, 5 <sup>th</sup> high           | 125  | 115.4  | 92%                       | 24.7  | 20%                       | 79%                  |
| SO <sub>2</sub> annual average                                | 50   | 19.0   | 38%                       | 4.0   | 8%                        | 79%                  |
| <u>US NAAQS</u>   |  |  |                           |   |                           |                      |
| SO <sub>2</sub> 1-hr average, 4 <sup>th</sup> high daily peak | 196  | 1,885.9  | 962%                      | 429.9   | 743%                      | 77%                  |
| <u>WHO Guidelines</u>   |  |  |                           |   |                           |                      |
| SO <sub>2</sub> 24-hr average, maximum                        | 20   | 241.4  | 1,207%                    | 58.6  | 486%                      | 76%                  |
| <b>PM<sub>10</sub></b>  |  |  |                           |   |                           |                      |
| <u>SA NAAQS</u>   |  |  |                           |   |                           |                      |
| PM <sub>10</sub> 24-hr average, 5 <sup>th</sup> high          | 75   | 29.7   | 40%                       | 11.9  | 16%                       | 60%                  |
| PM <sub>10</sub> annual average                               | 40   | 3.7  | 9%                        | 1.4   | 4%                        | 62%                  |
| <u>US NAAQS</u>   |  |  |                           |   |                           |                      |
| PM <sub>10</sub> 24-hr average, 2 <sup>nd</sup> high          | 150  | 44.5   | 30%                       | 14.6  | 10%                       | 67%                  |
| <u>WHO Guidelines</u>   |  |  |                           |   |                           |                      |
| PM <sub>10</sub> 24-hr average, maximum                       | 50   | 51.9   | 104%                      | 16.1  | 32%                       | 69%                  |
| PM <sub>10</sub> annual average                               | 20   | 3.7  | 19%                       | 1.4   | 7%                        | 62%                  |
| <b>PM<sub>2.5</sub></b>                                       |  |  |                           |   |                           |                      |
| <u>SA NAAQS</u>   |  |  |                           |   |                           |                      |
| PM <sub>2.5</sub> 24-hr average, 5 <sup>th</sup> high         | 40   | 27.0   | 68%                       | 11.0  | 28%                       | 59%                  |
| PM <sub>2.5</sub> annual average                              | 20   | 3.2  | 16%                       | 1.2   | 6%                        | 63%                  |
| <u>US NAAQS</u>   |  |  |                           |   |                           |                      |
| PM <sub>2.5</sub> 24-hr average, 8 <sup>th</sup> high         | 35   | 23.1   | 66%                       | 9.2   | 26%                       | 60%                  |
| <u>WHO Guidelines</u>   |  |  |                           |   |                           |                      |
| PM <sub>2.5</sub> 24-hr average, maximum                      | 25   | 45.0   | 180%                      | 14.0  | 56%                       | 69%                  |
| PM <sub>2.5</sub> annual average                              | 10   | 3.2  | 32%                       | 1.2   | 12%                       | 63%                  |
| <b>NO<sub>2</sub></b>   |  |  |                           |   |                           |                      |
| <u>SA NAAQS</u>   |  |  |                           |   |                           |                      |
| NO <sub>2</sub> 1-hr average, 89 <sup>th</sup> high           | 200  | 164.0  | 82%                       | 106.5   | 53%                       | 35%                  |
| NO <sub>2</sub> annual average                                | 40   | 8.76   | 22%                       | 4.7   | 12%                       | 46%                  |
| <u>US NAAQS</u>   |  |  |                           |   |                           |                      |
| NO <sub>2</sub> 1-hr average, 8 <sup>th</sup> high daily peak | 188  | 633.6  | 337%                      | 395.8   | 211%                      | 38%                  |
| <u>WHO Guidelines</u>   |  |  |                           |   |                           |                      |
| NO <sub>2</sub> 1-hr average, maximum                         | 200  | 2,020.6  | 1,010%                    | 1,563.2   | 782%                      | 23%                  |
| NO <sub>2</sub> annual average                                | 40   | 8.76   | 22%                       | 4.7   | 12%                       | 46%                  |

## Mapping Pollution Concentrations

The modeled gridded concentrations were used to develop contour plots (maps) showing pollutant concentrations from the 14 sources at each grid location.

Appendix A includes additional 3-D contour plots illustrating the spatial variability of modeled peak concentrations for one-hour ( $\text{SO}_2$  and  $\text{NO}_2$ ) and 24-hour ( $\text{PM}_{10}$ ) averaging times.



**Figure 3. Modeled Annual Average  $\text{SO}_2$  Concentration ( $\mu\text{g}/\text{m}^3$ ): All Sources, 2016 Actual Emissions**









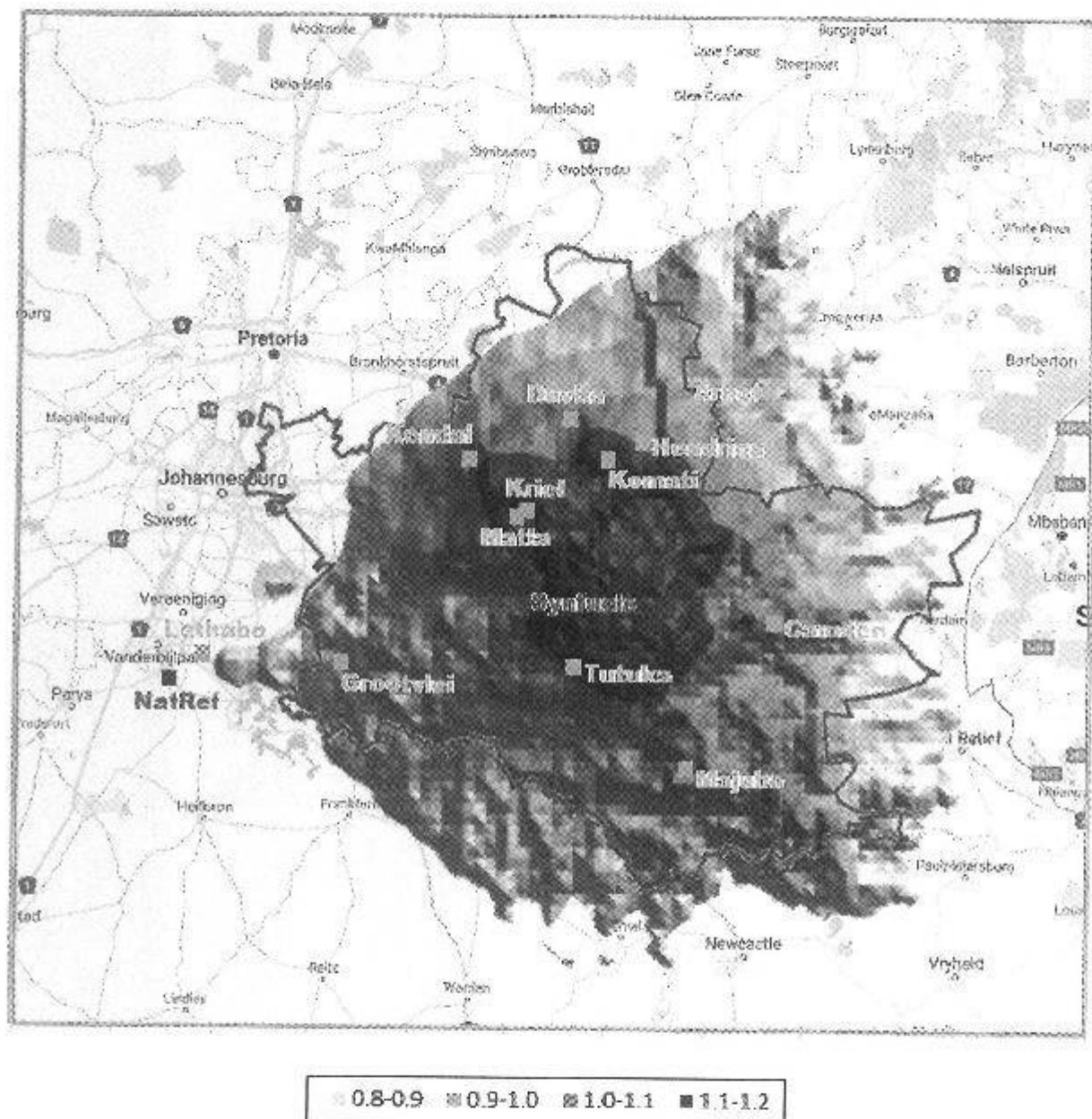


Figure 7. Modeled Annual Average PM<sub>2.5</sub> Concentration (µg/m<sup>3</sup>): All Sources, 2020 MES

The contour plots demonstrate that pollution from the 14 facilities occurs over a large area of the HPA. For example, the model results indicate that the annual average SO<sub>2</sub> concentration from the 14 facilities during 2016 exceeded 8 µg/m<sup>3</sup> over an area of 33,632 square kilometers (corresponding to the area within the orange contour band in Figure 3). This is almost one quarter of the entire modeling domain area. If the modeled sources were compliant with the 2020 MES, this area of relatively high pollution concentrations from the 14 sources would be completely eliminated (the highest annual average SO<sub>2</sub> concentration would only be 4.0 µg/m<sup>3</sup> under the 2020 MES scenario; see Table 2).

Similarly, the modeled annual average PM<sub>2.5</sub> concentration during 2016 due to emissions from the 14 sources was at least 2 µg/m<sup>3</sup> over an area of 44,368 square kilometers (30% of the full modeling domain area; the area within the orange contour band in Figure 4). The 5<sup>th</sup> highest modeled 24-hour average PM<sub>2.5</sub> concentration from the 14 sources exceeded 15 µg/m<sup>3</sup> over an area of 38,304 square km (the area within the orange contour band in Figure 6). If the 2020 MES were met, the model results indicate that these areas of greater PM<sub>2.5</sub> concentrations from the 14 sources would be completely removed. Under the 2020 MES scenario, the annual average PM<sub>2.5</sub> concentrations would exceed 1.0 µg/m<sup>3</sup> over an area of 16,576 km<sup>2</sup> (the area within the orange contour band in Figure 7), which is less than 15 percent of the area impacted at that concentration level during 2016 (within the outer contour band in Figure 4).<sup>19</sup>

### **Sensitive Locations: Schools and Hospitals**

In addition to the gridded receptors, the CALPUFF model was also used to predict concentration impacts at each of the 120 sensitive receptor locations shown in Figure 2, consisting mostly of schools, hospitals, and other locations where children, the elderly, and the infirm might reside (the list of sensitive receptor locations appears in Table A-1 of Appendix A). The modeled concentrations from each individual source (facility) at each sensitive receptor location, corresponding to each of the pollutant design value metrics in Table 2, are shown in Appendices C and D.

Daily average SO<sub>2</sub> exposure from the 14 facilities exceeded the World Health Organization's health-based guideline at *all* of the 120 sensitive sites in 2016. Implementing the 2020 MES at the facilities would bring SO<sub>2</sub> exposures at all except nine of the sensitive sites to within the WHO guideline.

One-hour average exposures of NO<sub>2</sub> due to cumulative emissions from the 14 facilities occurred at levels above the WHO guideline at 28 locations in 2018 and were highest at Elsie Ballot Hospital, Kwanala Primary School, Duvha Primary School, and Camden Combined School. If the 2020 MES were implemented, all but 14 locations would no longer be exposed to NO<sub>2</sub> levels that exceed the WHO one-hour average guideline.

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<sup>19</sup> The 1.0 µg/m<sup>3</sup> contour in Figure 4 extends beyond the modeling domain.

#### D. Conclusions Regarding Dispersion Modeling Results

The CALPUFF results demonstrate that the 14 sources contributed large amounts of pollutants to the ambient air in the HPA region during 2016. The 14 sources *alone* significantly contributed to exceedances of the SA NAAQS, and the unhealthy air quality conditions in the region.

According to the model, emissions from the 14 sources alone come close to exceeding the one-hour SA NAAQS level for SO<sub>2</sub> in the HPA region. (The modeled sources were responsible for 85% of the one-hour SO<sub>2</sub> standard level and 92% of the 24-hour SO<sub>2</sub> standard level in 2016.) The 14 sources represent the majority of the SO<sub>2</sub> emissions in and around the HPA,<sup>20</sup> that if combined with peak short-term modeled SO<sub>2</sub> impacts from other (non-modeled) sources<sup>21</sup> would likely lead to exceedances of the one-hour standard.<sup>22</sup> The peak modeled one-hour NO<sub>2</sub> concentration due to the 14 sources also nearly exceeded the acceptable SA NAAQS level. (The 14 sources alone accounted for over 80% of the acceptable one-hour NO<sub>2</sub> SA NAAQS level.) The peak modeled one-hour SO<sub>2</sub> and NO<sub>2</sub> concentrations due to the 14 sources in 2016 far exceeded the more stringent US NAAQS and the World Health Organization guidelines.

There are measurable human health impacts even at pollutant concentrations below the NAAQS standard levels. The NAAQS levels do not represent a "threshold of safety", below which no harm occurs.<sup>23</sup> This is particularly true for NAAQS that are weaker than the World Health Organization guidelines.

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<sup>20</sup> South Africa Department of Environmental Affairs. *Highveld Priority Area Air Quality Management Plan (AQMP)*. 2011.

<sup>21</sup> Comparisons of modeled and observed monthly average SO<sub>2</sub> concentrations suggests that other sources likely contribute significant amounts of SO<sub>2</sub> at certain locations, especially during winter months when the monitored SO<sub>2</sub> levels are observed to be elevated (for example, at Witbank; see Appendix A).

<sup>22</sup> Examination of air quality monitoring data for the HPA region for 2015-2017 shows that the peak (99<sup>th</sup> percentile) observed one-hour average SO<sub>2</sub> concentration was 361 µg/m<sup>3</sup> at Witbank, which exceeds the acceptable SA NAAQS level. The peak observed one-hour average SO<sub>2</sub> concentration in the HPA region during 2016 was 285 µg/m<sup>3</sup> (also at Witbank) (which is very close to the modeled 89<sup>th</sup> high of 297 µg/m<sup>3</sup> due to the 14 modeled sources, although not at the same location). The peak observed one-hour average SO<sub>2</sub> concentration during 2016 at the other four HPA monitoring sites ranged from 144 to 188 µg/m<sup>3</sup>. The peak observed daily (24-hour average) SO<sub>2</sub> concentration in 2016 at the five HPA monitors ranged from 71 µg/m<sup>3</sup> (at Secunda) to 190 µg/m<sup>3</sup> (at Witbank), which exceeded the acceptable SA NAAQS level of 125 µg/m<sup>3</sup>. (The modeled peak daily average SO<sub>2</sub> concentration in 2016 due to the 14 sources was 115 µg/m<sup>3</sup>).

<sup>23</sup> The US EPA's quantitative human health risk assessment (RA) for particulate matter (Quantitative Health Risk Assessment for Particulate Matter, Final Report. EPA-452/R-10-005. June 2010. [https://www3.epa.gov/ttr/naaqs/standards/pm/data/PM\\_RA\\_FINAL\\_June\\_2010.pdf](https://www3.epa.gov/ttr/naaqs/standards/pm/data/PM_RA_FINAL_June_2010.pdf)) clearly demonstrates that there are significant health effects associated with air quality below the levels of the NAAQS. For example, the RA pointed out that there are actually greater overall health impacts to an urban area due to days with 24-hour average PM<sub>2.5</sub> levels nearer to the annual average value rather than days with relatively higher PM<sub>2.5</sub> levels falling in the tail of the annual 24-hour PM<sub>2.5</sub> distribution. As explained by EPA (RA, page 3-11): "This finding reflects the fact that the number of deaths associated with short-term exposure to PM<sub>2.5</sub> depends both on the number of days at a given concentration and on the concentration itself. Because the urban areas considered... had 24-hour PM<sub>2.5</sub> distributions that were closer to normal or log-normal in form (i.e., not uniform), overall incidence of short-term exposure-related mortality was



Both the one-hour and 24-hour SA SO<sub>2</sub> standards and the one-hour NO<sub>2</sub> standard are close to being exceeded in the HPA due just to the 14 sources, which demonstrates that these sources contribute to unhealthy short-term exposures to SO<sub>2</sub> and NO<sub>2</sub>. When measured against the US health-based NAAQS, there is clear evidence that the 14 sources were alone responsible for causing unhealthy short-term exposures to SO<sub>2</sub> and NO<sub>2</sub> during 2016.<sup>24</sup>

There are significant health consequences associated with both long-term (annual) and short-term (i.e., 24-hour) PM<sub>2.5</sub> exposures, including increased risk of mortality. Although the combined emissions from all 14 modeled sources were not predicted to have caused an exceedance of the recently adopted PM<sub>2.5</sub> 24-hour SA NAAQS (40 µg/m<sup>3</sup>) under the 2016 baseline (actual emissions) scenario, the modeled sources alone accounted for almost 70% of the acceptable level, which represents a substantial contribution to short-term ambient PM<sub>2.5</sub> levels. The maximum modeled annual average PM<sub>2.5</sub> concentration also did not exceed either the SA or US NAAQS, however the combined impact of all modeled sources accounted for as much as 3.2 µg/m<sup>3</sup>, which is more than 15 percent of the acceptable SA NAAQS level for PM<sub>2.5</sub> (20 µg/m<sup>3</sup>), and more than 25 percent of the acceptable US annual average standard level (12 µg/m<sup>3</sup>). Given the numerous sources of PM<sub>2.5</sub> in and around the HPA, the power stations are significant contributors.

The modeled power stations' PM<sub>2.5</sub> impacts, together with the other significant sources of PM<sub>2.5</sub> in the HPA region, including automobiles, trucks (especially diesels), buses, and off-road vehicles, mining, construction equipment, trains, residential heating and cooking, agricultural activity, and windblown dust, all combine in varying amounts, both in time and location, to create the (routinely) observed exceedances of the 24-hour PM<sub>2.5</sub> standard level in the HPA region.<sup>25</sup> The long-term (annual average) PM<sub>2.5</sub> impacts from the 14 modeled sources did not, on their own, exceed the annual PM<sub>2.5</sub> standard levels in 2016, but they substantially contributed to elevated ambient concentrations. The increased exposure to fine particulate matter was experienced over a large area with a sizeable population. Even a modest long-term increase in PM<sub>2.5</sub> exposure can have significant health consequences, as established by the World Health Organization<sup>26</sup>, and as demonstrated in the next section of this report.

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driven by the relatively large number of days near the center of the distribution, rather than the small number of days out at the tail." EPA makes it very clear that there are measurable health impacts, including the increased risk of mortality, associated with exposure to PM<sub>2.5</sub> even at average daily PM<sub>2.5</sub> concentration levels.

<sup>24</sup> The model results indicate the potential for very high (intermittent) one-hour average SO<sub>2</sub> and NO<sub>2</sub> concentrations, which are not adequately controlled by the form of the SA one-hour SO<sub>2</sub> NAAQS (based on the 89<sup>th</sup> highest one-hour average).

<sup>25</sup> Examination of monitoring data shows that the peak (99<sup>th</sup> percentile) observed 24-hour average PM<sub>2.5</sub> concentration exceeded the (recently adopted) SA NAAQS level of 40 µg/m<sup>3</sup> at all ten HPA and VTPA sites during the 2015 to 2017 period, with peak concentrations ranging from 52 to 207 µg/m<sup>3</sup>. (The modeled 5<sup>th</sup> highest 24-hour average PM<sub>2.5</sub> concentration (corresponding to the 99<sup>th</sup> percentile) from the 14 sources during 2016 was 27 µg/m<sup>3</sup>).

<sup>26</sup> World Health Organization, *WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, Global update 2005, Summary of risk assessment* (2006) at 10.



The PM<sub>2.5</sub> impacts from the modeled sources are caused by a combination of both directly emitted (primary) PM<sub>2.5</sub> and secondary particulate matter, which is formed in the atmosphere from the conversion of SO<sub>2</sub> and NO<sub>x</sub>. In fact, the majority of the modeled PM<sub>2.5</sub> concentration impacts in the HPA from the 14 sources is due to secondary sulfate and nitrate (as a result of SO<sub>2</sub> and NO<sub>x</sub> emissions from the 14 sources). The significant modeled improvements in PM air quality if the 14 sources complied with the 2020 MES are largely due to reductions in SO<sub>2</sub> emissions (and to a lesser extent the emission reductions in PM<sub>2.5</sub> and NO<sub>x</sub> emissions).

The CALPUFF model results demonstrate that emissions from the 14 sources during 2016 were responsible for large contributions to air pollution throughout the modeling domain, which caused considerable harm to the exposed population. If the 2020 MES were met, the model results confirm that there would be a significant reduction in exposures to both short-term and long-term pollutant concentrations in the HPA area (as shown in Table 2).

## **ANALYSIS OF EARLY DEATHS FROM PM<sub>2.5</sub>**

### **A. Methodology**

The dispersion model results were used to estimate the health effects associated with exposure to primary and secondary PM<sub>2.5</sub> from the modeled sources.<sup>27</sup> Health impacts associated with PM<sub>2.5</sub> exposure were estimated using concentration-response functions that were originally adapted from the WHO Global Burden of Disease (GBD) 2010 project (Lim et al. 2012). The study was an authoritative examination of preliminary deaths caused by PM<sub>2.5</sub> globally, and developed a new risk model with emphasis on applicability at high average concentrations. The risk functions in the model level off at high concentrations, taking into account the findings showing that risk for the same concentration increase is higher at low concentrations. The risk functions have recently been extended to account for ambient PM<sub>2.5</sub> concentrations over the entire global exposure range (Burnett et al. 2014). These risk functions were used to relate PM<sub>2.5</sub> exposure to mortality in more recent GBD studies (2015 and 2016).

Burnett et al. (2014) developed an integrated exposure–response (IER) model to predict the relative risk (RR) associated with increased levels of exposure to PM<sub>2.5</sub> for four causes of mortality in adults: ischemic heart disease (IHD), cerebrovascular disease (stroke), chronic obstructive pulmonary disease (COPD), and lung cancer (LC). They also developed RR functions for the incidence of acute lower respiratory infection (ALRI) that can be used to estimate mortality in children under 5 years of age. Total mortality in the

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<sup>27</sup> Other air pollutants from the power stations with potentially severe health impacts include SO<sub>2</sub>, NO<sub>x</sub>, dioxin, mercury, volatile organic compounds, mercury, lead, cadmium, and arsenic, however their health impacts have not been sufficiently studied for quantitative risk assessment modeling.

IER model is estimated as the sum of the four cause-specific mortality risks for the adult population and the ALRI risk for children.

The IER model was used to estimate the increase in the causes of adult mortality that are most closely associated with increases in fine particle exposure in and around the HPA. The four causes of adult mortality are responsible for about 40 percent of the total (non-AIDS) deaths in South Africa. The cause-specific approach provides better transferability from one country to another than earlier approaches that used all-cause mortality as the indicator, and provides a breakdown of the causes of the preliminary deaths attributable to PM<sub>2.5</sub> exposure from the modeled coal-fired power plants and other sources.<sup>28</sup>

The IER method used in the current analysis accounts for the increase in mortality risk for five cause-specific types of mortality. The results of a more recent study, conducted by the same researchers who developed the IER (GBD) model, in which PM<sub>2.5</sub> exposure was related to *all-cause* (non-accidental) mortality, “suggest that PM<sub>2.5</sub> exposure may be related to additional causes of death than the five considered by the GBD and that incorporation of risk information from other, non-outdoor, particle sources leads to underestimation of disease burden, especially at higher concentrations”.<sup>29</sup> For this reason, the rates of increased mortality that were estimated in the current analysis using the five-cause IER model should be considered a conservative, lower bound, estimate of the mortality impacts due to the modeled sources.

Data that were used in the health analysis include: (1) population data for South Africa, by gender (male/female) and age group in each administrative unit (neighborhood) within the entire modeling domain, (2) baseline mortality rates for South Africa for each cause of death, by gender and age group, (3) concentration response function data, representing the IER model's risk functions (the relative increase in mortality due to an increase in PM<sub>2.5</sub> exposure concentration) for each cause of death, by gender and age, (4) baseline PM<sub>2.5</sub> exposures across the modeling domain, and (5) incremental PM<sub>2.5</sub> exposures due to the 14 modeled sources (model output) for each emissions scenario (2016 actual emissions, and 2020 MES). A detailed description of the health analysis methodology can be found in Appendix B of this report.

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<sup>28</sup> RRs developed for all-cause mortality are not directly translatable to South Africa (where mortality rates are higher for a number of non-air pollution related causes). The World Health Organization (WHO) Health Risks of Air Pollution in Europe (HRAPIE) project (2013) experts recommend estimation of the impact of long-term (annual average) exposure to PM<sub>2.5</sub> on all-cause (natural) mortality in adult populations (age 30+ years) based on a linear concentration response function (CRF), with an RR of 1.062 (95% CI = 1.040, 1.083) per 10 µg/m<sup>3</sup> increase in exposure (at all levels of baseline PM<sub>2.5</sub> exposure). Using this all-cause RR (which was developed based on data from adult populations in North America and Europe) would over-estimate the mortality impact in South Africa. Nevertheless, I applied the simple all-cause all-age HRAPIE model to provide an (alternative) *upper-bound* estimate of the mortality impacts due to PM<sub>2.5</sub> concentration impacts from the 14 modeled sources

<sup>29</sup> Burnett, R.T., et al., *Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter*, Proceedings of the National Academy of Sciences, Sept. 2018, [www.pnas.org/cgi/doi/10.1073/pnas.1803222115](http://www.pnas.org/cgi/doi/10.1073/pnas.1803222115).

The dispersion model results were used to determine average PM<sub>2.5</sub> exposure levels for the population within the entire modeling domain (total 2016 population: 20.6 million) for each emission scenario. The population-weighted average incremental PM<sub>2.5</sub> exposure from all 14 sources combined under the 2016 baseline (actual emissions) scenario was estimated to be 1.45 µg/m<sup>3</sup>. For the 2020 MES scenario, an average individual in the modeling domain would be exposed to 0.59 µg/m<sup>3</sup> of PM<sub>2.5</sub> from all modeled sources, a significant reduction relative to the baseline scenario.

## **B. Health Analysis Results**

The estimated annual mortality for each cause attributable to the PM<sub>2.5</sub> from all modeled sources is shown in Table 3. Table 4 shows the estimated mortality impacts due to the increase in PM<sub>2.5</sub> exposure from each modeled source.<sup>30</sup> The results for the baseline (actual emissions) scenario indicate that the 14 sources were responsible for between 305 and 650 early deaths in and around the HPA region during 2016 (95 percent confidence interval).

The three worst offenders were Lethabo power station (57 to 122 early deaths), Kendal power station (46 to 99 early deaths), and Kriel power station (34 to 76 early deaths).

The modeled PM<sub>2.5</sub> concentration impacts for all sources under the 2020 MES scenario (123 to 263 early deaths) were significantly lower than for the baseline scenario. Implementing the 2020 MES would result in 60 percent fewer deaths per year, preventing early death for between 182 and 388 people in and around the HPA every year.<sup>31</sup>

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<sup>30</sup> The PM<sub>2.5</sub> concentration impacts and associated health impacts due to all sources is less than the sum of the modeled sources. Combining all sources within the model slightly reduces the formation of particulate nitrate.

<sup>31</sup> As an alternative, I applied the HRAPIE experts' recommended method for estimating the impact of long-term (annual average) exposure to PM<sub>2.5</sub> on all-cause (natural) mortality in adult populations (age 30+ years). The results using the simple all-cause all-age HRAPIE model indicate that between 1,536 and 3,186 deaths (mean: 2,380) occurred in 2016 due to 14 sources. If the 2020 MES were met, the HRAPIE-recommended all-cause mortality model estimates that the 14 sources would be responsible for between 622 and 1,291 (mean: 965) annual deaths. The all-cause HRAPIE mortality model represents an (alternative) *upper-bound* estimate of mortality in the HPA region. However, although informative, as explained in footnote 29 (above), using the all-cause all-age HRAPIE model (which was developed based on data from adult populations in North America and Europe) would over-estimate the mortality impact in South Africa.

**Table 3. Estimated Annual Mortality (Additional Deaths/Year), by Cause**

|  | BASELINE     |              |              | 2020 MES     |              |              |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
|  | MEAN         | CI LOW       | CI HIGH      | MEAN         | CI LOW       | CI HIGH      |
| IHD  | 192.2        | 116.9        | 305.3        | 77.4         | 47.1         | 123.3        |
| Lung Cancer  | 21.3         | 4.8          | 36.2         | 8.6          | 2.0          | 14.6         |
| Stroke   | 183.3        | 56.2         | 340.1        | 74.1         | 22.7         | 137.5        |
| COPD   | 29.2         | 11.4         | 50.5         | 11.8         | 4.6          | 20.4         |
| Lower Respiratory Infections<br>(children under 5) | 28.6         | 17.6         | 41.0         | 11.6         | 7.2          | 16.6         |
| <b>Total</b>                                       | <b>454.7</b> | <b>304.5</b> | <b>650.2</b> | <b>183.6</b> | <b>122.9</b> | <b>262.6</b> |

**Table 4. Estimated Annual Mortality (Additional Deaths/Year), by Source**

|                    | BASELINE     |              |              | 2020 MES     |              |              |
|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                    | MEAN         | CI LOW       | CI HIGH      | MEAN         | CI LOW       | CI HIGH      |
| Arnot              | 24.7         | 16.6         | 35.3         | 11.0         | 7.4          | 15.7         |
| Camden             | 20.8         | 14.0         | 29.7         | 7.8          | 5.2          | 11.1         |
| Duvha              | 41.3         | 27.7         | 59.0         | 11.7         | 7.9          | 16.8         |
| Grootvlei          | 20.0         | 13.3         | 28.6         | 7.0          | 4.7          | 10.0         |
| Hendrina           | 18.8         | 12.6         | 26.8         | 9.7          | 6.5          | 13.9         |
| Kendal             | 69.2         | 46.3         | 99.0         | 27.7         | 18.6         | 39.7         |
| Komati             | 12.0         | 8.0          | 17.1         | 4.3          | 2.9          | 6.2          |
| Kriel              | 50.7         | 34.0         | 72.5         | 15.4         | 10.3         | 22.0         |
| Lethabo            | 85.1         | 56.6         | 121.8        | 48.1         | 32.0         | 68.9         |
| Majuba             | 37.4         | 25.1         | 53.4         | 14.3         | 9.6          | 20.5         |
| Matla              | 49.4         | 33.1         | 70.7         | 8.4          | 5.6          | 12.0         |
| Tutuka             | 41.8         | 28.0         | 59.7         | 14.2         | 9.5          | 20.3         |
| Synfuels           | 50.3         | 33.7         | 72.0         | 13.7         | 9.2          | 19.6         |
| NatRef             | 5.3          | 3.5          | 7.5          | 1.2          | 0.8          | 1.8          |
| <b>ALL SOURCES</b> | <b>454.7</b> | <b>304.5</b> | <b>650.2</b> | <b>183.6</b> | <b>122.9</b> | <b>262.6</b> |

  
Dr. H. Andrew Gray

3 June 2019

Date



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Suburb MPOMBELA

MBOMBELA - NLF

|         |              |      |      |
|---------|--------------|------|------|
| country | South Africa | size | 1200 |
|---------|--------------|------|------|

contact Ms Doreen Sithole tel (+27) 13/540/29

E-mail

**International** ☐ DOCUMENTS ☐ NON-DOCUMENTS

WE HAVE SEEN AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE (OVERLEAF) WHICH SHALL APPLY TO THIS CONSIGNMENT AND ALL FUTURE CONSIGNMENTS ACCEPTED BY POSTNET. WE FURTHER DECLARE THAT THIS CONSIGNMENT DOES NOT CONTAIN DANGEROUS GOODS.

**EXPRESS PACK SECURITY  
NUMBER ON LIP OF FLYER**

### SENDER'S DETAILS

Name: Fransis Date: 2022-08-10

Signature: \_\_\_\_\_ Time: 12:26:23

| CHARGES | RANDS |
|---------|-------|
|---------|-------|

| CHARGES | RANDS | CENTS |
|---------|-------|-------|
|---------|-------|-------|

|              |  |  |
|--------------|--|--|
| Basic Tariff |  |  |
|--------------|--|--|

|           |  |  |
|-----------|--|--|
| Surcharge |  |  |
|-----------|--|--|

|           |  |  |
|-----------|--|--|
| Insurance |  |  |
|-----------|--|--|

|                     |  |  |
|---------------------|--|--|
| Packaging Surcharge |  |  |
| 144T                |  |  |

|                 |  |  |
|-----------------|--|--|
| VAT             |  |  |
| TOTAL INCL. VAT |  |  |

or call 0860 POSTNET (76786281)

elco.za or call 0800 POSTNET (767 8638)

OSTNET STANDARD CONDITIONS OF CARRIAGE

**DEFINITIONS**  
In these terms and conditions of carriage, the following terms shall have the following meanings: 1.1.1 "the company" means First Southern Africa Pty Ltd or its duly authorized Agent/ franchisee issuing the waybill or providing the service to be shipped; 1.1.2 "consignor" means all goods transported under a single waybill; 1.1.3 "goods" includes all goods, parcels or documents transported by the company (or its shipper and includes its packaging or other container) and all accessories or contents are contained; 1.1.4 "the shipper" includes any person, natural or corporate, authorized (either directly or indirectly) by the consignor to enter into a contract of carriage with the company; 1.1.5 "transporter" includes the loading, loading, unloading, storage and delivery of the goods, and includes any services provided to the company; in connection with the "transport of" shall mean a consignment of 1.1.4 goods will "includes any goods" (including but not limited to) 1.1.5 goods and 1.1.6 goods and 1.1.7 goods and 1.1.8 goods and 1.1.9 goods and 1.1.10 goods and 1.1.11 goods and 1.1.12 goods and 1.1.13 goods and 1.1.14 goods and 1.1.15 goods and 1.1.16 goods and 1.1.17 goods and 1.1.18 goods and 1.1.19 goods and 1.1.20 goods and 1.1.21 goods and 1.1.22 goods and 1.1.23 goods and 1.1.24 goods and 1.1.25 goods and 1.1.26 goods and 1.1.27 goods and 1.1.28 goods and 1.1.29 goods and 1.1.30 goods and 1.1.31 goods and 1.1.32 goods and 1.1.33 goods and 1.1.34 goods and 1.1.35 goods and 1.1.36 goods and 1.1.37 goods and 1.1.38 goods and 1.1.39 goods and 1.1.40 goods and 1.1.41 goods and 1.1.42 goods and 1.1.43 goods and 1.1.44 goods and 1.1.45 goods and 1.1.46 goods and 1.1.47 goods and 1.1.48 goods and 1.1.49 goods and 1.1.50 goods and 1.1.51 goods and 1.1.52 goods and 1.1.53 goods and 1.1.54 goods and 1.1.55 goods and 1.1.56 goods and 1.1.57 goods and 1.1.58 goods and 1.1.59 goods and 1.1.60 goods and 1.1.61 goods and 1.1.62 goods and 1.1.63 goods and 1.1.64 goods and 1.1.65 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1.1.289 goods and 1.1.290 goods and 1.1.291 goods and 1.1.292 goods and 1.1.293 goods and 1.1.294 goods and 1.1.295 goods and 1.1.296 goods and 1.1.297 goods and 1.1.298 goods and 1.1.299 goods and 1.1.300 goods and 1.1.301 goods and 1.1.302 goods and 1.1.303 goods and 1.1.304 goods and 1.1.305 goods and 1.1.306 goods and 1.1.307 goods and 1.1.308 goods and 1.1.309 goods and 1.1.310 goods and 1.1.311 goods and 1.1.312 goods and 1.1.313 goods and 1.1.314 goods and 1.1.315 goods and 1.1.316 goods and 1.1.317 goods and 1.1.318 goods and 1.1.319 goods and 1.1.320 goods and 1.1.321 goods and 1.1.322 goods and 1.1.323 goods and 1.1.324 goods and 1.1.325 goods and 1.1.326 goods and 1.1.327 goods and 1.1.328 goods and 1.1.329 goods and 1.1.330 goods and 1.1.331 goods and 1.1.332 goods and 1.1.333 goods and 1.1.334 goods and 1.1.335 goods and 1.1.336 goods and 1.1.337 goods and 1.1.338 goods and 1.1.339 goods and 1.1.340 goods and 1.1.341 goods and 1.1.342 goods and 1.1.343 goods and 1.1.344 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1.1.400 goods and

[illegible][illegible][illegible][illegible]

14. Any latent defect, or absence of value or weakness, in the goods;  
15. Any reason other than a genuine neglect or omission on the part of the company.

CLAIMS

16. Any claims against the company must be notified to the company in writing accompanied by copies of all relevant documentation, within 14 days of the date of delivery of the goods by the company or, in circumstances of non-delivery, within 14 days of the scheduled delivery date of the goods, failing which it shall be deemed to have been waived.

2. Not later than compliance with 11.1, any claim against the company shall be extinguished (a) for purposes of 10 days after the date of delivery of the goods by the company or, in the case of non-delivery, after the scheduled delivery date of the goods, and (b) prior to the expiry of the period a summa is due to the purchaser, notwithstanding legal action has been started by the company.

3. The signature of the consignee on the *Wahlzettel* in acknowledgement of having received the goods referred to therein in good order and condition, shall, by prior final proof of the goods referred to therein having been properly delivered by the company, in good order and condition.

4. Any claim against the company for damage to the goods shall, in addition to 11.1 and 11.2, be extinguished for all purposes unless a consignee notifies the carrier of such loss or damage on the way (a) within the period of making delivery.

1.1 The goods, real and depreciable relating thereto, in so far as they are funds, equipment, fixtures and other resources generated by the company on the shipper's behalf, shall be subject to a special and general lien and pledge, in favour of the company, either for monies due in respect of such goods or for other monies due to the company by the shipper.

1.2 Any monies due to the company as a result of a bill within 15 days after written notice has been given to the shipper concerning payment and noting the said goods's terms have been obtained, the goods in other terms may be sold by auction or otherwise disposed of at the company's discretion and at the shipper's expense, and the said

**INDEMNITY**  
The shipper indemnifies the company against all liabilities, damages, claims, costs and expenses incurred as suffered by the company arising directly or indirectly from its connection with the shipper's instructions or their implementation, by or on behalf of or at the instance of the consignee in relation to the transportation of the goods (even where the company has consented to the transport of the goods) or any breach of the terms given to the company by the shipper.

1. These terms and conditions constitute the whole agreement between the company and the applicant and the company shall have the right to amend or alter these terms and conditions without the need to inform the applicant.

4.5. The validity and acquisition of these terms and conditions will be governed by and construed in accordance with the laws of the Republic of South Africa.

[illegible]

To view the Standard Conditions of Carriage online, Please visit <http://www.postnet.co.za/standard-conditions-of-carriage>

| Shipment Summary   |  |
|--|--|
| Shipment Number  | PNA7779205773  |
| Pickup Date  | 08/10/2022 5:43:00 PM                                      |
| Shipper Reference  |  |
| Current Status   | Delivered Doreen(Notify me when the shipment is delivered) |
| Delivered On   |  |
| Delivered To   |  |
| For inquiries and amending delivery instructions about this shipment, <a href="#">click here</a> to submit a customer care request or contact origin office at: , destination office at: |  |
| Time values are local to the service area in which the shipment checkpoint is recorded.  |  |



PostNet Name: PostNet - Sinoville

Tel. No.: (+27) 012 543 2371 Acc. No.: PN077



PNA7761444039

Senders Copy

From: (Sender) PostNet - Sinoville

Street Address Shop 7 Sinoville Corner

284 Braam Pretorius Street

Suburb Sinoville City/Town Pretoria

Country South Africa Code 0182

Contact Fransis Tel (+27) 824075639

E-mail sinoville@postnet.co.za

Insurance Yes ☒ If yes, state valueDomestic ☒ Overnight ☐ Economy (48-72hrs) ☐ Dawn Courier ☐ Saturday☐ Non Express (24-48hrs) ☐ Same Day Courier ☐ Other Specify ☐ Public Holiday After HoursInternational ☐ DOCUMENTS ☐ NON-DOCUMENTS

No. of Parcels Description of goods Length in cm Breadth in cm Height in cm Mass in kg

1 Parcel 40.00 30.00 1.00 2.00

1 Total No. of Parcels Total Vol 0.24 Total Mass 2.00

POSTNET AND ARAMEX RESERVE THE RIGHT TO MARK THE SERVICE "OVERNIGHT EXPRESS" FOR "DOMESTIC" SHOULD NO SERVICE BE SELECTED

POSTNET and Aramex company

To track your shipment go to: www.postnet.co.za or call 0860 POSTNET (7678638)

To: (Receiver) Mpumalanga Tourism Parks Agenc

Street Address Office G27

N4 Halls Gateway

Suburb MATAFFIN City/Town MATAFFIN - NLP

Country South Africa Code 1205

Contact Ms Thabile Mnsis Tel (+27) 132540279

E-mail

SPECIAL INSTRUCTIONS

WE HAVE SEEN AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE (OVERLEAF) WHICH SHALL APPLY TO THIS CONSIGNMENT AND ALL FUTURE CONSIGNMENTS ACCEPTED BY POSTNET. WE FURTHER DECLARE THAT THIS CONSIGNMENT DOES NOT CONTAIN DANGEROUS GOODS.

EXRESS PACK SECURITY NUMBER ON LIP OF FLYER

SENDER'S DETAILS

Name: Fransis Date: 2022-08-10

Signature: Time: 12:28:42

ACCEPTED BY POSTNET

Name Khosi

Signature 2022-08-10 12:28:42

Date Time

CHARGES RANDS CENTS

Basic Tariff

Surcharge

Insurance

Packaging Surcharge

VAT

TOTAL INCL. VAT

## POSTNET STANDARD CONDITIONS OF CARRIAGE

- 1.1 These terms and conditions of carriage, together with the following, shall apply to all consignments accepted for carriage by PostNet (Pty) Ltd. or its franchisees (the "Company") in South Africa.
- 1.2 "Goods" means articles of goods, parcels or documents consigned to the Company by the shipper and received by the Company in its own name or on its behalf.
- 1.3 "Shipper" means the person or entity who consigns goods to the Company for carriage by the Company.
- 1.4 "Receiver" means the person or entity to whom goods are consigned by the Company for carriage by the Company.
- 1.5 "Freight" means the charge payable by the shipper to the Company for carriage of goods by the Company.
- 1.6 "Insurance" means the cover provided by the Company for the goods in transit.
- 1.7 "Packaging" means the material used to protect the goods in transit.
- 1.8 "Label" means the document attached to the goods indicating the destination and other relevant information.
- 1.9 "Consignment" means the goods being transported by the Company.
- 1.10 "Standard Conditions of Carriage" means these terms and conditions.
- 1.11 "PostNet" means the Company.
- 1.12 "Aramex" means the Company.
- 1.13 "PostNet and Aramex" means the Company.
- 1.14 "PostNet and Aramex Reserve the Right to Mark the Service 'Overnight Express' for 'Domestic' Should No Service be Selected" means the Company's right to mark the service as 'Overnight Express' for 'Domestic' if no service is selected.
- 1.15 "PostNet and Aramex Company" means the Company.
- 1.16 "To track your shipment go to: www.postnet.co.za or call 0860 POSTNET (7678638)" means the Company's website and contact number.
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To view the Standard Conditions of Carriage online, Please visit <http://www.postnet.co.za/standard-conditions-of-carriage>

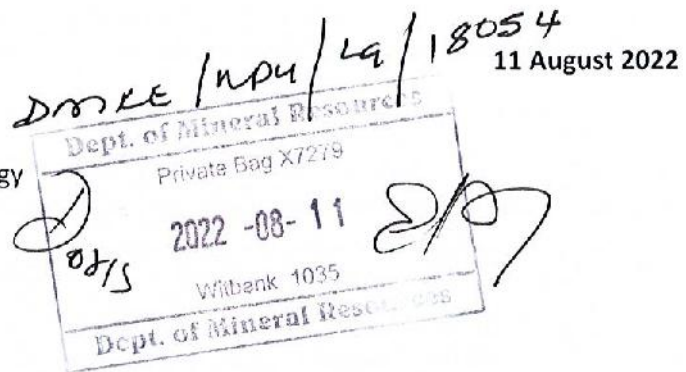




**HAND DELIVERY**

**DMR REF: MP 30/5/1/2/2/169 MR**

Regional Manager: Mpumalanga Region  
Department of Mineral Resources and Energy  
Saveways Centre, First Floor  
Mandela Drive  
eMalahleni  
1035



**RE: DRAFT BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME: GLENCORE COAL OPERATIONS SOUTH AFRICA: GOEDGEVONDEN COMPLEX: DMR REF: MP 30/5/1/2/2/169 MR**

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The proposed amendments trigger the requirement for a Basic Assessment process as contemplated in regulations 19 and 20 of the 2014 Environmental Impact Assessment (EIA) Regulations promulgated in Government Notice No. R. 982-986 of 4 December 2014 in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

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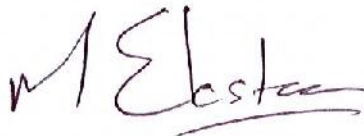
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*Lizinda Dickson / Fransis Stoltz*

**Tel: 012 543 9093; Fax: 086 571 0939; Email: [ggvamendment@participation.co.za](mailto:ggvamendment@participation.co.za)**

Should you require any further clarity feel free to contact our Public Participation Office.

Yours sincerely,



**MARIETJIE EKSTEEN**

EAPASA Reg. No. 2020/1800

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7 Landdros Mare Street, Polokwane  
PO Box 31675, Superbia, 0759  
[marietjie@jacanacc.co.za](mailto:marietjie@jacanacc.co.za)

Co Reg. Nr.: CK2005/136263/23  
Member: M. Eksteen  
VAT Reg. Nr.: 9596/533/15/9







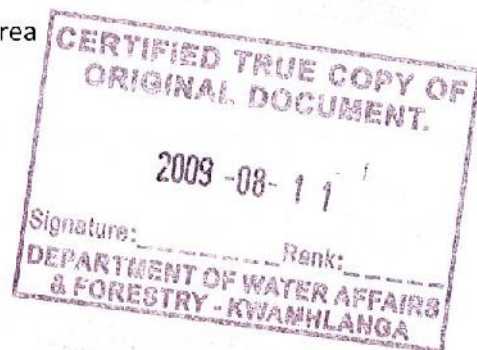
**HAND DELIVERY**

**DMR REF: MP 30/5/1/2/2/169 MR**

**11 August 2022**

Department of Water & Sanitation  
Mpumalanga Regional Office: Olifants Water Management Area  
61 Lanham Street  
Erasmus  
Bronkhorstspuit  
1020

**Attention:** Ms Mmadi Moloto



**RE: DRAFT BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME: GLENCORE COAL OPERATIONS SOUTH AFRICA: GOEDGEVONDEN COMPLEX: DMR REF: MP 30/5/1/2/2/169 MR**

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marietjie@jacanacc.co.za

Co Reg. Nr.: CK2005/136263/23  
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***Tel: 012 543 9093; Fax: 086 571 0939; Email: [ggvamendment@participation.co.za](mailto:ggvamendment@participation.co.za)***

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Yours sincerely,

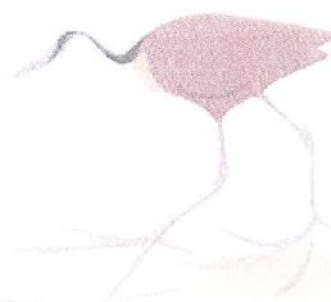


**MARIETJIE EKSTEEN**

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**HAND DELIVERY**

DMR REF: MP 30/5/1/2/2/169 MR

11 August 2022

Emalahleni Local Municipality  
Civic Centre  
Cnr Mandela & Arras Streets  
eMalahleni  
1035



*malele Riba*  
*[Signature]*

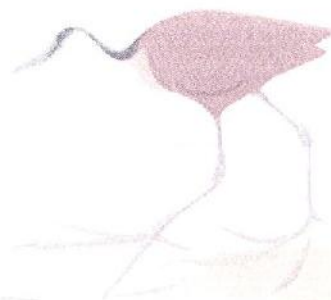
Attention: **Mr Life Mahlaule**  
Assistant Manager: Environmental Management and Compliance

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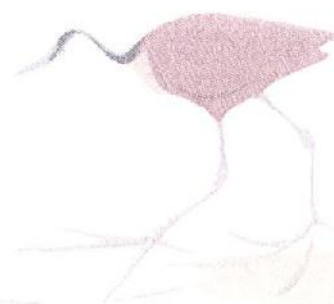
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Member: M. Eksteen  
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Received date: 11-August-2022

Received by: Evelyn Mkwani

J A C A N A

environmentals cc



**HAND DELIVERY**

**DMR REF: MP 30/5/1/2/2/169 MR**

**11 August 2022**

Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs  
Cnr Ryan and Rosemead Streets  
Klipfontein  
Emalahleni  
1200

**RE: DRAFT BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE AMENDMENT OF THE MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PROGRAMME: GLENCORE COAL OPERATIONS SOUTH AFRICA: GOEDGEVONDEN COMPLEX: DMR REF: MP 30/5/1/2/2/169 MR**

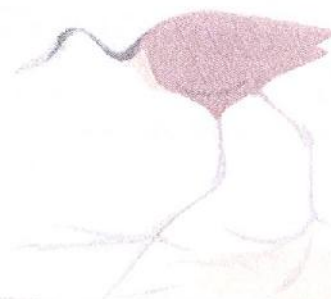
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Heritage Cases *Goedgevonden Colliery EA Amendment: Underground inclines and Roads Realignment* has been created.

Heritage Cases

## Goedgevonden Colliery EA Amendment: Underground inclines and Roads Realignment

CaseHeader

LocationInfo

Admin

### ProposalDescription:

Amendment for mine and layout optimisation: 1) Introduce limited additional mining areas (underground) that have now become economically viable 2) Change the mining methodology in certain areas, from opencast to underground 3) Include some limited additional infrastructure requirements for the underground mining 4) Slightly revise the re-alignment of P53-1 on portions of Goedgevonden 10 IS, Zaaivater 11 IS, Grootpan 7 IS and Kleinzuikerboschplaat 5 IS in Nkangala District, Mpumalanga.

**ApplicationDate:** Monday, August 15, 2022 - 12:59

**CaseID:** 19308

**Applicants:** [Tebogo Chauke](#)

**Consultants/Experts:** [Marietjie Eksteen](#)

### OtherReferences:

| Dept   | CaseReference        | DueDate    | FinalDecision |
|--------|----------------------|------------|---------------|
| DMR-MP | MP 30/5/1/2/2/169 MR | 12/09/2022 |               |

**Heritage Reports:** [HIA Report for new incline shafts and P53-1 Road Alignment Development](#)

**ReferenceList:**

### AdditionalDocuments

1. [Draft BAR for EA Amendment 2022](#)
2. [Draft EMPR for EA Amendment 2022](#)
3. [DBAR - Appendix 1 PP Report for EA Amendment 2022](#)
4. [DBAR - Appendix 2 Biodiversity Report for EA Amendment 2022](#)
5. [DBAR - Appendix 3 Aquatic Report for EA Amendment 2022](#)
6. [DBAR - Appendix 4 Hydroipedology Report for EA Amendment 2022](#)
7. [DBAR - Appendix 5 Air Quality Report for EA Amendment 2022](#)
8. [DBAR - Appendix 6 Noise Report for EA Amendment 2022](#)
9. [DBAR - Appendix 7 Blasting Report for EA Amendment 2022](#)
10. [DBAR - Appendix 8 Visual Report for EA Amendment 2022](#)
11. [DBAR - Appendix 9 Socio-economic Report for EA Amendment 2022](#)
12. [DBAR - Appendix 11 Geotech Report for EA Amendment 2022](#)
13. [DBAR - Appendix 12 Groundwater Report for EA Amendment 2022](#)
14. [DEMPP - Appendix 2 AIP Control Plan](#)

[Back to Top](#)

South African Heritage Resources Agency  
(SAHRA)

111 Harrington Street  
Cape Town  
8001

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Cape Town, 8000  
Tel 021 462 4502/Fax 021 462 4509  
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(<http://www.sahra.org.za>)



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