

Minutes for the DWS Pre-Application Meeting held for the:

Proposed Doornhoek Fluorspar Mine

DMR Reference No: NW 30/5/1/1/2/763

NW 30/5/1/1/2/1696

NW 30/5/1/1/2/1728

Date: 22 February 2016

Time: 10:30

Pre-application Meeting Department of Water and Sanitation – Minutes

**Place: Department of Water and Sanitation, Kurperoord Office,
Hartbeespoort Dam**

Attendees:

Michael Grobler (MG)	EXIGO
Ferdinand Mostert (FM)	EXIGO
Chantal Uys (CU)	EXIGO
Allan E Saad (Snr) (AES)	Project Manager/Applicant
Allan D Saad (Jnr) (ADS)	Project Manager/Applicant
Clement Makwela (CM)	Department of Water and Sanitation (DWS)
Lethabo Ramashala (LR)	Department of Water and Sanitation (DWS)
Rachel Mpe (RM)	Department of Water and Sanitation (DWS)
Gladness Masindi (GM)	Department of Water and Sanitation (DWS)
Amanda Ramotsho (AR)	Department of Water and Sanitation (DWS)

These	Notes	Action
1-2	Welcoming & Introductions The meeting was opened by Mr Michael Grobler (MG), who handed out the proposed agenda for the meeting and circulated the attendance register. MG thanked the officials for their time. Introductions were made by all. MG stated that this was a pre-application meeting as no application has yet been submitted. The purpose of the meeting was to align the project with the Department of Water and Sanitation (DWS) from the start. The agenda was accepted by all. MG stated that Ms Chantal Uys (CU) will be taking minutes.	
3	Purpose of the meeting MG briefly gave the purpose of the meeting as follows: <ol style="list-style-type: none"> 1. To provide feedback on work conducted till present for the proposed Doornhoek Mine 2. To discuss potential impacts and water supply options 3. To obtain input and guidance from the DWS for the EIR and IWUL 4. To clarify the way forward 	

4-17	<p>Project History / Background & Description</p> <p>Exigo started working on the project in 2013 when conducting baseline studies. A pre-feasibility study (PFS) was conducted 2014 to 2015. The Environmental Authorisation (EA) and Mining Right (MR) Applications as well as an Integrated Water Use Licence Application (IWULA) is planned to be submitted during 2016. MG stated that a site visit occurred with the Department less than two (2) years ago on 25 November 2014.</p> <p>Mr Allan Saad Snr (AES) stated that the project is located 15km South-East of Zeerust. Mining was undertaken in the area until the 1980's when mining operations ceased. AES indicated the location of the project on a locality map and some photos of and past mining activities in the area. He stated that the previous mining activities consisted mainly of dry mining and the area was characterised by empty existing pits and a lack of rehab. He gave a short overview of the project history to date. In 2005 the mineral rights were consolidated. The project area is 23000 Ha but not the entire area is proposed to be developed. AES indicated the historical rights on a map. He listed the existing infrastructure in the project area. The geology of the project area was indicated on a map. The geology consists predominantly of dolomite which contained the mineral resource; the dolomite is covered by shales.</p> <p>He indicated the ore body which was planned to be mined over a 30 year life of mine (LOM). The high grade zones would be mined over the LOM. It is planned that downstream processing and beneficiation takes place instead of exporting the mineral. AES listed the general uses for fluorspar, mainly in electronic applications. He stated that the raw product could be exported however local beneficiation is planned for spin-off job creation and economic development. MG stated that fluorspar has been identified as a strategic mineral.</p> <p>Ms Rachel Mpe (RM) asked about the phases of the planned mining and asked AES to indicate the different phases with the pointer. AES indicated the phased approach on slide 13. RM asked to be taken through the mining process per area proposed as well as the depth of mining. AES explained that Phase 1 (year 1-5) will be opencast mining to a depth of 30 meters. MG stated that the project team hoped to get input from the DWS with regards to the proposed phasing over the LOM.</p> <p>AES indicated the world estimated reserves for fluorspar on slide 14. He stated that the proposed Doornhoek Fluorspar Mine is one of the largest fluorspar deposits in the world. He explained that historical prospecting had occurred in the area, additional boreholes were drilled as part of the current exploration activities, a LIDAR survey of the area was done, as well as a preliminary economic assessment. The project team is currently busy with the Environmental Impact Assessment (EIA). He stated that the overall LOM for the project was 100 years for the available resources; however the current project is based on a 30 year LOM. He informed them that the single largest cost is transport of the raw material to a harbour for export so downstream local beneficiation is very important. MG stated that this was also an initiative from the government. AES further stated that one of the most important aspects of the project is water provision. MG stated that water studies had been undertaken previously in order to create a baseline in this regard.</p>	
18	<p>Previous Baseline Specialist Studies</p> <p>MG listed the specialist studies conducted as part of the baseline study.</p>	
19-27	<p>PFS Specialist Studies Feedback</p> <p>MG continued to list the additional specialist studies undertaken during the PFS Phase. He listed some sensitivities associated with the project area in terms of preliminary identified ecological and heritage sensitivities. MG asked Ferdinand Mostert (FM) to discuss the hydrogeological baseline for the project. FM stated that a geochemical assessment had been conducted and it was found that acid mine drainage (AMD) leachate unlikely. There could potentially be low sulphate leaching, but this was below</p>	

	<p>the SANS drinking water standards. He stated that the fluorite concentrations would however exceed the baseline values.</p> <p>A waste classification assessment was also undertaken and the waste was found to be type 3 so a class c barrier system would be required. He informed the officials that a Phase A Baseline Hydrogeological study was undertaken followed by a PFS Phase Hydrogeological study. The results from these studies were based on a high-level assessment. FM indicated the extent and boundaries of the aquifer on a map. He explained that dykes in the area act as compartments which will limit the potential dewatering impact. The existing Witkop Mine is situated in Compartment 9 and thus there was an historical impact in this compartment. The other compartments appeared to be unaffected. RM asked what mineral is mined at the Witkop Mine and how close the mine is located to the proposed Doornhoek Mine? AES stated that fluorspar was initially mined at Witkop but that lime is currently mined. The Witkop Mine is situated adjacent to proposed site.</p> <p>FM went through the baseline hydrogeological data compiled to date. Based on the outcomes of the previous studies it was recommended that additional fieldwork be undertaken to recalibrate the existing model. MG clarified that the current model was based on a worst case and therefore the model had to be recalibrated with more accurate data. AES indicated the location of the Witkop Mine on a map. RM asked if the Witkop Minewas in a different compartment than the proposed Doornhoek Mine. MG replied in the affirmative. He stated that the impact from the Witkop Mine would however need to be assessed. FM stated that the baseline data was invaluable in this regard.</p> <p>RM asked whether all the compartments would be mined apart from compartment 9. MG stated that mining would affect compartment 1, 2 and 3, however all 20 compartments were mapped and assessed on a high-level basis to obtain an overall baseline of the area. RM asked whether a hydrocensus was conducted. FM stated that a high-level hydrocensus with a radius of more than 20km was done for the area. RM asked whether the hydrocensus included private boreholes. FM answered in the affirmative and clarified that some additional exploration boreholes were also included in the hydrocensus.</p>	
28-29	<p>Discussion on water supply options & Section 21 water uses</p> <p>MG listed the water supply options which are being considered. He stated that there is an existing water supply pipeline to the Witkop Mine. The Witkop Mine is currently under care and maintenance. Discussions had taken place between the applicant and the Witkop Mine in the past. MG asked how the status and ownership of the pipeline could be determines. He requested guidance from DWS in this regard.</p> <p>Ms Lethabo Ramashala (LR) asked what the source of the water supply to the pipeline was. AS stated that the water was sourced from the Zeerust dam. Mr Clement Makwela (CM) stated that this would be municipal supply from the Zeerust Local Municipality. AES asked who the pipeline belonged to. MG stated that discussions with the municipality in this regard should take place. LR stated that agreements with the municipality had to be obtained in this regard and provided to Department.</p> <p>MG asked whether water supply above the amount in the approved agreement for the pipeline between Witkop and the municipality should be applied for to the municipality or the DWS. LR asked whether the required water supply for the Doornhoek Mine has been calculated. MG answered in the negative. LR stated that the calculated amount should be provided to the municipality for approval. The agreement between the municipality and the applicant then had to be provided to DWS. MG stated that the approach to water supply would be to make use of existing resources first and only then</p>	<p>Noted.</p> <p>Noted.</p>

	<p>revert to groundwater resources.</p> <p>FM stated that it is expected that the planned mine depth for Phase 1 will not be deep enough for dewatering to occur due to current water levels. However if there was any dewatering, the dewatered water will be re-used. LR asked how groundwater will be re-assessed. MG stated that a study was currently being undertaken in this regard, which would look at sustainable water supply options. He suggested that a combination of municipal water supply and groundwater. RM stated that a combination of the two water supply options would be recommended and asked about water shortages in Zeerust. CM stated he was not aware of any shortages at this time. LR recommended that consultation with the municipality take place to plan for water supply and to ensure that water was available. MG indicated other possible water uses as follows: Section 21 (a), (b), (c) & (i), 21(g) and 21(j). The relevance of Section 21(j) was uncertain at this time due to the no dewatering being foreseen for the mine. However this will be further investigated in the studies. Water will be used in a closed loop system as far as possible.</p> <p>LR asked whether beneficiation was part of this project. AES stated that this was not currently included but will hopefully be implemented after the first 5 years of operations, but he could not commit to this at the moment. MG asked whether beneficiation would take place on site. AES stated that such a plant may perhaps be located in Zeerust. MG stated that industrial development Zones (IDZ's) were being developed all over the country. AES stated that they would prefer to do beneficiation locally as the project area was characterised by poor economic development.</p>	Noted.
30	<p>Questions and answers</p> <p>MG asked for any high-level comments and/or guidance from the Department. RM stated that all the information presented looked very well, and that they were pleased with the availability of baseline data to assist with the evaluating and monitoring any impacts. She pointed out that a key aspect was to liaise with the municipality with regards to the water previously allocated to the Witkop Mine. She stated that from a Departmental perspective that a combination of groundwater and existing allocation is preferred. MG offered to send through information to DWS following the meeting with the local municipality. MG stated that GN704 and stormwater management will also be complied with, drainages would be avoided as far as possible, and dewatering was unlikely but water would be re-used as far as possible. Ms Gladness Masindi (GM) stated that the sustainability of aquifer had to be investigated. FM stated that a groundwater balance will be compiled. GM asked what the 2000 exploration boreholes which had been drilled were being used for and what was the planned intended use. MG stated that some of these boreholes were drilled in the 1970's, FM stated that these were exploration boreholes so they had been capped or have since collapsed and were not being used for water supply. However, the use of these existing exploration boreholes will be further researched in water supply studies. GM asked that a water supply analysis be done to provide the volumes required as well as the projected water use volumes over the LOM in the mine water balance. FM stated that the base case as well as the projected water use according to the project schedule considering both draught scenarios and flooding scenarios, will be provided. MG asked whether the applicant should apply for both phases or only for phase 1 and indicate that phase 2 will be applied for at a later stage. LR stated that the 30 year LOM had to be applied for in terms of water uses over this period.</p>	<p>Noted and agreed.</p> <p>Noted.</p> <p>Noted. To be provided with IWULA.</p> <p>Noted.</p>
31	<p>Way Forward</p> <p>MG indicated proposed way forward.</p>	
32	<p>Closing</p> <p>MG stated that Exigo's contact details were provided on slide 32 of the presentation and invited the Department to contact them if they had any queries. He asked what the Department's preference would be with regards to the submission and whether a presentation will be required. MG suggested that a presentation on groundwater results</p>	

	perhaps be done upon submission. RM stated that the suggested presentation with submission will be welcome.	Noted.
	MG thanked everyone for attending the meeting and closed the meeting. AES stated that they hoped to conclude the EIA by the end of April.	

Minutes taken by C. Uys



An EOH Company

Email info@exigo3.com
Tel +27 012 751 2160
Fax +27 086 607 2406

The Village Office Park (Block E),
309 Glenwood Road, Faerie Glen,
Pretoria, 0043

Postnet Suite 74,
Private Bag X07,
Arcadia, 0007

Vat nr: 4910184854

Innovation in
Sustainability

www.exigo3.com

Annexure A: Meeting Presentation

Directors: Dr Koos Vivier, Dr Christine Vivier, Michael Grobler, Elrize van Zyl

Associates: Dr Buks Henning, Dr Robert Hansen, Neels Kruger

Registration nr: 2006/011434/07

EOH



An EOH Company

Innovation in Sustainability

Doornhoek Fluorspar Mine: DWS Pre-application meeting

Copyright © 2014 – EXIGO

Confidential:

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means — electronic, mechanical, photocopying, recording, or otherwise — without the permission of EXIGO. This document provides an outline of a presentation and is incomplete without the accompanying oral commentary and discussion.



Agenda

A green circular logo with the text "Innovation in Sustainability" inside. It is positioned in the top right corner of the slide, partially overlapping a large, faint, stylized graphic of a circular arrow or infinity symbol.

Innovation in
Sustainability

1. Welcoming & Introductions
2. Purpose of the meeting
3. Additional agenda points
4. Project Description and History & Feedback
5. Previous Baseline Specialist Studies
6. PFS Specialist Studies Feedback
7. Discussion on water supply options
8. Questions and answers
9. Way Forward
10. Closing

Purpose of the meeting

1. Pre-application meeting to provide feedback on work conducted till present for the proposed Doornhoek Mine
2. To discuss potential impacts and water supply options
3. Obtain input and guidance from the DWS for the EIR and IWUL
4. To clarify the way forward

Project History / Background

A green circular logo with the text "Innovation in Sustainability" inside. It is positioned in the top right corner of the slide, partially overlapping a large, faint, stylized 'E' or 'G' shape in the background.

Innovation in
Sustainability

1. Baseline Study 2013
 2. Pre-feasibility study 2015
 3. Mining Right Application/EIA and IWUL 2016
- Site-Visit and meeting 25 November 2014

Typical landscape

Innovation in
Sustainability



Reverse circulation drilling

Innovation in
Sustainability



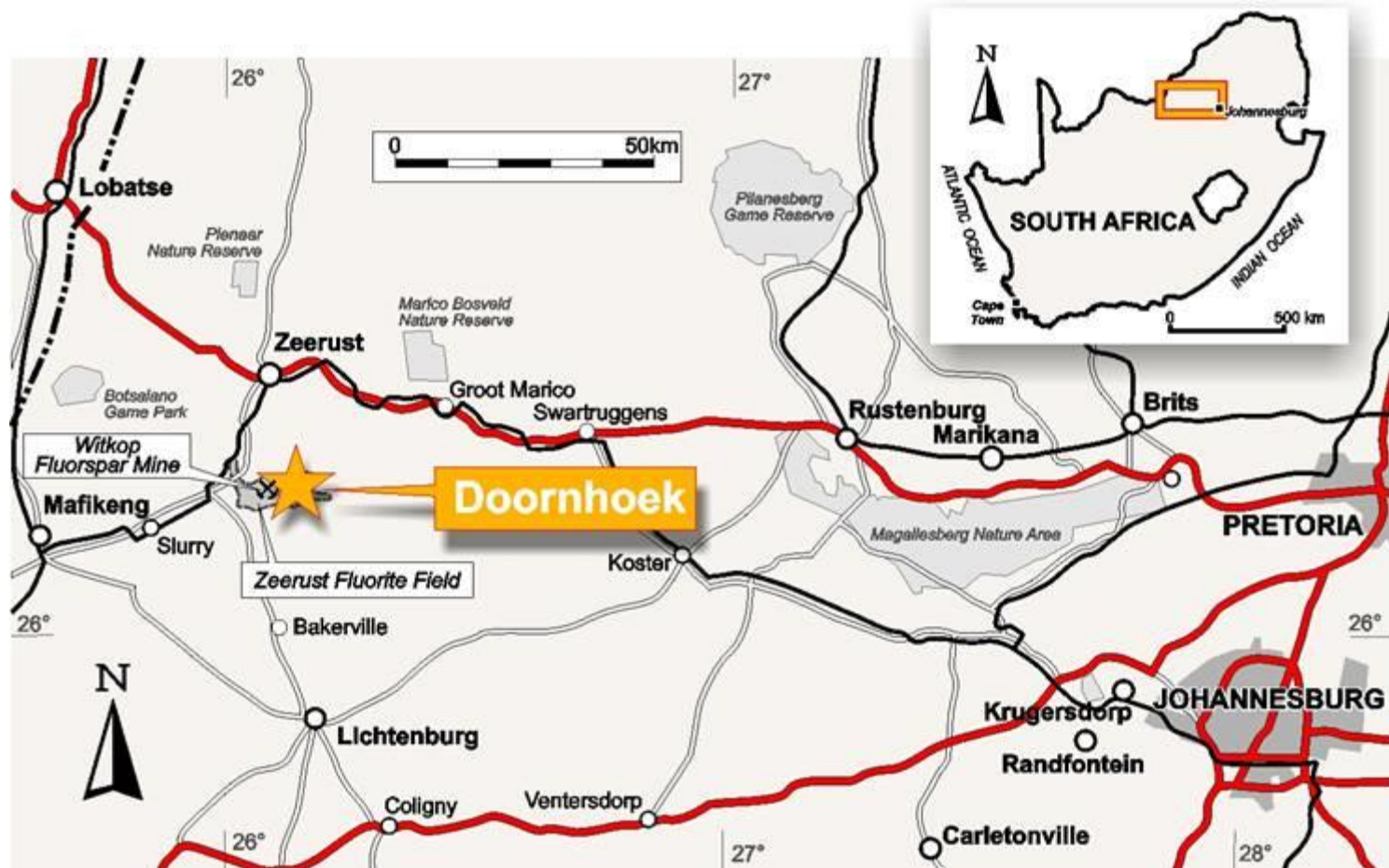
Aerial view of historical mining by Rand Mines 1980

Innovation in
Sustainability



Project location

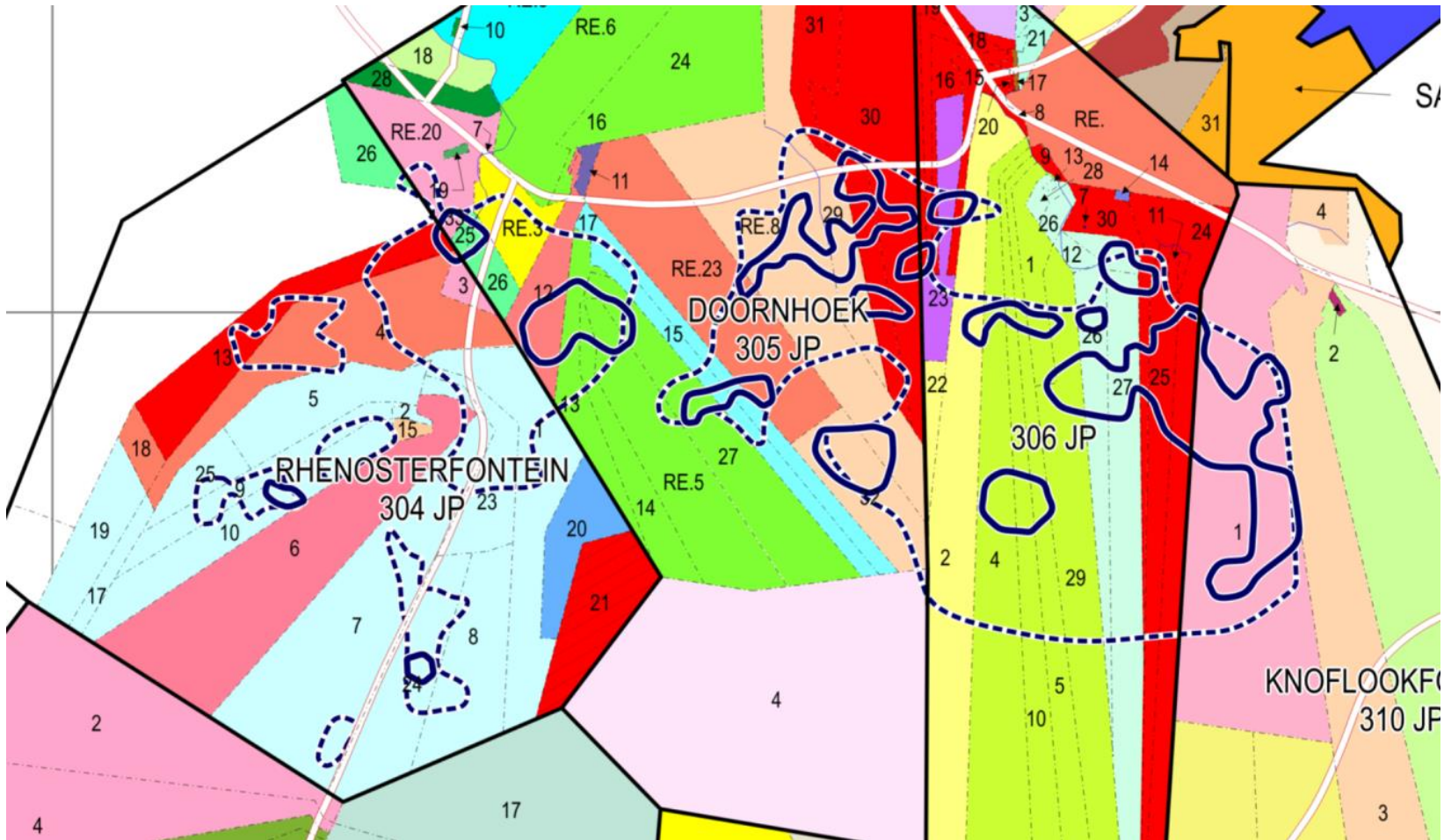
Innovation in
Sustainability



Project history

- Private and complex mineral rights holding until 2004
- Historically rights were subdivided together with surface
- Some mineral rights were sold to mining companies and sterilized
- Result was complex ownership with many subdivisions
- 2004 mineral rights revert to State
- 2005 SA Fluorite consolidate and secure mineral rights
 - >23,000 hectares
- 2006 CAMEC secure majority interest
- 2010 ENRC acquire CAMEC
- 2013 RPA complete Preliminary Economic Assessment
 - 43-101 compliant

Historical rights



Infrastructure

- 15km from nearest town and rail siding
 - Tarred road
- Water – studies underway
 - Dolomitic terrain and catchment reservoirs
- Power available on site
 - Sub-station on adjoining property
- Mobile communication on site
- Low population density and
- No relocations required

Geology and site

Size: 22,255.32 hectares

Innovation in
Sustainability

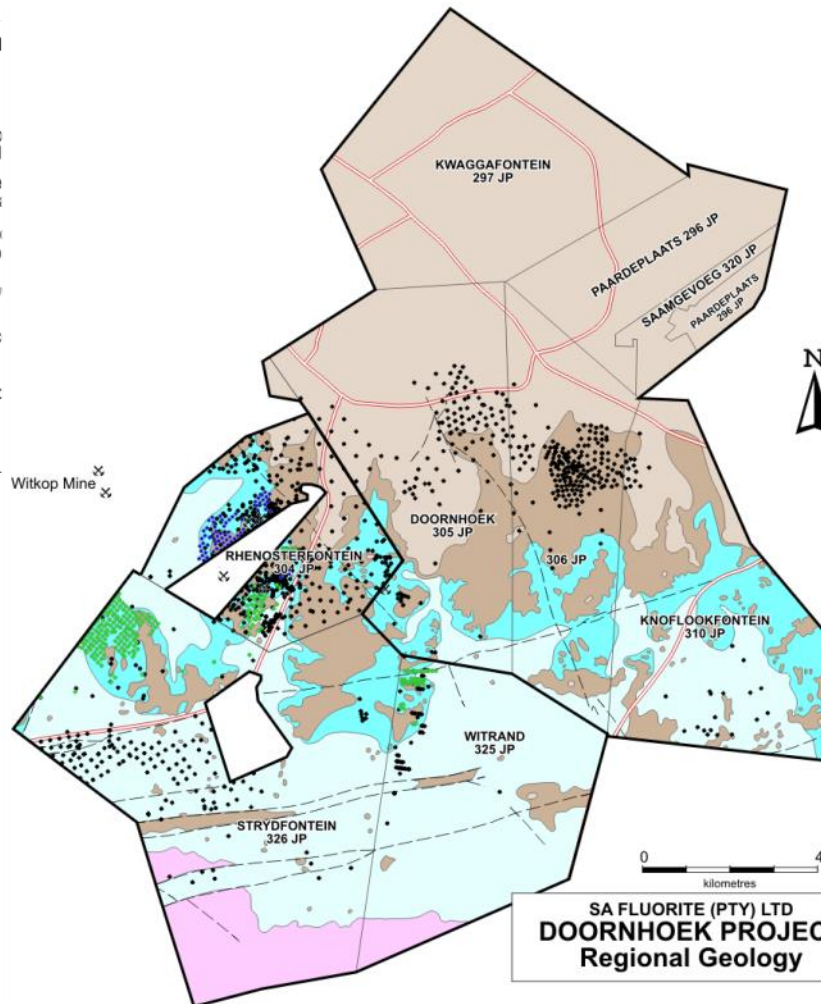
GEOLOGICAL LEGEN

— Faults and dykes

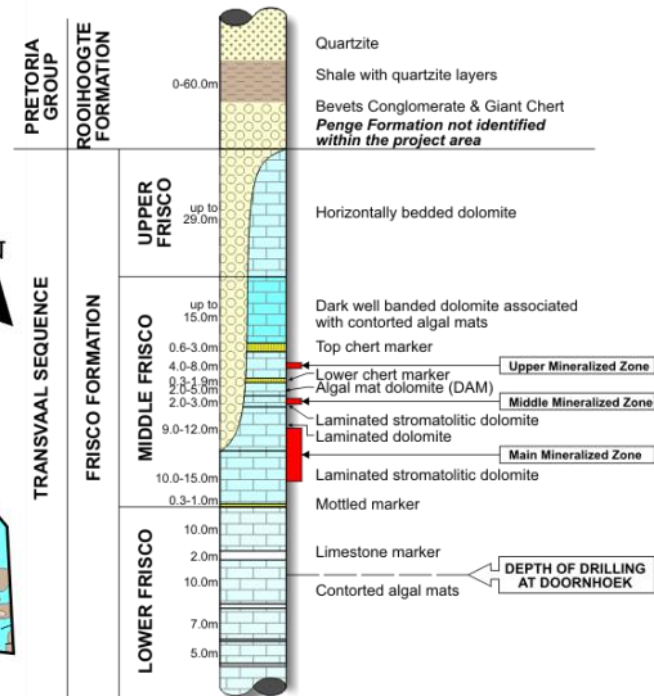
- Polo ground quartzites and shales Rc
- Banded ironstone, banded chert, chert breccia, black siliceous shale Pe
Gi
- Algal dolomite, dark well bedded dolomite and limestone Mi
Fo
- Dark dolomite, limestone and shale Lo
- Cherty algal dolomite with chert breccia on top Ec

- Diamond Drill Borehole
- RC and Auger Holes

Witkop Mine

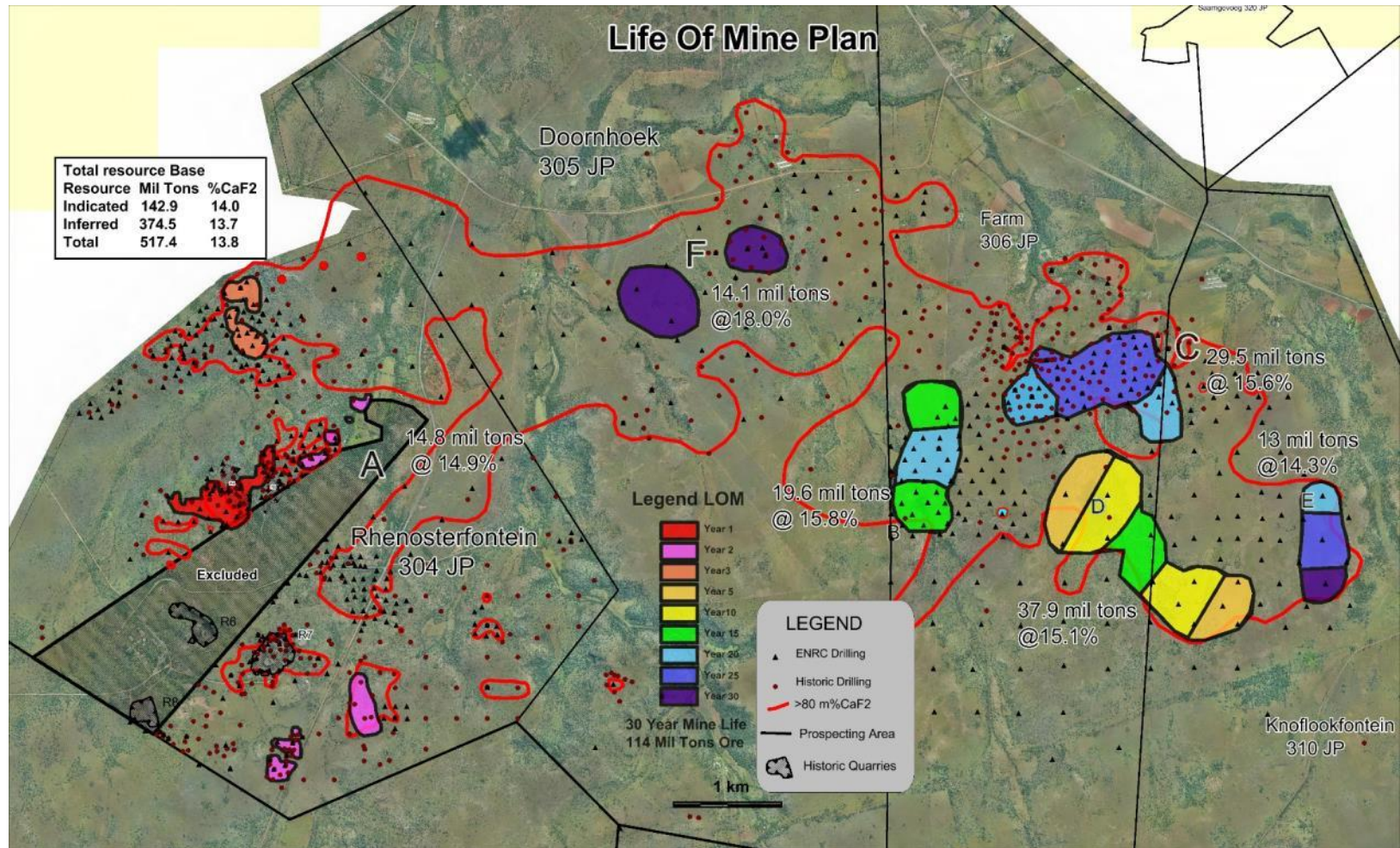


STRATIGRAPHY OF THE FRISCO FORMATION IN THE ZEERUST FLUORSPAR MINING DISTRICT



Starter pits and orebody outline – 30 yr LOM

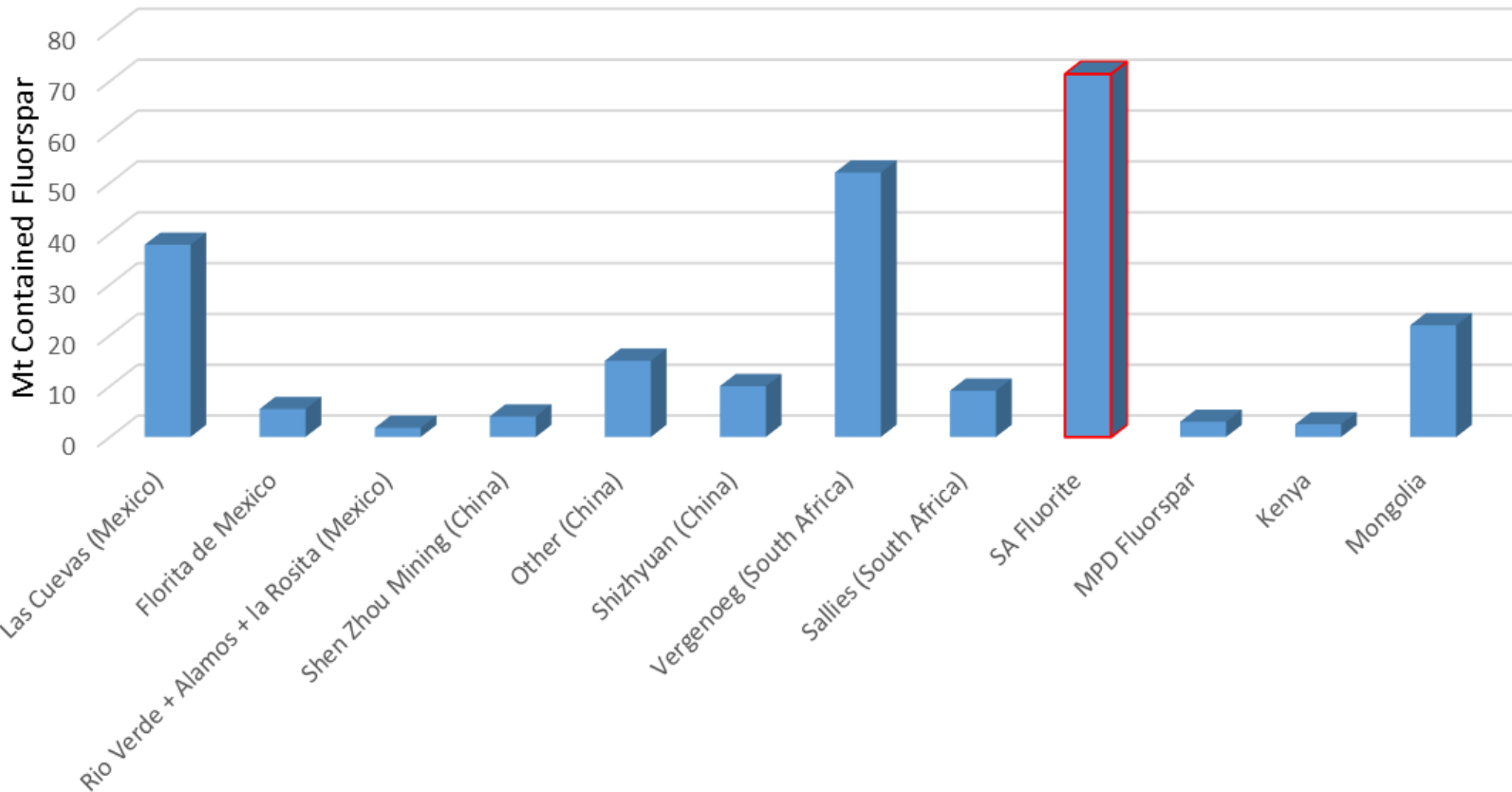
Innovation in
Sustainability



Contained fluorspar comparison

Innovation in
Sustainability

World estimated reserves of contained Fluorspar comparison



Work completed to date

- **Drilling**
 - 2000 boreholes drilled
 - totalling approx 140,000m
 - 239 auger boreholes drilled
 - totalling approx 1,487m
- **Geological mapping** – detailed groundwork
- **Aeromagnetic survey** – high resolution close spaced
- **Lidar survey** – covers entire area
- **Permitting** - maintained in good standing
- **Surface rights acquisitions** – strategic landholding
- **Metallurgical test work** – underway
- **Environmental studies** – ongoing
- **Preliminary Economic Assessment** – Roscoe Postle Associates Inc - Toronto – completed Nov'13 – NI 43-101 compliant

Economic analysis

- Resource sufficient for +100 life-of-mine (LOM)
- Economic analysis calculated on 30 year mine life
- Low-cost opencast operation
- Sensitive to grade, exchange rate and CaF_2 price
- Weak Rand to USD exchange rate beneficial
- Transport to harbour is single largest cost
- Amenable to downstream processing and development of secondary industries

Summary

- Largest contained fluorspar deposit in the world
- Single large flat-lying shallow orebody
- Amenable to low-cost opencast mining
- Good infrastructure
- Favourable metallurgy
- LOM far in excess of 30 years
- Favourable for the development of downstream processing facilities

A world class fluorite deposit

Previous Baseline Specialist Studies



Innovation in
Sustainability

Specialist Field	Company	Author(s)
Lead EIA Consultant	AGES / Exigo	Michael Grobler; Catherine Da Camara
Archaeological Scoping Report	AGES / Exigo	Neels Kruger
Groundwater Baseline Report and Fatal Flaw Analyses	AGES / Exigo	Dr. Koos Vivier & Megan Hill
Ecological Baseline Assessment and Fatal Flaw Analyses	AGES / Exigo	Dr Buks Henning

PFS Specialist Studies

Innovation in
Sustainability

Specialist Field	Company	Author(s)
Lead EIA Consultant	AGES / Exigo	Michael Grobler; Herman Gildenhuys
Hydrogeological Assessment Phase A & B	Exigo	Dr. Koos Vivier & Megan Hill
Geochemical Assessment Phase A	Exigo	Dr. Robert Hansen
Wetland Delineation	Exigo	Dr Buks Henning
Aquatic Assessment	SAS	Stephen van Staden / Emile van der Westhuizen
Environmental Legal Risk Register	EOH Legal	Morné Viljoen / Selvan Subroyen
Water and Dust Monitoring	Exigo	Eise Venter

Preliminary Issues Identified

Sensitivities in the area include:

- High ecological sensitivity – important fauna corridors and unique habitat
- Medium to high ecological sensitivity – unique vegetation entity with high conservation importance
- Heritage sites
- Area of heritage sensitivity
- Possible heritage sensitive sites such as drainage lines and ridges
- Springs
- Streams and rivers

Geochemical Assessment Results

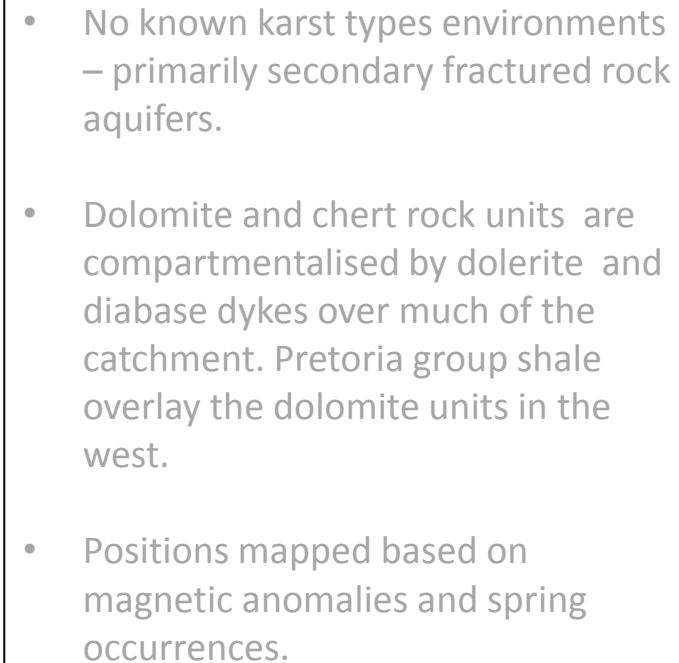
Findings & Conclusions:

- Formation of **AMD** conditions from waste rock and tailings is **unlikely**.
- **Leaching** of **metal** and metalloid contaminants from solution is **unlikely**
- **Sulphate** could potentially leach from the tailings material in concentrations exceeding the groundwater baseline, but **lower than the lowest SANS drinking water standard**
- **Fluoride** concentrations in the tailings material leachate **exceeds the groundwater baseline value**.
- **Waste classifies** as Type 3, i.e. low risk requiring a Type C barrier system design

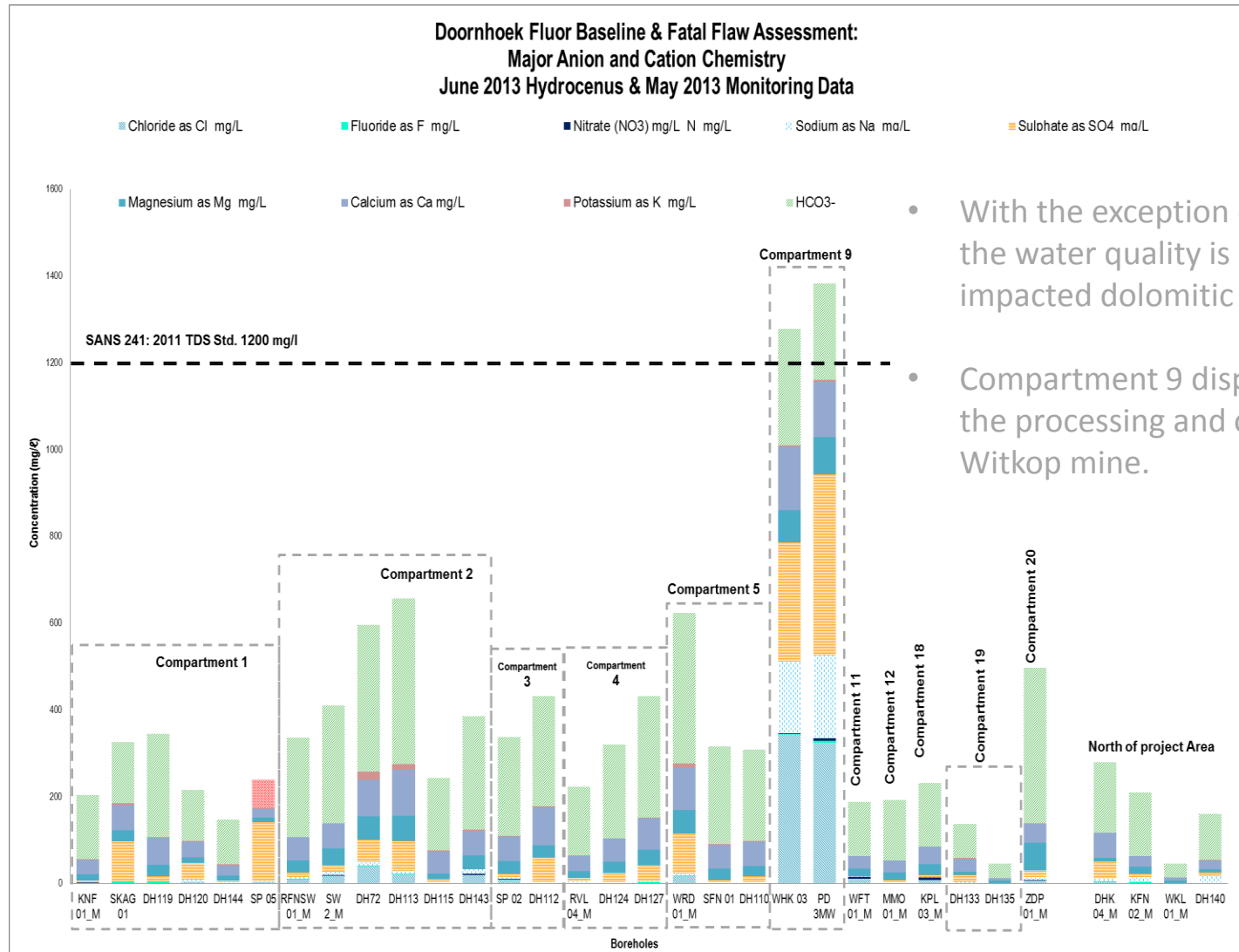
Work conducted to date include:

- Phase A (2013) comprised a baseline assessment, a fatal flaw analysis and development of a monitoring network for baseline characteristics prior to mine initiation.
- Based on the outcomes of the baseline assessment the scope of work for phase B (2014) was formulated and a high level site characterisation study was conducted.

Innovation in Sustainability

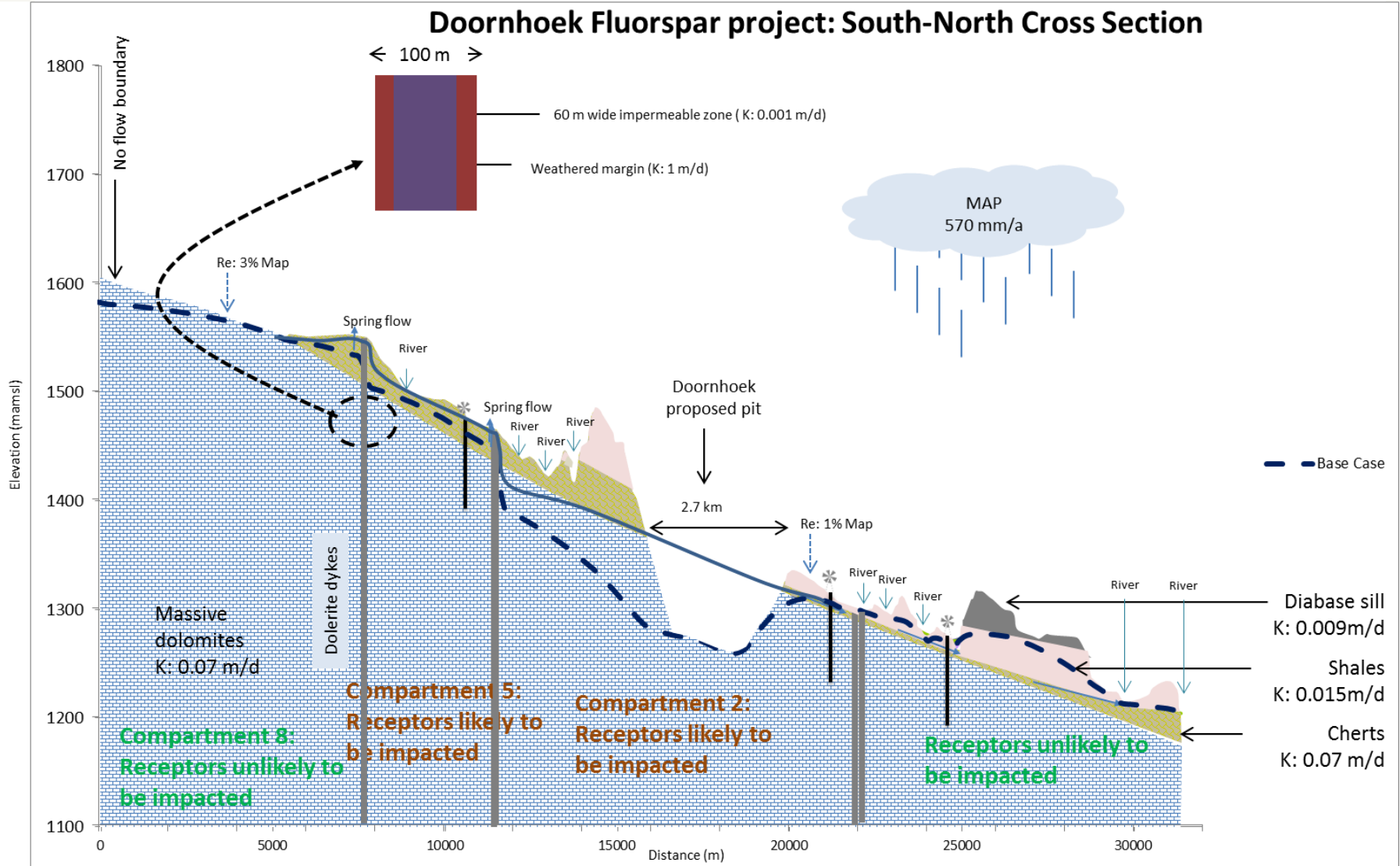


Site characterization: baseline water quality

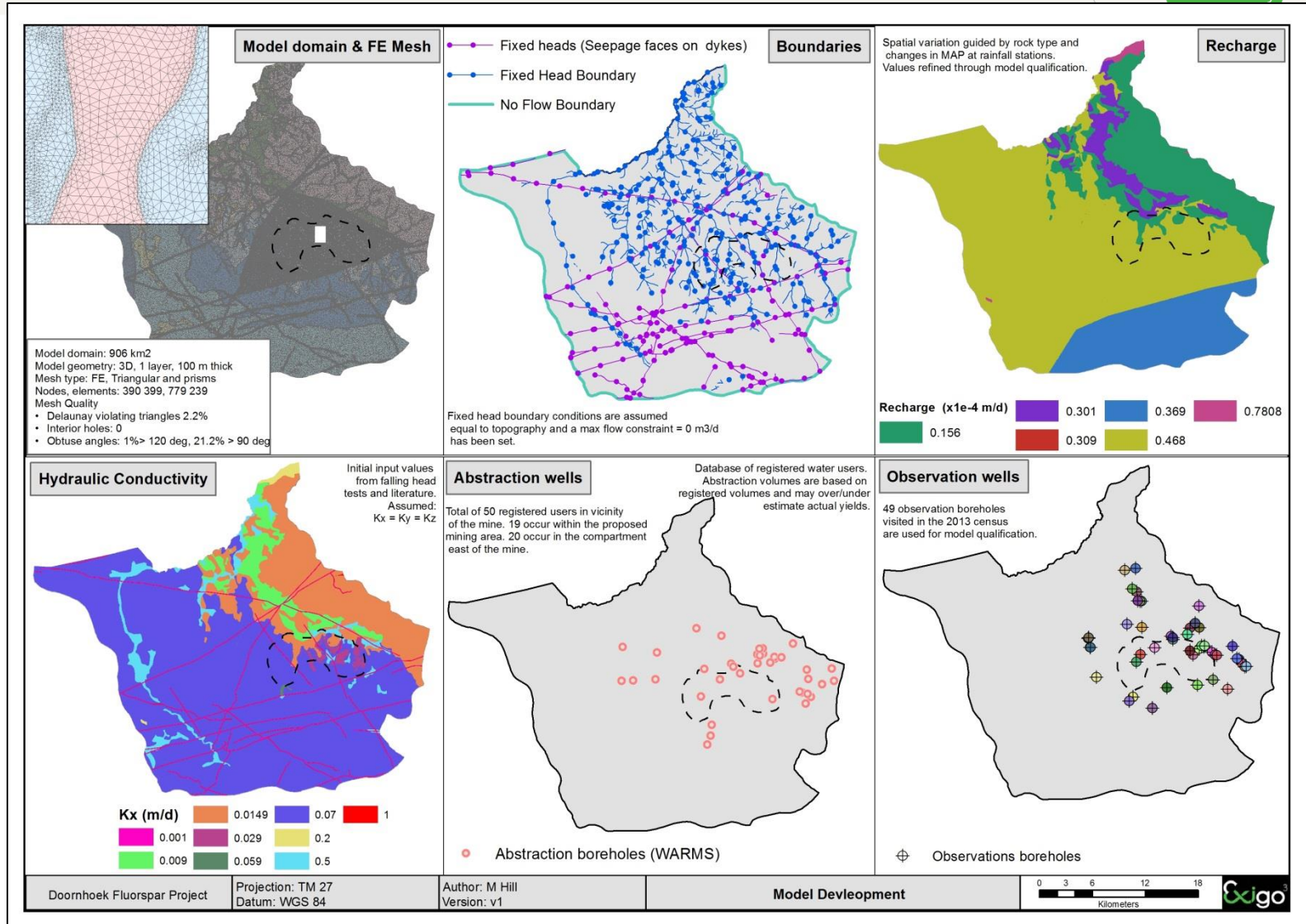


- With the exception of compartment 9 the water quality is reflective of un-impacted dolomitic groundwater's .
- Compartment 9 displays impact due to the processing and operations and Witkop mine.

Hydrogeological conceptual model

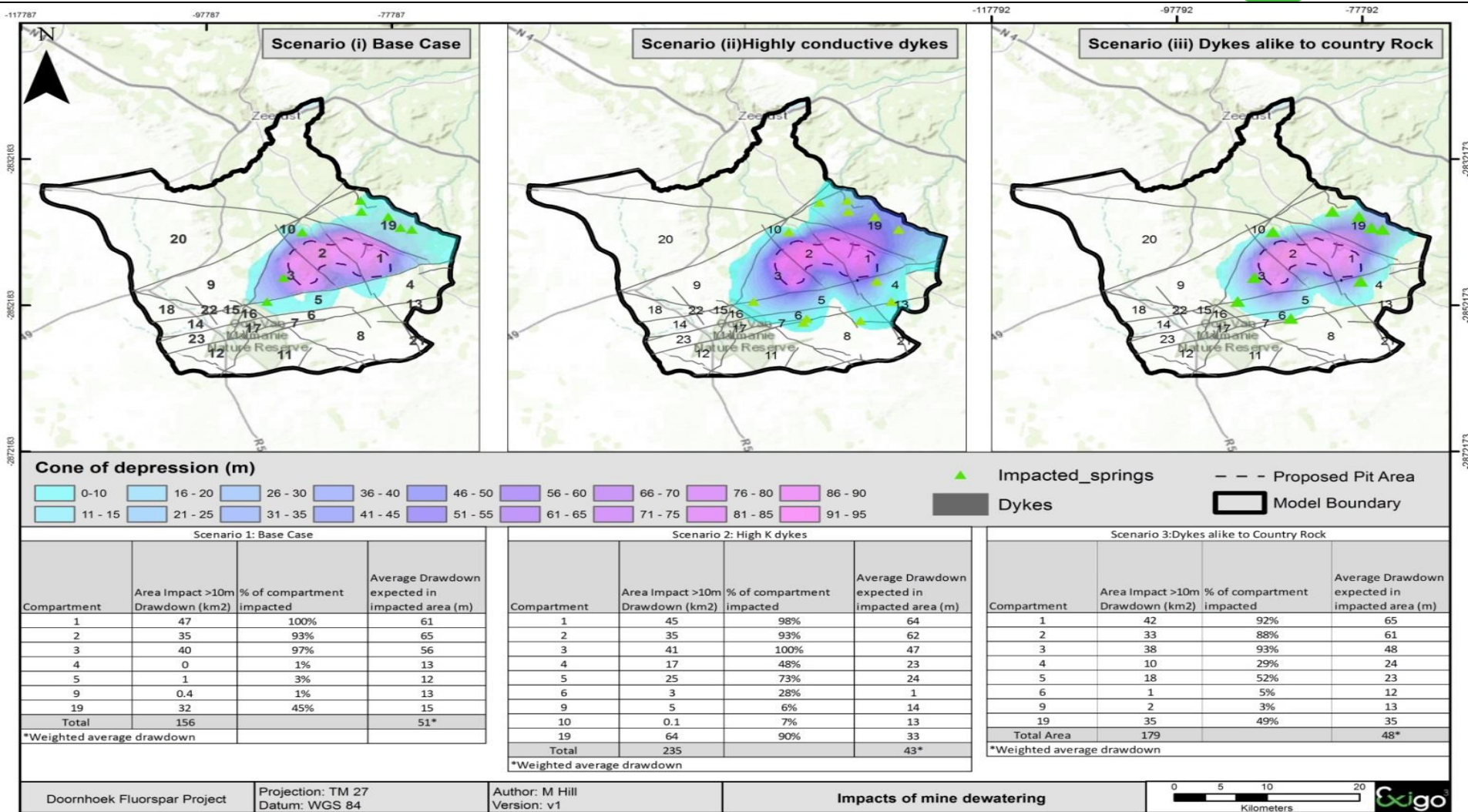


Numerical groundwater model development



Impact Assessment Scenarios

Innovation in
Sustainability



Discussion on water supply options

Witkop water supply pipeline:

- Ownership
- Licensing
- Availability/capacity
- Process of determination

Groundwater supply :

- Existing boreholes
- Development of new resources
- Licensing

Other options:

Discussion on other S21 water uses

Potential water uses:

- Section 21a: Taking water from a resource
- Section 21b: Storing of water
- Section 21c: Impeding or diverting of a watercourse
- Section 21g: Disposing of waste in a manner which may detrimentally impact on a water resource
- Section 21i: Altering the bed, banks, course or characteristics of a watercourse.
- Section 21j: Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people

Q&A

Way Forward



Innovation in
Sustainability

- MRA application
- Scoping
- EIA
- IWULA

THANK YOU

For any comments or queries please contact:

Michael Grobler/ Chantal Uys

Address: Exigo Sustainability (Pty) Ltd, Postnet 74,
Private Bag X07, Arcadia, 0007.

Telephone: (012) 751 2160

Fax: 086 607 2406.

Email: michael@exigo3.com/ chantal@exigo3.com

Annexure B: Meeting Agenda

Proposed construction and operation of Doornhoek Fluorspar Mine and associated infrastructure located near Zeerust, North-West Province

Pre-application Meeting – Department of Water and Sanitation (DWS)

VENUE: DWS Kurperoord Office, Hartbeespoort Dam

DATE: 22 February 2016

TIME: 10:30 AM

NO	DESCRIPTION		
1.	PURPOSE OF THE MEETING		
	<ul style="list-style-type: none"> The purpose of the meeting is to provide feedback of the work conducted until present during the PFS Phase and to discuss the process from the DWS's perspective, discuss water supply options and obtain feedback and agree on the way forward. 		
2.	MEETING AGENDA		
No	Agenda Item	Speaker	Time
1	Welcoming and Introductions	All	10:30
2	Purpose of the Meeting	Michael Grobler	
3	Additional agenda points	Michael Grobler	
4	Project Description, History and Feedback	Allan Saad	
5	Previous Baseline Specialist Studies	Michael Grobler	
6	PFS Specialist Studies Feedback	Michael Grobler / Ferdinand Mostert	
7	Discussion on the water supply options	All	
8	Questions and Answers	All	
9	Way Forward	All	
10	Meeting closure	Michael Grobler	11:30



An EOH Company

Email info@exigo3.com
Tel +27 012 751 2160
Fax +27 086 607 2406

The Village Office Park (Block E),
309 Glenwood Road, Faerie Glen,
Pretoria, 0043

Postnet Suite 74,
Private Bag X07,
Arcadia, 0007

Vat nr: 4910184854

Innovation in
Sustainability

www.exigo3.com










Annexure C: Attendance Register

Directors: Dr Koos Vivier, Dr Christine Vivier, Michael Grobler, Elrize van Zyl

Associates: Dr Buks Henning, Dr Robert Hansen, Neels Kruger

Registration nr: 2006/011434/07

EOH

NAME	ADDRESS	CONTACT NUMBER	EMAIL/FAX NUMBER	SIGNATURE
Allan D Saad	-	082 356 1375	Allan Saad@gmail.com	
Allan E. Daad	SA Fluorte	082 881 7850	aaad@psd.mweb.co.za	
Letlabo Ramashala	Harties-Kurperoord	082 9083 177	ramashala@dws.gov.za	
RACHEL MPE	DWS@NW	012 207 9911	mpere@dws.gov.za	
GLADNESS MASINDI	LIMPOPO - NORTH WEST PROTOMA	012 207 9911 083 4881 385	masindig@dws.gov.za	
Clement Mabwela	DWS-NW-MMB	019 387 955 083 407 6879	Mabwela@dws.gov.za	
AMANDA RAMOTSHO	DWS	012 207 9911 079 357 8681	ramotshoa@dws.gov.za	
FERDINAND MSTER	309 GLENWOOD RD, FALERE GLEN, PTA.	078 344 5021	ferdinand@exigo3.com	
Michael Grabber	Exigo	082 475 4266	michael@exigo3.com	
Chantal Uys	Exigo	012 781 2160	chantal@exigo3.com	