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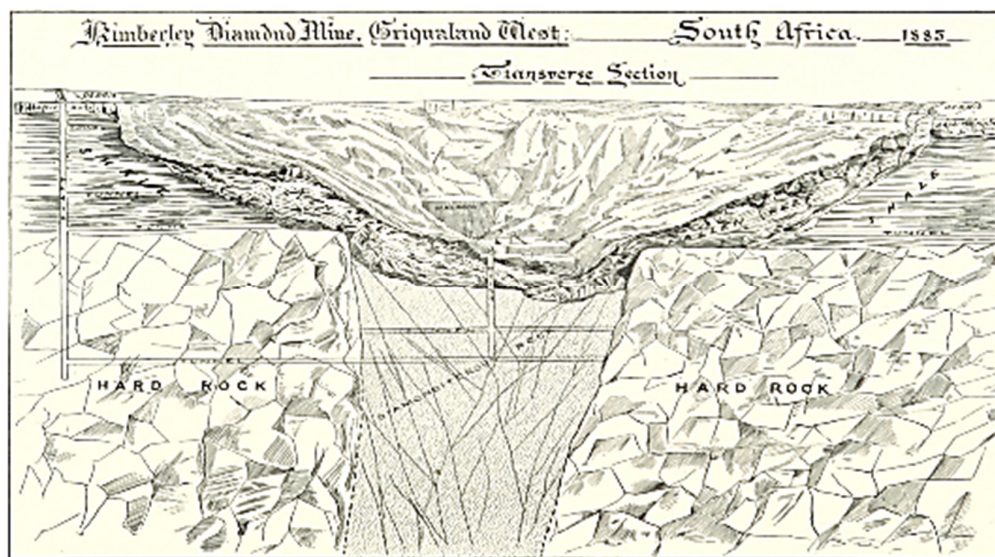
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1st phase H.I.A. of a proposed upgrading and extension of the proposed storm-water management project at Venetia Mine, Limpopo Province, South Africa

For De Beers Consolidated Mines (Pty) Ltd.

Project number DEB-VEN-21-02-03

May 2021.



Report prepared by: -

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B.Sc (Engineering) Civil, M. (Architecture) Conservation. Asapa member no 087.

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1.1. Location and GPS Coordinates of the study area.



Fig. 01. This image shows the location of the different study areas concerned. (Google Earth 2021.)¹

1.2. G.P.S. Coordinates of the limits of the site under assessment.

Area of interest	Degrees south	Degrees east	Area of interest	Degrees south	Degrees east
North Road	22°24'52.31"S	29°18'24.84"E	Eastern Portion	22°25'27.32"S	29°20'39.36"E
OMWSD 4	22°27'0.76"S	29°19'35.70"E	OMWSD 3	22°26'53.55"S	29°19'23.75"E
OMWSD N&S	22°27'1.58"S	29°19'25.06"E	PCD 1	22°26'45.72"S	29°19'14.65"E
PCD 2	22°26'39.70"S	29°18'30.20"E	PCD 3	22°26'51.13"S	29°17'40.06"E
PCD 4	22°26'33.48"S	29°19'5.37"E	FRD 1 RWD	22°26'30.82"S	29°18'18.58"E
South Road	22°27'26.37"S	29°17'49.68"E			

Fig. 02. Above table shows G.P.S. coordinates that are defining the POSTIONS BUT NOT THE EXTENT of the study areas. (GPS coordinates from Google Earth.)

1.3. Description of the site.

South Africa’s biggest diamond mine, Venetia, is located in the Northern Transvaal within Limpopo Province in the north-east part of the country. The mine is owned by De Beers, which is a subsidiary of Anglo American.

A reconnaissance sampling programme was carried out by De Beers in 1969 to detect the source of alluvial diamonds. Construction activities at the mine began in 1990, following the finding of viable kimberlite pipes in 1980.

¹ Image supplied by Shangoni by e-mail on the 20th April, 2021.

Commissioned in August 1992, the Venetia mine accounts for approximately 40% of South Africa’s annual diamond production. The mine-pit has a surface area of 3.8ha and Venetia Mine employs approximately 4,365 people. It produced 4.6 million carats (Mct) of diamonds in 2017. The existing Venetia open-pit mine will be converted to an underground operation by 2021 to increase the life of the mine to 2046.

The main aim of the present proposed project is to manage both rainwater and water extracted from the new underground extension of the mine.

As can be seen in *fig. 01* above, the expected impact is located mainly inside the existing impacted and disturbed perimeters of the mine.

2. Contact Details.

2.1. Client.

Sishen Mine Contact Person: Telephone E-mail address	Benita Piek. 015 575 2273 Benita.Piek @ debeersgroup.com
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2.2. Consultants.

Environment. Shangoni Management Services. Physical address. Unit C8, Block@Nature, 472 Botterklapper Street, The Willows, 0081. Postal address. PO Box 74726, Lynnwood Ridge, Pretoria, 0040. Contact person. Ashley Miller Telephone. (27)12 807 7036. E-mail. ashley@shangoni.co.za	Heritage. Sidney Miller. Physical address. 328 Malherbe Street, Capital Park, 0084, Tshwane. Postal address. Postnet suite 427, P.B. X15, Menlo Park, 0102, Tshwane. Contact person. Sidney Miller. Telephone. 082 939 6536. E-mail. sidneymears@gmail.com.
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2.3. Type of Development.

Mining; - Water Management

2.4. Zoning of Site.

Mining.

3. Executive Summary.

3.1. Mandate of Shangoni Management services.

Shangoni's mandate is to procure a comprehensive impact assessment (including a first phase heritage impact assessment) of their client's proposed impact on the study area described above. This has to comply with the mine's environmental management programme that is ISO14001 certified.

The proposed impact is the upgrading and improvement of management of storm-water and water extracted from newly undertaken underground mining.

3.2. Intent of Venetia Mine.

It is the intent of the client to upgrade and improve management of storm-water and water extracted from currently undertaken underground mining.

3.3 The project description.

The present project is not for new mining. It is for the upgrading and extension of facilities to manage water responsibly within the framework of the National Environmental Management Act (NEMA), Act no 107 of 1998.

3.4. Historical milieu.²

A. The general area is known to contain both Early as well as Later Stone Age sites as well as rock art and engraving sites. These are mainly encountered along main drainage lines such as the Limpopo River and its tributaries such as the Kolope River. None of these were observed during the investigation. .

The proposed water management project and associated infrastructure will have no impact on Stone Age archaeological sites or material.

B. In the general area Iron Age sites such as the internationally known Mapungubwe and its associated sites is situated more to the north and east of Venetia, and later sites to the south in the Soutpansberg. None of these were observed during the investigation.

The proposed water management project and associated infrastructure will have no impact on Iron Age archaeological sites or material.

C. On the area investigated the only historical sites are generally old farms from the 20th century. One such farmyard situated near the present bus depot is utilised within the mining framework, but is situated outside the areas of impact.

The proposed water management project and associated infrastructure will have no impact on historical sites or material.

D. There are no sites of cultural/spiritual significance located on or near the areas under investigation.

E. There are no sites connected to slavery located on or near the areas under investigation.

F. There are no people of importance connected to the history of the study area.

G. There is no special historical technological or scientific advancement of standing that can be linked to the property under investigation.

² For full description see chapter 8.

3.5. Environmental milieu.³

Geology. The geology of the area is well known owing to the ancient Limpopo Mobile Belt dating back around 250 million years ago.

Regarding the kimberlite intrusions, the Venetia kimberlite cluster comprises 14 kimberlite pipes on a surface area of 4km². The kimberlite pipes have been intruded in synform structure.

The first kimberlite, known as K1, is kidney-shaped and is the biggest kimberlites ore body in the structure, with a surface area of 12ha. The second biggest body, K2, is oval-shaped and occupies 5ha of area. The dimensions of K1 and K2 are 640mx260m and 250mx200m respectively.

The cluster also consists of small kimberlite bodies and dykes along the Lezel fault plane, as well as various satellite ore bodies.

Vegetation. The site under investigation is located on one veld type, namely zone 15. Acocks describes this as Mopani Veld. (Acocks, 1988.)

3.6. Summary of findings.

Owing to the character of the ecology (geology, vegetation and precipitation) of the region it has always been a harsh environment for humans to settle in on a long term basis. Access to water was through major drainage lines that were seldom permanent and through isolated springs. This has limited long term settlement for any cultural group, except for short periods such as the Mapungubwe culture. No archaeological material was located during the study.

3.7. Recommendation.

According to the requirements of the National Heritage Act, Act 25 of 1999, there is no reason why the proposed water management scheme cannot be initiated.



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³ *For full description see chapter 7.*

4. Definitions.

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of paleontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

5. Protected Sites in Terms of the National Heritage Act, Act no 25 of 1999.⁴

The following are the most important sites and objects protected by the National Heritage Act:

- a. Structures or parts of structures older than 60 years
- b. Archaeological sites and objects
- c. Paleontological sites
- d. Meteorites
- e. Ship wrecks
- f. Burial grounds
- g. Graves of victims of conflict
- h. Public monuments and memorials
- i. Structures, places and objects protected through the publication of notices in the Gazette and Provincial Gazette
- j. Any other places or object which are considered to be of interest or of historical or cultural significance
- k. Geological sites of scientific or cultural importance
- l. Sites of significance relating to the history of slavery in South Africa
- m. Objects to which oral traditions are attached
- n. Sites of cultural significance or other value to a community or pattern of South African history

6. Methodology.

6.1. The study area was visited between the 5th and 8th of May 2021.

6.2. Owing to the scale of mining operations, the intensity of safety regulations and the availability of personnel that is qualified and certified to escort visitors to the site, it is rather difficult to follow traditional methods of assessment. No private vehicles are allowed on the mining premises.

6.3. On the first day the consultant was accompanied to areas in the game reserve that include the sites known as OMWSD 4 and OMWSD N&S by Cecil Cloete and to The Eastern Portion and PCD 3 by the two field rangers Trevor Tshiwanandalani and Alex Selofa. These three guided the consultant through the appropriate areas. Alex is well versed in archaeological matters as he was and is working with the archaeologist Tom Huffman on other areas of the reserve. With Alex's assistance a possible heritage site was located but it turned out to be a 20th century cattle station.

6.4. On the second day the consultant was accompanied by Benita Piek that is well conversant with layout and infrastructure of the designated mining area. Here it was found that all areas has been disturbed over the last thirty years of mining operations.

6.5. Finds were recorded by GPS readings and photography.

⁴ *For the present study the highlighted lines are applicable.*

- 6.6.** The above information was recorded and collated in section 9 of this report.
- 6.7.** Background information concerning the geology and vegetation of the region was collected from reliable resources and is presented in section 7 of this report.
- 6.8.** Background information concerning the archaeology and historical milieu of the region was collected from reliable resources (especially from previous heritage impact assessments available), and is presented in section 8 of this report.
- 6.9.** In sections 10 and 11 field ratings (SAHRA minimum standards May 2007) and statements of significance (SAHRA minimum standards May 2007) were attributed as necessitated by situation.
- 6.11.** Section 12 contains a summary of the research results with a recommendation in section 13.
- 6.12.** The collective gist of the information collated in the report is summarised in the executive summary in section 3.

7. Environment.

7.1. Geology.⁵

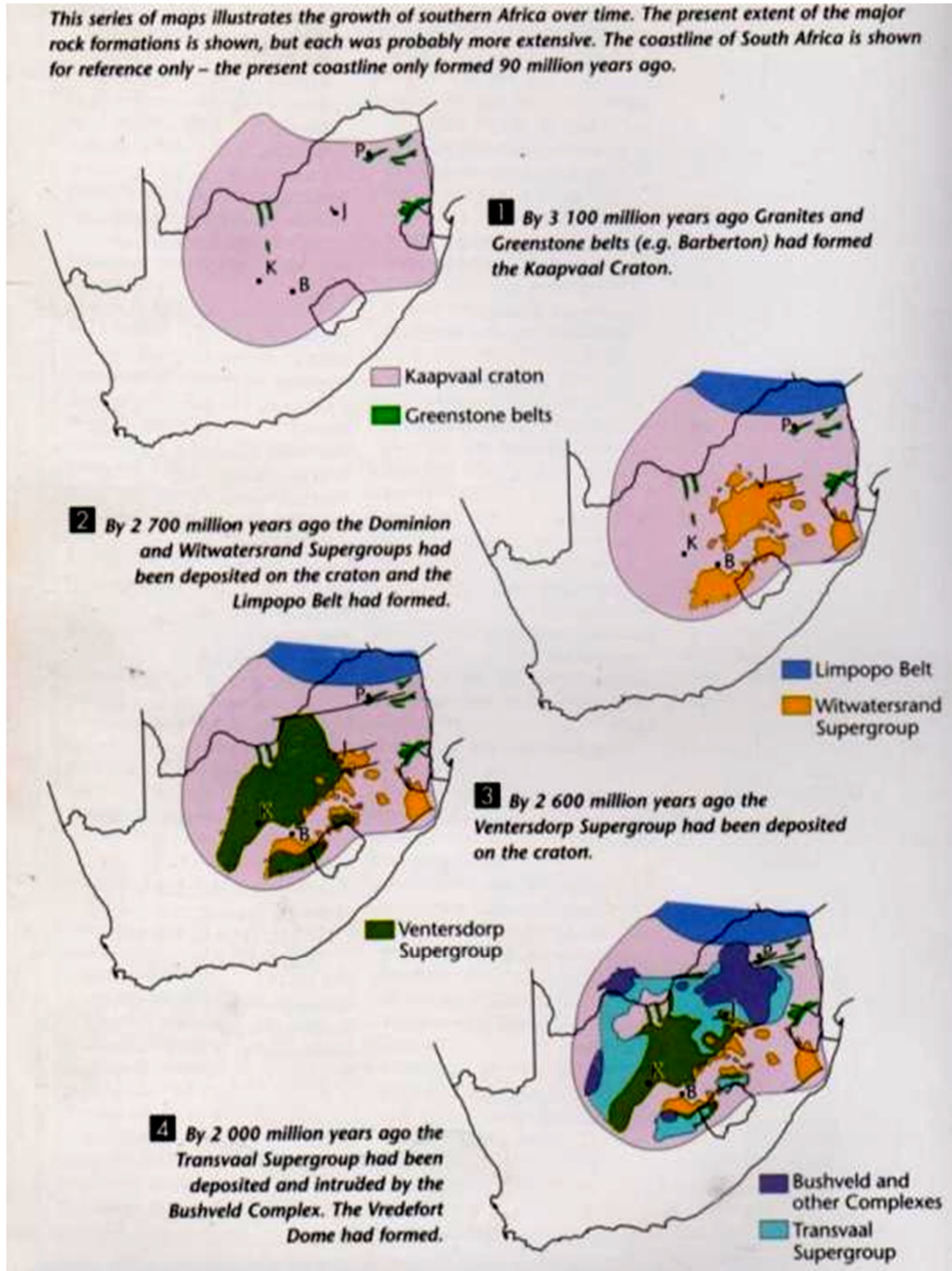


Fig. 02. Above is illustrated the formation of the South African geological substructure between 3100 million years ago and 2000 million years ago. In our present study area the Kaapvaal Craton had formed and the Transvaal Supergroup had been deposited. The Bushveld Complex had appeared and the Vredefort meteorite impact had occurred. P in the illustrations marks Pretoria as reference to the study area. (McCarthy & Rubidge: 334.)

⁵ See McCarthy & Rubidge 2005 and Haughton 1940 for full description.

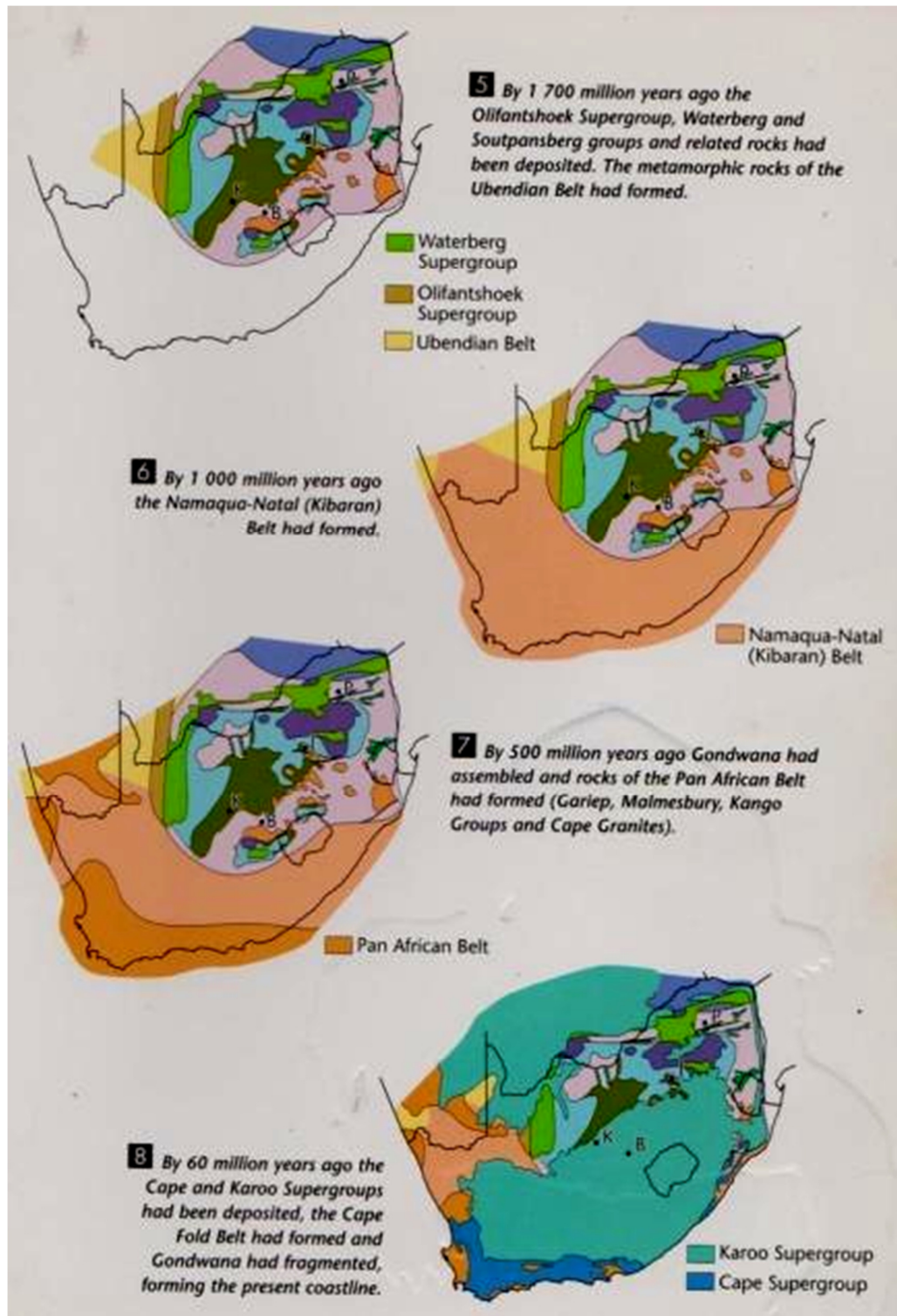


Fig. 03. Above is illustrated the formation of the South African geological substructure between 2000 million years ago and 60 million years ago. As can be seen above it is only the Karoo Supergroup that had any further significant impact on the study area. P, in the illustrations, marks Pretoria. (McCarthy & Rubidge: 335.)

7.2. Vegetation.

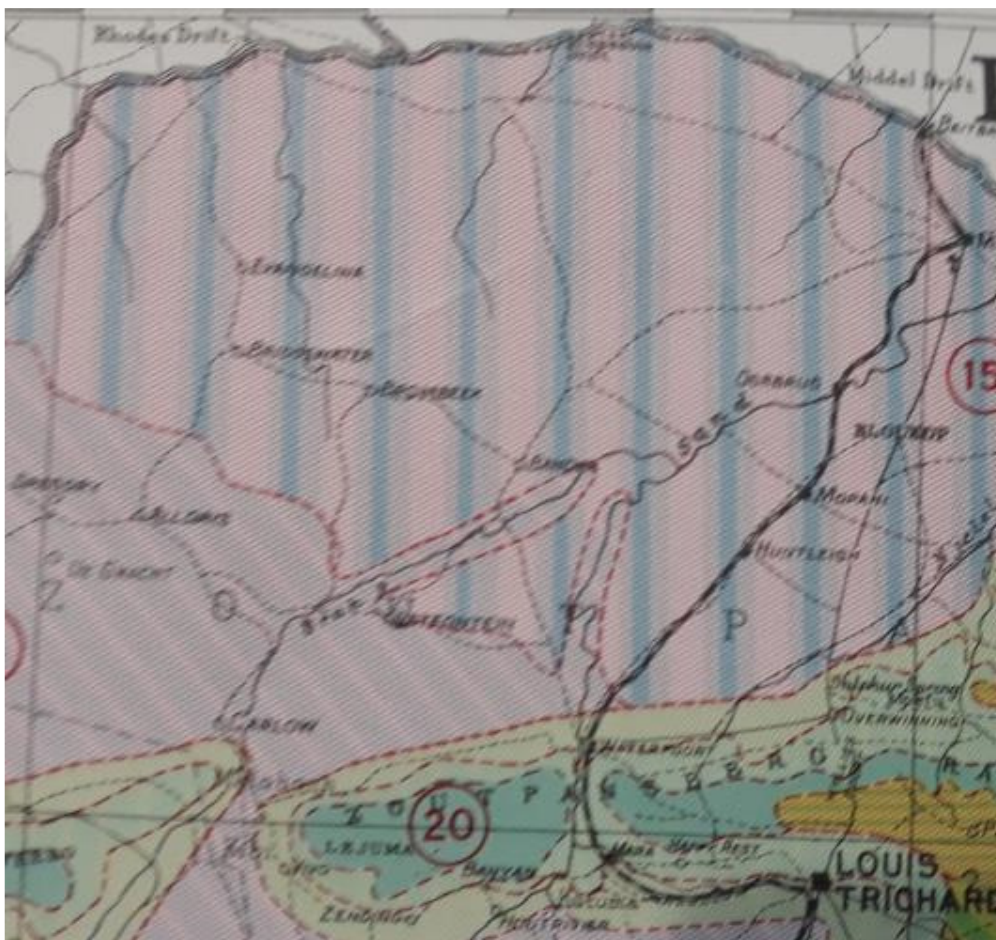


Fig. 04. The site under investigation, or study area, is located at the heartland of veld type zone 15. Acocks describes this as Mopani Veld. (Acocks, 1988.)⁶

7.2.1. Type 15. Mopani Veld. (Acocks, pp43.)⁷

According to Acocks there are two different types in this category.

1 is the wide, gently undulating valley of the Limpopo north of the Soutpansberg; altitudes ranges from 400 to 750 m above sea level and rainfall between 250 and 400 mm per annum, strictly confined to the summer season.

2 Is a broad belt running south from the eastern part of the Soutpansberg nearly to the Olifants River in the east. The second block is wetter with rainfall over 400 mm per year and altitude between 300 and 450 m above sea level. The vegetation is taller and more mixed.

In the first area the vegetation is typically a short, fairly dense growth of shrubby *Colophospermum mopane*, generally associated with a number of other trees and shrubs in a somewhat sparse and tufted grassveld. These are as follow.

⁶ The author is aware of the updated version of Acocks's work by Mucina & Rutherford, 2010, but for the purposes of this investigation the Acocks version is preferred by the present author.

⁷ For a full description see Acocks pp 43 and 44.

Trees and shrubs		Grasses	
Colophospermum mopane	Boscia foetida	Antheophora pubescence	Tricholanea monachne
Acacia tortilis heteracantha	Boscia albitrunca	Brachiaria nigropedata	Eragrostis nindensis
Acacia nigrescence and others	Cassia abbreviata	Eragrostis superba	Cenchrus ciliaris
Combretum apiculatum	Commiphora spp.	Schmidtia pappophoroides	Panicum maximum
Sclerocarya birrea	Grewia spp.	Heteropogon contortus	Digitaria eriantha
Dichrostachys cinerea	Ximenia sp.	Stipagrostis uniplumis	Neorauntanenia
Cadaba termitaria	Lycium sp.	Chloris roxburghiana	
Schotia capitata	Terminalia pruniodes		
Adansonia digitata			

Fig. 05. Table of trees, shrubs and grasses that may be encountered in and around the study area.. (Acocks, 1988.)

8. Archaeological and Historical Background.⁸

8.1. Previous Archaeological Research.

Already as early as the 1930's the region became known for its cultural heritage with the discovery on the Mapungubwe hill site and the valley of Bambandjalo, also known as K2. Owing to the Second World War and several other factors archaeological research only started again in the late 1960's. With both the archaeological departments of the universities of Pretoria and Wits carrying on systematic exploration and research, most sites of importance were found, recorded and excavated. These sites are all directly associated with the Limpopo or Vhembe River as a permanent source of water in an otherwise very dry environment.

So with the announcement in 1988 that a new diamond mine was to be opened on the farm Venetia there was some concern regarding the possibility of the mining operations impacting upon possible important heritage sites.

Therefore In 1989 an extensive survey for archaeological sites was undertaken by Mr. E.O.M. Hanisch⁹, of the University of Venda, on the farms Venetia 103 MS, Rugen 105 MS and Krone 104 MS. The pipeline route between the Venetia mine and the well fields on Schroda 46 MS and Greefswald 37 MS was also inspected and monitored. Apparently the affected areas on Drumsheigh 99 MS and Elseger 37 MS were not investigated as these areas *were already disturbed*.

At that stage the survey revealed the presence of a Middle Stone Age site and seventeen Iron Age sites on the farm Venetia 103 MS. These were attributed to the Mapungubwe - (1100 – 1250) and the later Khami people. (1400 – 1750)

⁸ See DMR Reference no: LP30/5/1/2/3/2/1/58EM October 2012 appendix 9 Archaeological Impact Assessment

⁹ See Bibliography for reference material.

The final evaluation of these sites stated that there was no outstanding significant site which had to be protected at all costs. Apparently archaeological remains were scarce and when they did occur were normally un-diagnostic. It was recommended that some of the sites should be excavated to retrieve chronological and/or special information. This was done and excavation results was recorded in the Environmental Management Programme Report for Venetia Mine, July 2000, Appendix 3.

In 2011 Dr Julius Pistorius was asked to do a follow-up archaeological survey for an amendment of existing environmental management programmes and reports, and to the development of a EIA for the proposed underground mining project and the review of al EMPS and EMPRS for the then existing operation.

The result of Dr Pistorius's work were the finding of an insignificant Middle Stone Age site, a small (possibly Khami Period) Iron Age site and a 20th century pioneer graveyard belonging to the Venter family.

The present HIA established that apart from the Venter graveyard, none of the above mentioned heritage sites remain, and that there is no new sites to add to the previous ones mentioned in old reports.

8.2. Stone Age.



Fig. 06. *This is a typical image of san Rock art from the region (Image from the farm Sentinel, Zimbabwe, Greefswald.)*

All phases of the Stone Age are generally well represented in the general region. The best representative sites are the Pietersburg Complex south of Polokwane, Makapan's cave and the rock art of the Soutpansberg, the Blouberg and the Limpopo River valley. The Pietersburg Complex represents the Early Stone Age that covers the period from 2, 5 million years ago to 250 000 years ago, while at Makapan we find that both the Middle Stone Age (250 000 to 20 000 years ago) and the Later Stone Age (LSA) (20 000 to 300 years ago) are represented. This implies that the Limpopo Region would have had a

fluctuating population of humanoids for 2, 5 million years, depending on environmental conditions, mainly precipitation.

The very active presence of LSA people in the region is not only recorded by their living sites, but especially through their rock art that survives in proliferation from the Soutpansberg, to the Blouberg and into the valleys surrounding the Limpopo River.

8.3. Iron Age.¹⁰



Fig. 07. The classical “Lydenburg Heads” from the Klingbill site shows the typical but later Matakoma style of early Iron Age ceramics. These were ceremonial objects rather than utilitarian and dates to the eighth century. (Lydenburg Museum, 1988.)

8.3.1 Early Iron Age.

The nature of Iron Age settlement in southern Africa is well understood and well documented. Iron Age settlers were not only users of the

natural environment’s resources, but they were essentially farmers. They raised stock and also planted crops that needed specific environmental conditions such as summer rainfall and soils suited for cultivation. They were also already essentially a mining community, using a range of minerals such as iron, copper and tin.

In the early days these communities’ lives were focused around their livestock and the general term describing them is *central cattle pattern people*, as even their villages were built around the kraals of their livestock.

Between the fourth and ninth centuries Southern Africa was “colonized” by Early Iron Age Agropastoralists, especially the wetter bushveld regions of the north and eastern Transvaal and Natal, as far south as Mtunzini. The typical *Matakoma* ceramic style is diagnostic and can be found on deep red loam soils close to old permanent water drainage lines. Happy Rest, Klein Afrika and Mapungubwe are but a few sites known in the general region. These people led an insular lifestyle with little or no contact with the outside world. The population was minimal, and contact between communities were rare.

8.3.1 Middle Iron Age.

By the ninth century a dramatic new age started to dawn on Southern Africa. Arabic traders have learned about the natural treasures of Southern Africa and have extended their sea-fairing capabilities so as to establish trading posts at Mogadishu, Zanzibar, and as far south as Maputo.

Bringing glass beads, cloth and other trinkets they traded for African products, such as skins, ivory, timber, “black gold” (slaves) and real gold mined in the Northern Transvaal and Central Zimbabwe.

By the late tenth century the site called K2 close to Mapungubwe hill became one of the most important trading centers in Southern Africa. It is then in this time of evolving *primitive capitalism* that we find the evolution of a split in status between commoners and kings. This not only socially but also physically when the Mapungubwe hill is populated by a ruling class, surrounded by thousands of *subjects*. For most of the eleventh century Mapungubwe was the capital of an area nearly the size of France, stretching from Botswana to the Mozambique coast and from the Waterberg to the Zambezi River.

But with the discovery and mining of gold in Zimbabwe, the Mapungubwe kingdom came to a fall, and the stone walled *musandas*¹¹ of Zimbabwe came into existence.

¹⁰ See Huffman 2007.

¹¹ Seat of the ruler.



Fig. 08. The classical Mapungubwe serving bowl is typical of the ceramics found on Mapungubwe hill. (University of Pretoria, department of Archaeology.)

With access to trade goods monopolized by the Zimbabwe and later Khami cultures, the Iron Age communities of South Africa south of the Soutpansberg fell back to the central cattle pattern of existence which in time developed into two language groups, Nguni and Sotho/Tswana. In the Soutpansberg however the Venda nation retained much of the stone walled type of lifestyle similar to Great Zimbabwe and Khami and not the central cattle pattern of lifestyle, as well as a derivative of the language of the Zimbabwe people.

8.4. Historical Period.

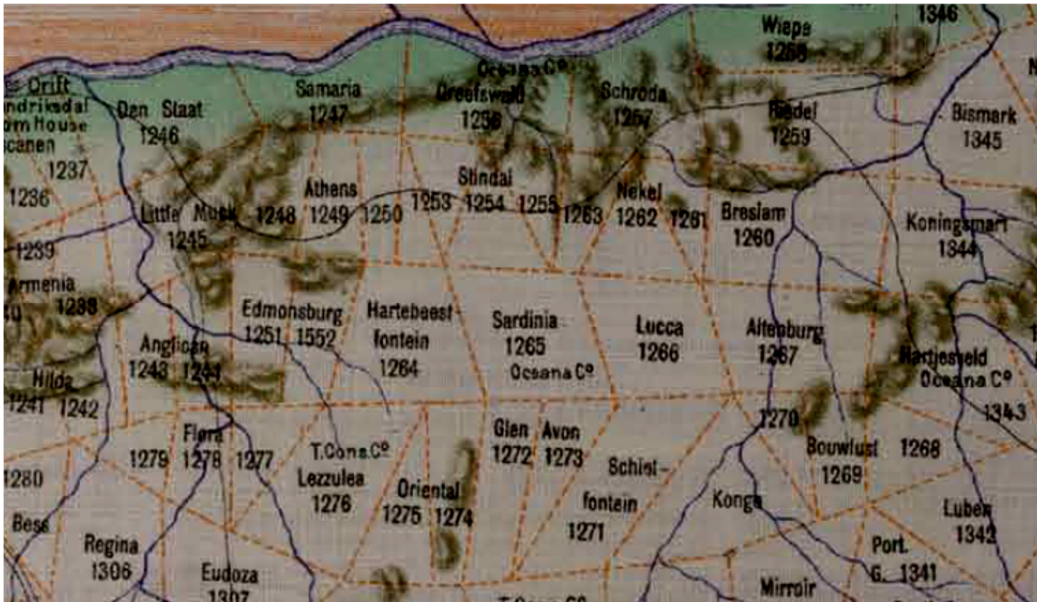


Fig. 09. The region of the study area as depicted in Jeppe's 1899 Map of the Transvaal.

The arrival of Europeans in the region was possibly heralded by the notorious Coenraad Buis early in the nineteenth century amongst the Basotho and Batswana to the east and the Northeast. This was soon followed up by missionaries such as Burchell in 1811, Campbell in the 1820's and in May 1821 the notorious Reverend Robert Moffat established himself at Kuruman. Later,

in 1834, Moffat accompanied the explorer Smith on his journey to Mzilikazi then living just north of the Magaliesberg along the Crocodile River. Soon after, the Great Trek followed in 1836, and Natal, the Freestate and the Transvaal were settled in with various levels of success by Europeans from the Cape Colony.

By 1848 the pioneers had established the town named Zoutpansbergdorp (Later also known as Schoemansdal), some 16 kilometres to the west of the modern day Louis Trighardt. By the 1900's all land north of the Soutpansberg had been claimed by white farmers, except the area to the east of the Sandrivier. By 1899 we see on Jeppe's Map of the Transvaal that all the farms surrounding the present study area had been established and named. Some pieces of land had in the meantime been subdivided and/or been consolidated and renamed.

Time line for the establishment of Venetia Diamond Mine.¹²

1903. Diamond bearing gravels discovered on the farm Seta, 35 kilometres north-east of the present mine.

1969. De Beers undertook a soil sampling programme.

1974. Discovery of a small kimberlite near Beit Bridge, Zimbabwe, leads to further sampling.

1980. Existence of kimberlites confirmed in September.

1988. Feasibility study commissioned in July and completed in July 1989.

1989. Board approval of R1,1 billion project given in December.

1992. 30 month project with first production month being July.

2014. Proposed date for starting underground mining.

2045. Projected life span of Venetia Diamond Mine.

¹² *PowerPoint presentation by Venetia Mine to a Fund Managers Delegation 2002*

9. Documentation of Data on the Premises under Investigation.



Fig. 10. This images shows the location of OMWSD dam and proposed positions for possible extension. Here one can then clearly see that owing to 30 years of mining activity the areas are so disturbed that there is no chance for the survival of in-situ cultural material. (Google Earth 2021.)¹³



Figs. 11 & 12. Typical views looking north in the middle of OMWSD 4. (Photos S.M. Miller 2021.)

¹³ Image supplied by Shangoni by e-mail on the 20th April, 2021.



Fig. 13. The western side of OMWSD 4 is already naturally damming rainwater against the eastern wall of sludge dam OMWSD N&R. (Photo S.M. Miller 2021.)



Fig. 14. The northern side of OMWSD 4 seen from inside the mine, looking into the game reserve and over the airstrip. This area is highly disturbed owing to construction of the airstrip and continuous flooding during the rainy season. (Photo S.M. Miller 2021.)



Fig. 15. Looking down on OMWSD 3 with OMWSD N&S in the background and OMWSD 3 to the right. (Photo S.M. Miller 2021.)



Fig. 16. Looking over OMWSD 4 to OMWSD N&S. (Photo S.M. Miller 2021.)



Fig. 17. Looking over the highly disturbed OMWSD 4 to OMWSD N&S in the background (Photo S.M. Miller 2021.)



Fig. 18. Looking over the disturbed OMWSD 4 to the administration complex in the background (Photo S.M. Miller 2021.)



Fig. 19. This image shows the location of PCD 1 and PCD 4 for possible extension of water management system. Here one can also clearly see that owing to 30 years of mining activity the areas are so disturbed that there is no chance for the survival of in-situ cultural material. (Google Earth 2021.)¹⁴



Fig. 20. Looking north over the disturbed PCD1 (Photo S.M. Miller 2021.)

¹⁴ Image supplied by Shangoni by e-mail on the 20th April, 2021.



Fig. 21. Looking south over the disturbed PCD 4 (Photo S.M. Miller 2021.)



Fig. 22. Looking south-east over the disturbed PCD 4 (Photo S.M. Miller 2021.)



Fig. 23. This image shows the location of the FRD RWD dam and proposed alternative sites for the new water management scheme. Here one can again clearly see that owing to 30 years of mining activity the areas are so disturbed that there is no chance for the survival of in-situ cultural material. (Google Earth 2021.)¹⁵

¹⁵ Image supplied by Shangoni by e-mail on the 20th April, 2021.



***Figs. 24 to 26.** Typical views of the FRD RWD dam and proposed alternative sites. Thirty years of mining have removed all chances of the survival of any cultural material of heritage value. (Photos S.M. Miller 2021.)*



Fig. 27. This image shows the location of the PCD 3 area another proposed site for the new water management scheme. Also here can be seen that owing to 30 years of mining activity the areas are so disturbed that there is no chance for the survival of in-situ cultural material. (Google Earth 2021.)¹⁶



Fig. 28. Typical view of the PCD 3 area in the game farm side of the fence. (Photo S.M. Miller 2021.)

¹⁶ Image supplied by Shangoni by e-mail on the 20th April, 2021.



Figs. 29 to 31. Typical views of the PCD 3 area. (Photos S.M. Miller 2021.)



Fig. 32. This image shows the location of the SOUTH ROAD. It is an existing fence road that needed to be checked for cultural remains. None was found. (Google Earth 2021.)



Figs. 29 to 31. Typical views of the SOUTH ROAD AREA. No cultural material could be observed. (Photos S.M. Miller 2021.)

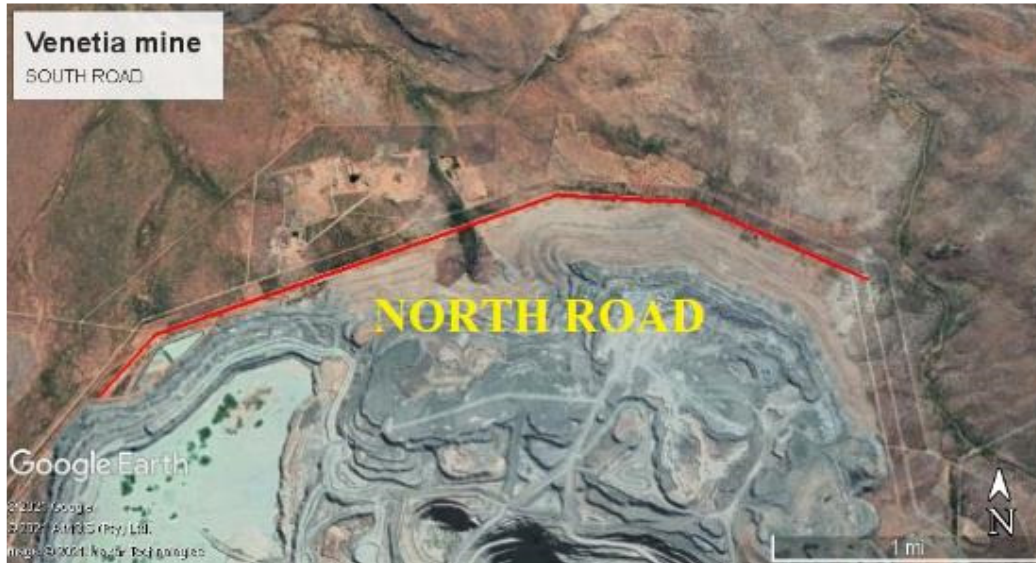


Fig. 32. This image shows the location of the NORTH ROAD. It is an existing road that will play a role in the proposed new water management project. It had to be checked for cultural remains. None was found. (Google Earth 2021.)



Fig. 33. Typical view of drainage problems along the north road. (Photo S.M. Miller 2021.)



Figs. 34 to 36. Typical views of drainage problems and disturbances along the north road. (Photos S.M. Miller 2021.)



Fig. 37. This image shows the location of the EASTERN AREA. The largest portion of this area falls in the mining area that has already been seriously compromised regarding the possibility to retrieve cultural remains. The area in the game reserve along the drainage line is rugged and rocky with steep inclines to the drainage line. This would not have been suitable for human occupation in the past. (Google Earth 2021.)



***Fig. 38.** Typical terrain between the fence and the drainage line in the game reserve. (Photo S.M. Miller 2021.)*



***Fig. 39.** Typical terrain between the fence and the interior of the mining area. There is so much disturbance that no cultural material (if it was ever present) would be found. (Photo S.M. Miller 2021.)*



Fig. 40. The two game rangers that accompanied the investigator in the game reserve part of the project. Alex Selofa on the left and Trevor Tshiwandalani on the right Alex have been working for nearly twenty years in the reserve, and has been working amongst others with Tom Huffman that used to chair the school of Archaeology at WITS. So he is well versed in the issues of cultural remains. He pointed the investigator to a possible archaeological site that is discussed below. (Photo S.M. Miller 2021.)



Figs. 41 and 42. Typical views of the site located at 22°25'52.60"S 29°21'13.35"E. (Circled in red in fig. 37.)¹⁷The site bears the characteristics of the Icon type sites, but no cultural material could be located owing to the density of the vegetation. (Photos S.M. Miller 2021.)



Figs. 43 and 44. Typical views of the site located at 22°25'52.60"S 29°21'13.35"E. (Circled in red in fig. 37.) It also contains the remains of a twentieth century brick built reservoir (on the left), and several concentrations of *Ricinus communis*, the castor bean¹⁸ or castor oil plant (on the right.) These plants are exotics and are commonly associated with disused cattle kraals. (Photos S.M. Miller 2021.)

¹⁷ This site falls outside the study area but is included as a site of interest owing to the presence of the exotic *Ricinus communis*, or castor bean.

¹⁸ Afrikaans: - olie-pit plant.

10. Field Rating. (SAHRA minimum standards May 2007.)

Area of interest	Rating according to minimum standards May 07	Area of interest	Rating according to minimum standards May 07
North Road	N/A	Eastern Portion	N/A
OMWSD 4	N/A	OMWSD 3	N/A
OMWSD N&S	N/A	PCD 1	N/A
PCD 2	N/A	PCD 3	N/A
PCD 4	N/A	FRD 1 RWD	N/A
South Road	N/A		

11. Statements of Significance. (SAHRA minimum standards May 2007.)

Area of interest	Rating according to minimum standards May 07	Area of interest	Rating according to minimum standards May 07
North Road	N/A	Eastern Portion	N/A
OMWSD 4	N/A	OMWSD 3	N/A
OMWSD N&S	N/A	PCD 1	N/A
PCD 2	N/A	PCD 3	N/A
PCD 4	N/A	FRD 1 RWD	N/A
South Road	N/A		

12. Summary.

12.1. Mandate of Shangoni Management services.

Shangoni's mandate is to procure a comprehensive impact assessment (including a first phase heritage impact assessment) of their client's proposed impact on the study area described above. This has to comply with the mine's environmental management programme that is ISO14001 certified.

The proposed impact is the upgrading and improvement of management of storm-water and water extracted from newly undertaken underground mining.

12.2. Intent of Venetia Mine.

It is the intent of the client to upgrade and improve management of storm-water and water extracted from currently undertaken underground mining.

12.3. The project description.

The present project is not for new mining. It is for the upgrading and extension of facilities to manage water responsibly within the framework of the National Environmental Management Act (NEMA), Act no 107 of 1998.

12.4. Historical milieu.¹⁹

A. The general area is known to contain both Early as well as Later Stone Age sites as well as rock art and engraving sites. These are mainly encountered along main drainage lines such as the Limpopo River and its tributaries such as the Kolope River. None of these were observed during the investigation. .

The proposed water management project and associated infrastructure will have no impact on Stone Age archaeological sites or material.

B. In the general area Iron Age sites such as the internationally known Mapungubwe and its associated sites is situated more to the north and east of Venetia, and later sites to the south in the Soutpansberg. None of these were observed during the investigation.

The proposed water management project and associated infrastructure will have no impact on Iron Age archaeological sites or material.

C. On the area investigated the only historical sites are generally old farms from the 20th century. One such farmyard situated near the present bus depot is utilised within the mining framework, but is situated outside the areas of impact.

The proposed water management project and associated infrastructure will have no impact on historical sites or material.

D. There are no sites of cultural/spiritual significance located on or near the areas under investigation.

E. There are no sites connected to slavery located on or near the areas under investigation.

F. There are no people of importance connected to the history of the study area.

¹⁹ For full description see chapter 8.

G. There is no special historical technological or scientific advancement of standing that can be linked to the property under investigation.

12.5. Environmental milieu.²⁰

Geology. The geology of the area is well known owing to the ancient Limpopo Mobile Belt dating back around 250 million years ago.

Regarding the kimberlite intrusions, the Venetia kimberlite cluster comprises 14 kimberlite pipes on a surface area of 4km². The kimberlite pipes have been intruded in synform structure.

The first kimberlite, known as K1, is kidney-shaped and is the biggest kimberlites ore body in the structure, with a surface area of 12ha. The second biggest body, K2, is oval-shaped and occupies 5ha of area. The dimensions of K1 and K2 are 640mx260m and 250mx200m respectively.

The cluster also consists of small kimberlite bodies and dykes along the Lezel fault plane, as well as various satellite ore bodies.

Vegetation. The site under investigation is located on one veld type, namely zone 15. Acocks describes this as Mopani Veld. (Acocks, 1988.)

13.1. Summary of findings.

Owing to the character of the ecology (geology, vegetation and precipitation) of the region it has always been a harsh environment for humans to settle in on a long term basis. Access to water was through major drainage lines that were seldom permanent and through isolated springs. This has limited long term settlement for any cultural group, except for short periods such as the Mapungubwe culture. No archaeological material was located during the study.

13.2. Recommendation.

According to the requirements of the National Heritage Act, Act 25 of 1999, there is no reason why the proposed water management scheme cannot be initiated.



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²⁰ *For full description see chapter 7.*

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Appendix 1: Declaration of Independence.

I, Sidney Mears Miller (ID 5412135029082) declare that:

I act as an independent environmental practitioner in this application;

I will perform the work relating to the application in an objective manner, even if this result in views and findings that is not favourable to the applicant;

I declare that there are no circumstances that may compromise my objectivity in performing such work;

I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity;

I will comply with the Act, regulations and all other applicable legislation;

I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;

I have no, and will not engage in, conflicting interests in the undertaking of the activity;

I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;

I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;

I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;

I will keep a register of all interested and affected parties that participated in a public participation process;

I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; all the particulars furnished by me in this form are true and correct;

will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations;

I realize that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity AND OR proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations.



SIDNEY MEARS MILLER.

Appendix 2: Provisional indemnity.

Declaration by author.

I Sidney Miller hereby declare that all reasonable steps were taken to identify the heritage resources on the property under investigation. For obvious reasons heritage remains that occurs underground cannot be vouched for. In the event of such remains being uncovered during the mining operations work should be stopped and a heritage practitioner or the heritage authorities must be informed. The cost of such new investigation will be for the account of the client.



SIDNEY MEARS MILLER.

Appendix 3: Shangoni impact and mitigation monitoring analysis.

No.	Aspect affected	Activity	Potential Impact	Phase	Mitigation type	Impact management actions / Mitigation measures	Impact management outcome	Standard to be Achieved	Time period for implementation
	Venetia new water management system	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable