


Appendix 7: Heritage Report

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Our Ref:	S0342/S0438/S0493	
Attention:	<p>Donald Lithole SAHRA Limpopo P.O. Box 1371 Polokwane 0700</p> <p>cc. Mary Leslie SAHRA Head Office P.O. Box 4637 Cape Town 8000</p>	
<p>Expansion of the Char Plant and Construction of Coke and Co-generation Plants at Exxaro's Grootegeluk Mine in Lephalale, Limpopo Province</p>		

Dear Mr Lithole

The National Heritage Resources Act (No. 25 of 1999) requires that the responsible heritage authority must be informed of 'any development or other activity which will change the character of a site – (l) exceeding 5000 m². Exxaro Reductants is proposing to undertake a development that will alter the character of a site with an extent greater than this and the SAHRA are hereby informed of this.

The proposed projects are described below.

Project Description – Char Plant Expansion

A 4 retort Char Plant has been in operation on the farm Daarby 458 LQ, within the boundaries of the Grootegeluk Coal Mine since June 2009. The char plant is owned and operated by Exxaro Reductants (Pty) Ltd and is therefore a separate entity to the Grootegeluk Mine (owned by Exxaro Coal). The existing plant covers an area of approximately 5.5ha.

The proposed expansion to the Char Plant involves increasing the number of retorts from 4 to a maximum of 12. The expansion would therefore involve the construction of an almost identical replica of the existing Char Plant. The Char Plant expansion will be located directly



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adjacent to the existing plant and will occupy a combined area of approximately 8.5ha (refer to Appendices 1 to 3 for locality maps and aerial photos).

The char plant involves the conversion of lumpy coal blends to high quality carbon reductants (char) through devolatilisation by releasing volatile compounds through heating the coal at approximately 900°C. The process takes place in a closed circuit and involves the re-application of gaseous heat in the absence of oxygen, which maximises the recovery of lumpy carbon – this reaction takes place in vertical retort. Char is a metallurgical carbon reductant and is increasingly used to supplement market coke due to the limited availability of imported coking coal. The char plant is therefore in a prime position, as it has access to suitable coal feedstock as well as being close to major consumers (ferro-chrome, ferro-manganese and platinum producers).

The volatile gases leave the top of the retort and contain methane, hydrogen, tar and oil gases and a small quantity of Sulphur Dioxide. This off-gas is then cleaned by first precipitating the tar into tar tanks and then cooled to precipitate water which will contain a small amount of hydrocarbon oils and sulphur. Thereafter the gas is clean gas consisting of hydrogen, methane and air. The precipitated water is termed liquor due to fact that it still contains some hydrocarbons and sulphur, therefore it is destructed in a liquor destructor by using gas produced by the plant to harmless CO₂ and H₂O (steam) which exit the stack.

Infrastructure associated with the char plant which will be expanded as part of this project includes:

- Admin buildings;
- Gas boosters;
- Gas cleaning and cooling equipment;
- Tar storage tanks;
- Liquor buffer tanks;
- Liquor destructors;
- Liquor destructor stacks;
- Retort vents; and
- Coal and product stockpiles.

Additional infrastructure, not included within the existing char plant, but to be included in the expansion project includes:

- Oil and water separating plant;
- Tar conditioning facility;
- Briquetting plant;
- Spare store; and
- Tar storage and reclaiming facility (TSRF).

The project programme for the development of this char plant expansion is earmarked to commence construction in October 2011 and to begin operation of the plant in April 2013. Currently the exit gases from the char plant is a source of wasted energy, and at a later stage the char plant intends to convert this wasted energy into steam to generate electricity.

Project Description – Coke and Co-generation Plants

Exxaro Reductants (Pty) Ltd and Exxaro Energy (Pty) Ltd would also like to develop a Coke Manufacturing Complex with electricity Co-generation Plant at Grootegeluk Mine, located on the farm Daarby 458 LQ in Lephalale (Ellisras). The complex is envisaged to consist of 120 Coke ovens and fitted with a co-generation section which together with the char co-generation plant will produce 120 MW of electricity. The complex will be approximately 21 hectares in size and will be located near the existing char plant which is to be expanded (refer to Appendices 1 to 3 for locality maps and aerial photos).

Semi-soft coking coal is crushed to less than 2mm and then stamped into 45 ton blocks. Each 45 ton block is pushed into a coke oven at 900°C and the coke block is devolatilised in the oven for a period of 65 hours at an oven temperature of 1200°C. During this heating cycle, coke is formed and volatile materials in the coal (off-gases) are released. The gases, which are mainly rich in carbon monoxide (CO) and hydrogen (H₂), would have been burnt and released to the atmosphere under normal circumstances. The off-gases contain large amounts of energy and are combusted above the coal block, beneath the oven floor, in the gas off-duct and lastly before the waste heat boiler. This project will use the coke oven gases in a waste heat boiler which will supply steam to a turbine in order to drive a generator to produce electricity. The project has the potential to produce 70 MW which will cater for the total electricity demand of Grootegeluk Mine. The produced electricity will be fed directly into the Eskom grid.

By using the coke oven flue gas as a primary fuel for electricity production, significant environmental benefits are gained, since burning the same amount of fuel more efficiently means fewer emissions for the same level of output. The coke plant utilises all the tars, oils, and gases in the coal to produce steam and electricity i.e. it produces no by-products other than final electricity.

The infrastructure required for the co-generation plant mainly consists of four waste heat boilers, gas combustion system, steam system, turbines, water condensation system, alternators, switchgears, generator and control gears.

The project programme for the development of the coke and associated co-generation plants is to begin construction in April 2013 and to begin operation of the plants in April 2015.

Heritage Assessment

The National Heritage Resources Act requires that the responsible heritage authority be informed of developments exceeding 5000 m². The SAHRA must then notify the applicant of their requirements.

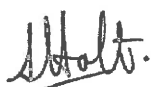
The footprint of the proposed Char Plant Expansion will be increased from 5.5 ha to 8.5 ha and the footprint of the new Coke and Co-gen Plants will be approximately 21 ha in extent. However, the proposed sites have been previously disturbed by coal stockpiling undertaken on the sites for the past 40 years (see aerial photos in Appendix 2 and 3). The possibility of artefacts of cultural or heritage significance being located at the site is therefore considered to be negligible.

A phase one Heritage Impact Assessment has been conducted for the entire mining rights area for the Exxaro Grootegeluk Mine (previously owned by Kumba Resources Ltd), which includes the proposed site of the Char Plant Expansion and the new Coke and Co-gen Plants. For your information, I have attached a copy of this report, dated September 2005 as Appendix 4. The investigation was conducted by J. van Schalkwyk of the National Cultural History Museum, who also wrote the report. The results of this report indicate that the closest archaeological site to the proposed developments is 3.16km away (see Appendix 2 and 3). For this reason, it is assumed that no additional heritage mitigation is required for these developments.

This letter therefore serves to inform SAHRA of the proposed developments and to provide motivation for not undertaking any further heritage assessments for these developments. Please direct a response to Synergistics Environmental Services. Should there be any queries, please do not hesitate to call the undersigned.

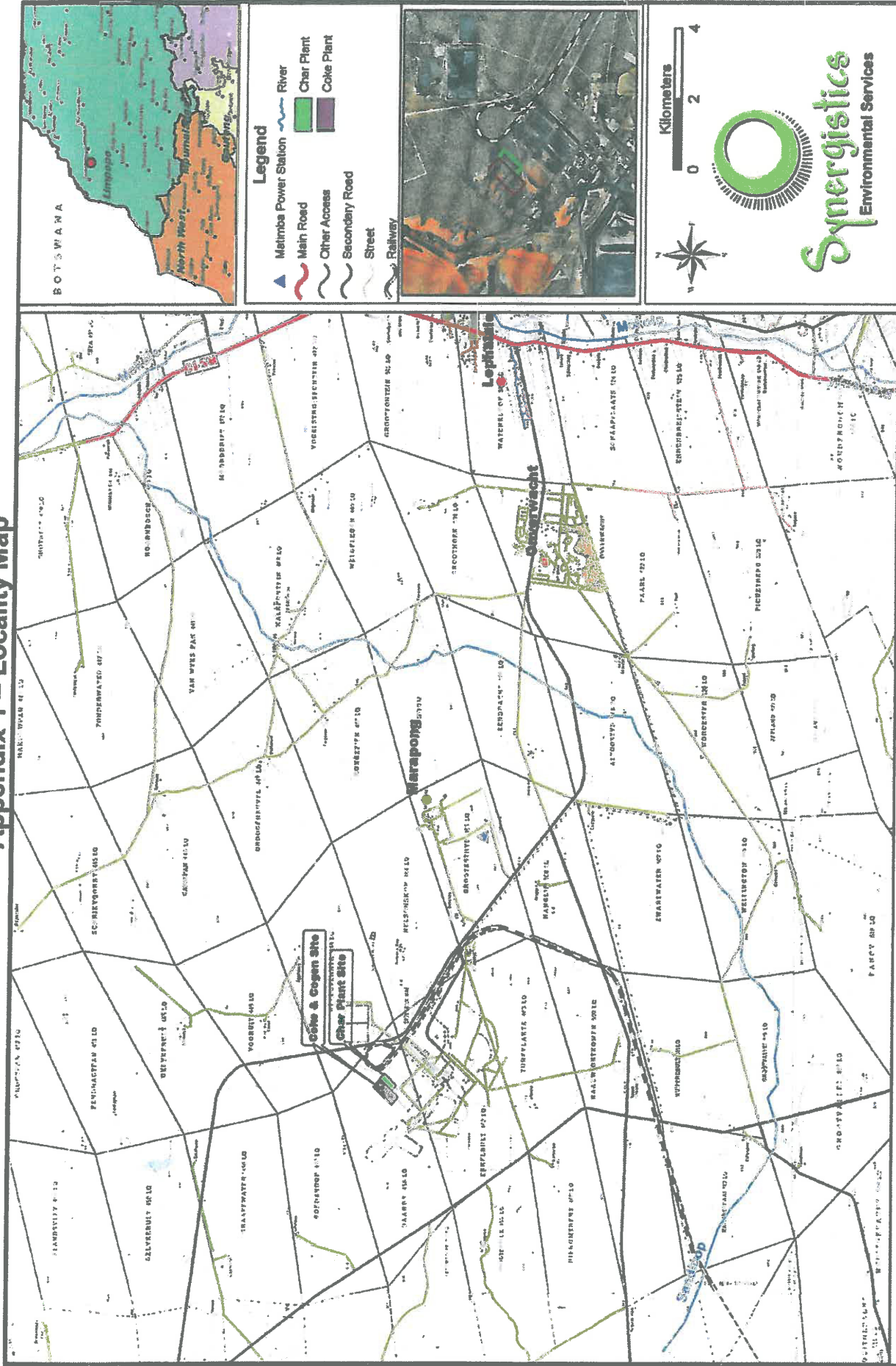
for Synergistics Environmental Services

Yours sincerely,



Shelley Holt
B.Sc. Hons
Environmental Scientist

Appendix 1 – Locality Map



Locality Map

SO438

Spheroid
WGS84

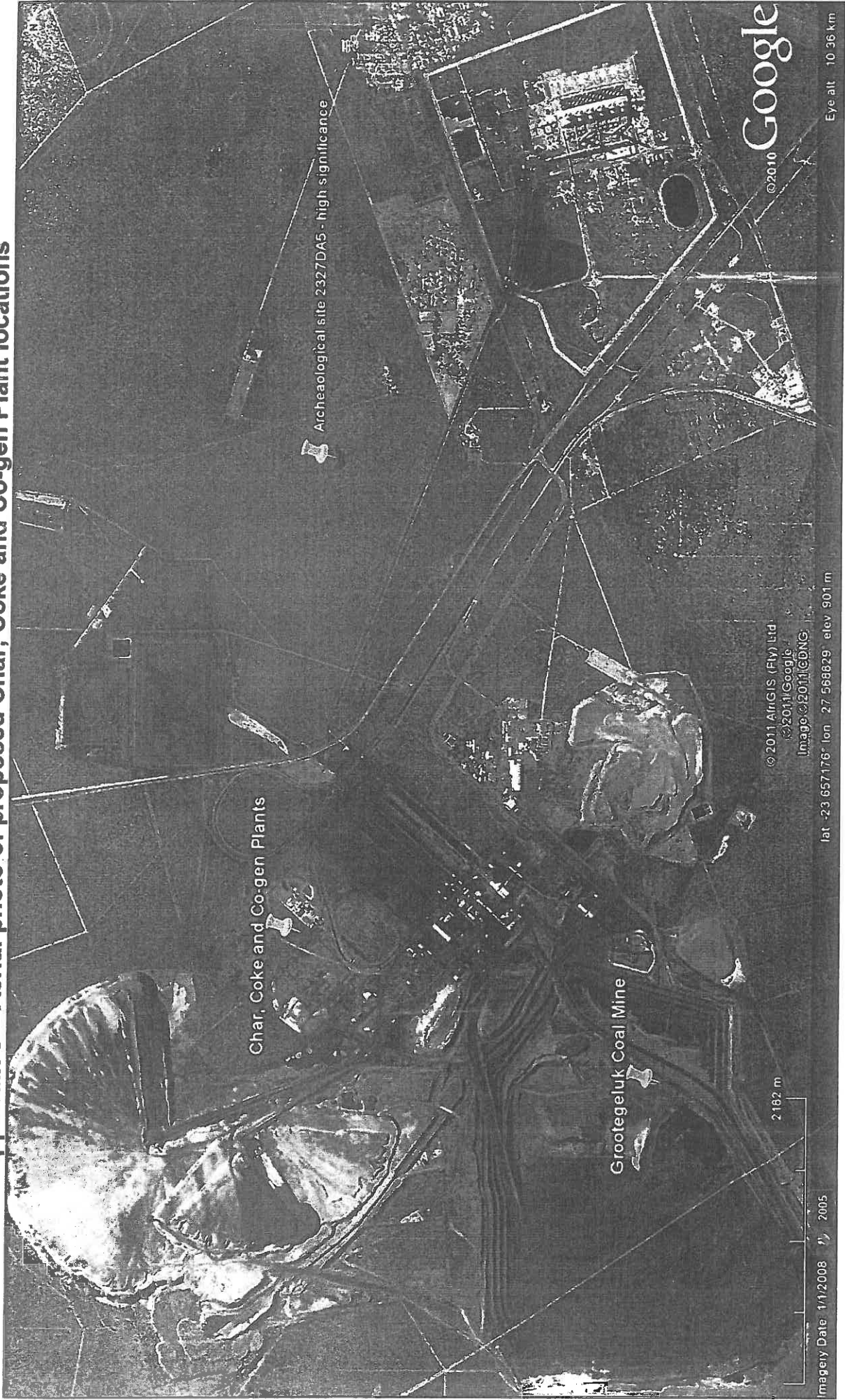
Coordinate System
DMS
Central Meridian
10



Appendix 2 – Aerial Photo of mining rights area



Appendix 3 – Aerial photo of proposed Char, Coke and Co-gen Plant locations



Appendix 4 – Heritage Survey Report for Grootegeluk Mine

**HERITAGE SURVEY REPORT OF THE KUMBA PROPERTIES AT
GROOTEGELUK MINE, LEPHALALE AREA, LIMPOPO PROVINCE**

For:

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GROOTEGELUK MINE
PO Box 178
LEPHALALE
0555**

Survey conducted and report prepared by the:

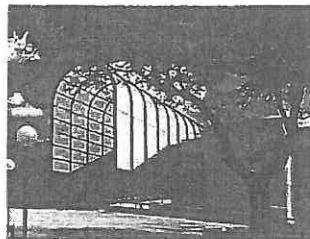
**NATIONAL CULTURAL HISTORY MUSEUM
PO Box 28088
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REPORT: 2005KH90

Date of survey: September 2005

Date of report: September 2005



**NATIONAL CULTURAL HISTORY MUSEUM
NASIONALE KULTUURHISTORIESE MUSEUM**

SUMMARY

Heritage survey report of the Kumba properties at Grootegeluk Mine, Lephalale area, Limpopo Province

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the boundaries of the property of the Grootegeluk Mine.

Only a few sites were identified. It seems as if people avoided this area in the past, largely due to its inhospitable environment. It was only during historic times that significant numbers of people started to settle here. This increased drastically after the mining activities started.

Two of the identified sites are viewed as having high significance. In Section nine of this report, extensive recommendations are made as to their preservation. In short, the following are recommended:

- The location of the sites should be added to an overall mine development plan in order to avoid them or to implement the proposed mitigation proposals in time.
- The hill known as Nelson's kop is obviously a site of high significance as it had (still have?) ritual importance for both hunter-gatherers and African farmers. Development in this area should be avoided.
- The cemeteries should be avoided. Alternatively, if that is not possible, mitigation measures can be implemented by relocating the graves.
- If archaeological sites are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.

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HERITAGE SURVEY REPORT OF THE KUMBA PROPERTIES AT GROOTEGELUK MINE, LEPHALALE AREA, LIMPOPO PROVINCE

1. THE SURVEY

The National Cultural History Museum was contracted by Kumba Resources to survey their properties at the Grootegeluk mine, consisting of a number of farms. The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural importance (Fig. 1) found within the boundaries of the mine properties (Fig. 2).

2. TERMS OF REFERENCE

The scope of work consisted of conducting a Phase 1 archaeological survey of the site in accordance with the requirements of Section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

This include:

- Conducting a desk-top investigation of the area;
- A visit to the area under consideration.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the area of interest;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

3. DEFINITIONS AND ASSUMPTIONS

The following aspects have a direct bearing on the survey and the resulting report:

- *Cultural resources* are all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, structures and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.
- The *significance* of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

- Sites regarded as having *low significance* have already been recorded in full and require no further mitigation. Sites with medium to high significance require further mitigation measures.
- The *latitude* and *longitude* of archaeological sites are to be treated as sensitive information by the developer and should not be disclosed to members of the public.

According to Section 3(1), for the purposes of the Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

(2) Without limiting the generality of subsection (1), the national estate may include-

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites;
- (g) graves and burial grounds, including-
 - (i) ancestral graves;
 - (ii) royal graves and graves of traditional leaders;
 - (iii) graves of victims of conflict;
 - (iv) graves of individuals designated by the Minister by notice in the Gazette;
 - (v) historical graves and cemeteries; and
 - (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including-
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - (ii) objects to which oral traditions are attached or which are associated with living heritage;
 - (iii) ethnographic art and objects;
 - (iv) military objects;
 - (v) objects of decorative or fine art;
 - (vi) objects of scientific or technological interest; and
 - (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

Figure 1. Categorization of heritage resources according to the National Heritage Resources Act, No. 25 of 1999.

4. LEGISLATIVE REQUIREMENTS

Aspects concerning the conservation of cultural resources are mainly dealt within two acts. These are the South African Heritage Resources Act (Act No 25 of 1999) and the Environment Conservation Act (Act No 73 of 1989).

4.1 South African Heritage Resources Act (Act No 25 of 1999)

Archaeology, palaeontology and meteorites

In terms of Section 35(4) of this Act, no person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or material or any meteorite; bring onto, or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Structures:

Section 34(1) of this Act states that no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

“Structure” means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

“Alter” means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.

Human remains:

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

4.2 Environment Conservation Act (Act No 73 of 1989)

This Act states that a survey and an evaluation of cultural resources should be undertaken in areas where development, which will change the face of the environment, is to be made. The impact of the development on the cultural resources should also be determined and proposals to mitigate this impact are to be formulated.

5. METHODOLOGY

5.1 Preliminary investigation

5.1.1 *Survey of the literature*

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the heritage potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted - see the list of references below.

Literature dealing with the area specifically is largely non-existing. Most of which that could be found, deal with the agricultural potential (Mentz & Coetzee 1973) of the area or coal mining exploration and activities (Cloete 1980, Faure 1993).

5.1.2 *Data bases*

The *Archaeological Data Recording Centre* (ADRC), housed at the National Cultural History Museum, Pretoria, was consulted. The *Environmental Potential Atlas* was also consulted.

5.1.3 *Other sources*

The topocadastral and other maps were also studied - see the list of references below.

5.2 Field survey

The area that had to be investigated was identified by *Kumba Resources* by means of maps. As this is a very large area, and, based on previous knowledge and the desktop study that indicated that very little would be found, an approach to the field survey was developed that was aimed at locating all possible sites:

- Firstly, each of the farms was investigated by driving across it, using the existing roads. This gave the necessary insight into the area, its geography, topography, vegetation, etc. and, as a result, an idea of what could be expected.
- Secondly, special attention was given to natural features, e.g. pans (e.g. Eendrag Pan – Fig. 3) and outcrops (e.g. Nelson's Kop and Koei and Kalf – Fig. 4) as well as other topographical occurrences such as trenches, holes, and clusters of trees.
- Thirdly, the remains of previous habitation such as farmsteads were plotted from the 1:50 000 maps and the sites were then visited (Fig. 5 & 6).
- Lastly, where possible, the different landowners/occupiers were interviewed in an effort to obtain information on the existence of known sites.

5.3 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual

localities were determined by means of the *Global Positioning System* (GPS)¹ and plotted on a map (see Fig. 1). This information is added to the description in order to facilitate the identification of each locality.

Map datum used: Hartebeeshoek 94 (WGS84).

¹ According to the manufacturer a certain deviation may be expected for each reading. Care was, however, taken to obtain as accurate a reading as possible, and then to correlate it with reference to the physical environment before plotting it on the map.

6. DESCRIPTION OF THE AREA

The area that was investigated is indicated in Fig. 1. It included approximately 19 farms, all of which are located in the Lephalale (formerly Ellisras) district of Limpopo Province.

The topography of the area is very flat, with very few features (e.g. hills, outcrops or rock shelters, rivers) that usually drew people to settle in its vicinity, are found in the area. Only a few small hills or outcrops occur. All the rivers crossing the area are non-perennial. The biggest river, the Makolo, passes some distance to the east of the study area, flowing from south to north.

The geology is made up of alternating bands of arenite and shale, with a basalt intrusion to the west of the study area. All is overlain by sand, probably aeolic in origin, having being laid down from the west.

The area can be described as typical savanna, with the original vegetation consisting of Mixed Bushveld, with a section to the north classified as Sweet Bushveld.

In the recent past, all of these properties were used for cattle farming. As a result, farming related infrastructure was developed. When the properties were bought up by Kumba Resources, the land use on most farms changed to game farming and, as a result, people moved off the farms.

7. DISCUSSION

Probably because of the somewhat inhospitable environment, being very flat, hot and dry (less than 300 mm of rain per annum) and with few sources of surface water, people did not settle in large numbers in the area in the past. As a result, only a few sites of cultural significance were identified in the study area (see Appendix 2).

In the larger region, in areas where there are outcrops, especially close to rivers, rock art sites have been documented. The ones closest to the study area are located on the farm Grootfontein 501LQ, on the northern outskirts of the town of Lephalale. Other rock art sites are found further away to the south and the east.

Early and Later Iron Age sites are similarly found to the south and the east, as well as to the north. As these people were agro-pastoralists (and did not have the technology to extract subterranean water), they preferred to settle in areas where such resources were readily available.

The historic period starts off quite late in this part of the country. Probably one of the earliest published sources that refer to the area, in a generalised sense, is that of the explorer Thomas Baines who passed through the area during the early 1870s (Fig. 7). Although for other sections of his travels he gives detailed descriptions of the local population, he does not comment on anybody in this particular area. Although his rendering of the various rivers and other topographical features are quite accurate for the time, he seems to imply that there were no communities settled here (Baines 1877).

Similarly, Van Warmelo (1935) in his encyclopaedic work on the distribution of various Bantu-speaking groups show an area largely devoid of communities, with only a few isolated occurrences, all possibly farm-workers (Fig. 8). The closest community indicated by him are the Seleka, who reside approximately 50 km to the north. To the south, it seems from his maps that the area also used to be claimed by the Seleka. This is a very Sothoised group of Ndebele whom have also lived amongst the Ngwato in Botswana and their arrival in the area date to late Pre-colonial times.

In the town of Lephalale (Ellisras) there is a cemetery containing the graves of some of the earliest white settlers in the area. The town of Ellisras was only laid out in December 1960, and was named after two of the pioneer families in the area, Ellis and Erasmus. In 2002, the name was changed to Lephalale. This latter name is taken from the Phalala River, which is derived from the Tswana verb 'to flow' or 'one which overflows' (Raper 2004: 86, 204).

With reference to the study area itself, the following sites have been identified.

7.1 Stone Age

Stone tools dating to the Middle Stone Age were recorded at a few select spots, predominantly at outcrops and pans (Fig. 9). As these artefacts were found on the surface, they are not in their original context any more and can yield very little information. As a result, they are viewed to have no significance.

However, the opposite holds true for the site at Nelson's kop (see Appendix 2). Here some interesting engravings of animal spoors, cupules and cut marks were identified on the southern face of the hill (Fig 10). In addition, on top of the hill a number of small stone walled sites occur. A few non-diagnostic stone flakes and potsherds occur in the shelter.

From ethnographic sources it is known that hills or promontories, for example in the Karoo, are important features to the San because they offer vantage points in an otherwise remarkably flat landscape from which the springbok may be watched (Deacon 1988). This is probably the purpose of the stone circles on top of Nelson's Kop, serving as lookout points. The fact that there is a big panel with a variety of engravings on it indicates that this is in all probability a site of potency, for the making of rain by the San and later Sotho-Tswana speaking people in the area (see Van der Ryst *et al* 2004).

Although such sites are not unknown, this is currently the only known one in the larger region. Furthermore, it might even be linked with the other rock painting sites in the larger region, e.g. on the outskirts of Lephalale. A negative impact on this site would then, by extension, also have a negative impact on all the other sites. Based on its uniqueness, scientific and religious value, this site is viewed as having high significance and development should not be allowed to take place on or near it.

7.2 Iron Age

No sites dating to the Iron Age were identified. A few pieces of pottery were found at an outcrop on the farm Kuipersbult (Appendix 2). However, these did not include any diagnostic pieces and it is therefore difficult to determine its dating or identity. They are viewed as having no significance.

7.3 Historical period

Although a number of old farmsteads occur in the area, all have been demolished and little of them remain. As far as could be ascertained from available resources, none of these can be related to a significant event or an important historical individual. As a result, they are also viewed as having no significance. Two small informal cemeteries that relate to this period of farm occupation were identified (see Appendix 2).

Other structures, such as water troughs, windmills and dams, some dating to the days when the farms were used for cattle farming, are still in use. However, these all conform to general patterns and none exhibit unique technology or solutions.

The mining history in the area is represented by the the headgear of the first shaft that was sunk, leading to the eventual large scale mining activities (Fig. 11).

7.4 Intangible heritage

Some farms names have recently been changed (e.g. Kafirsdraai to Kromdraai), and rightly so as the old names are derogatory. Other farm names reflect on the earliest settlers and their Dutch origin or, more probably on the original surveyors and their background, such as the obvious Dutch influence in the spelling of some farms e.g. Schrickvoorby and Eendrachtpan. Others, such as Vaalpensloop presents tantalising evidence to the possible prehistory of the area. The name Vaalpense was used to refer to a group of impoverished people of a mixture of San and Bantu-speaking origin that used to populate large areas viewed as marginal by other groups (Van Schalkwyk 1985).

However, to document all of this falls outside the scope of this report, as it would entail tracking down previous inhabitants and interviewing them in detail.

8. IDENTIFICATION OF RISK SOURCES

Scoping exercises usually focus on two phases of a proposed development: *the construction and operation phases*. The following project actions may impact negatively on archaeological and other sites of cultural importance. The actions are most likely to occur during the construction phase of any proposed project.

TABLE 1:

Construction phase:

Possible Risks	Source of the risk
Actually identified risks	
- damage to sites	Construction work
Anticipated risks	
- looting of sites	Curious workers

Operation phase:

Possible Risks	Source of the risk
Actually identified risks	
- damage to sites	Not keeping to management plans
Anticipated risks	
- damage to sites	Unscheduled activities

9. MANAGEMENT PLAN

There are only a few cultural heritage resources known to exist in the surveyed area and their future management would not present much of a problem. Any mining activities would have very little impact on these sites, unless it takes on the form of a physical impact. Fortunately, from ground level, the development does not have a visual impact on any of the sites.

- As a first step the location of the sites, presented in Appendix 2, should be added to an overall mine development plan in order that they can be avoided in future. However, if development is to take place on or near a site, the recommended management action proposed in Appendix 2 should be implemented.

The old mine headgear site enjoys a certain amount of conservation at present, largely due to its isolated position and the fact that it is already fenced off.

- It is recommended that the environmental team at the mine inspect it annually. This can be combined with a general cleanup of the area.

The only site of cultural significance for which no mitigation would be acceptable, is the rock engravings and stone circles at Nelson's Kop. It therefore requires and special management actions to preserve this site:

- It is recommended that a buffer zone is created around the hill by declaring an area from the base of the hill in any direction for a distance of at least 250 metres as a no-go area for development.
- Furthermore, visitors should be informed of the sensitivity of the site and they should not be allowed to visit the site unsupervised. Fortunately, the current land user allows only hunting in the area. He knows about the importance of the site and is sympathetic towards the conservation thereof.
- Inspection of the site should be done annually by the environmental team at the mine.
- A general clean up of the site is recommended, but only of the very obvious litter such as beer cans and bottles and bottle tops.
- No fires, e.g. for braais or picnics are to be allowed in or near the shelter.
- As part of the current survey, the site was documented by the archaeologist. It is planned to present this information in published format at some time in the near future. This would serve as baseline information on the status of the site.

The biggest risk posed by any development project would be the accidental uncovering of unknown sites.

- In such a case, an archaeologist should be contacted in order to investigate the occurrence and to make suggestions with regard to suitable mitigation measures.

10. SUMMARY

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the boundaries of the property of the Grootegeluk Mine.

Only a few sites were identified. It seems as if people avoided this area in the past, largely due to its inhospitable environment. It was only during historic times that significant numbers of people started to settle here. This increased drastically after the mining activities started.

Two of the identified sites are viewed as having high significance. In Section nine of this report, extensive recommendations are made as to their preservation. In short, the following are recommended:

- The location of the sites should be added to an overall mine development plan in order to avoid them or to implement the proposed mitigation proposals in time.
- The hill known as Nelson's kop is obviously a site of high significance as it had (still have?) ritual importance for both hunter-gatherers and African farmers. Development in this area should be avoided.
- The cemeteries should be avoided. Alternatively, if that is not possible, mitigation measures can be implemented by relocating the graves.
- If archaeological sites are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.

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11.3 Maps

1: 50 000 Topocadastral maps – 2327CB, 2327DA

12. PROJECT TEAM

J van Schalkwyk – principal investigator

APPENDIX 1: STANDARDISED SET OF CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON CULTURAL RESOURCES

Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a “no-go” implication on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

- 1 = no further investigation/action necessary
- 2 = controlled sampling and/or mapping of the site necessary
- 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
- 4 = preserve site at all costs

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2: SURVEY RESULTS²

[Previous site numbers relate to other known sites on a particular ¼ degree sheet already documented in the ADRC, and does not necessarily refer to sites occurring on or close to the specific surveyed area.]

Map datum used: Hartebeeshoek 94 (WGS84).

1. Site number: 2327DA5

Location: Nelsonskop 464LQ; S -23.65094; E 27.58650

Description: A small hill. Some interesting engravings of animal spoors, cupules and cut marks were identified on the southern face of the outcrop (Fig. 10). On top of the hill, a number of small stone walled enclosures occur. The hill is in all probability a site of potency, for the making of rain, by the San and later Sotho-Tswana speaking people in the area.

Discussion: Based on its uniqueness, scientific and religious value, this site has a high significance and development should not be allowed to take place on or near it.

Recommended management action: 4 = preserve site at all costs.

Legal requirements: SAHRA permit

2. Site number: 2327DA4

Location: Kuipersbult 511LQ; S -23.70760; E 27.57939

Description: Small outcrop. A few small pieces of non-diagnostic Iron Age pottery occur on the site. The site could have served as rainmaking site, but no engravings of other artefacts were found here.

Discussion: The site is viewed to have little significance.

Recommended management action: 1 = no further investigation/action necessary

Legal requirements: None

3. Site number: 2327CB1

Location: Vergulde Helm 316LQ; S -23.71142; E 27.49734

Description: An informal cemetery with four graves. Two of these go back to the 1930s, and the other two date to within the last 10 years.

Discussion: This site falls just outside the identified areas and is only mentioned because it is very close to the border with the farm Eenzaamheid 512LQ.

Recommended management action: 1 = no further investigation/action necessary

Legal requirements: If relocation is necessary, SAHRA permit; local government permits; notification of descendants.

4. Site number: 2327DA3

Location: Kuipersbult 511LQ; S -23.71889; E 27.55988

Description: Single grave. Inscription: MS Moloantoa 25/5/1848 - 24/12/1953

Discussion: If development takes place, this feature would have to be relocated.

Recommended management action: Relocate grave if necessary.

Legal requirements: If relocation is necessary, SAHRA permit; local government permits; notification of descendants.

5. Site number: 2327DA11

Location: Groothoek 504LQ; S -23.66140; E 27.67658

² See Appendix 1 for an explanation of the conventions used in assessing the heritage remains.

Description: Apparently this is the headgear of the first shaft that was sunk in this area before large scale mining took place (Fig. 11).

Discussion: Fortunately, this site is located far from future development and would not be impacted on. Furthermore, it is already fenced in and therefore enjoys a certain amount of protection.

Recommended management action: 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary.

Legal requirements: SAHRA permit

APPENDIX 3: GLOSSARY AND ABBREVIATIONS

This section is included to give the reader some necessary background. It must be kept in mind, however, that these dates are all relative and serve only to give a very broad framework for interpretation.

STONE AGE

Early Stone Age (ESA)	2 000 000 - 150 000 Before Present
Middle Stone Age (MSA)	150 000 - 30 000 BP
Late Stone Age (LSA)	30 000 - until c. AD 200

IRON AGE

Early Iron Age (EIA)	AD 200 - AD 1000
Late Iron Age (LIA)	AD 1000 - AD 1830

HISTORICAL PERIOD

Since the arrival of the white settlers - c. AD 1840 in this part of the country

ADRC - Archaeological Data Recording Centre

core - a piece of stone from which flakes were removed to be used or made into tools

PHRA – Provincial Heritage Resources Agency

SAHRA - South African Heritage Resources Agency

ILLUSTRATIONS

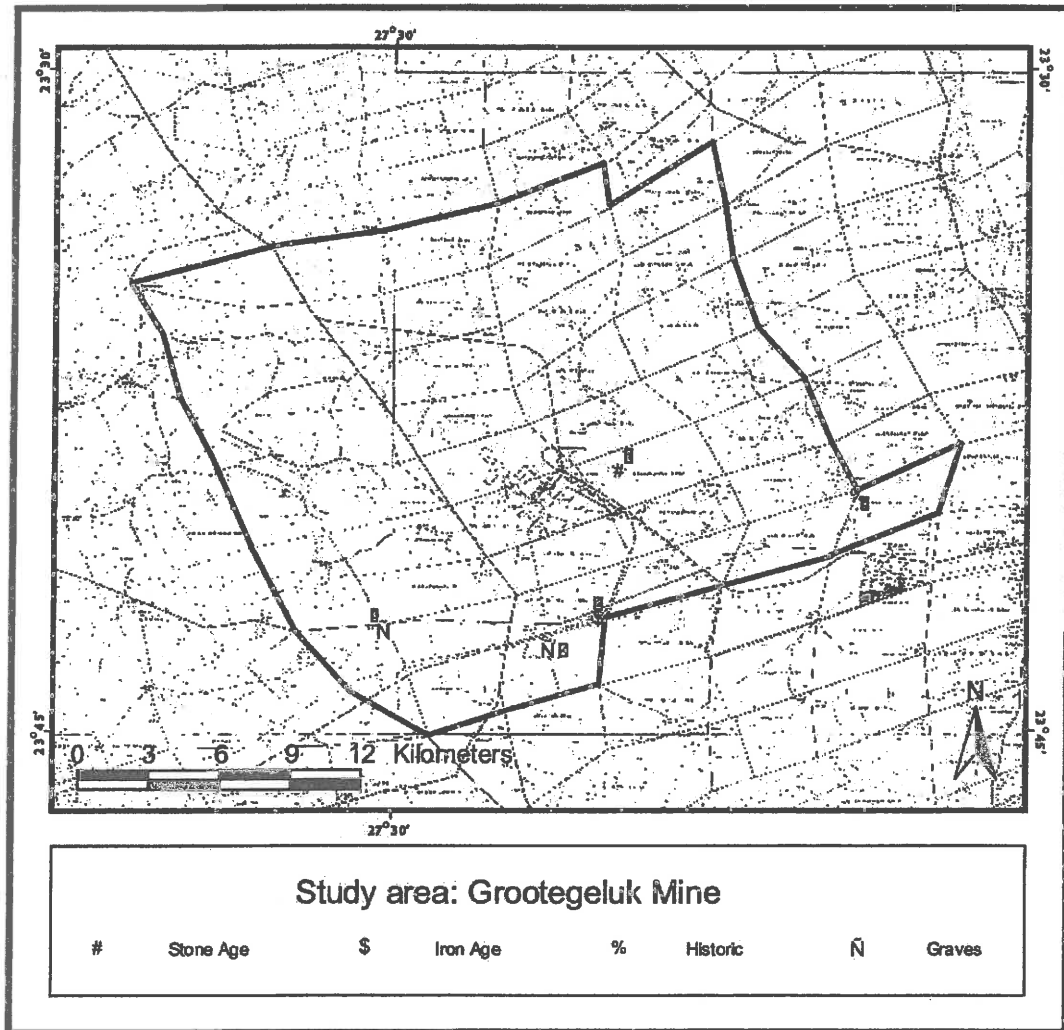


Figure 2. Location of the study area, showing the identified sites.

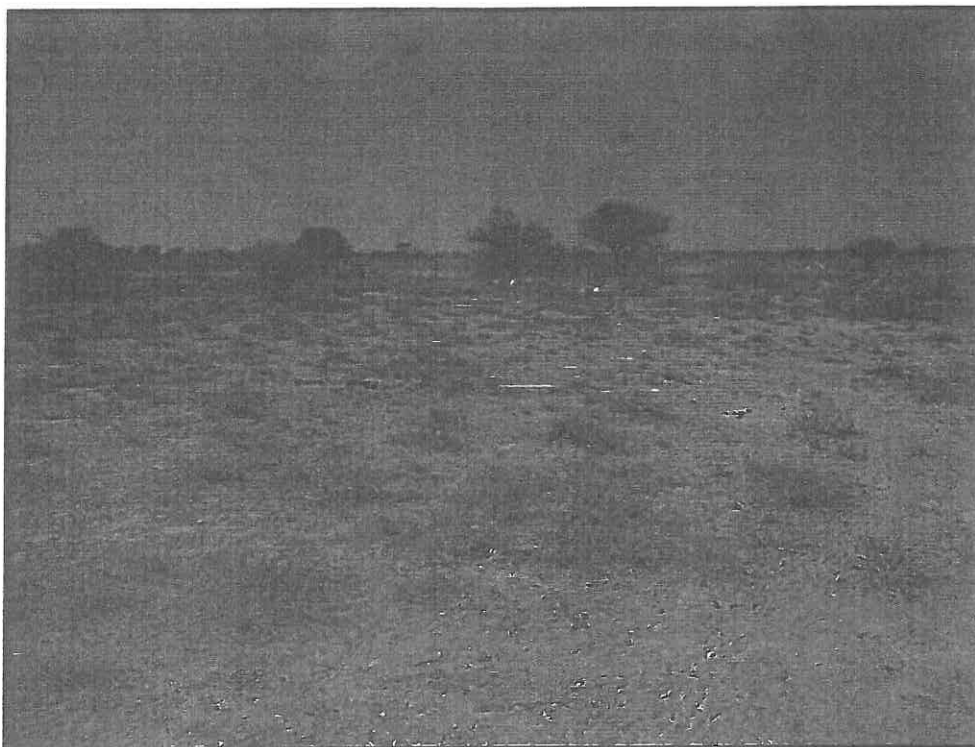


Figure 3. Eendragpan on the farm Gelykebult 450LQ.

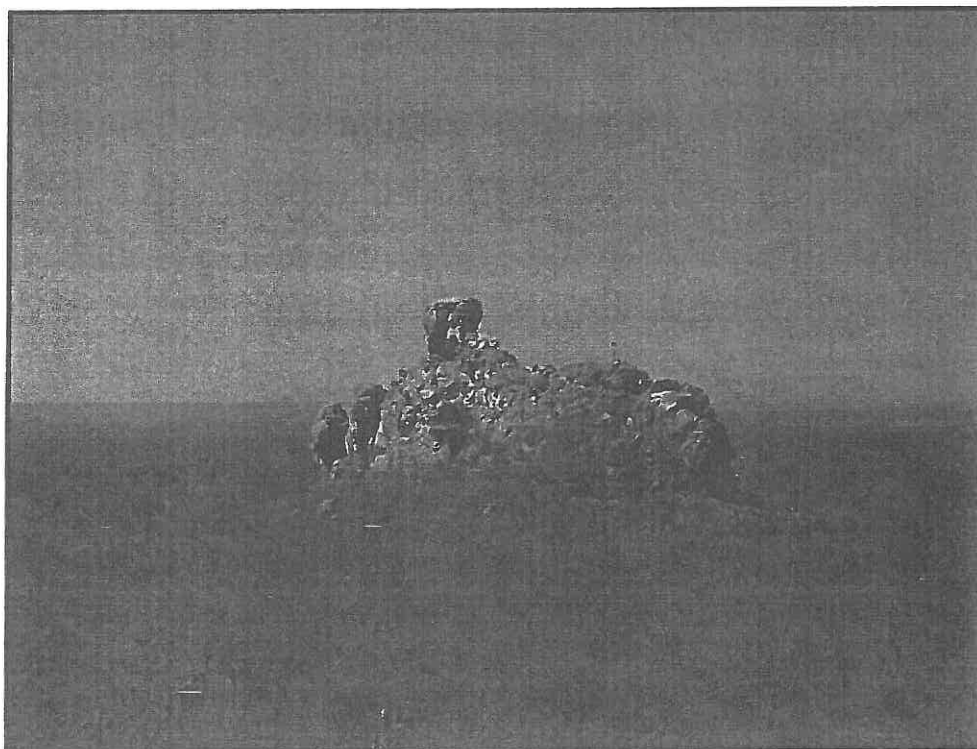


Figure 4. The outcrop known as 'Koei', on the farm Welgevonden 444LQ.



Figure 5. The remains of the old farmstead on the farm McCabesvley 311LQ.

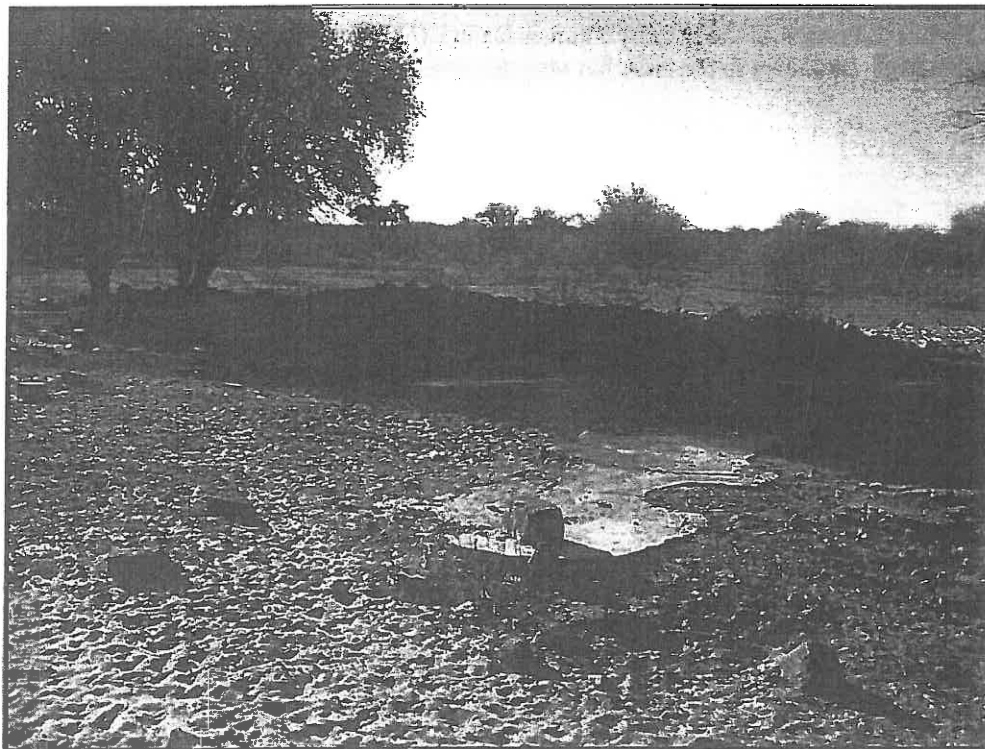


Figure 6. Remains of the old farmstead on Eendragtpan 451LQ.

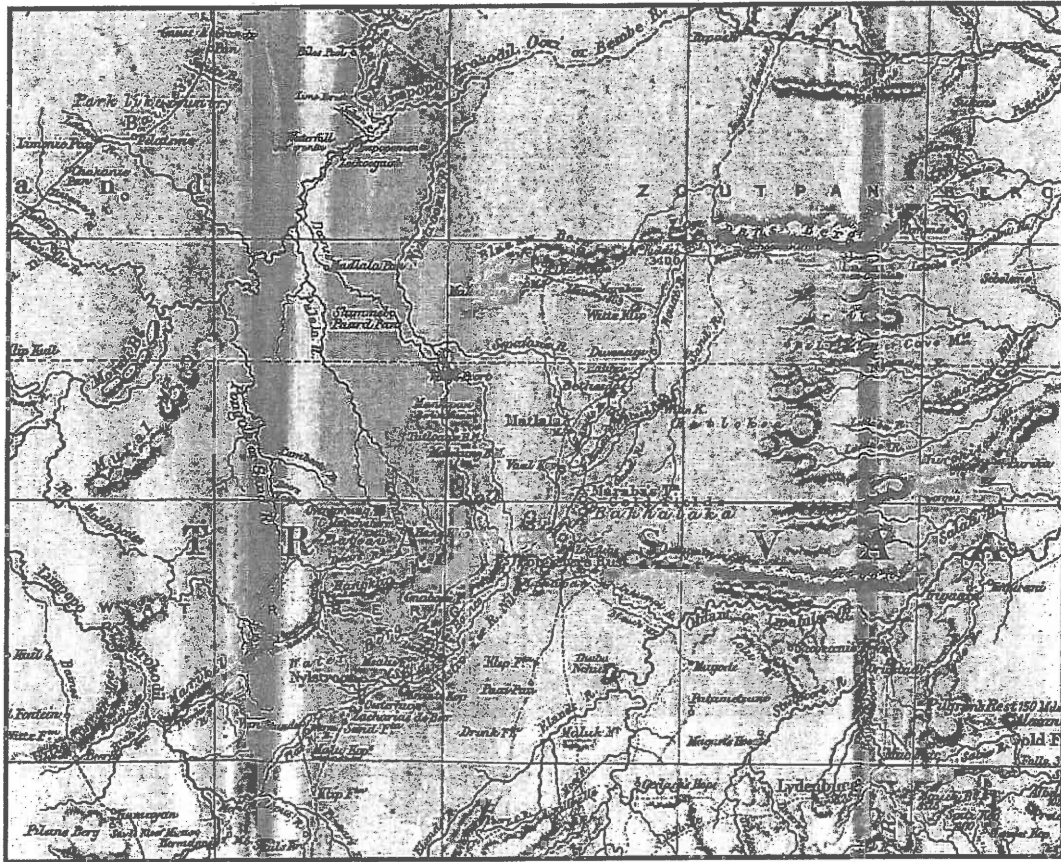


Figure 7. Portion of the map by Thomas Baines (1877), showing not only the absence of settled communities in the area, but also the general lack of knowledge.

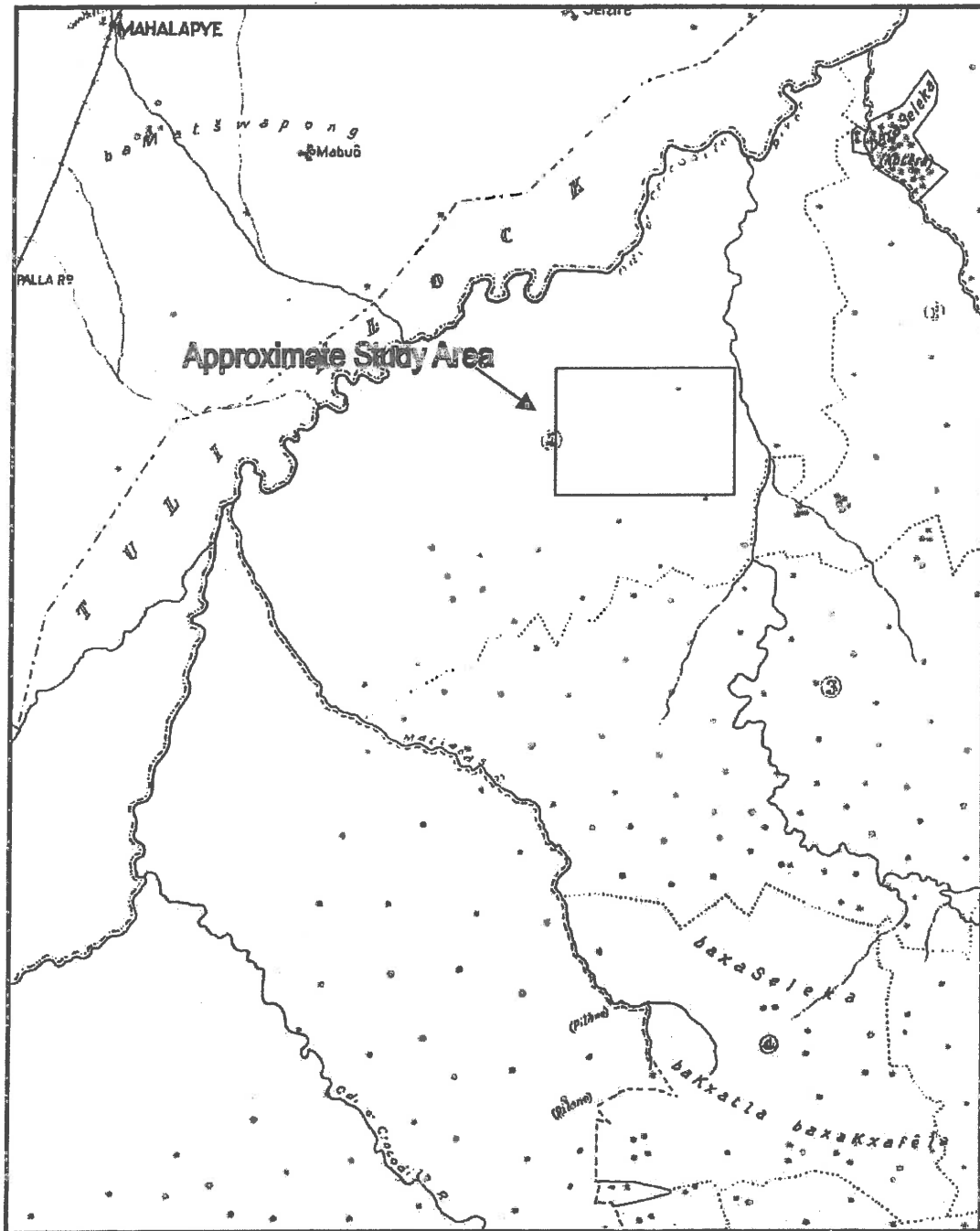


Figure 8. Map of the study area showing the distribution of Bantu-speaking communities in the larger region (Van Warmelo 1935). (One orange dot represents 10 individuals, c. 1935.)

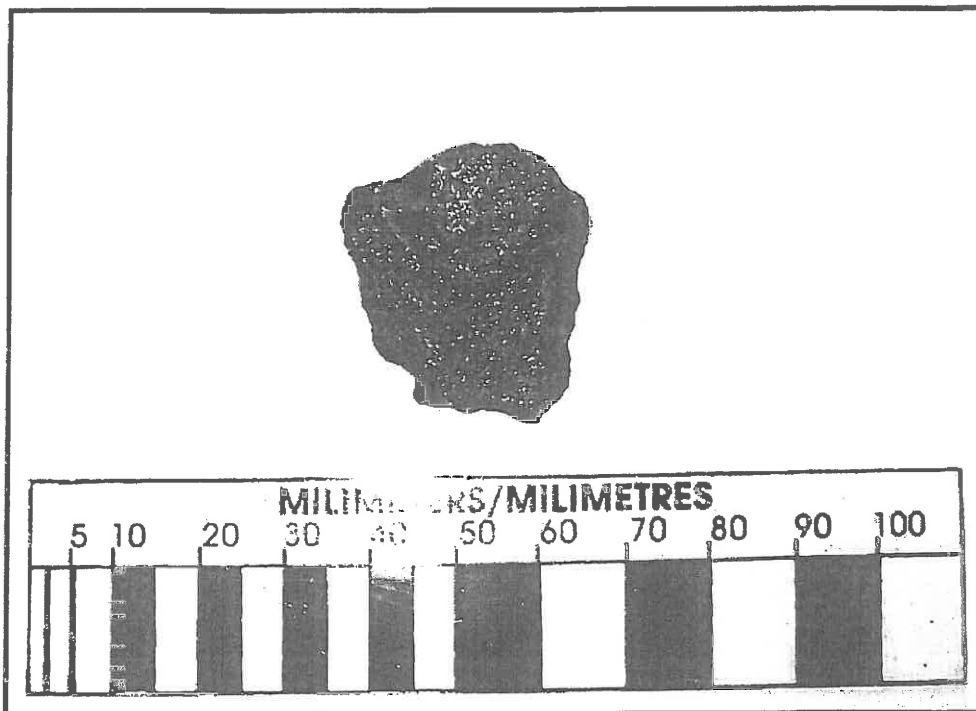


Figure 9. Quartzite stone tool dating to the Middle Stone Age, found near the edge of the pan.

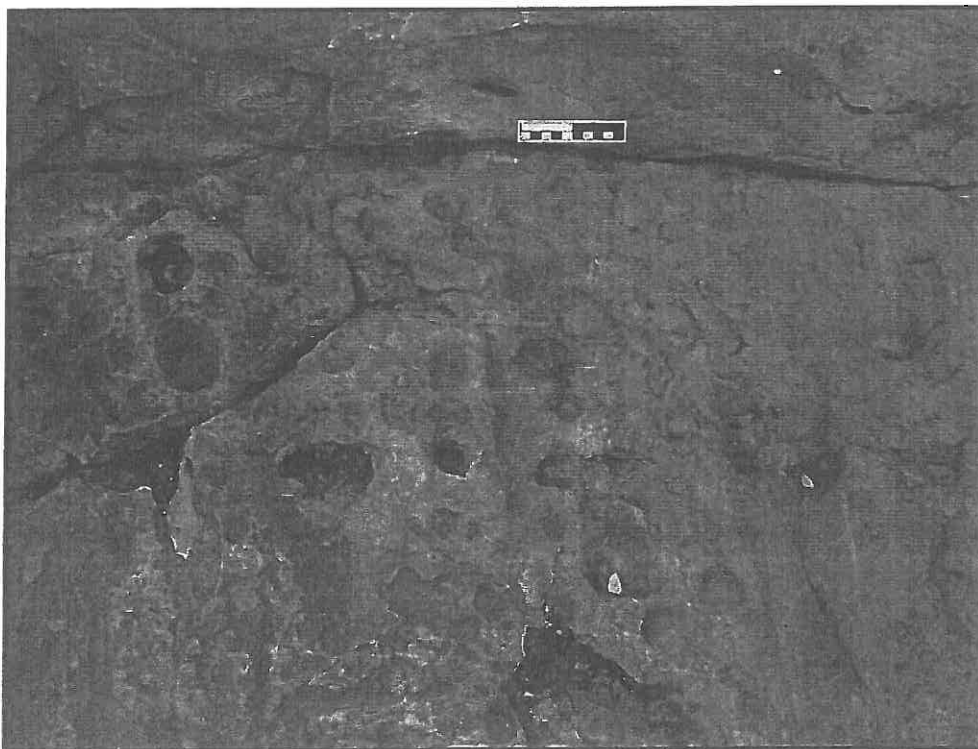


Figure 10. Cupules and cut marks in the rock shelter on Nelson's Kop

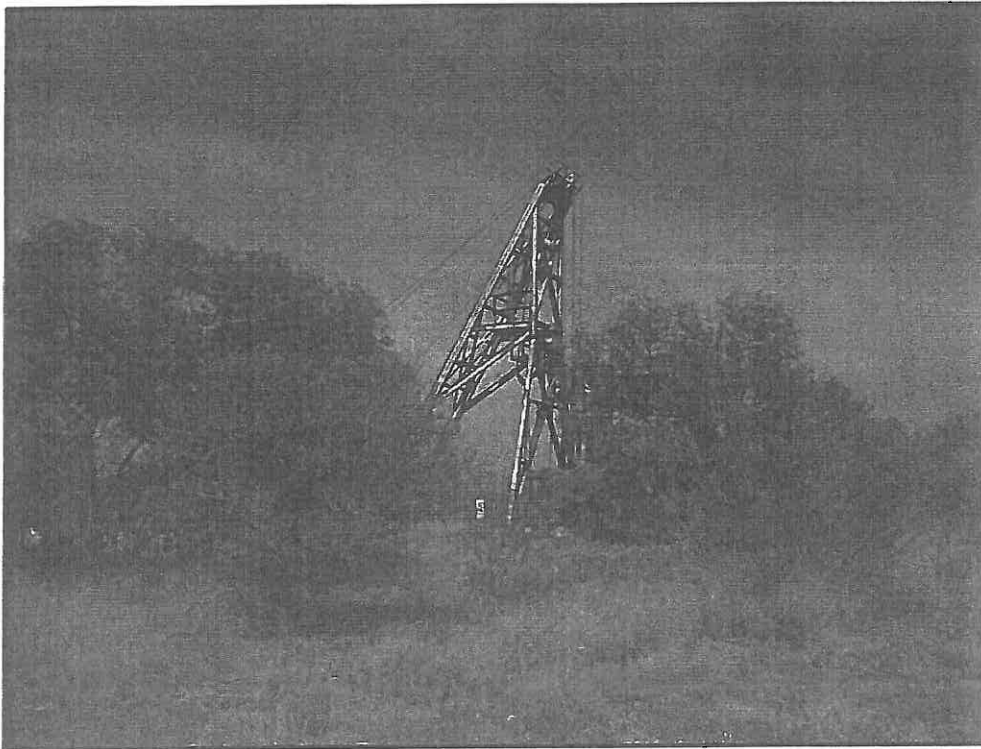


Figure 11. The old headgear on Groothoek 504LQ.

