ARCHAEOLOGICAL SCOPING STUDY OF A PROPOSED WIND ENERGY FACILITY ON THE MAANHAARBERGE & KOMBUISFONTEINBERGE DE AAR NORTHERN CAPE

Prepared for:

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EXECUTIVE SUMMARY

DJ Environmental Consultants, on behalf of Mulilo Renewable Energy, appointed the Agency for Cultural Resource Management to conduct an Archaeological Scoping Study (as part of an EIA process) for a proposed wind energy farm on Portions of the Farms Smausport 130, Zwartjekopjes 131, Haartebeestplaat 135, Haartebeehoek 31, Bosjemans Fountain 136 and others) near De Aar in the Northern Cape Province.

As the applicant, Mulilo Renewable Energy proposes to construct an initial 300 Mega Watt wind energy farm comprising about 150 wind turbines, access roads and an overhead powerline linking to the national transmission grid via Hydra substation. The actual wind turbines are located on the high points of the study area, which are generally all above 250 m from the surrounding terrain at the foot of the mountains.

According to Mr David Morris of the McGregor Museum in Kimberley some archaeological work has been done in general area of De Aar, but not in, or even close to, the study area for the proposed wind energy facility. The area is quite remote and is used mainly by local farmers for the grazing of small stock.

The proposed wind farm project will be developed over 2 Phases. It is important to note that the Archaeological Scoping Study focused only on Phase 1 of the proposed project.

The Scoping Study entailed the following:

- A 2-day site visit that included a foot survey of the three existing, permanent and temporary wind measuring masts, as well as the surrounding areas, on the Farm Smouspoort. The wind measuring masts are for the purpose of collecting wind data, and

- A survey of a portion of the Farm Zwartkoppies where up to 23 wind turbines are proposed

Dr Johan Almond of Nature viva cc has been appointed to conduct a Paleontological Impact Assessment (PIA) - desk top study of the proposed project.

Heritage consultant Ms Melanie Atwell has been commissioned to undertake a Heritage Scoping Study of the proposed wind farm facility.

The following archaeological findings were made:

- Relatively large numbers of Middle Stone Age and Later Stone Age tools were documented during the Scoping Study. A few diffuse scatters of tools were also noted. The tools comprise mainly very highly weathered, unmodified flakes, chunks, blade tools, a few cores and retouched flakes on the raw material known as hornfels, that are spread very thinly and unevenly over the surrounding environment. No other cultural remains such as pottery or ostrich eggshell were found. No evidence of any factory or workshop site was identified, but a thin scatter of tools associated with the remains of a possible stone circle was found on the farm Zwartkoppies. Most of the finds has been recorded with a GPS waypoint and photographed.

Overall, it is maintained that the proposed development of Phase 1 of the wind energy farm will not have an impact of great significance on these and potentially other archaeological remains, as (overall), the numbers are quite small and their distribution very widespread.

Given the constraints associated with a study of this nature it is also maintained that the scoping study has captured good information on the archaeological heritage present.

Other findings include:

- A historic well (or water pit) on the Farm Smouspoort. The pit apparently dates to the time of the South African War (1899-1904). This feature will not be impacted by the proposed project.

- About 100 m of dry stone walling on the Farm Smouspoort. It is alleged that the walling (the remains of a kraal) was built by impoverished Black farmers after the period of the great Cattle Killing in the Eastern Cape in 1856, following the prophecy of Nongqawuse. While this has not been confirmed by the archaeologist, these remains will not be impacted by the proposed project.

Scoping indications are:

- Archaeological remains (in Phase 1 of the proposed project) will be impacted by the proposed development but that a detailed Archaeological Impact Assessment of the proposed location sites for the wind turbines is not required.

- In archaeological terms, no fatal flaws have been identified

The following recommendations are, however, made

1. Archaeological Scoping must be done in Phase 2 of the proposed project

2. An Archaeological Impact Assessment (AIA) of proposed access roads in Phase 1 and Phase 2 of the proposed Wind Energy Farm must be done.

3. An Archaeological Impact Assessment of the final proposed transmission line must be done.

4. The location of the proposed construction site camp must be assessed by the archaeologist.

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1. INTRODUCTION

DJ Environmental Consultants, on behalf of Mulilo Renewable Energy (Pty) Ltd, appointed the Agency for Cultural Resource Management to conduct an Archaeological Scoping Study for a proposed wind energy farm on Portions of the Farms Smausport 130, Zwartjekopjes 131, Haartebeestplaat 135, Haartebeehoek 31, Bosjemans Fountain 136 and others) near De Aar in the Northern Cape Province. De Aar is located about 755 kms north east of Cape Town on the N1.

The renewable energy industry is currently experiencing an explosive growth worldwide. In South Africa, while such energy sources are not expected to replace the country's traditional reliance and dependency on coal-generated power, the National Energy Regulator of South Africa (NERSA) has published a favourable feed-in tariff structure for renewable energy that allows for independent clean energy producers to invest in renewable energy resources. Several such wind and solar energy facilities are currently in advanced planning stages country-wide in South Africa. The growing wind farm industry is considered to be of national importance in anticipation of its contribution to electricity supply and reduced reliance of non-renewable energy sources.

It is in this context that the applicant proposes to construct a 300 Mega Watt wind energy farm near De Aar, comprising up to 150 (or more) turbines, internal access roads and an overhead powerline linking to the existing Hydra substation, a few kilometres south east of De Aar. The electricity that will be generated from the proposed project will be fed directly into the national grid at Hydra.

Wind profiling of the area has shown that the proposed study is highly suitable for the production of wind energy. The actual turbines are located on the high points of the study area, which are generally all above 250 m from the surrounding terrain at the foot of the mountains.

The Archaeological Scoping Study forms part of the Environmental Impact Assessment (EIA) process that is being conducted by independent environmental consultants DJ Environmental Consultants.

Dr Johan Almond of Nature Viva cc has been appointed to conduct a Paleontological Impact Assessment (PIA) desk-top study of the proposed project.

Heritage consultant Ms Melanie Atwell has also been commissioned to undertake a Heritage Scoping Study of the proposed wind energy facility.

The infrastructure associated with the proposed De Aar wind energy farm includes the following:

- Up to 150 wind turbines;
- Underground cables between turbines;
- An overhead power line linking into the Hydra substation at De Aar
- Access roads

The Archaeological Scoping Study entailed the following:

- A 2-day site visit that included a survey of the three existing, permanent and temporary wind measuring masts, as well as the surrounding areas, on the Farm Smouspoort.

- A survey of a significant Portion of the Farm Zwartkoppies where up to 23 wind turbines are proposed;

The proposed wind farm project will be developed over 2 Phases. It is important to note that the Archaeological Scoping Study focused only on Phase 1 of the proposed project.

2. TERMS OF REFERENCE

The terms of reference for the Archeological Scoping Study are to:

1. Determine whether there are likely to be any important archaeological resources that may potentially be impacted by the proposed project (Phase 1), including the construction of the wind turbines, proposed access roads and the proposed overhead transmission line.

3. THE STUDY SITE

The study area includes the mountains to the east of De Aar, as well as the mountain ranges to the west; namely the Maanhaarberge and Kombuisfonteinberge, which are located about 20 kms south west of town of De Aar (Figure 1). A, Google aerial photograph of the proposed wind farm facility is illustrated in Figure 2. The proposed site for the wind energy farm is very rugged, remote and accessible only via 2 x 4 or 4 x 4, vehicle. The site is located within an existing farm that is zoned Agriculture, but due to its high elevation, no agricultural activity, apart from some marginal sheep grazing, occurs. The proposed wind energy farm is massive, spread over an area of about 25 000 ha. The two principal farms include Smouspoort (Figures 3-8) and Zwartkoppies (Figures 9-12).

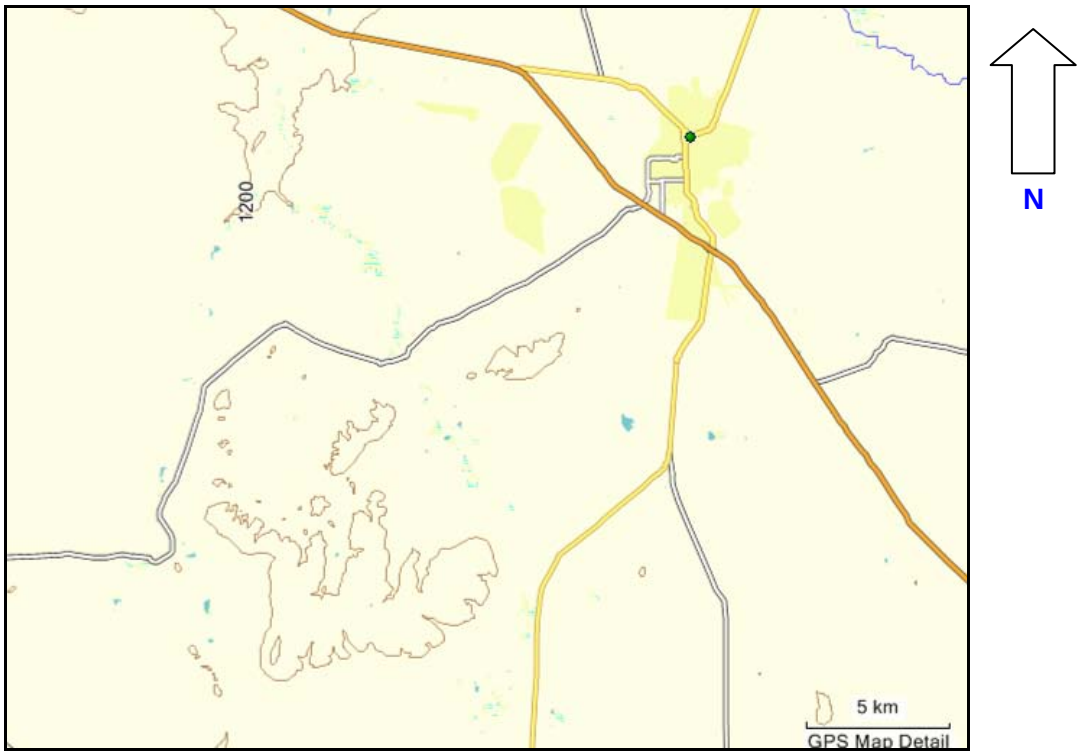

Figure 1. Garmin MapSource Locality Map

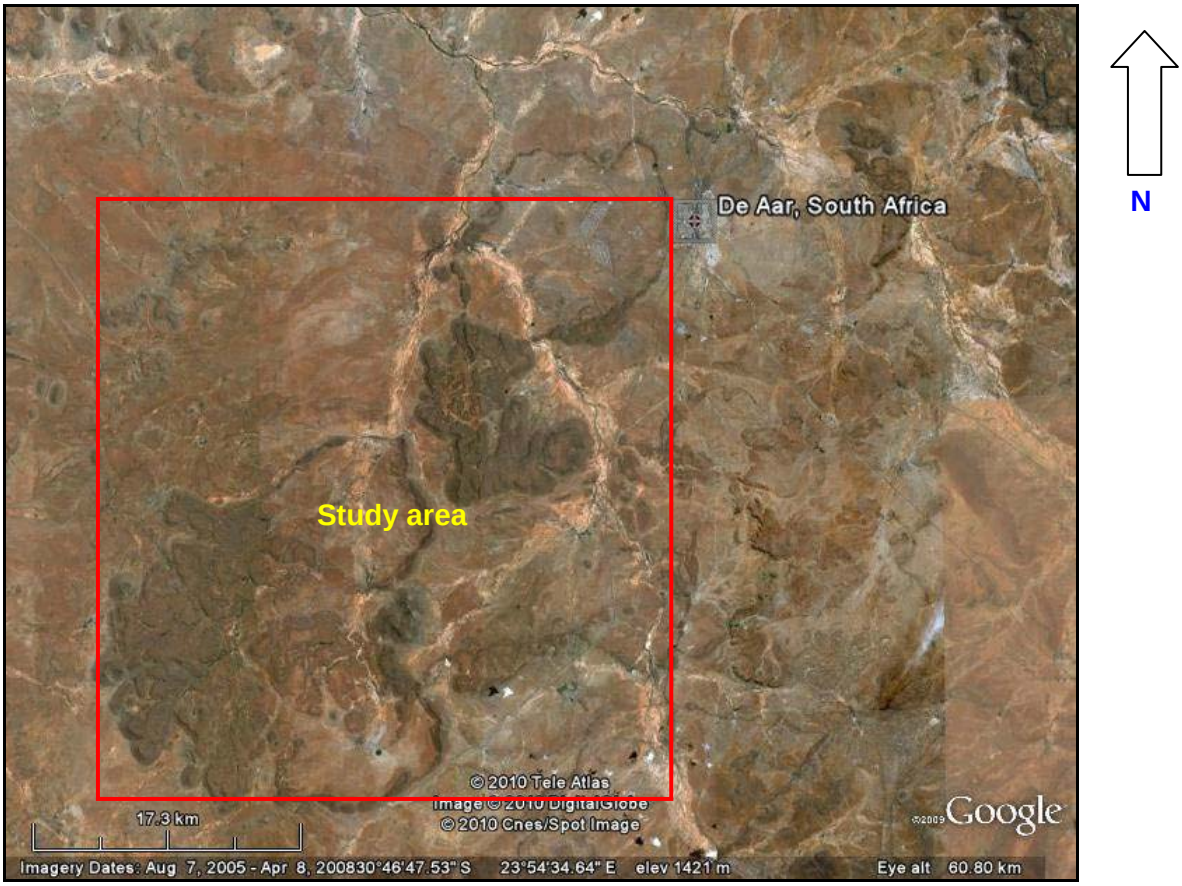

Figure 2. Google aerial photograph of the study site

Figure 3. Smouspoort Farm. View north east

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Figure 5. Smouspoort Farm. View north taken from the trig beacon at Aasvoelkop

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Photograph taken from Zwartkoppies Farm

Figure 9. Zwartkoppies Farm. View south looking toward escarpment of Smouspoort

Figure 11. Zwartkoppies Farm. View facing north to De Aar

Figure 10. Zwartkoppies Farm. View south west

Figure 12. Zwartkoppies Farm. View north. Dotted line is the existing Eskom line.

4. METHODOLOGY FOR THE STUDY

4.1 Method of survey

The proposed wind farm project will be developed over 2 Phases. It is important to note that the Archaeological Scoping Study focused only on Phase 1 of the proposed project (refer to Figure in Appendix).

The Scoping Study is an attempt to predict the archaeological impacts of a proposed wind farm facility on a large, undeveloped portion of land. A two-day site visit was completed and a number of observations made. Predictions as to the archaeological sensitivity of the proposed wind farm site are thus based on a limited field study. The relatively large area of the study site covered by the archaeologist during the Scoping Study has, however, meant that fairly accurate predictions regarding overall site distribution could be made. There is no body of information on which to base an

archaeological prediction and not much is known of the archaeology, as no research has been conducted in the study area. According to Mr David Morris (pers. comm.) of the McGregor Museum in Kimberley some archaeological work has been done in the area around De Aar, but not in, or even close to, the study area for the proposed wind energy farm. The area is quite remote and is used mainly by local farmers for the grazing of small stock. Rock engravings are known to occur on several farms in De Aar, but these are located north of the town on the R48 to Philipstown, as well as south of the town (Morris pers. comm.).

The Archaeological Scoping study was conducted over 2 days, on the 25th and 26th of March, 2010. The study concentrated on the proposed wind turbine areas which are all located in the hill section above 250 m (Figure 13). The three existing (one permanent and two temporary) location sites for the wind measuring masts were searched for archaeological remains (Figures 14-16). A relatively large area surrounding each of the location sites of the wind measuring masts, on the Farm Smouspoort was also searched. A polygon indicating the areas searched is illustrated in Figure 13. The actual location sites for the proposed wind turbines were not searched as the positions of the wind turbines may change as more accurate wind data is recorded.

A large area, on portion of the Farm Zwartkoppies was also searched on foot (Figure 13). Up to 23 wind turbines are proposed on the site.

A vehicle survey was also undertaken, where the archaeologists searched areas at random, or targeted specific potential areas of archaeological sensitivity. For example, rocky kopjes and cliffs and large dolerite boulders were searched for rock painting sites and rock engravings.

Considering the large area of the farm covered on foot (and by vehicle) by the archaeologist, it is maintained that the survey has captured good information on the archaeological heritage present.

None of the proposed and existing access roads were searched. It is important to note that most of the existing roads will just require upgrading. Existing tracks and roads are favoured since they constitute previously impacted areas.

The proposed overhead transmission lines were not searched for archaeological remains.

A large number of digital photographs of the site was taken, which have been saved to DVD.

A GPS track path of the archaeological survey was created. This track path has been saved to a DVD and submitted with a digital copy of the report.

Most of the archaeological occurrences and observations were plotted using a Garmin Oregon 300 GPS unit, set on map datum wgs 84 and photographed.

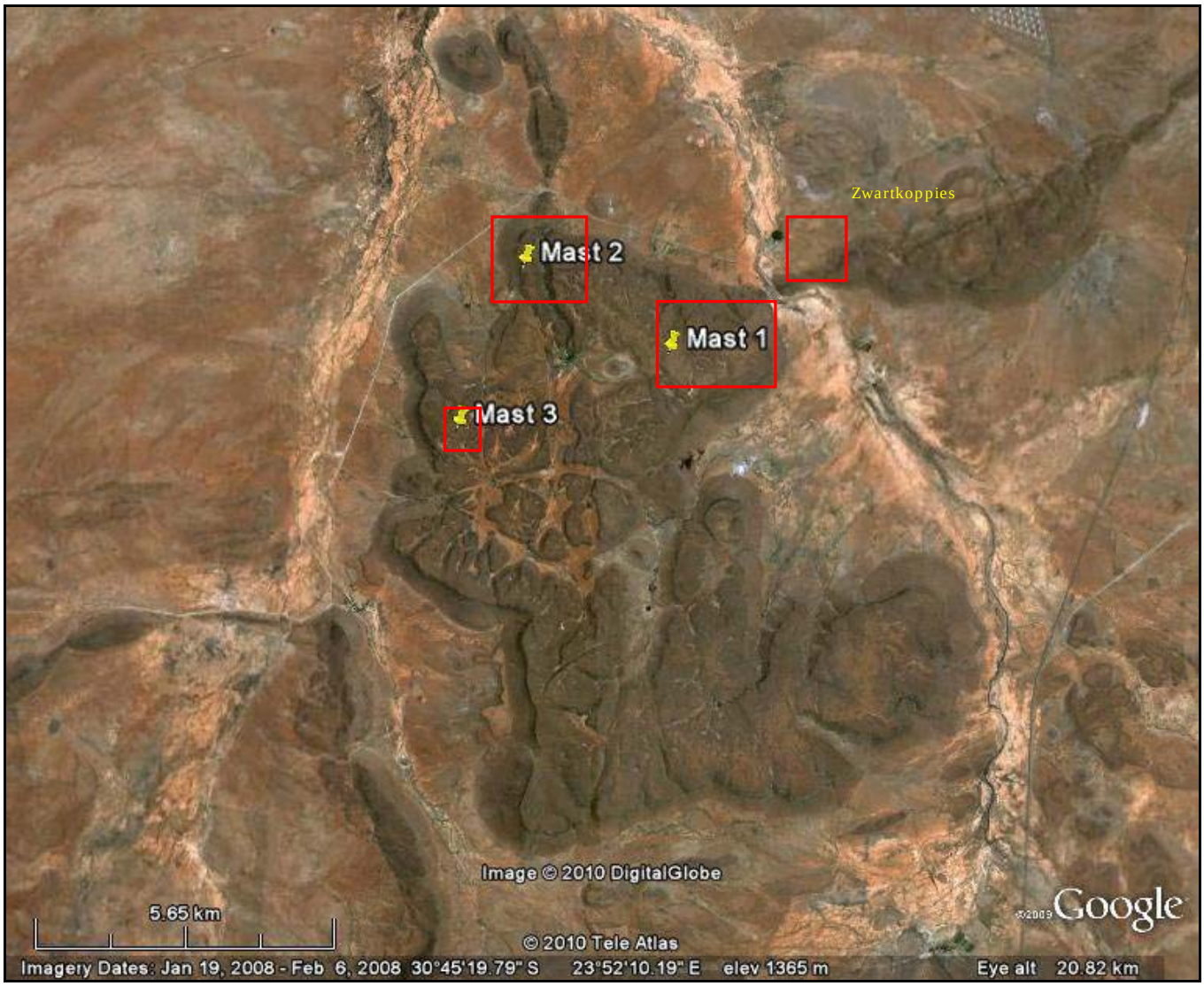

Figure 13. Aerial photograph illustrating the wind measuring masts and areas covered during the foot survey

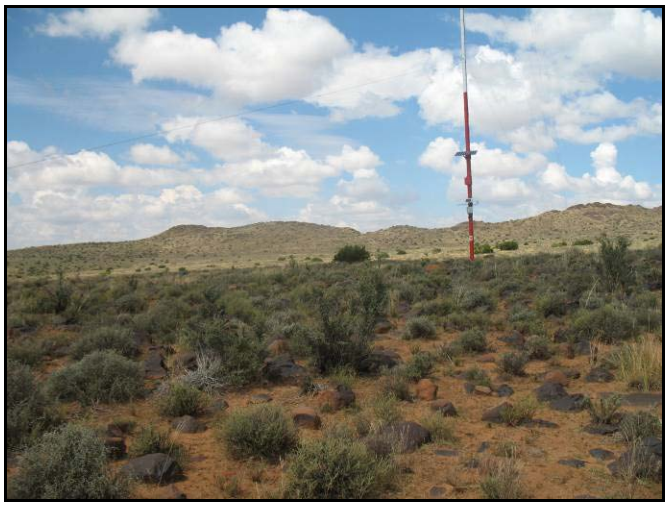

Figure 14. Wind Measuring Mast 1 (permanent)

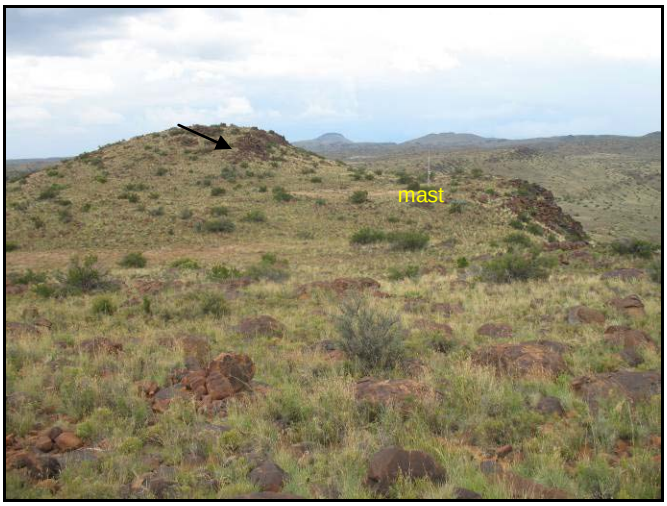

Figure 15 Wind Measuring Mast 2 (temporary)

Figure 16 Base of Wind Measuring Mast 3 (temporary). Mast still to be erected

4.2 Constraints and limitations

Clearly, there are significant constraints associated with wind farm projects as they cover very large areas of farmland. The total study area for the proposed De Aar Wind Farm facility is massive (over 25 000 ha), and it would take several weeks to properly survey an area this size. Even the main hill section of the study area is large (over 9000 ha), very rugged and mostly inaccessible except on foot. The primary heritage resources that have been identified are pre-colonial archaeology, although some historic features were pointed out to the archaeologist by the farmer.

Archaeological visibility over the study site is, however good.

5. FINDINGS

5.1 Pre-colonial archaeology

Surprisingly, given the high altitude (250 m) of the proposed wind farm facility and the rugged terrain of the receiving environment, relatively large numbers of Stone Age tools were located and documented during the study. The majority of the tools are assigned to the Middle Stone Age and Later Stone Ages, but it is very difficult to distinguish between the two (apart from very obvious elements such as prepared platforms), as the implements are mostly very highly weathered and patinated. The tools comprise mainly unmodified cortex flakes and chunks, but blade tools, and a few cores and retouched flakes were also recorded. The majority of artefacts have been recorded with a GPS waypoint (refer to GPS track path). More than 99.9% of the tools are on the raw material known as hornfels, but a few pieces of `fresher' looking indurated shale flakes, larger round cores and blade tools were also found. Most of the implements are isolated finds that are spread very thinly and unevenly over the surrounding environment. No other cultural remains such as pottery or ostrich eggshell were found.

No evidence of any factory or workshop site was identified. There is no patterning in the distribution of the finds, but a few, small, dispersed scatters of tools were found. For example, a thin scatter of indurated shale flakes were found in a heavily trampled stream catchment on the Farm Zwartkoppies (050 on the GPS track path), while a small scatter of flake tools and large blades were documented on a flat rocky mountain top (053). A small scatter of hornfels tools that appear to be associated with the possible remains of a stone circle was also found above the Eskom access road on the Farm Zwartkoppies (044). This was the only site where some evidence of human settlement occurs. A collection of tools and the context, in which some of the scatters occur, is illustrated in Figures 17-24.

No rock engravings or any rocky art sites were documented. Several likely or possible areas were targeted by the archaeologist but no evidence of any engravings, rock art or Stone Age occupation was noted.

Figure 17. Collection of tools from Smouspoort. Scale in cm

Figure 18. Collection of tools from Smouspoort. Scale in cm

Figure 19. Collection of tools from Smouspoort. Scale in cm

Figure 22. Collection of tools (050) from Zwartkoppies. Scale in cm

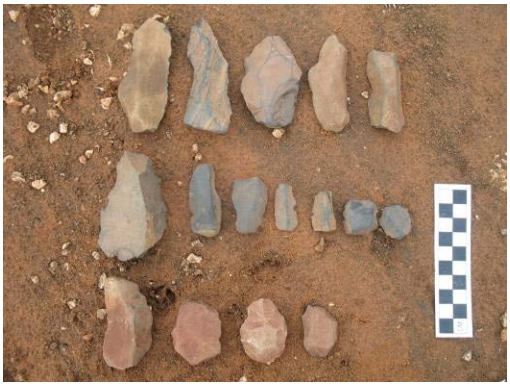

Figure 20. Collection of tools from possible stone circle (044) on Zwartkoppies. Scale in cm

Figure 23. Collection of tools (053) from Zwartkoppies. Scale in cm

Figure 21. Remains of possible stone circle (044) on Farm Zwartkoppies

Figure 24. 053

5.1.1 Sources of Impact

The main cause of impacts to archaeological sites is physical disturbance of the material itself and its context. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose archaeological artefacts, the artefacts are relatively meaningless once removed from the area in which they were found.

5.1.2 Predicted impacts

In the case of the proposed De Aar wind farm, it is expected that impacts will be quite limited. The very rocky and rugged terrain suggests that the archaeological resources are confined to the surface and it is highly unlikely that any subsurface or buried archaeological material will be uncovered during excavations, for the tower bases or for cable trenches, for example.

The upgrading of existing access roads or the construction of new access roads, including internal access roads linking the wind towers may, however, have a larger, wider and more significant impact on pre-colonial archaeological remains, but (given time constraints) these impacts have not been properly assessed by the archaeologist.

Overall, however, it is maintained that the proposed development of the wind energy farm will not have an impact of great significance on the archaeological remains, as the numbers are relatively small and their distribution quite widespread.

5.2 Colonial or historic period

Two colonial or historic period `sites' have been documented by the archaeologist (refer to Google photograph in Appendix and GPS track path). These include a pit excavated into the mountain side, alongside a gravel road, on the Farm Smouspoort. The site is referred to as Goenmanskloof. According to the farmer, Mr Jurie van Zyl, the water pit was excavated during the time of the South African War (1899-1904), when Smouspoort was used as an outspan and meeting place for Boer soldiers. The feature has since collapsed, but the entrance to the `site' is still visible, although it is obscured by thick bush (Figure 25).

A more enigmatic feature includes the remains of about 100 m of dry stone packed walling that occur quite close to a small earth dam situated on the high plateau, on the Farm Smouspoort (Figures 26-28). According to Mr van Zyl (pers. comm.), the walling comprises the remains of a stone kraal that was (apparently) built by impoverished Black farmers who migrated from the Eastern Cape after the mass Cattle Killing in 1856, as a result of Nongqawuse's prophecy. The archaeologist was not able to confirm this information. According to Mr van Zyl, several stone kraals built below the escarpment on the farm are also attributed to these farmers who sought shelter and work on the farm. The oldest building on Smouspoort dates to 1861, which is five years after the Cattle Killings, took place.

Figure 25 Historic water pit.

Figure 27. Stone walling

Figure 26. Stone walling

Figure 28. Stone wall. The ranging rod is 1.0 m

5.2.1 Sources of impact

Historic structures and features are sensitive to physical damage such as demolition as well as neglect and deterioration over time. They are also context sensitive, in that changes to the surrounding landscape will affect their significance.

5.2.2 Predicted Impacts

With regard to the water pit, upgrading of the gravel access road will not impact on the historic feature. However, care should be taken to ensure that this does not occur.

There are no wind turbines situated close the stone walling, so no physical impact is anticipated or expected either.

6. RECOMMENDATIONS AND MITIGATION ACTION

The following recommendations are made:

1. The location sites for the proposed wind turbines in Phase 1 of the proposed De Aar Wind Energy Farm are not considered to be archaeologically sensitive and no mitigation of important archaeological occurrences is required. It is maintained that the proposed development of the wind energy farm will not have an impact of great significance on these (and potentially other) archaeological remains, as the numbers are relatively small and their distribution fairly widespread. A detailed AIA is, therefore not required. Recording of archaeological occurrences, including GPS waypoints and photography has been undertaken by the archaeologist and it is felt that such a record of the archaeological heritage is adequate.

2. Archaeological Scoping must be done in Phase 2 of the proposed project.

3. An Archaeological Impact Assessment (AIA) of proposed access roads in Phase 1 and Phase 2 of the proposed Wind Energy Farm must also be done.

4. An Archaeological Impact Assessment of the final proposed transmission line must be done.

5. The location of the proposed construction site camp must be assessed by the archaeologist.

7. CONCLUSION

With regard to Phase 1, of the proposed De Aar Wind Energy Facility, indications are that in terms of historical and archaeological heritage, the proposed activity is viable, and impacts are expected to be limited.

In archaeological terms, no fatal flaws have been identified

Appendix

Figure. De Aar Wind Power Generation Facility. Google aerial photograph illustrating locations of Wind Measuring Mast and historical features mentioned in the text

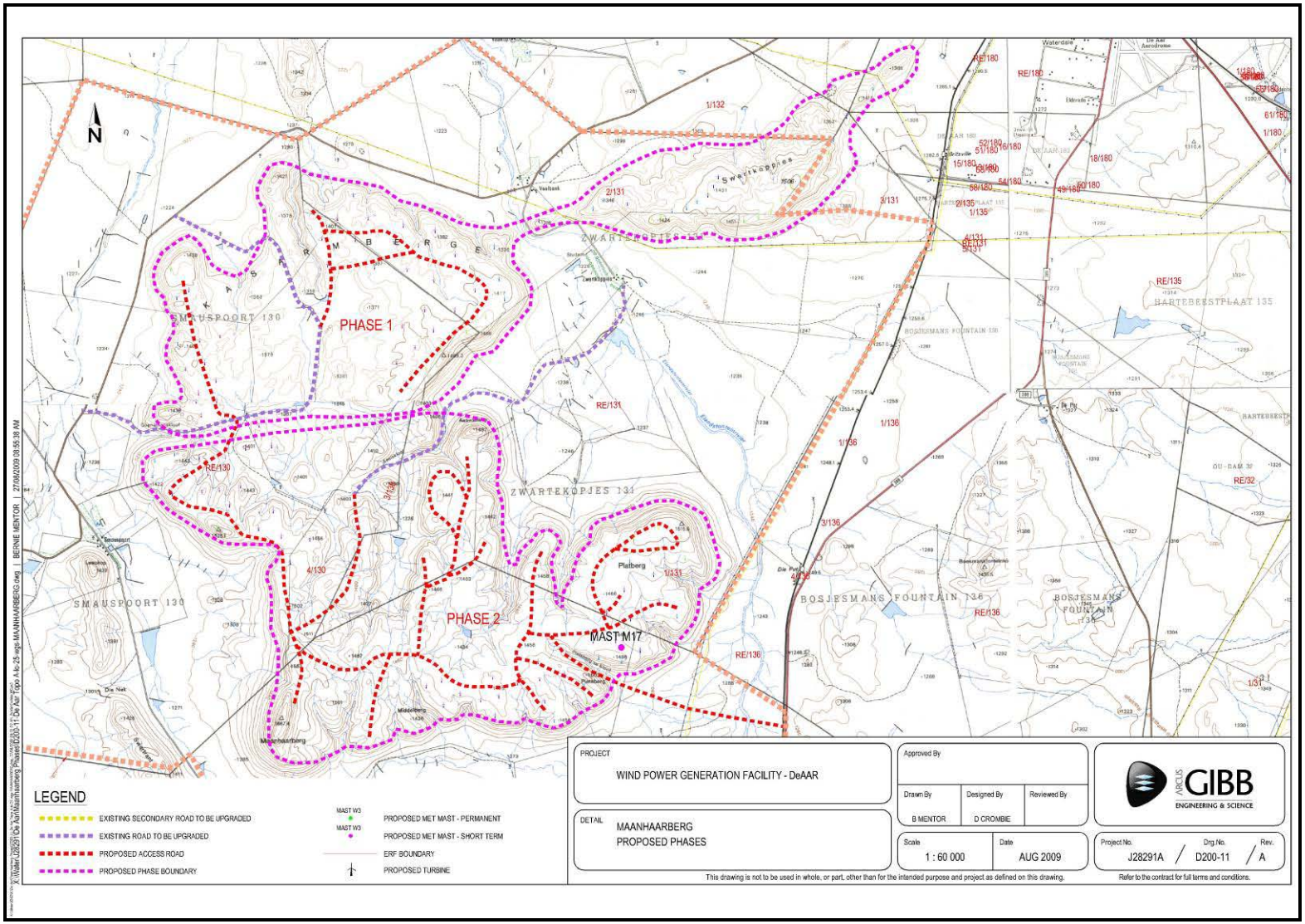

Figure: De Aar Wind Power Generation Facility. Phase 1 and Phase 2