NGXWABANGU WIND POWER (PTY) LTD.: PROPOSED NGXWABANGU WEF PROJECT, CHRIS HANI DISTRICT MUNICIPALITY, EASTERN CAPE PROVINCE

Archaeological Impact Assessment

Prepared for: **Ngxwabangu Wind Power (Pty) Ltd.**

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ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF AREAS DEMARACTED FOR THE PROPOSED NGXWABANGU WEF PROJECT, NGXWABANGU, CHRIS HANI DISTRICT MUNICIPALITY, EASTERN CAPE PROVINCE

Conducted on behalf of:
Ngxwabangu Wind Power (Pty) Ltd.

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DECLARATION

I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Ngxwabangu WEF Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA, EC-PHRA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, 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;
- All the particulars furnished by me in this declaration are true and correct. z

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 proceeding other than remuneration for work performed in terms of the Regulations.

_____

Signature of specialist
Company: Exigo Sustainability
Date: 7 May 2023

This Archaeological Impact Assessment report has been compiled considering the National Environmental Management Act 1998 (NEMA) and Environmental Impact Regulations 2014 as amended, requirements for specialist reports, Appendix 6, as indicated in the NEMA Table below.

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable.
1.(1) (a) (i) Details of the specialist who prepared the report	Page 4, Section 1.2 and Addendum 1 of Report.	-
(ii) The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 and Addendum 1 of Report.	-
(b) A declaration that the person is independent in a form as may be specified by the competent authority	Page 4 of the report	-
(c) An indication of the scope of, and the purpose for which, the report was prepared	Section 1.3 and Section 1.4: Project Brief and Terms of Reference	-
(cA) An indication of the quality and age of base data used for the specialist report	Section 4: Archaeo-Historical Context	-
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 9: Statement of Significance and Impact Rating	-
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3: Method of Enquiry	-
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3: Method of Enquiry	-
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 9: Statement of Significance and Impact Rating	-
(g) An identification of any areas to be avoided, including buffers	Section 5: Results Archaeological Survey	-
(h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 9: Statement of Significance and Impact Rating	-
(i) A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3.2: Limitations and Constraints	-
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 9: Statement of Significance and Impact Rating	
(k) Any mitigation measures for inclusion in the EMPr	Section 6.3: Management Actions Section 7: Recommendations	
(l) Any conditions for inclusion in the environmental authorisation	N/A	None required
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 6.3: Management Actions Section 7: Recommendations	
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Section 1 & Section 7	
(n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and		
(n)(ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 6.3: Management Actions Section 7: Recommendations	-
(o) A description of any consultation process that was undertaken during the course of carrying out the study	N/A	Not applicable. A public consultation process will be conducted as part of the EIA and EMPr process.
(p) A summary and copies if any comments that were received during any consultation process	N/A	Not applicable.
(q) Any other information requested by the competent authority.	N/A	Not applicable.
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Section 1.5: CRM: Legislation, Conservation and Heritage Management	

EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) for the proposed Ngxwabangu WEF Project in the Chris Hani District Municipality, Eastern Cape Province. The project entails the establishment of a Wind Energy Facility with associated OHL infrastructures in two project areas (Ngxwabangu and Ncora) within a total project area of approximately 27307.57ha in the Ngxwabangu area. The report includes background information on the area's archaeology, its representation in Southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies. A copy of the report will be supplied to the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed.

Project Title	Ngxwabangu WEF Project
Project Location	**Ngxwabangu Project Area: S31.83199° E27.53955°** **Ncora Project Area: S31.85894° E27.65634°**
1:50 000 Map Sheet	3127DC
Farm Portion / Parcel	Ngxwabangu Commonage
Magisterial District / Municipal Area	Chris Hani District Municipality
Province	Eastern Cape Province

The cultural landscape of the Eastern Cape encompasses a period of time that spans millions of years, covering human cultural development from the Stone Ages up to recent times. It depicts the interaction between the first humans and their adaptation and utilization to the environment, the migration of people, technological advances, warfare and contact and conflict. Contained in its archaeology are traces of conquests by Bantu-speakers, Europeans and British imperialism encompassing the struggle for land, resources and political power. As such, the history and archaeology of the larger Eastern Cape Province is relatively well known but in the Ngxwabangu region little systematic archaeological research has been conducted and, as such the heritage landscape is somewhat of an enigma. A careful analysis of historical aerial imagery and archive maps of Ngxwabangu – and particularly areas subject to this assessment – indicate a landscape that has been altered extensively by recent and historical ruralisation, potentially sterilising surfaces and subsurface of heritage remains.

In order to arrive at a final Layout for the proposed project, a rigorous process of site screening was conducted for the Ngxwabangu WEF at desktop level. Here, a detailed appraisal of previous AIAa, HIAs and published literature coupled with a detailed analysis of historical aerial imagery and archive, topographical, geological and landscape feature maps was conducted in order to inform on the final layout for the WEF during the **Scoping Phase.** An archaeological site assessment was then conducted to identify heritage receptors on-site and in the larger landscape. Information on the final layout of the OHL corridors were made available to specialists at an advanced stage of this assessment and some these areas could not be included in the site surveys. The following observations are made for the proposed Ngxwabangu WEF Project in terms of heritage aspects, impacts and heritage resources management:

- As information on the layout of the OHL corridors was made available to specialists at an advanced stage of this assessment where some these areas could not be included in the site surveys, ground-truthing of unsurveyed development footprint areas should be conducted during the finalisation of the EMP and the project infrastructure layouts.
- Two possible later Iron Age Farmer Period stone walled sites in the Ngxwabangu Project Area (**EXIGO-NWEF-IA01, EXIGO-NWEF-IA02)** have the potential to inform on the spread of Iron Age communities in the interior of the Eastern Cape and the site is of medium heritage significance. The sites are situated away from project infrastructure components and impact on the sites seem unlikely. Conservation buffers of at least 100m around the sites should be implemented and the areas should be monitored on a frequent basis by an informed ECO in order to avoid the destruction of existing and previously undetected heritage remains. Should impact on the sites prove inevitable it should be adequately documented by means of a Phase 2 Specialist Study. Such a study should minimally include the mapping, documentation and possible sampling of the site in order to conserve the historical fabric of the heritage resource. The necessary alteration and/or destruction permits should be obtained from the relevant Heritage Resources Authorities prior to site sampling and destruction.
- The remains of Historical Period settlements in the Ngxwabangu and Ncora Project Areas (**Exigo-NWEF-HS01 - Exigo-NWEF-HS08)** are of low significance due to the poor state of preservation of many of the sites and features. Some of the settlements occur around and within areas demarcated for development of **WTG 36** and its associated access roads as well as **OHL Corridors** and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains and human burials which might occur in association with the settlements.
- The remains of Historical Period structures and features in the in the Ngxwabangu and Ncora Project Areas (**Exigo-NWEF-HP06 - Exigo-NWEF-HP13, Exigo-NWEF-HP15 - Exigo-NWEF-HP17, Exigo-NWEF-HP19 - Exigo-NWEF-HP29)** are of low significance but it should be noted that human burials might occur around these settlements. Some of the features and sites occur around and within areas demarcated for development of **WTG 36** and its associated access roads and **OHL Corridors** and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains. Here, 20m conservation buffers should be maintained around these features in order to avoid the destruction of previously undetected heritage remains.
- A ceremonial / ritual site was noted on a high ridge overlooking the Tsojana Dam (**Site EXIGO-NWEF-FT01**). The site is most probably of high social and cultural value to local residents and it infers a high heritage significance rating. The site occurs away from areas demarcated for development but potential impact on the sites should be monitored to avoid damage to the feature. In addition, the PP and Stakeholder Engagement Process should include consultation with local communities on the heritage and cultural significance of the site, possible indirect impacts (site access, conservation) and required management measures.
- Graves and burials identified in the Ngxwabangu Project Area (**Site Exigo-NWEF-BP01 - Site Exigo-NWEF-BP10**) are of high significance and some of sites occur in close proximity of areas demarcated for development of **WTG 36** and its associated access roads as well as **OHL Corridors**. As a primary measure, Heritage Authority (SAHRA) guidelines require a conservation buffer of at least 50m around the burial sites and graves. Where construction or digging risk encroaching on this conservation buffer, a temporary construction barricade should be erected around burials at risk in order to clearly demarcate the locations of the burials. A site management plan detailing strict

site management conservation measures should be compiled for all burials in the project area. All burials should be monitored on a bi-monthly basis by an informed ECO or by the heritage Specialist in order to detect any impact on the resource at the earliest opportunity.

- **Should impact on any human burial prove inevitable, full grave relocations are recommended for these burial grounds. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials (see Addendum B)**.
- As a large number of burial sites as well as a site of ritual importance have been located in the project area, it is recommended that the EIA public participation and social consultative process (PP and Stakeholder Engagement) address the possibility of further graves and ritual sites occurring in the project area.
- The term "Living Heritage" can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the project area or it surroundings and due cognisance should be taken of these sites of "Living Heritage" in the cultural landscape. In addition, it is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. It is recommended that a **Chance Find Procedure** be included in the EMPR in order to outline measure for the accidental discovery of subsurface palaeontological, archaeological or historical material, or burials not previously documented.
- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.

Impact Statement

Heritage resources occur in the Ngxwabangu WEF Project zones and some of these heritage receptors might be impacted on by the proposed project. WEF developments with linear and narrow components such as OHLs and access roads are generally considered to be lower-risk since localised and spatially confined heritage resources can easily be avoided by project design of individual turbine positions, pylon placements and service roads. As such, impacts can be mitigated and in the opinion of the author of this Archaeological Impact

Assessment Report, the proposed project proceed from a culture resources management perspective, provided that mitigation measures are implemented where applicable, and provided that potential previously undetected subsurface heritage remains encountered during any phase of development are subjected to a Chance Find Procedure as part of the EMP.

It is the opinion of the Specialist that the proposed Ngxwabangu WEF will have a low negative cumulative impact on the heritage value of the area for the following reasons:

- The low frequency of significant archaeological resources documented within the project area implies low-severity short and long-term impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads.
- The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.
- It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.

This report details the methodology, limitations and recommendations relevant to these heritage areas, as well as areas of proposed development. It should be noted that recommendations and possible mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

Ngxwabangu WEF Project Heritage Sites Locations

Site Code	Coordinate S E	Coordinate E	Short Description	Field Rating	Mitigation Action
NGXWABANGU PROJECT AREA					
Exigo-NWEF-IA01	-31.80109419	27.52475146	Later Iron Age Site	**3. Medium Significance**	**Avoidance:** Implement a heritage conservation buffer of at least 100m. **Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.
Exigo-NWEF-IA02	-31.8039344	27.526614	Later Iron Age Site	**3. Medium Significance**	
Exigo-NWEF-BP01	-31.7989884	27.53057797	Burial Site	**4a. High Significance**	**Avoidance:** Implement a heritage conservation buffer of at least 50m. **Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. *Consider grave relocation subject to authorisations and permitting if impacted on.*
Exigo-NWEF-BP02	-31.83191847	27.55774708	Burial Site	**4a. High Significance**	
Exigo-NWEF-BP03	-31.83290393	27.55742588	Burial Site	**4a. High Significance**	
Exigo-NWEF-BP05	-31.86282255	27.57493299	Burial Site	**4a. High Significance**	
Exigo-NWEF-BP06	-31.86329981	27.57511136	Burial Site	**4a. High Significance**	
Exigo-NWEF-BP07	-31.8587937	27.57758545	Burial Site	**4a. High Significance**	
Exigo-NWEF-HS01	S31.80648°	E27.55348°	Historical Period Settlement	**2a. Low Significance**	**Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.
Exigo-NWEF-HS02	S31.85288°	E27.53231°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-HS03	S31.85643°	E27.60069°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-HS04	S31.86546°	E27.57651°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-HS05	S31.86609°	E27.63091°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-HS06	S31.85593°	E27.65221°	Historical Period Settlement	**2a. Low Significance**	

Exigo-NWEF-HP06	-31.86619232	27.56774778	Historical Period Site	**2a. Low Significance**	**Avoidance:** Implement a heritage conservation buffer of at least 20m. **Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.
Exigo-NWEF-HP07	-31.86341188	27.57122367	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP08	-31.86326603	27.5750692	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP09	-31.86208569	27.57421676	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP10	-31.86016297	27.57574763	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP11	-31.85912931	27.57630201	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP12	-31.85910031	27.57711631	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP13	-31.8637915	27.59184432	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP19	-31.83258248	27.55901517	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP20	-31.83191604	27.55544239	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP21	-31.82688992	27.5590865	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP29	-31.83075414	27.55925448	Historical Period Site	**2a. Low Significance**	
Site Code	**Coordinate S E**	**Coordinate E**	**Short Description**	**Field Rating**	**Mitigation Action**
NCORA PROJECT AREA					
Exigo-NWEF-HS05	S31.86616°	E27.62906°	Historical Period Settlement	**2a. Low Significance**	**Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.
Exigo-NWEF-HS06	S31.85836°	E27.63812°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-HS07	S31.85189°	E27.70321°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-HS08	S31.85742°	E27.65362°	Historical Period Settlement	**2a. Low Significance**	
Exigo-NWEF-FT01	-31.87123697	27.63196724	Ceremonial / Ritual Site	**4a. High Significance**	**Site Monitoring:** Site monitoring by the heritage consultant or an ECO familiar with the heritage occurrences of the site. **Social Consultation**: It is suggested that local communities be consulted with regards to the religious and social meaning of the site as well as impacts.
Exigo-NWEF-HP15	-31.87054027	27.64062515	Historical Period Site	**2a. Low Significance**	**Avoidance:** Implement a heritage conservation buffer of at least 20m. **Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.
Exigo-NWEF-HP16	-31.8678801	27.63048305	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP17	-31.86863163	27.6464054	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP22	-31.86851788	27.62706793	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP23	-31.86608571	27.63090592	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP24	-31.87819186	27.63858215	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP25	-31.86969487	27.64683807	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP26	-31.86882634	27.64189526	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP27	-31.85592768	27.65221456	Historical Period Site	**2a. Low Significance**	
Exigo-NWEF-HP28	-31.86048626	27.65463349	Historical Period Site	**2a. Low Significance**	
Site Code	**Coordinate S E**	**Coordinate E**	**Short Description**	**Field Rating**	**Mitigation Action**
NCORA TO QOLWENI OHL LINE PROJECT AREA					
Exigo-NWEF-BP08	S31.84877°	E27.71473°	Burial Site	**4a. High Significance**	**Avoidance:** Implement a heritage conservation buffer of at least 50m. **Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. *Consider grave relocation subject to authorisations and permitting if impacted on.*
Exigo-NWEF-BP09	S31.84751°	E27.71547°	Burial Site	**4a. High Significance**	
Exigo-NWEF-BP10	S31.84640°	E27.71659°	Burial Site	**4a. High Significance**	

NOTATIONS AND TERMS/TERMINOLOGY

Absolute dating: Absolute dating provides specific dates or range of dates expressed in years.

Archaeological record: The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

Artefact: Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artefact are not altered by removal of the surroundings in which they are discovered. In the Southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

Assemblage: A group of artefacts recurring together at a particular time and place, and representing the sum of human activities.

Context: An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context,* disturbance or displacement by later ecological action or human activities occurred.

Cultural Heritage Resource: 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 palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural landscape: A cultural landscape refers to a distinctive geographic area with cultural significance.

Cultural Resource Management (CRM): A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

Feature: Non-portable artefacts, in other words artefacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

Impact: A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Lithic: Stone tools or waste from stone tool manufacturing found on archaeological sites.

Matrix: The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

Midden: Refuse that accumulates in a concentrated heap.

Microlith: A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.

Monolith: A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

Phase 1 CRM Assessment: An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

Phase 2 CRM Study: In-depth studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or collection (in terms of a permit) at sites that may be lost as a result of a given development.

Phase 3 CRM Measure: A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

Provenience: Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association,* the co-occurrence of an artefact with other archaeological remains; and *superposition,* the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

Random Sampling: A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

Scoping Assessment: The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an impact assessment. The main purpose is to focus the impact assessment on a manageable number of important questions on which decision making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

Site (Archaeological): A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

Stratigraphy: This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

Systematic Sampling: A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

Trigger: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an *issue* and/or potentially significant *impact* associated with that proposed development that may require specialist input. Legal requirements of existing and future legislation may also trigger the need for specialist involvement.

LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
BGG	Burial Grounds and Graves
CRM	Culture Resources Management
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
GPR	Ground Penetrating Radar
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Right Area
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)

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1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability was commissioned by Ngxwabangu Wind Power (Pty) Ltd. for an Archaeological Impact Assessment (AIA) study for the proposed Ngxwabangu WEF Project in the Chris Hani District Municipality, Eastern Cape Province. The rationale of this AIA is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance in previously unstudied areas; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

1.2 Project Direction

Exigo Sustainability's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for Exigo Sustainability, Mr Neels Kruger acted as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated AIA report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA) as well as a Master's Degree candidate in archaeology at the University of Pretoria.

1.3 Project Brief

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities. The proposed Ngxwabangu WEF will consist of up to 36 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), a 33 kV medium voltage Overhead Line (OHL) of approximately 12km to connect the northern section to the southern section of the site, an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS) (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. The construction footprint of the proposed WEF will be up to 208.574 ha (inclusive of roads), rehabilitated to an operational footprint of up to 117.534 ha (inclusive of roads).

In summary, the proposed Ngxwabangu WEF will include:

- Up to 36 turbines with a maximum nominal power output of up to 260MW.
- The proposed WEF will include turbines with a hub height of up to 130m, a rotor diameter of up to 170m, blade length of up to 85m, and a maximum tip height of up to 215m and a lower tip height of 30m.
- Permanent laydown areas adjacent to each wind turbine (up to 4 000 m^2).

- Temporary laydown areas adjacent to each wind turbine (up to 3 150 m^2).
- Foundations (up to 900 m^2) for each wind turbine.
- An IPP Substation (SS) of up to 4ha (inclusive of a 33/132kV Eskom SS, offices and parking and a permanent SS laydown area). Two alternatives are proposed:
  - IPP Substation Alternative 1: situated in southern area. This is the preferred alternative.
  - IPP Substation Alternative 2: situated in the northern area.
- Four (4) Collector Substations (SS) of up 3ha each (33kV). Two (2) of the Collector SSs are situated within the western cluster of turbines (turbines 1-39 and two (2) of the Collector SSs are situated within the eastern cluster of turbines.
- Temporary Laydown Area, Temporary Buffer Yard, Temporary Batching Plant, Temporary CTMF and Temporary Site Camp (Construction Compound) of up to 9ha.
- BESS of up to 3ha (temporary laydown area, CTMF and CC area will be converted to the BESS facility post-construction phase). Two alternatives are proposed:
  - BESS Alternative 1: Situated adjacent to the southern IPP Substation (IPP SS Alternative 1). This is the preferred alternative.
  - BESS Alternative 2: Situated adjacent to the northern IPP Substation (IPP SS Alternative 2).
- Two (2) medium voltage underground powerlines (up to 33kV) between the Collector SS and the IPP Substation of up to 6km and 9km in length. Two alternatives are proposed:
  - 33kV Powerline Alternative 1: Connecting the Northern and Eastern Collector SSs to the southern IPP Substation (IPP SS Alternative 1). This is the preferred alternative.
  - 33kV Powerline Alternative 2: Connecting the Northern and Eastern Collector SSs to the northern IPP Substation (IPP SS Alternative 2).
- A 33kV medium voltage Overhead Line (OHL) of approximately 12km to connect the northern section to the southern section of the site.
- Medium voltage cabling (up to 33kV) between turbines and the collector substations, to be laid underground and along roads, where technically feasible.
- Internal access roads of up 103km constructed at up to 15m wide (construction phase), rehabilitated to 8m wide (operational phase). Existing roads will be used as far as possible. However, where required, internal access roads will be constructed between the turbines.

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT (PRE-MITIGATION)	OPERATIONAL FOOTPRINT (POST-MITIGATION)
Permanent Turbine Laydown Area	TOTAL 4 000 m^2 x 36 turbines = 144 000 m^2 which equates to 14.400 ha	TOTAL 4 000 m^2 x 36 turbines = 144 000 m^2 which equates to 14.400 ha
Permanent Turbine Foundation Area	TOTAL Up to 900m^2 x 36 turbines = 32 400 m^2 which equates to 3.240 ha	TOTAL Up to 900m^2 x 36 turbines = 32 400 m^2 which equates to 3.240 ha
Permanent Turbine Transformer Area	TOTAL Up to 25m^2 x 36 turbines = 900 m^2 which equates to 0.090 ha	TOTAL Up to 25m^2 x 36 turbines = 900 m^2 which equates to 0.090 ha
Permanent BESS Area	TOTAL Up to 30 000m^2 which equates to 3.000 ha	TOTAL Up to 30 000m^2 which equates to 3.000 ha

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT (PRE-MITIGATION)	OPERATIONAL FOOTPRINT (POST-MITIGATION)
Permanent IPP Substation (including a 33/132kV Switching Station)	TOTAL Up to 40 000m² = 40 000 m² which equates to 4.000 ha	TOTAL Up to 40 000m² = 40 000 m² which equates to 4.000 ha
Permanent Collector Substations (33kV)	TOTAL Up to 30 000m² x 4 = 120 000 m² which equates to 12.000 ha	TOTAL Up to 30 000m² x 4 = 120 000 m² which equates to 12.000 ha
Permanent WEF Gatehouse	TOTAL Up to 40m² which equates to 0.004 ha	TOTAL Up to 40m² which equates to 0.004 ha
Temporary Turbine Laydown Area	TOTAL 3 150 m² x 36 turbines = 113 400 m² which equates to 11.340 ha	TOTAL 0 m² x 36 turbines = 0m² which equates to 0.000 ha
Temporary WEF Site Camp Temporary WEF Laydown Area Temporary WEF CTMF Area Temporary Buffer Yard Temporary WEF Batching Plant	TOTAL Up to 90 000m² which equates to 9.000 ha	TOTAL Up to 0m² which equates to 0.000 ha
New Internal Access Roads (15 m construction, rehabilitated to 8 m during operation)	TOTAL Up to 57 000 m x 15m = 855 000 m² which equates to 85.500 ha	TOTAL Up to 57 000 m x 8m = 456 000 m² which equates to 45.600 ha
Upgraded Existing Internal Access Roads (15 m construction, rehabilitated to 8 m during operation)	TOTAL Up to 44 000 m x 15m = 660 000 m² which equates to 66.000 ha	TOTAL Up to 44 000 m x 8m = 352 000 m² which equates to 35.200 ha
TOTAL FOOTPRINT:	Up to 57.074 ha of clearing needed for the construction phase of the development of the proposed WEF (excluding roads) Up to 208.574 ha of clearing needed for the construction phase of the development of the proposed WEF (including roads)	Up to 36.734 ha of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed WEF (excluding roads) Up to 117.534 ha of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed WEF (including roads)

NGXWABANGU WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 36 turbines
Power output per turbine	Unspecified
Facility output	Up to 260 MW
Turbine hub height	Up to 130 m
Turbine rotor diameter	Up to 170 m
Turbine blade length	Up to 85 m
Turbine upper tip height	Up to 215 m

Turbine lower tip height	30m
IPP Substations (SS)	33kV
Collector Substations (SS)	33kV
Eskom Substation (SS)	33/132kV
Cabling	33kV (underground where technically feasible, otherwise overhead)
Internal Access Roads	15m (construction phase), to be rehabilitated to 8m (operational phase)
BESS Technology	Solid State (Li-Ion) or REDOX-Flow (High level risk assessment for both) – 3ha

NGXWABANGU WIND ENERGY FACILITY			
FARM NAME	SG DIGIT NUMBER	FARM NUMBER/PORTION	AREA (HA)
Farm 123	2317/2011	Portion 0 of 123	885.056
Mcambalala	2048/2011	Portion 0 of 101	3 047.617
Nququ Plantation	6134/2001	Portion 0 of 66	1 389.899
Farm 98	1308/2011	Portion 0 of 98	2 588.953
Lower Nququ	4739/1948	Portion 0 of 95	4 605.394
Ngxwabangu	1211/2013	Portion 0 of 170	3 109.851
Upper Ncuncuzo	84/2014	Portion 0 of 184	2 283.640
Ncuncuzo	83/2014	Portion 0 of 183	5 674.083
Mtshanyana	1192/2013	Portion 0 of 188	3 723.084
		TOTAL	27 307.577

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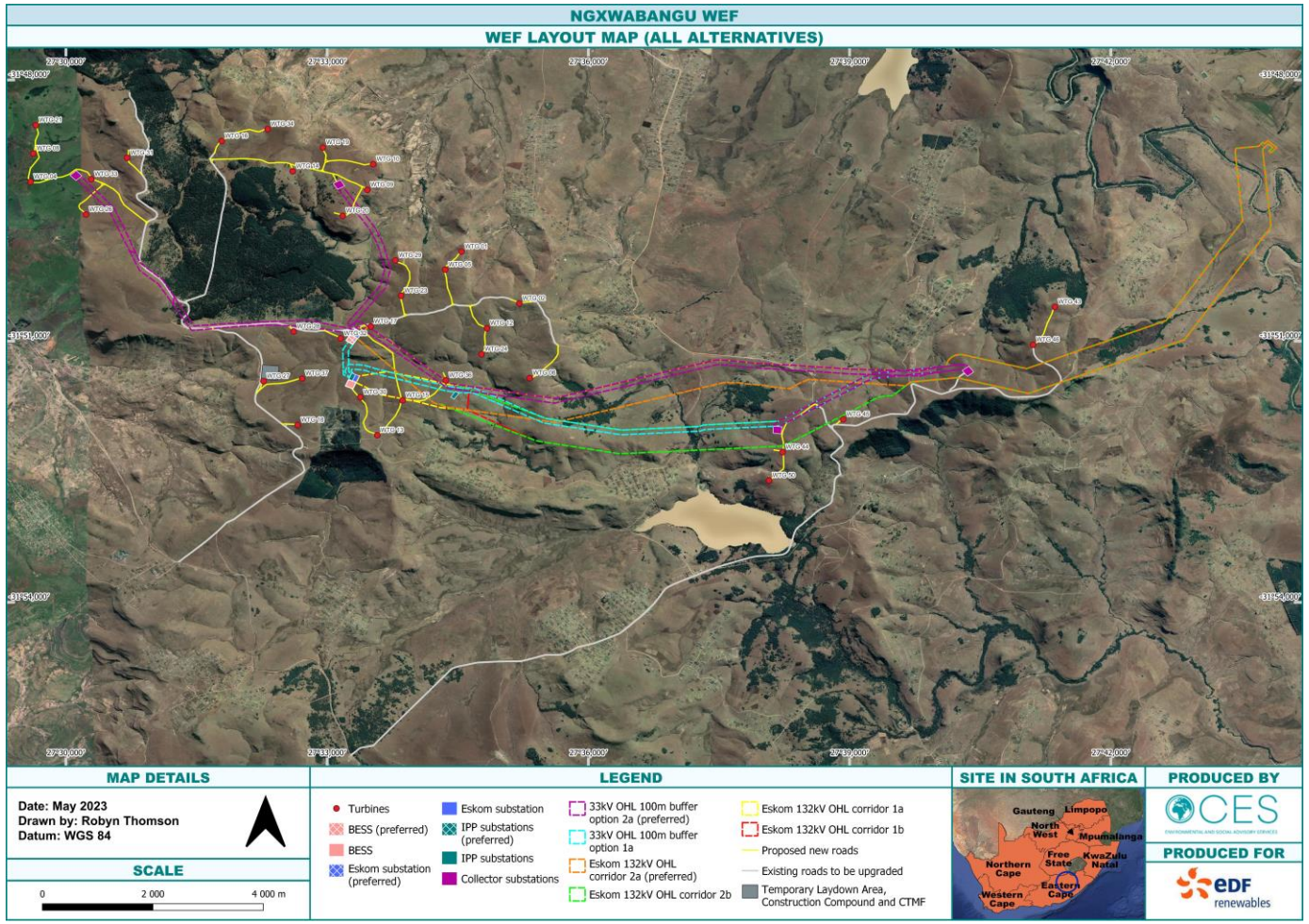

Figure 1-1: Aerial map indicating the project components subject to the proposed Ngxwabangu WEF Project.

1.4 Terms of Reference

Heritage specialist input into the Environmental Impact Assessment (EIA) process is essential to ensure that, through the management of change, developments still conserve our heritage resources. It is also a legal requirement for certain development categories which may have an impact on heritage resources. Thus, EIAs should always include an assessment of heritage resources. The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources. Based hereon, this project functioned according to the following **terms of reference for** heritage specialist input**:**

- *Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements which may be affected, if any.*
- *Assess the nature and degree of significance of such resources within the area.*
- *Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;*
- *Assess and rate any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.*
- *Propose possible heritage management measures provided that such action is necessitated by the development.*
- *Liaise and consult with the South African Heritage Resources Agency (SAHRA*.

1.5 CRM: Legislation, Conservation and Heritage Management

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 palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

1.5.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and its provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act No 25 of 1999 (section 35) the following features are protected as cultural heritage resources:

a. Archaeological artifacts, structures and sites older than 100 years

b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography

c. Objects of decorative and visual arts

d. Military objects, structures and sites older than 75 years

e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites of scientific or technological value.

In addition, the national estate includes the following:

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 features of cultural significance
e. Geological sites of scientific or cultural importance
f. Archaeological and paleontological importance
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

With regards to activities and work on archaeological and heritage sites 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 by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

(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, 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;

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves and burial grounds are commonly divided into the following subsets:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments.

c. National Heritage Resources Act No 25 of 1999, section 35

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

1.5.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

A detailed guideline of statutory terms and requirements is supplied in Addendum 2.

2 REGIONAL CONTEXT

2.1 Area Location

The proposed Ngxwabangu WEF Project is located on portions of communal land in the former Transkei region of the Chris Hani District Municipality, Eastern Cape Province. The town of Engcobo is situated more or less 30km north of the project area and a number of small villages, notably Ngxwabangu, Mahlatini, Maqwathini and Kwa-Boyu occur around the proposed project. The project footprints appear on 1:50 000 map sheet **3127DC** (see Figure 2-1). Key geographical points for the project locations are:

- **Ngxwabangu Project Area: S31.83199° E27.53955°**
- **Ncora Project Area: S31.85894° E27.65634°**

2.2 Area Description: Receiving Environment

The Ngxwabangu region is situated on the hills of the Eastern Cape grasslands south of the Drakensberg. The ecological landscape is defined as a combination of mixed grasslands and forest / scrub forest, typically dominated by mixed grassveld and forests at differing altitudes. The annual rainfall ranges between 1150 to over 1300mm per annum. The geology of the larger region is constituted by mudstones and sandstones of the Beaufort group and towards the coast, shales, mudstones and sandstones of the Ecca group, with exposures of dolerite intrusions mostly in the higher lying areas, are found. Soils in the area are moderate to deep and vary between sandy loams in the upper half to clayey loam in the downstream half. The project site is bisected by the Ngxabangu River draining into the Tsojana Dam and several perennial and non-perennial streams and drainage lines, most of them originating in the surrounding hills, transect the area.

2.3 Site Description

The project areas subject to this assessment are situated along rolling hills and plains within the rural Eastern Cape landscape. The terrain consists predominantly of deep valleys interrupted by flatter parcels of developable land with areas that have been altered where informal and formal housing, schools, shops, homesteads, crop fields, roads and other infrastructure have been established. Original vegetation remains intact along the Ngxabangu River and the Tsojana Dam and along water courses but disturbance agents such as ploughing and grazing cause severe surface erosion and decomposition of low-lying geomorphological deposits in places. A large number of villages and settlements form part of the landscape around the project area:

- Ngxwabangu
- Mahlatini
- Maqwathini
- Kwa-Boyu
- Mahlengele
- Kulufini

Much of the proposed project area has been transformed in past years by extensive agricultural and forestry activities, the remnants which are evident across the landscape.

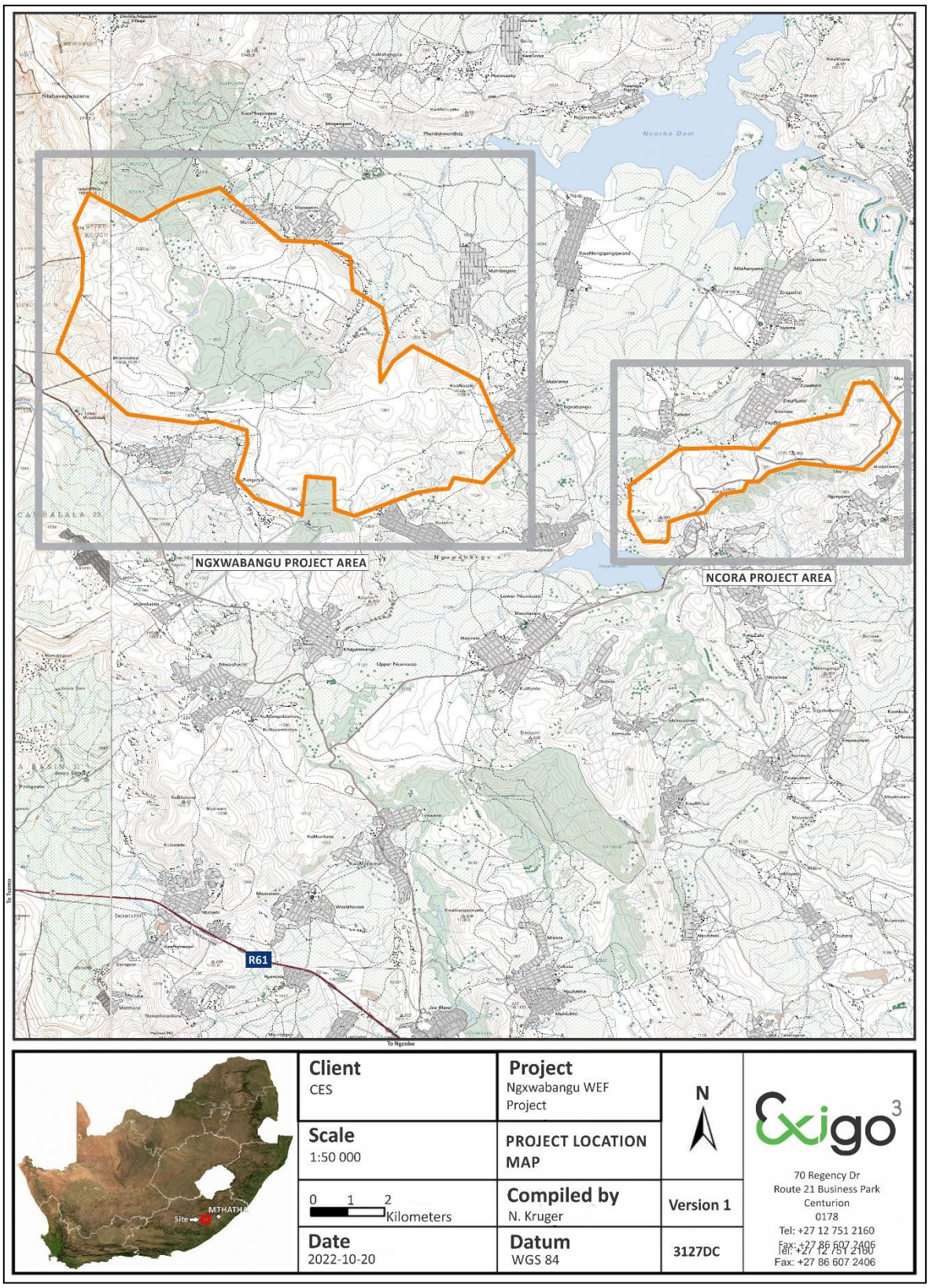

Figure 2-1: 1:50 00 Map representation of the location of the Ngxwabangu WEF Project (sheet 3127DC).

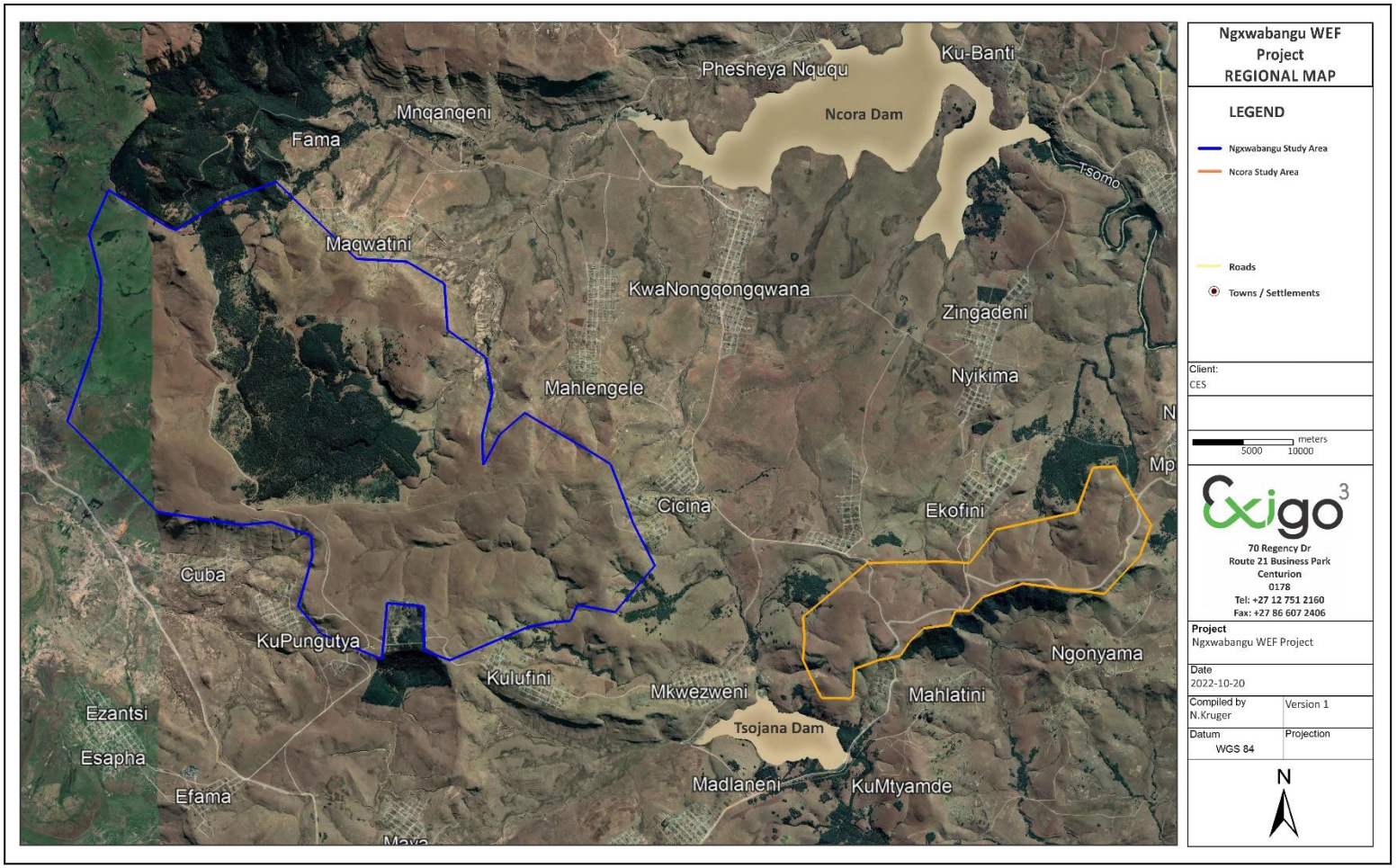

Figure 2-2: Aerial map providing a regional context for the proposed Ngxwabangu WEF Project.

3 METHOD OF ENQUIRY

3.1 Sources of Information

Data from detailed desktop, aerial and field studies were employed in order to sample surface areas systematically and to ensure a high probability of heritage site recording.

3.1.1 Desktop Study

The larger landscape around Ngxwabangu has not been well documented in terms of its archaeology and history but available academic papers and research articles supplied a historical context for the proposed project and archival sources, aerial photographs, historical maps and local histories were used to create a baseline of the landscape's heritage. In addition, the study drew on available unpublished Heritage Assessment reports to give a comprehensive representation of known sites in the study area.

3.1.2 Aerial Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied to assist the foot and automotive site surveys where depressions, variation in vegetation, soil marks and landmarks were examined. Specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments. In addition, historical aerial photos obtained during the archival search were scrutinized and features that were regarded as important in terms of heritage value were identified and if they were located within the boundaries of the project area they were physically visited in an effort to determine whether they still exist and in order to assess their current condition and significance. By superimposing high frequency aerial photographs with images generated with Google Earth as well as historical aerial imagery, potential sensitive areas were subsequently identified and geo-referenced. These areas served as referenced points from where further vehicular and pedestrian surveys were carried out.

3.1.3 Mapping of sites

Merging data generated during the desktop study and the aerial survey, the project area was plotted on historical and more recent 1:50 000 topographic maps of the Ngxwabangu area. These maps were then superimposed on high-definition aerial representations in order to graphically demonstrate the geographical locations and distribution of potentially sensitive landscapes.

3.1.4 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the project impact areas was conducted in November 2021 and February 2022. The process encompassed a systematic field survey in accordance with standard archaeological practice by which heritage resources are observed and documented. In order to sample surface areas systematically and to ensure a high probability of site recording, the project areas were systematically surveyed on foot and in motor vehicle. GPS reference points identified during the aerial survey were also visited and random spot checks were made (see detail in previous section). Using a Garmin Montana GPS objects and structures of archaeological / heritage value were recorded and photographed with a Samsung Digital camera. Real time aerial orientation, by means of a mobile Google Earth application was also employed to investigate possible

disturbed areas during the survey. It should be noted that information on the final layout of the OHL corridors were made available to specialists at an advanced stage of this assessment and some these areas could not be included in the site surveys (refer to Section 3.2.3).

3.2 Limitations

3.2.1 Access

The project areas subject to this assessment are accessed via local roads connecting to the R61 road. Access control is not applied to the areas relevant to this assessment but the general landscape proves challenging to navigate which restricted free movement during the site visit.

3.2.2 Visibility

The surrounding vegetation in the study area landscape is mostly comprised out of mixed grasslands and scattered trees in areas that has largely been transformed by farming activities. Visibility proved to be a minor constraint in the more densely vegetated northern periphery of the project area along the Ngxabangu River (see Figures 3-1 to 3-5). In single cases during the survey sub-surface inspection was possible. Where applied, this revealed no archaeological deposits.

Figure 3-1: View of the Ncora Project Area looking east.

Figure 3-2: View of open fields and a watercourse and waterfall in the Ngxwabangu Project Area.

Figure 3-3: View of the Tsojana Dam and its surroundings in the larger project landscape.

Figure 3-4: View of general surroundings in the Ngxwabangu Project Area.

Figure 3-5: View of the project area to the south. Note the large plantation on the right.

3.2.3 Limitations and Constraints

The site survey for the Ngxwabangu WEF Project AIA primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the aerial survey) as well as areas of high human settlement catchment. In summary, the following constraints were encountered:

- **Visibility:** Visibility proved to be a minor constrain in areas with denser surface cover as well as portions where vegetation is more pristine.

- **Site Access:** The general landscape proved challenging to navigate which restricted free movement during the site visit.
- **Data Availability:** Information on the final layout of the OHL corridors were made available to specialists at an advanced stage of this assessment and some these areas could not be included in the site surveys (refer to Figure 3-6). Even though it is assumed that findings in this assessment provides an accurate representation of the heritage landscape and potential site sensitivities, **final site walkovers of unsurveyed development footprint areas will be required prior to construction.**

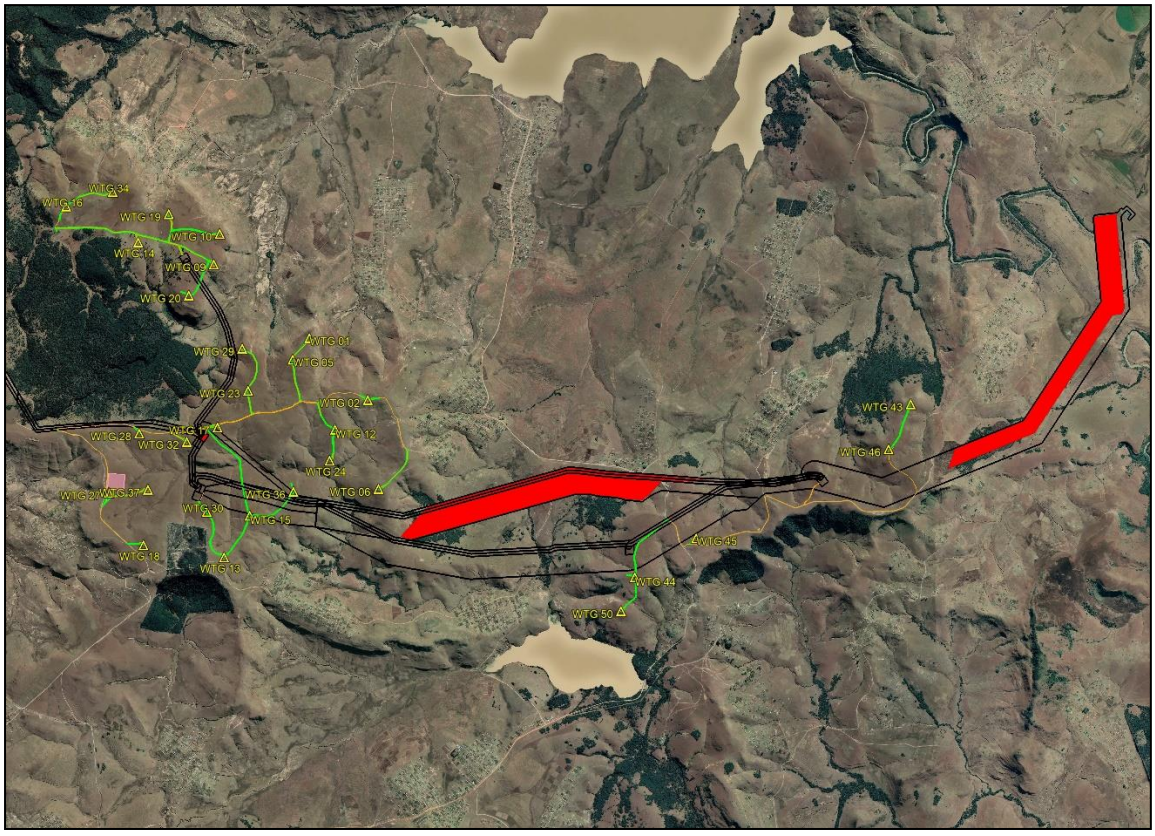

Figure 3-6: Aerial maps indicating areas not included in the site survey (red shade). Final site walkovers of these development footprint areas will be required prior to construction.

It should be noted that, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Ngxwabangu WEF Project, the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

3.3 Impact Assessment

For consistency among specialists, impacts were rated and assessed using an Impact and Risk Assessment Methodology provided by CES[1], for the Scoping Phase of the EIA process in accordance with the requirement of EIA Regulations. **Please refer to Section 6 and Addendum 3**.

4 ARCHAEO-HISTORICAL CONTEXT

4.1 The archaeology of Southern Africa

Archaeology in Southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer Period**. The following table provides a concise outline of the chronological sequence of periods, events, cultural groups and material expressions in Southern African pre-history and history.

Table 1 Chronological Periods across Southern Africa

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: *Australopithecines* *Homo habilis* *Homo erectus*	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First *Homo sapiens* species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	*Homo sapiens* including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

4.2 The Ngxwabangu Area: Specific Themes.

The archaeological history of the Eastern Cape Province dates back to about 2 million years and possibly older. The Albany Museum database holds limited information of archaeological sites for the north Eastern Cape, however, records are held at several institutions including the University of the Transkei (now Walter Sisulu University), the University of Fort Hare, and the Rock Art Research Institute at the University of the Witwatersrand. Rock art research, mainly conducted by researchers from the Rock Art Research Institute,

[1] CES Risk Assessment Methodologies Internal guideline document, 2019

University of the Witwatersrand, have been conducted around the Barkly East, Ugie, Maclear, Dordrecht and other areas in the Southern Drakensberg escarpment of the north-eastern Cape. Middle Stone Age and Later Stone Age sites have also been excavated and researched during the 1970's. The literature shows evidence of an archaeological heritage that spans from the Early Stone Age, Middle Stone Age to the Later- Stone, as well as evidence of pastoralism and Iron Age farmers. Rock paintings are prolific throughout Southern Drakensberg Mountains. The region is also significant historically as a frontier between hunter-gatherers, pastoralists, Nguni-speaking farming communities and European settlers.

4.2.1 Early History and the Stone Ages

According to archaeological research, the earliest ancestors of modern humans emerged some two to three million years ago. The remains of Australopithecine and *Homo habilis* have been found in dolomite caves and underground dwellings at places such as Sterkfontein and Swartkrans near Krugersdorp. *Homo habilis*, one of the Early Stone Age hominids, is associated with Oldowan artefacts, which include crude implements manufactured from large pebbles. The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across South Africa and is associated with *Homo erectus*, who manufactured hand axes and cleavers from as early as one and a half million years ago. Middle Stone Age sites dating from as early as two hundred thousand years ago have been found all over South Africa. Middle Stone Age hunter-gatherer bands also lived and hunted in the Orange and Vaal River valleys. These people, who probably looked like modern humans, occupied campsites near water but also used caves as dwellings. They manufactured a wide range of stone tools, including blades and point s that may have had long wooden sticks as hafts and were used as spears.

A few important Early Stone Age (ESA) sites are known from a number of Ciskei sites including Middledrift commonage and wide flood plain along the Keiskamma River, streams and erosion channels show Early Stone Age material on silcrete sandstone, from within the fluvial deposits (Derricourt 1973). ESA handaxes were documented and recorded on a site near Indwe (Smith 2010). ESA material has been reported in other sites in the Transkei (Derricourt 1977: Feely 1987). Apart from stone artefacts, the ESA sites in the Transkei have produced very little as regards other archaeological remains. This has made it difficult to make inferences pointing to economical dynamics of the ESA people in this part of the world (Mazel 1989). Although Middle Stone Age (MSA) artefacts occur throughout the Eastern Cape, the most well-known MSA sites include the type-site for the Howiesons Poort stone tool industry, Howiesons Poort rock shelter, situated close to Grahamstown and Klasies River Mouth Cave, situated along the Tsitsikamma coast. MSA sites are located both at the coast and in the interior across southern Africa. MSA people occupied the Southern Drakensberg area before 29 000 BP (Opperman 1996) until between 22 5000 BP and 20 9000 BP (Opperman & Heydenrych 1990). During the colder Bottleneck Stadia' the uplands appear to have been abandoned by people and rock glaciers (Lewis & Hanvey 1993), head deposition (Lewis & Dandis 1985) and frost churning (Harvey & Lewis 1991) occurred at the high altitudes (Lewis 2002). Strathalan Cave B is situated in the foothills of the Southern Drakensberg range approximately 10 km north-east of Maclear contained a terminal MSA continuous occupation from between 28 000 to about 22 000 years ago. The site deposit revealed a sequence of Middle Stone Age occupation floors characterized by the presence of grass bedding materials. The stone artefact collection included slender blades and wooden tools were also used. The subsistence system was based on the hunting of medium-large antelopes and the gathering of plant foods (Opperman & Heydenrych 1990; Opperman 1992). Surface scatters of MSA stone artefact industries occur widely as in the former homelands of the Ciskei and Transkei (Derricourt 1973).

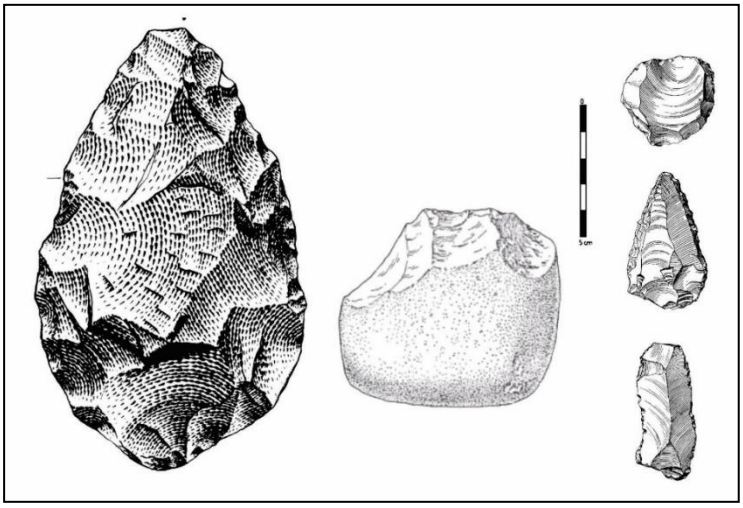

Figure 4-1: Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).

4.2.2 The Later Stone Age (LSA) and Rock Art

The Late Stone Age commenced twenty thousand years ago or somewhat earlier. The various types of Later Stone Age industries scattered across the country are associated with the historical San and Khoi-Khoi people. The San were renowned as formidable hunter-gatherers, while the Khoi-Khoi herded cattle and small stock during the last two thousand years. Late Stone Age people manufactured tools that were small but highly effective, such as arrow heads and knives. Later Stone Age (LSA) sites occur both at the coast and inland as caves deposits, rock shelters, open sites and shell deposits. The majority of LSA archaeological sites in the Eastern Cape area would date from the past 10 000 years where San hunter-gatherers inhabited the landscape living in rock shelters and caves as well as on the open landscape. These latter sites are difficult to find because they are in the open veld and often covered by vegetation and sand. Sometimes these sites are only represented by a few stone tools and fragments of bone. The Southern Drakensberg was occupied by hunter-gatherers before 10 000 BP (Opperman 1987) but was subsequently abandoned in the Holocene after ca. 6 000 BP, only to be re-occupied by 3 000 BP (Tusenius 1989). Ecological evidence suggests that the southern Drakensberg may have been too dry to support the animals and plants needed for the existence of hunter-gatherer people between 6 000 and some time before 3 000 BP (Tusenius 1989). The north-eastern Cape forms a link between the better watered eastern half of South Africa and the drier west. The wettest conditions apparently existed around 2700 BP, probably correlating with an increase in human occupation in the Southern Drakensberg following the possible abandonment of that area during the dry phase(s) of preceding millennia (Rosen et al. 1999). The succession of stone artefact Industries within the LSA of the Drakensberg region of the north-eastern Cape demonstrates that the resources of this area, which is characterized by a steep ecological gradient, were consistently exploited throughout end Pleistocene and Holocene following the amelioration of conditions after the cold maximum of the Late Pleistocene. The culture stratigraphic sequence if very comparable to that recorded in Lesotho, the middle Orange River basin and the southern and Eastern Cape (Opperman 1982). The renowned San rock paintings of the Drakensberg region also belongs to the LSA period- although the majority were made between 4000 years ago and about 120 years ago. Rock Art can be in the form of rock paintings or rock engravings. Rock paintings occur on the walls of caves and rock shelters across southern Africa and are prolific in the Southern Drakensberg, north-eastern Cape extending the entire Drakensberg range into KwaZulu-Natal and Lesotho. Rock engravings are limited to the Karoo and Northern Cape Regions and do not generally occur within the north Eastern Cape region and former Transkei region. Rock art research within the Southern Drakensberg has been conducted by several researchers and students from the Rock Art Research Institute, University of the Witwatersrand, over a period of 25 years, with a well-

established database of site from Maclear, Tsolo, Mthatha, Ugie, Dordrecht and the wider region and extent of the Drakensberg range and Maluti Mountains.

4.2.3 Pastoralism in the Eastern Cape

As noted above, Khoekhoe pastoralists or herders entered southern Africa about 2000 years ago, with domestic animals such as fat-tailed sheep and goats, travelling through the south towards the coast. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers. The most significant Khoekhoe pastoralist sites in the Eastern Cape include Scott'sCave near Patensie (Deacon 1967), Goedgeloof shell midden along the St. Francis coast (Binneman 2007) and Oakleigh rock shelter near Queenstown (Derricourt 1977). Often, these archaeological sites are found close to the banks of large streams and rivers. Little detailed pastoralist research has been conducted in the Ngxwabangu area).

4.2.4 Iron Age / Farmer Period

The beginnings of the Iron Age (Farmer Period) in Southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry), metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. Iron Age people moved into Southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. From the coast they followed the various rivers inland. Being cultivators, they preferred rich alluvial soils. The Iron Age can be divided into three phases. The Early Iron Age includes the majority of the first millennium A.D. and is characterised by traditions such as Happy Rest and Silver Leaves. The Middle Iron Age spans the 10th to the 13th Centuries A.D. and includes such well known cultures as those at K2 and Mapungubwe. The Late Iron Age is taken to stretch from the 14th Century up to the colonial period and includes traditions such as Icon and Letaba.

Even though much research has been conducted on the Iron Age (IA) across southern Africa, only a small portion has focused on the Eastern Cape. A few important Eastern Cape Early Iron Age Sites (EIA) sites include Kulubele situated in the Kei River Valley near Khomga (Binneman 1996), Ntsitsana situated in the interior Transkei, 70 km west of the coast, along the Mzimvubu River (Prins & Granger 1993), and Canasta Place situated on the west bank of the Buffalo River (Nogwaza 1994). Previous investigations into the EIA in the Transkei and Ciskei include work at Buffalo River Mouth (Wells 1934; Laidler 1935), at Chalumna River Mouth (Derricourt 1977) and additional research by Feely (1987) and Prins (1989). The first EIA farming communities during the first millennium AD preferred to occupy river valleys within the eastern half of southern Africa owing to the summer-rainfall climate that was conducive for growing millet and sorghum. The closest documented and well-researched Early Iron Age site, to Elliot is located within the Great Kei River Valley. The site is situated some 200 m below the plateau and 60 km inland from the coast, within the borders of the Transkei, approximately 100 km up the coast towards Durban. There has in the past been some speculation that Early Iron Age populations may have spread well south of the Transkei into the Ciskei, possibly up to the Great Fish River (Binneman et al. 1992), however, no further research has been undertaken to confirm these statements. A closer Early Iron Age site has been documented to the south of East London (Cronin 1982). Thicker and decorated pottery sherds, kraals, possible remains of domesticated animals, upper and lower grindstones and storage pits are associated for identifying EIA sites. The sites are generally large settlements, but the archaeological visibility may in most cases be difficult owing to the organic nature of the homesteads. Metal and iron implements are also associated with EIA communities.

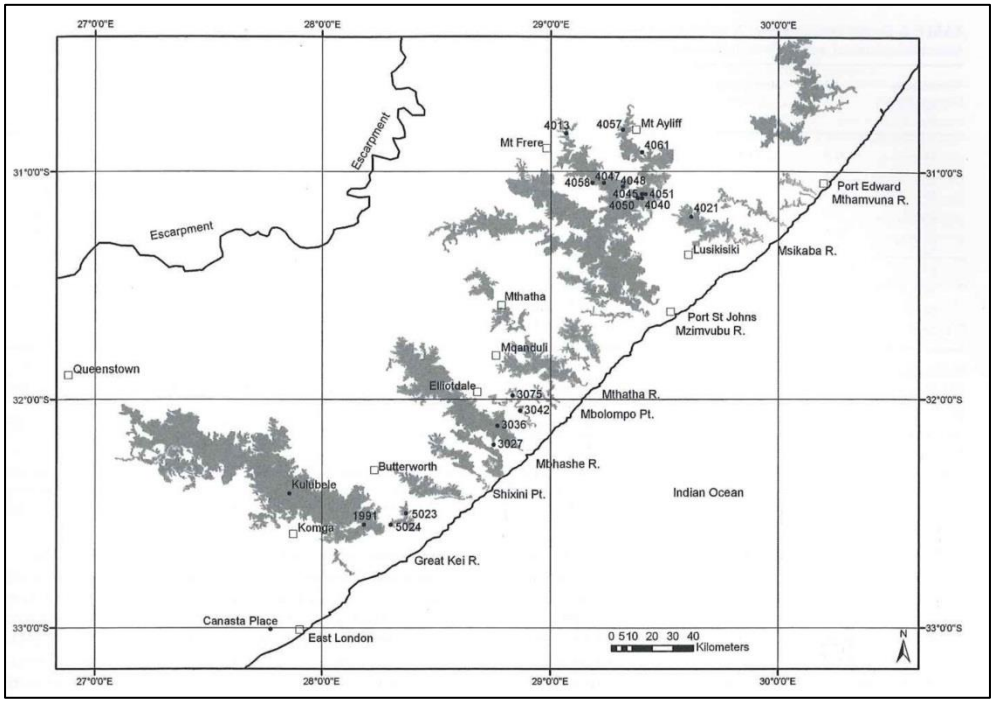

Figure 4-2: Early Iron Age farmer period sites in the Eastern Cape around Mthata (after Feely & Bell-Cross 2011).

The Later Iron Age (LIA) is not only distinguished from the EIA by greater regional diversity of pottery styles but is also marked by extensive stone wall settlements. LIA sites in the Eastern Cape Province occur adjacent to the major rivers in low lying river valleys but also along ridge crests above the 800m contour. The LIA in the project area can be ascribed to the Mpondomise, Thembu, and Xhosa tribal clusters or their immediate predecessors (Feely 1987). It is also possible that some stone walled sites, especially those incorporating shelters or caves, were constructed by hybrid San/Nguni groups. Trade played a major role in the economy of LIA societies. Goods were traded locally and over long distances. The main trade goods included metal, salt, grain, cattle and thatch. This led to the establishment of economically driven centres and the growth of trade wealth. Keeping of domestic animals, metal work and the cultivation of crops continued with a change in the organisation of economic activities (Maggs, 1989; Huffman 2007). Hilltop settlements are mainly associated with LIA settlement patterns that occurred during the second millennium AD. Later Iron Age settlements have been formally recorded by the Albany Museum and cover a relatively extended area in comparison with the Early Iron Age settlement patterns. With the exception of the Tembu, stone buildings which characterizes the Iron Age sites of Sotho areas, is absent in the Transkei and Ciskei, and a pattern of some mobility without, it is presumed, a stone working technology of significance, makes the allocation of sites a major problem (Derricourt 1973).

4.2.5 Later History: Reorganization, Colonial Contact and living heritage

The Eastern Cape region is typically viewed by historians as a frontier zone. This area was the meeting place between an aggressively expanding colonial frontier and the southernmost distribution of black Bantu-speaking farming communities in Africa (Huffman 2007). It is well known in the historical literature for the nine frontier wars that were fought here between the settlers of the Cape colony and the Xhosa nation between 1779 and 1879 (see below). Whereas white colonial settlement expanded north and eastwards from Table Bay, in modern Cape Town, some 350 years ago Bantu-speaking agro pastoralists, the predecessors of the Xhosa nation, inhabited areas to the east of the Sundays river already since 1300 years ago (Binneman et al 1992). For many centuries their movement further west and south were hindered by a climatic frontier that prevented these small-scale subsistence farmers from cultivating summer-rainfall

crops, such as millet and sorghum, their main source of food. Adding to climatic constraints, the first Bantu speaking pioneers encountered other indigenous population groups in these more marginal areas as did colonial agents many centuries later. These were the Khoisan - the direct descendants of the first modern people to have emerged in Africa some 200 000 years ago. These people had from the time of van Riebeeck become popularly known as the San or Bushmen and Khoekhoen or Hottentots. Whereas the Khoekhoen typically lived closer to the coastal areas where they could find adequate grazing for their cattle and sheep the San hunter-gatherers lived further inland in areas not favoured by either Khoekhoen pastoralists or Bantu-speaking agropastoralists. Nevertheless, the Eastern Cape became the contact zone between these different cultures both in the historical and prehistoric past.

By the closing decades of the 18th century, South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers moved into, and occupied Khoekhoe and remnant hunter-gatherer land. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible A large group of British settlers arrived in the eastern Cape in 1820; this, together with a high European birth rate and wasteful land usage, produced an acute land shortage, which was alleviated only when the British acquired more land through massive military intervention against Africans on the eastern frontier. Until the 1840s the British vision of the colony did not include African citizens and most of these groups were expelled across the Great Fish River, the unilaterally proclaimed eastern border of the colony. The first step in this process included attacks in 1811–12 by the British army on the Xhosa groups, the Gqunukhwebe and Ndlambe. An attack by the Rharhabe-Xhosa on Graham's Town in 1819 provided the pretext for the annexation of more African territory, to the Keiskamma River. Various Rharhabe-Xhosa groups were driven from their lands throughout the early 1830s. They counterattacked in December 1834, and Governor Benjamin D'Urban ordered a major invasion the following year, during which thousands of Rharhabe-Xhosa died. The British crossed the Great Kei River and ravaged territory of the Gcaleka-Xhosa as well; the Gcaleka chief, Hintsa, invited to hold discussions with British military officials, was held hostage and died trying to escape. The British colonial secretary, Lord Glenelg, who disapproved of D'Urban's policy, halted the seizure of all African land east of the Great Kei. D'Urban's initial attempt to rule conquered Africans with European magistrates and soldiers was overturned by Glenelg; instead, for a time, Africans east of the Keiskamma retained their autonomy and dealt with the colony through diplomatic agents However, after further fighting with the Rharhabe-Xhosa on the eastern frontier in 1846, Governor Colonel Harry Smith finally annexed, over the next two years, not only the region between the Great Fish and the Great Kei rivers (establishing British Kaffraria) but also a large area between the Orange and Vaal rivers, thus establishing the Orange River Sovereignty. These moves provoked further warfare in 1851–53 with the Xhosa (joined once more by many Khoe), with a few British politicians ineffectively trying to influence events. Between 1811 and 1858 colonial aggression deprived Africans of most of their land between the Sundays and Great Kei rivers and produced poverty and despair. From the mid-1850s British magistrates held political power in British Kaffraria, destroying the power of the Xhosa chiefs. Following a severe lung sickness epidemic among their cattle in 1854–56 the Xhosa killed many of their remaining cattle and in 1857–58 grew few crops in response to a millenarian prophecy that this would cause their ancestors to rise from the dead and destroy the whites. Many thousands of Xhosa starved to death, and large numbers of survivors were driven into the Cape Colony to work. British Kaffraria fused with the Cape Colony in 1865, and thousands of Africans newly defined as Fingo resettled east of the Great Kei, thereby creating Fingoland.

The Transkei, as this region came to be known, consisted of the hilly country between the Cape and Natal. It became a large African reserve and grew in size when those parts that were still independent were annexed in the 1880s and '90s.

5 RESULTS: OFF-SITE DESKTOP AND ARCHAEOLOGICAL SITE SURVEYS

5.1 The Off-Site Desktop Survey

The history and archaeology of the larger Eastern Cape Province is relatively well known but in the larger Ngxwabangu region little systematic archaeological research has been conducted and, as such the heritage landscape is somewhat of an enigma. In terms of heritage resources, the archaeological landscape surrounding the project area is primarily well known for the occurrence of Iron Age farmer sites and Colonial remnants. However, no particular reference to archaeological sites or features of heritage potential were recorded during an examination of literature thematically or geographically related to the project area.

A careful analysis of historical aerial imagery and an archive map of areas subject to this assessment indicate a landscape which has been transformed over centuries by human activity relating to agriculture and settlement. These sources indicate a densely populated region heavily relying on historical agriculture and livestock farming.

The historical aerial imagery and archive maps reveal the following (see Figure 5-1 to Figure 5-8):

- A number of large settlements with so-called "huts" appear on topographic maps dating to 1962 and 1982 but none of these features seem to occur within project areas subject to this assessment. These maps indicate vast cultivated fields occurring across the project properties and in the project areas.
- Van Warmelo (1935) indicates a number of Thembu groups residing in and around Cala and the project area in 1935.
- Aerial imagery dating to 1957 indicate that large portions of the project area have been altered by historical farming and agriculture with the occurrence of many settlements around the project area.

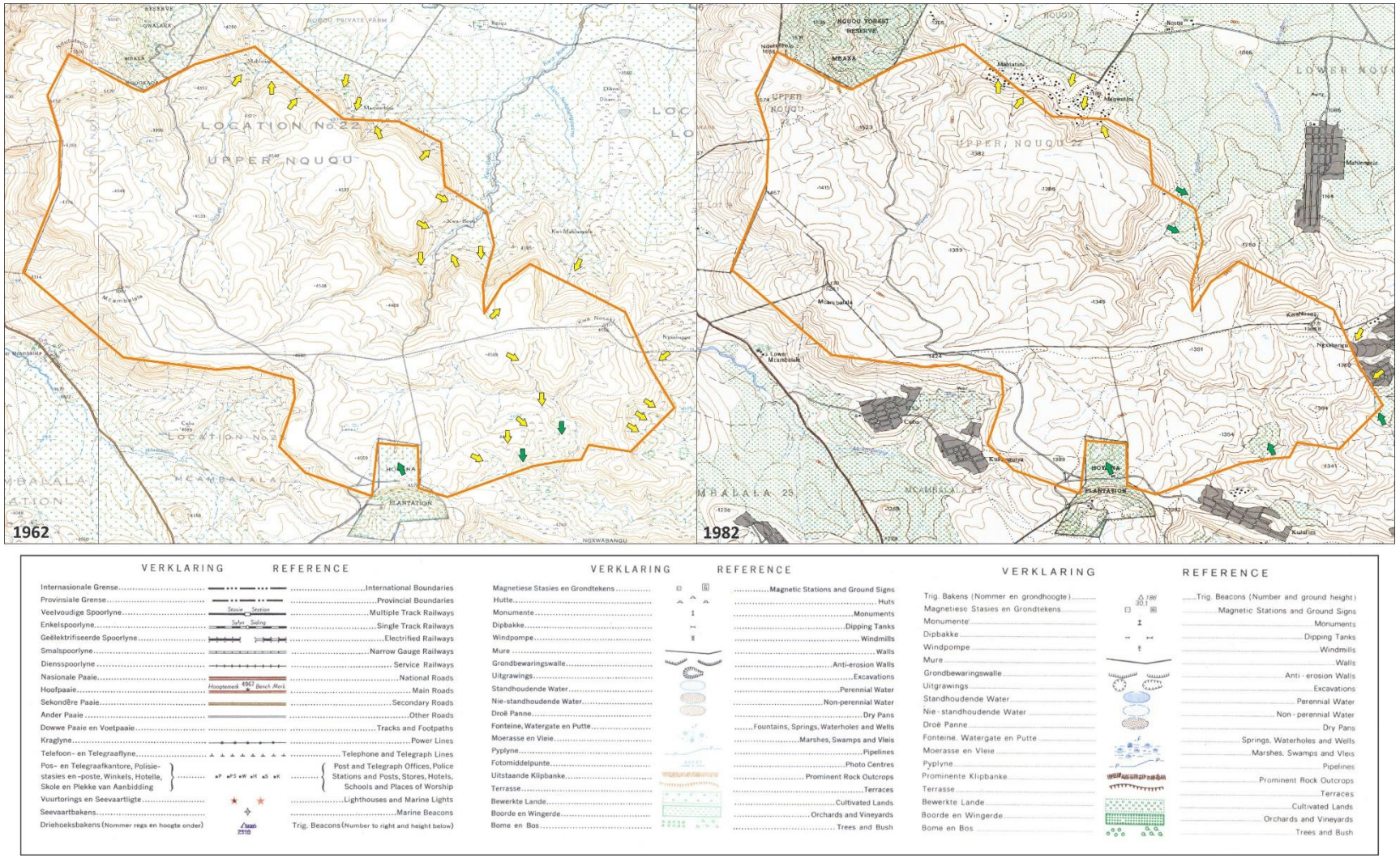

Figure 5-1: Historical topographic maps of the Ngxwabangu Project Area (orange outline) in the past decades. Green arrows point to cultivated lands and large-scale human settlement noted on the maps are indicated by yellow arrows.

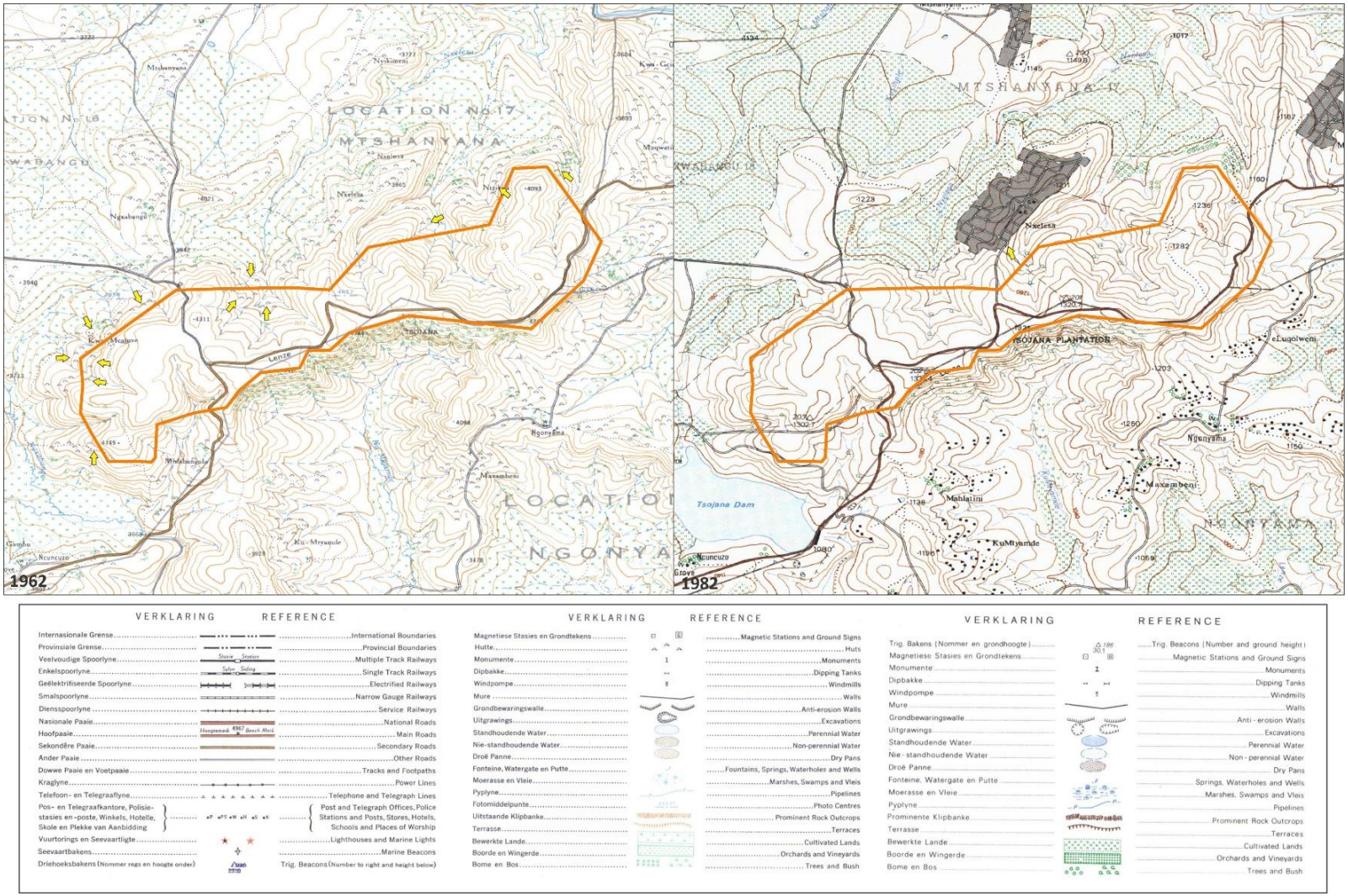

Figure 5-2: Historical topographic maps of the Ncora Project Area (orange outline) in the past decades. Large-scale human settlement noted on the maps are indicated by yellow arrows.

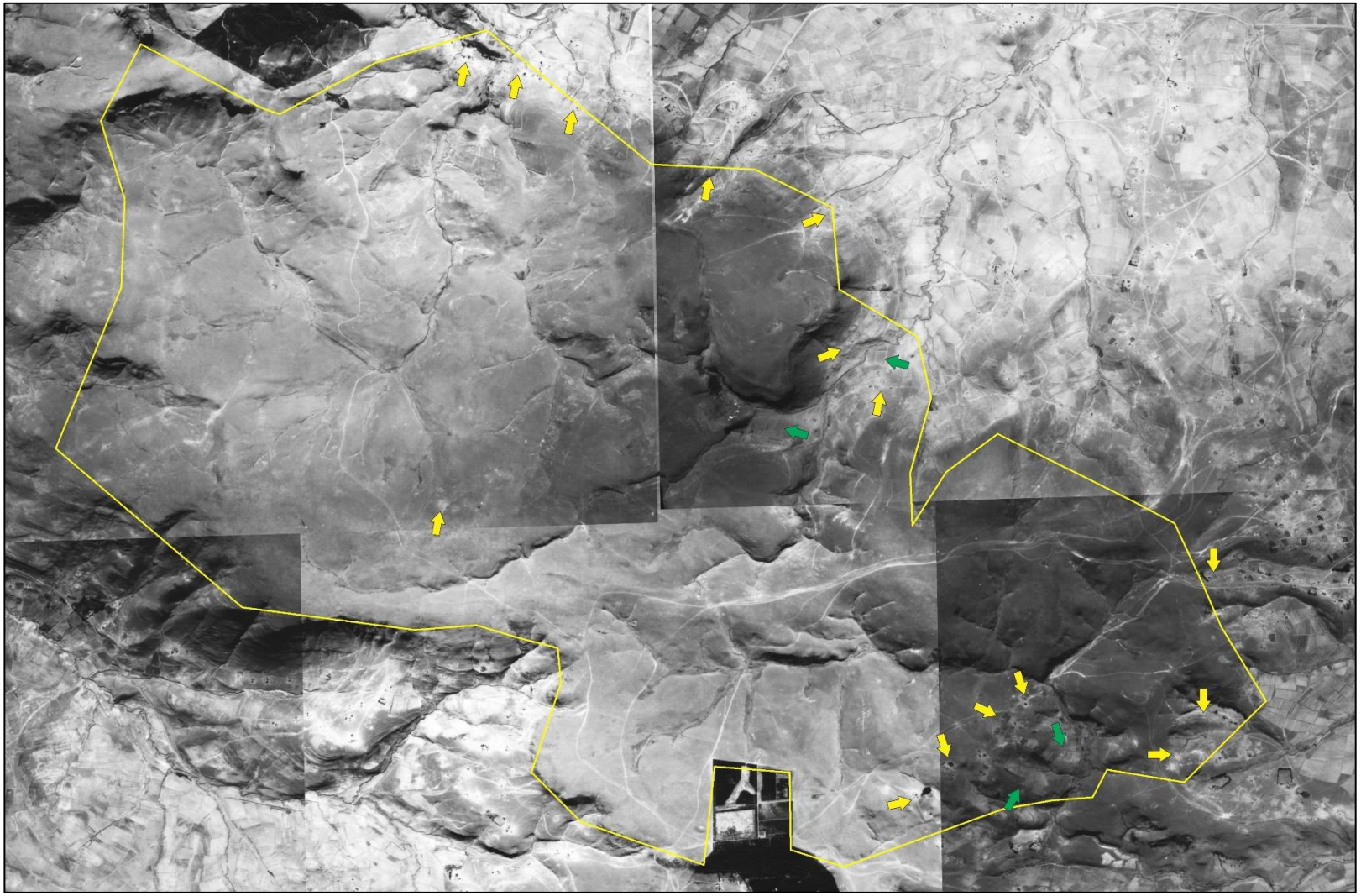

Figure 5-3: A historical aerial image of the Ngxwabangu Project Area (yellow outline) dating to 1957. Green arrows point to cultivated lands and large-scale human settlement visible on the image are indicated by yellow arrows.

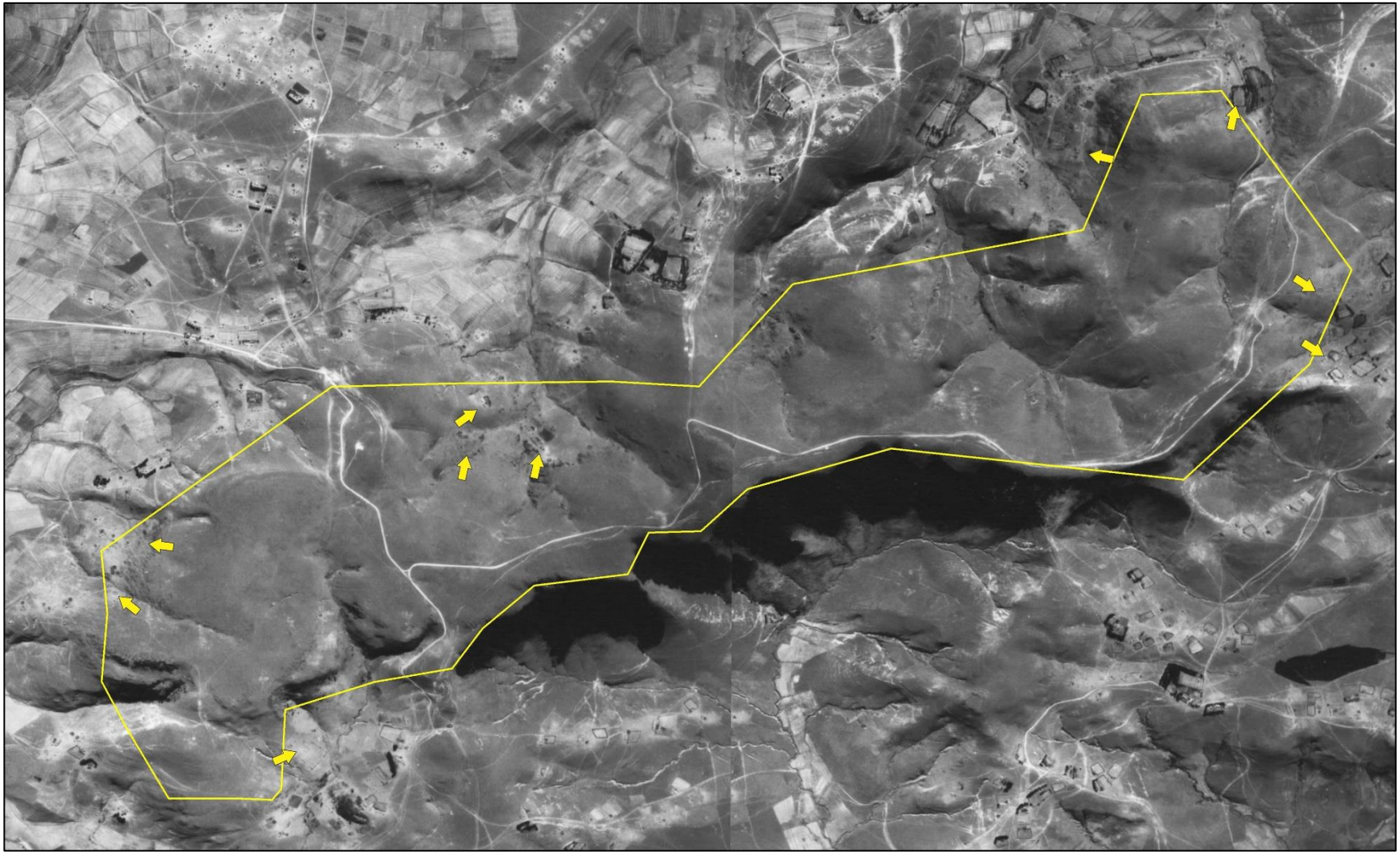

Figure 5-4: A historical aerial image of the Ncora Project Area (yellow outline) dating to 1957. Green arrows point to cultivated lands and large-scale human settlement visible on the image are indicated by yellow arrows.

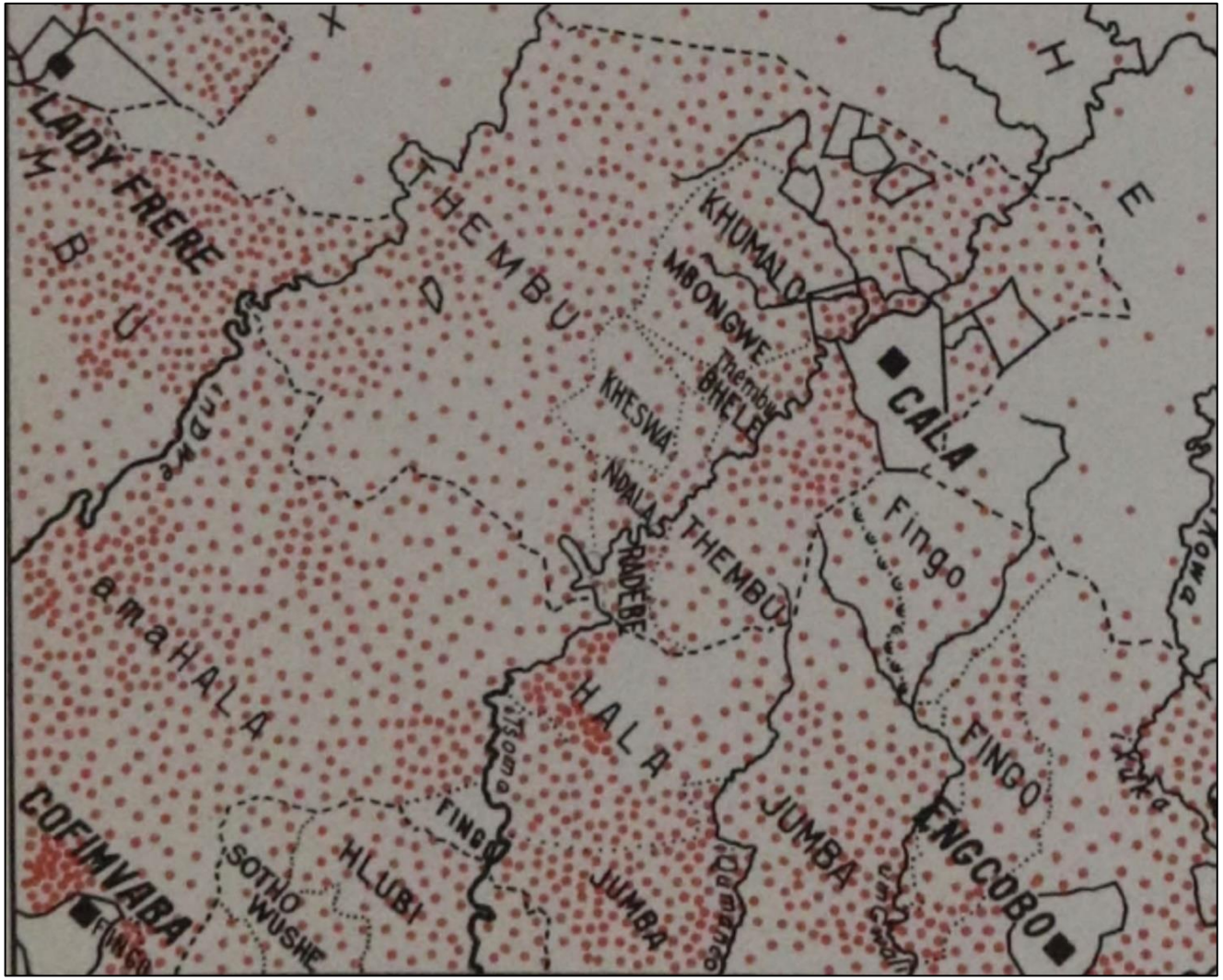

Figure 5-5: An excerpt of Van Warmelo's Map of the project landscape dating to 1935. Each red dot represents "10 taxpayers". Note that the larger landscape was densely populated by various Xhosa groups at the time.

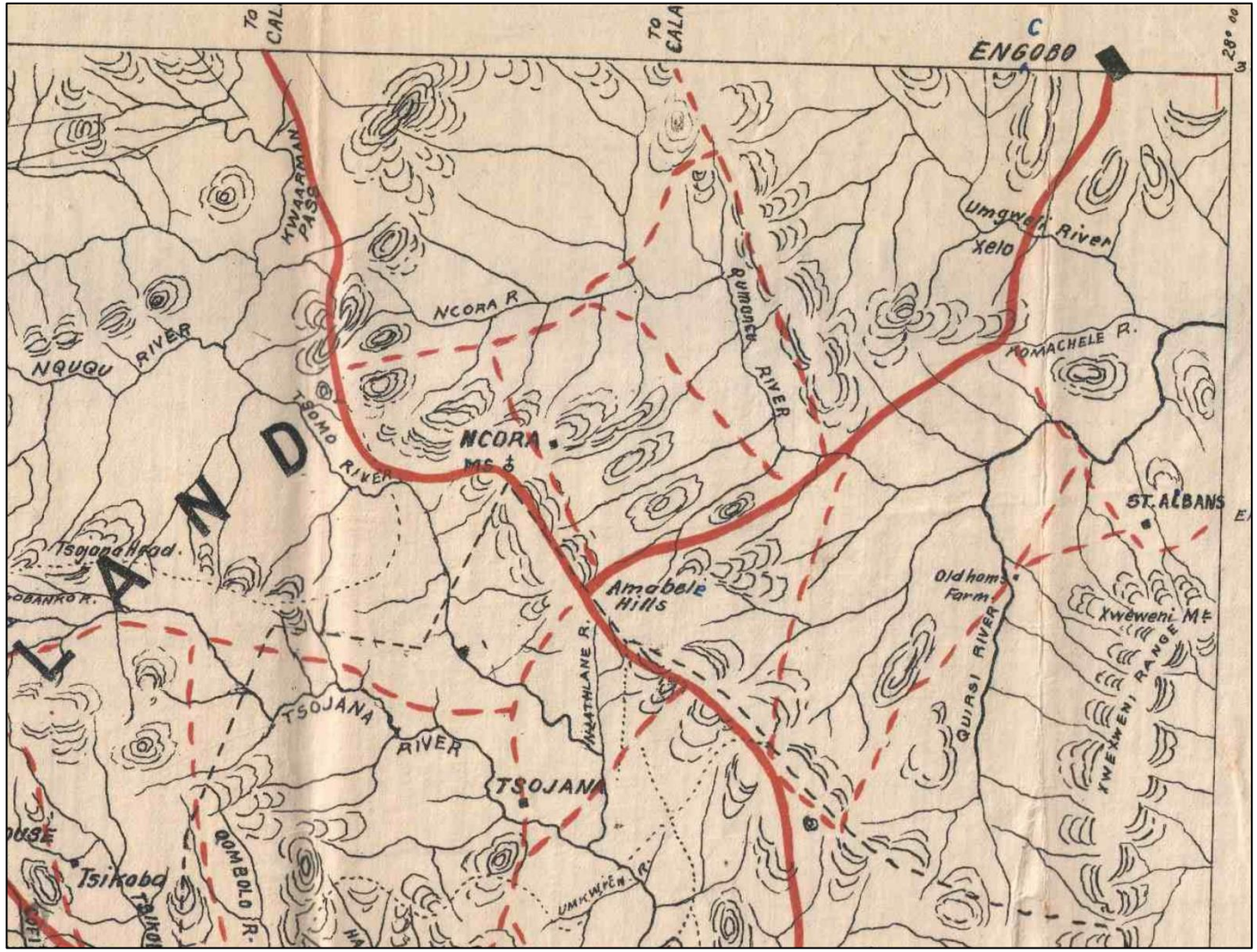

Figure 5-6: The South African War, 1899-1902 Maps Queenstown Region indicating the project area at the time.

Figure 5-7: District Map of Tsomo, Transkei dating to 1916.

5.2 The Archaeological Site Survey

5.2.1 Ngxwabangu Project Area

a. Potential Iron Age Farmer Period

- **Site EXIGO-NWEF-IA01**
  -31.80109419 27.52475146
- **Site EXIGO-NWEF-IA02**
  -31.8039344 27.526614

A frontier zone between the north and the south, the Eastern Cape landscape contains traces of precolonial Iron Age Farmer Period remnants. Three circular stone enclosures were documented on the summit of a hill west of Mahlathini in the Ngxwabangu Project area. Site EXIGO- NWEF-IA01 is a single enclosure measuring approximately 25m in diameter and Site EXIGO- NWEF-IA02 consists of two enclosures measuring approximately 20m and 10m respectively. The fairly well-preserved structures, which are in places overgrown with aloe and other shrubs, were built with round stones, in some instances to a height of more than 1.5m. Entrances are demarcated by monoliths at many of the enclosures, which were probably used as livestock "kraals". No material culture was observed at the site and a clear temporal context for the structures is not known but it is likely that the stone walls date to the terminal phases the Iron Age farmer period in the area. This inference is made based on the fact that the stone enclosures are exclusively circular in shape whereas squarely built enclosures, commonly found in the surrounding landscape, would occur on newer Historical or Contemporary period sites. In addition, the site is situated away from current and historical settlement areas and homesteads and its general appearance do not resemble Historical period livestock enclosers in the surrounding landscape. Finally, many of the stones in the walls are covered with rock lichens along exposed surfaces with no growth evident on obstructed sides. Lichens are known to grow at a slow rate, particularly on exposed soil surfaces which in this instance, suggests an older date range for the stone walls. The site is thus an archaeological site of medium significance which is protected under the National Heritage Resource Act (NHRA 1999). The sites are situated away from project infrastructure components and impact on the sites seem unlikely. Mitigation measure will nonetheless apply.

Figure 5-8: View of circular stone wall enclosure at Site EXIGO-NWEF-IA01.

Figure 5-9: Stone walls on a high hill at Site EXIGO-NWEF-IA02.

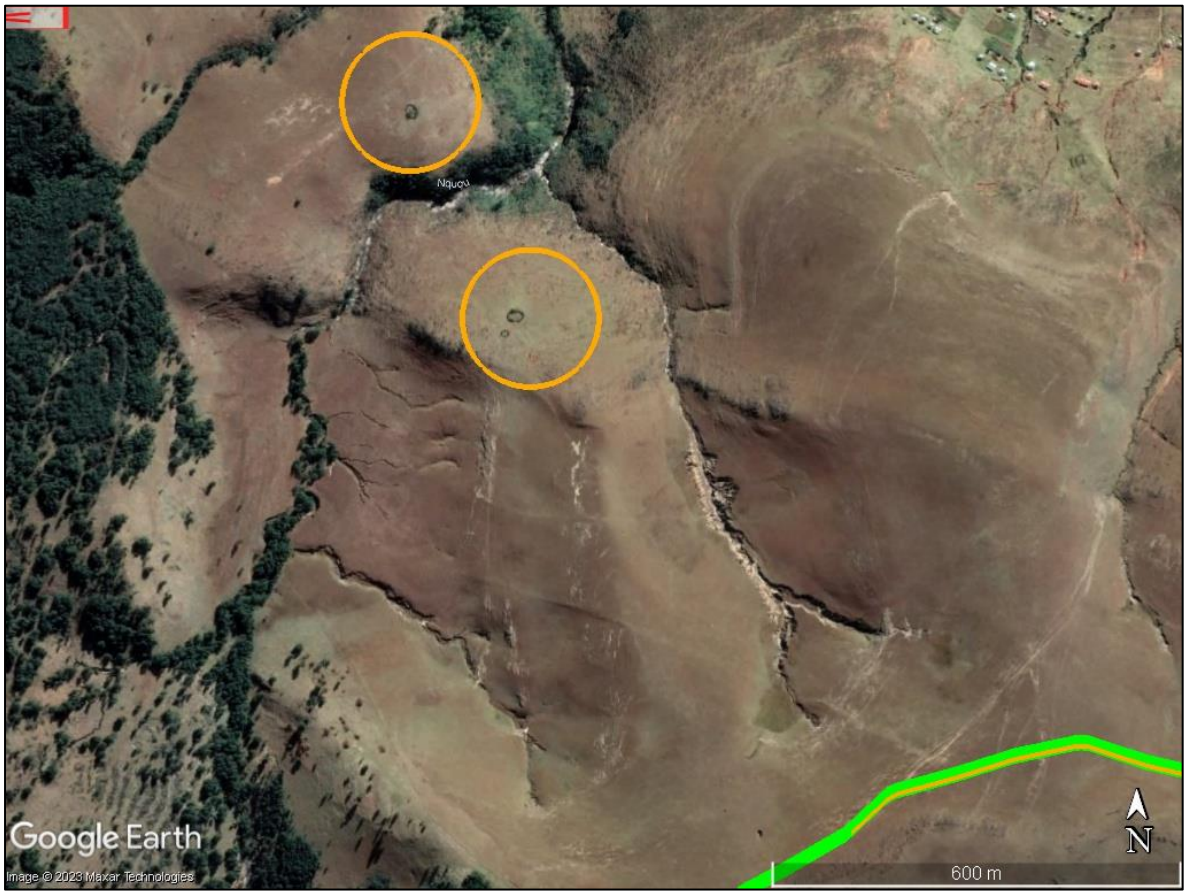

Figure 5-10: Site EXIGO-NWEF-IA01 (left) and Site EXIGO-NWEF-IA02 (right) as well as the required 100m conservation buffer (orange line) in relation to the proposed project development infrastructure in that area.

b. The Historical / Colonial Period

Ngxwabangu and its surroundings have a long and extensive early Colonial Period settlement history. From around the first half of the 19th century, the area was frequented by explorers, missionaries and farmers who all contributed to a recent history of contact and conflict. The project area remained rural for the largest part of the previous centuries and a number of features, structures and buildings dating to different phases of the Historical Period were identified in the study areas. Even though absolute temporal contexts for the structures could not be ascertained, it might be assumed that, generally the features probably date to the early to mid-20th century. These inferences are based on the following observations:

- Aerial imagery dating to the first part of the 20th century as well as similar topographic maps indicate

vast human settlement in the project area and in the landscape at large in the previous century.

- As a general rule, southern African Iron Age farming communities constructed irregular circular stock enclosures. Squarely built enclosures only appear consequent to Colonial contact, which implies that cattle kraals identified in the villages did not belong to Iron Age stock farmers, but rather later more recent family units.

In addition, the close proximity of many of the features to other similar homesteads currently in use, might suggest a continuous occupation of these sites during the past century until recent times.

- **Exigo-NWEF-HS01**
  S31.80648° E27.55348° (Relative Midpoint)
- **Exigo-NWEF-HS02**
  S31.85288° E27.53231° (Relative Midpoint)
- **Exigo-NWEF-HS03**
  S31.85643° E27.60069° (Relative Midpoint)
- **Exigo-NWEF-HS04**
  S31.86546° E27.57651° (Relative Midpoint)
- **Exigo-NWEF-HS05**
  S31.86609° E27.63091° (Relative Midpoint)
- **Exigo-NWEF-HS06**
  S31.85593° E27.65221° (Relative Midpoint)

Four large settlement areas consisting out of the dilapidated remains of huts, stone livestock enclosures, graves and vast agricultural lands occurred where present-day Mahlatini, Maqwathini and Kwa-Boyu are to be found. These settlement areas are indicated on historical topographic maps and material culture such as grind stones, glass, metal and plastic remain at some of the sites. In many instances, settlements and living areas are continuously occupied through the past centuries until contemporary times occurs and an absolute age for the settlements cannot be ascertained. However, an analysis of historical topographical maps and aerial photographs indicates that the landscape was relatively densely populated with vast agricultural fields surrounding human settlements from at least 1957. Settlement remains are therefore probably older than 60 years - and generally protected under the National Heritage Resource Act (NHRA 1999) but the sites and features are poorly preserved and of low heritage significance. Some of the settlements occur around and within areas demarcated for development of **WTG 36** and its associated access roads and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains and human burials which might occur in association with the settlements.

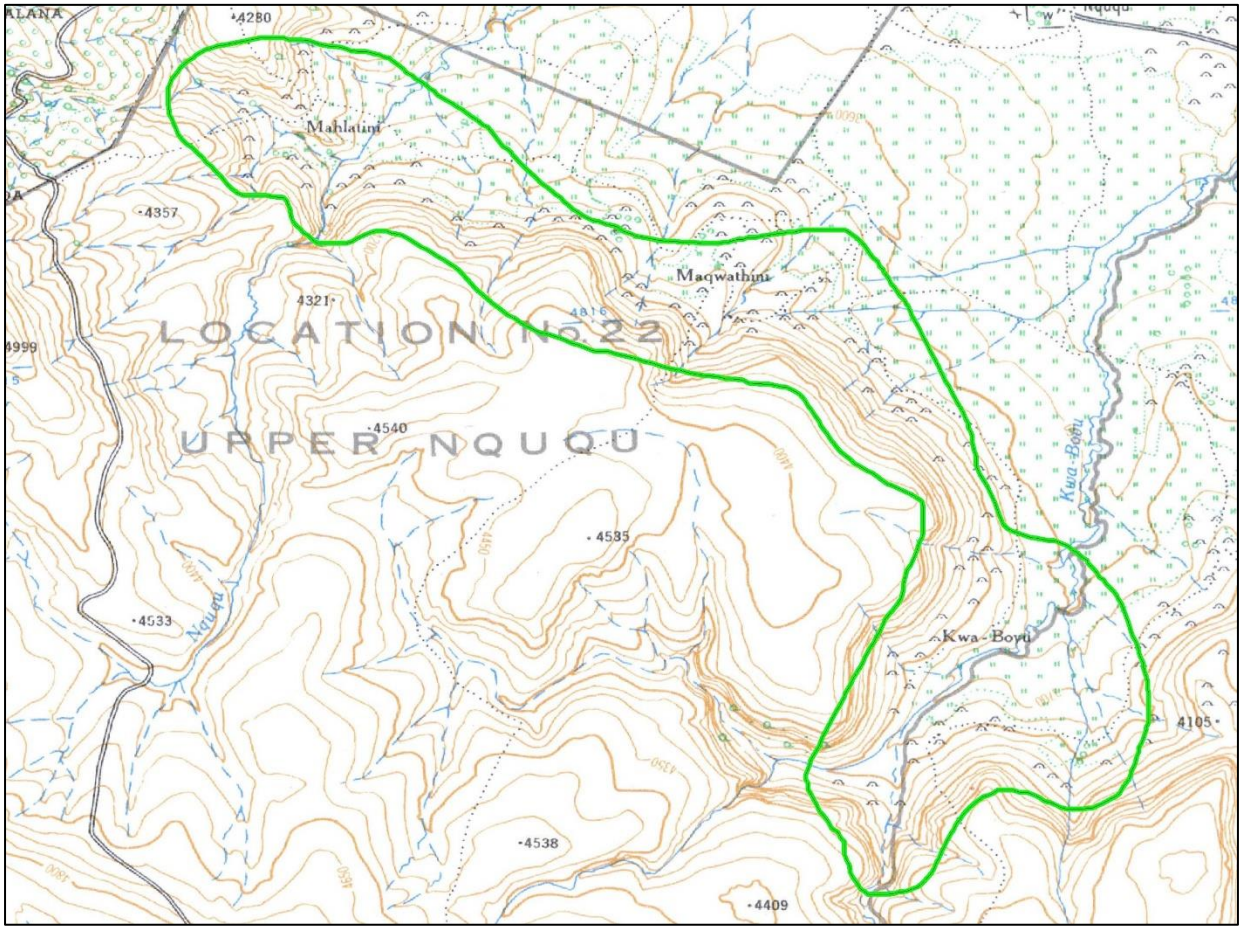

Figure 5-11: Historical topographic map dating to 1963 indicating the presence of large numbers of homesteads across Mahlatini, Maqwathini and Kwa-Boyu noted as Site EXIGO-NWEF-HS01 (green outline).

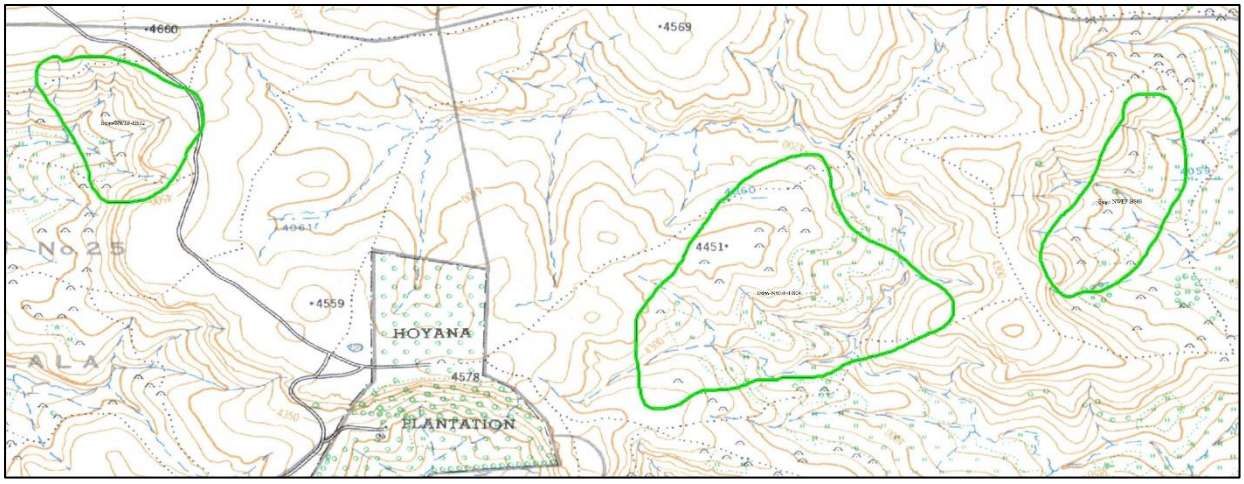

Figure 5-12: Historical topographic map dating to 1963 indicating the presence of large numbers of homesteads noted as Site EXIGO-NWEF-HS02 - Site EXIGO-NWEF-HS04 (green outlines).

Figure 5-13: View of large livestock enclosures and Historical Period remains at Site EXIGO-NWEF-HS01 (left) and Site EXIGO-NWEF-HS04 (right).

- **Exigo-NWEF-HP06**
- -31.86619232 27.56774778
- **Exigo-NWEF-HP07**
  -31.86341188 27.57122367
- **Exigo-NWEF-HP08**
  -31.86326603 27.5750692
- **Exigo-NWEF-HP09**
  -31.86208569 27.57421676
- **Exigo-NWEF-HP10**
  -31.86016297 27.57574763
- **Exigo-NWEF-HP11**
  -31.85912931 27.57630201
- **Exigo-NWEF-HP12**
  31.85910031 27.57711631
- **Exigo-NWEF-HP13**
  -31.8637915 27.59184432
- **Exigo-NWEF-HP19**
  -31.83258248 27.55901517
- **Exigo-NWEF-HP20**
  -31.83191604 27.55544239
- **Exigo-NWEF-HP21**
  -31.82688992 27.5590865
- **Exigo-NWEF-HP29**
  -31.83075414 27.55925448

In addition to the settlement areas discussed, individual features were recorded which can probably be attributed to the late Historical Period in the region. Here, the dilapidated remains of many square stone-built livestock enclosures and upright monoliths, the ruined remains of a many square brick buildings, huts and dwellings, as well as material culture such as glass, metal, lower grind stones and plastic occur within and around the Ngxwabangu Project area. An absolute age for these structures and features could not be ascertained but an analysis of historical topographical maps and aerial photographs indicates that the area was relatively densely populated with vast agricultural fields surrounding human settlements during the previous century. According to indications, the structure was in use by around 1960 and the structure are probably older than 60 years - and generally protected under the National Heritage Resource Act (NHRA 1999). However, the features and sites are poorly preserved and of low heritage significance.

Some of the features and sites occur around and within areas demarcated for development of **WTG 36** and its associated access roads as well as the proposed **OHL corridors** and potential impact on the sites should

be closely monitored to avoid the destruction of previously undetected heritage remains.

Figure 5-14: View of a building remains at Site EXIGO-NWEF-HP07 and Site EXIGO-NWEF-HP20.

Figure 5-15: View of a lower grind stone (left) and a stone foundation (right) in the project area.

Figure 5-16: View of hut foundations and indentations at Site EXIGO-NWEF-HP07 and Site EXIGO-NWEF-HP09.

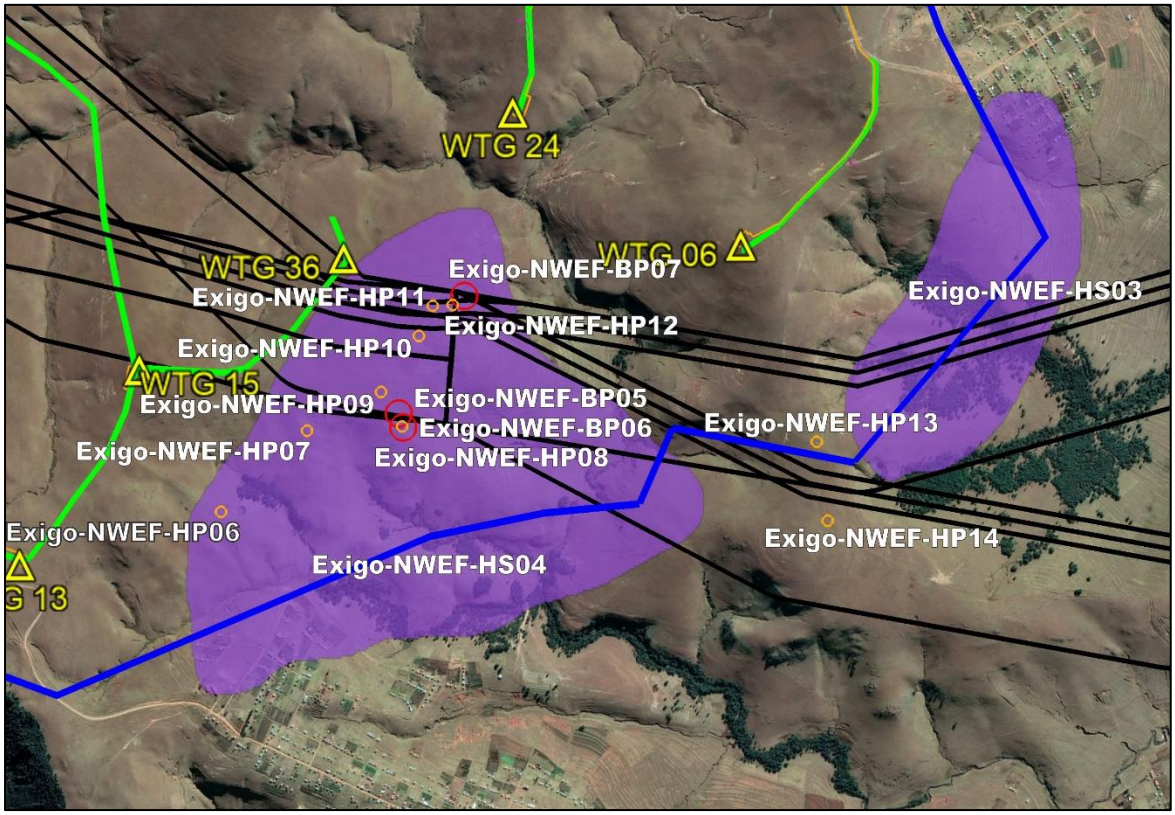

Figure 5-17: View of Historical Periods sites (orange circles) and burial sites (red circles) as well as larger Historical Periods settlements (blue shade) in relation to proposed project infrastructure. The green line indicates a planned access road and the black lines indicate the OHL corridors.

c. Burial Sites

- **Exigo-NWEF-BP01**
  -31.7989884 27.53057797

A small family cemetery containing a number of graves occurs along the slope of a mountain in the Mahlatini, area. Some of the graves are indicated by marble headstones and brick structures fashioned with ceramic tiles and other graves are indicated by elongated soil and stone burial mounds. The site is not enclosed in a fence, it is not maintained and the condition of the burials is fair. The burial site is of high heritage significance but it is not situated within project development areas. A conservation buffer should nonetheless be observed.

Figure 5-18: View of a burial at Site EXIGO-NWEF-BP01.

- **Exigo-NWEF-BP02**
  -31.83191847 27.55774708
- **Exigo-NWEF-BP03**
  -31.83290393 27.55742588

Two clusters of graves occur near a homestead in the Mahlengele area. The graves are indicated by elongated soil and stone burial mounds. The burial site is of high heritage significance but it is not situated in project development area and a conservation buffer should be observed.

- **Exigo-NWEF-BP05**
  -31.86282255 27.57493299

A number of burial mounds were noted in an open field in association with the remains of a Historical Period Settlement in the Kulufini area. The graves are indicated by rough elongated stone cairns filled in with soil and covered with surface grass. Upright stones have been placed as headstones at some of the graves. The site is not maintained and the condition of the burials is fair. The burial site is of high heritage significance. The burial site occurs in close proximity of areas demarcated for development of **WTG 36** and its associated access roads as well as proposed **OHL corridors** and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains.

Figure 5-19: View of a burial at Site EXIGO-NWEF-BP05.

- **Exigo-NWEF-BP06**
  -31.86329981 27.57511136

Another cluster of burial mounds were noted in an open field in association with the remains of a Historical Period Settlement in the Kulufini area. The graves are indicated by rough elongated stone cairns filled in with soil and covered with surface grass. Upright stones have been placed as headstones at some of the graves. The site is not maintained and the condition of the burials is fair. The burial site is of high heritage significance. The burial site occurs in close proximity of areas demarcated for development of **WTG 36** and its associated access roads as well as proposed **OHL corridors** and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains.

Figure 5-20: View of a burial at Site EXIGO-NWEF-BP06.

- **Exigo-NWEF-BP07**
  -31.8587937 27.57758545

At least 3 burial mounds were noted in an open field in association with the remains of a Historical Period Settlement in the Kulufini area. The graves are indicated by rough elongated stone cairns filled in with soil and covered with surface grass. Upright stones have been placed as headstones at some of the graves. The

site is not maintained and the condition of the burials is fair. The burial site is of high heritage significance. The burial site occurs in close proximity of areas demarcated for development of **WTG 36** and its associated access roads as well as proposed **OHL corridors** and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains.

Figure 5-21: View of a burial at Site EXIGO-NWEF-BP07.

5.2.2 Ncora Project Area

a. The Historical / Colonial Period

As noted previously, Ncora and its surroundings have a long and extensive early Colonial Period settlement history and the project area remained rural for the largest part of the previous centuries. A number of features, structures and buildings dating to different phases of the Historical Period were identified in the study area for the Ncora Project. Even though absolute temporal contexts for the structures could not be ascertained, it might be assumed that, generally the features probably date to the early to mid-20th century.

- **Exigo-NWEF-HS05**
  S31.86616° E27.62906° (relative midpoint)
- **Exigo-NWEF-HS06**
  S31.85836° E27.63812° (relative midpoint)
- **Exigo-NWEF-HS07**
  S31.85189° E27.70321° (relative midpoint)
- **Exigo-NWEF-HS08**
  S31.85742° E27.65362° (relative midpoint)

In the Ncora Project Area, the remains of four settlements consisting out of dilapidated huts, stone livestock enclosures, graves and vast agricultural lands were documented. These settlement areas are indicated on historical topographic maps and material culture such as grind stones, glass, metal and plastic remain at some of the sites. In many instances, settlements and living areas are continuously occupied through the past centuries until contemporary times occurs and an absolute age for the settlements cannot be ascertained. However, an analysis of historical topographical maps and aerial photographs indicates that the landscape was relatively densely populated with vast agricultural fields surrounding human settlements from

at least 1957. Settlement remains are therefore probably older than 60 years - and generally protected under the National Heritage Resource Act (NHRA 1999) but the sites and features are poorly preserved and of low heritage significance. The settlement areas do not occur near areas demarcated for development but potential impact on the sites should be monitored to avoid the destruction of previously undetected heritage remains and human burials which might occur in association with the settlements.

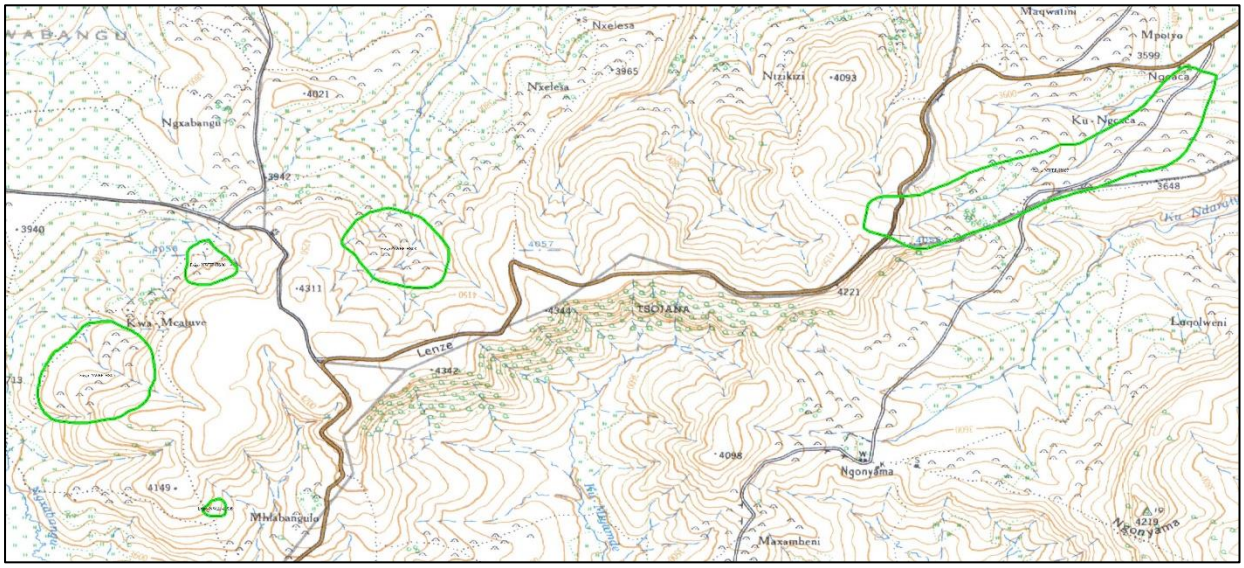

Figure 5-22: Historical topographic map dating to 1963 indicating the presence of large numbers of homesteads across the Ncora Project Area (green outlines).

Figure 5-23: View of dilapidated stone enclosures at Site EXIGO-NWEF-HS07 and Site EXIGO-NWEF-HS08.

- **Exigo-NWEF-HP15**
  -31.87054027 27.64062515
- **Exigo-NWEF-HP16**
  -31.8678801 27.63048305
- **Exigo-NWEF-HP17**
  -31.86863163 27.6464054
- **Exigo-NWEF-HP22**
  -31.86851788 27.62706793
- **Exigo-NWEF-HP23**
  -31.86608571 27.63090592
- **Exigo-NWEF-HP24**
  -31.87819186 27.63858215

- **Exigo-NWEF-HP25**
  -31.86969487 27.64683807
- **Exigo-NWEF-HP26**
  -31.86882634 27.64189526
- **Exigo-NWEF-HP27**
  -31.85592768 27.65221456
- **Exigo-NWEF-HP28**
  -31.86048626 27.65463349

The larger Ncora Project Area also holds individual features which can probably be attributed to the late Historical Period in the region. Here, the dilapidated remains of many square stone-built livestock enclosures and upright monoliths, the ruined remains of a many square brick buildings, huts and dwellings, as well as material culture such as glass, metal, lower grind stones and plastic were noted. An absolute age for these structures and features could not be ascertained but an analysis of historical topographical maps and aerial photographs indicates that the area was relatively densely populated with vast agricultural fields surrounding human settlements during the previous century. According to indications, the structure was in use by around 1960 and the structure are probably older than 60 years - and generally protected under the National Heritage Resource Act (NHRA 1999). However, the features and sites are poorly preserved and of low heritage significance. The settlement areas do not occur near areas demarcated for development but potential impact on the sites should be monitored to avoid the destruction of previously undetected heritage remains and human burials which might occur in association with the settlements.

Figure 5-24: View of a dilapidated stone walls at Site EXIGO-NWEF-HP27.

Figure 5-25: View of stone enclosure in the project area at Historical Period settlements.

b. Other Sites

- **Exigo-NWEF-FT01**
  -31.87123697 27.63196724

A ceremonial / ritual site was noted on a high ridge overlooking the Tsojana Dam in the Ncora Project area. Here, ceremonial objects such as candles, cloth and snuff containers were noted around a large rock tank. The natural rock tank, occurring in a sandstone boulder, is filled with water. The site is most probably of high social and cultural value to local residents and it infers a high heritage significance rating. The site occurs away from areas demarcated for development but potential impact on the sites should be monitored to avoid damage to the feature. In addition, the PP and Stakeholder Engagement Process should include consultation with local communities on the heritage and cultural significance of the site, possible indirect impacts (site access, conservation) and required management measures.

Figure 5-26: View of a ceremonial / ritual sites EXIGO-NWEF-FT01. Note the candles along the rim of the natural rock tank.

5.2.3 Ncora to Qolweni OHL Project Area

- **Exigo-NWEF-BP08**
  S31.84877° E27.71473°

At least four burial mounds were noted in an open field in association with the remains of a Historical Period Settlement in the eLuqolweni area. The graves are indicated by elongated stone cairns where upright stones have been placed as headstones at some of the graves. The site is not maintained and the condition of the burials is fair. The burial site is of high heritage significance. The burial site occurs in close proximity of the **Ncora to Qolweni OHL Line corridor** and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains.

Figure 5-27: View of a burial at Site EXIGO-NWEF-BP08.

- **Exigo-NWEF-BP09**
  S31.84751° E27.71547°

At least two burial mounds were noted in an open field in association with the remains of a Historical Period Settlement in the eLuqolweni area. The graves are indicated by stone cairns or soil heaps where upright stones have been placed as headstones at some of the graves. The site is overgrown, not maintained and the condition of the burials is poor. The burial site is of high heritage significance. The burial site occurs in close proximity of the **Ncora to Qolweni OHL Line corridor** and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains.

Figure 5-28: View of a burial at Site EXIGO-NWEF-BP09.

- **Exigo-NWEF-BP10**
  S31.84640° E27.71659°

At least two burial mounds were noted in an open field in association with the remains of a Historical Period Settlement in the eLuqolweni area. The graves are indicated by soil heaps where upright stones have been placed as headstones at some of the graves. The site is overgrown, not maintained and the condition of the burials is poor. The burial site is of high heritage significance. The burial site occurs in close proximity of the

Ncora to Qolweni OHL Line corridor and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains.

Figure 5-29: View of a burial at Site EXIGO-NWEF-BP10.

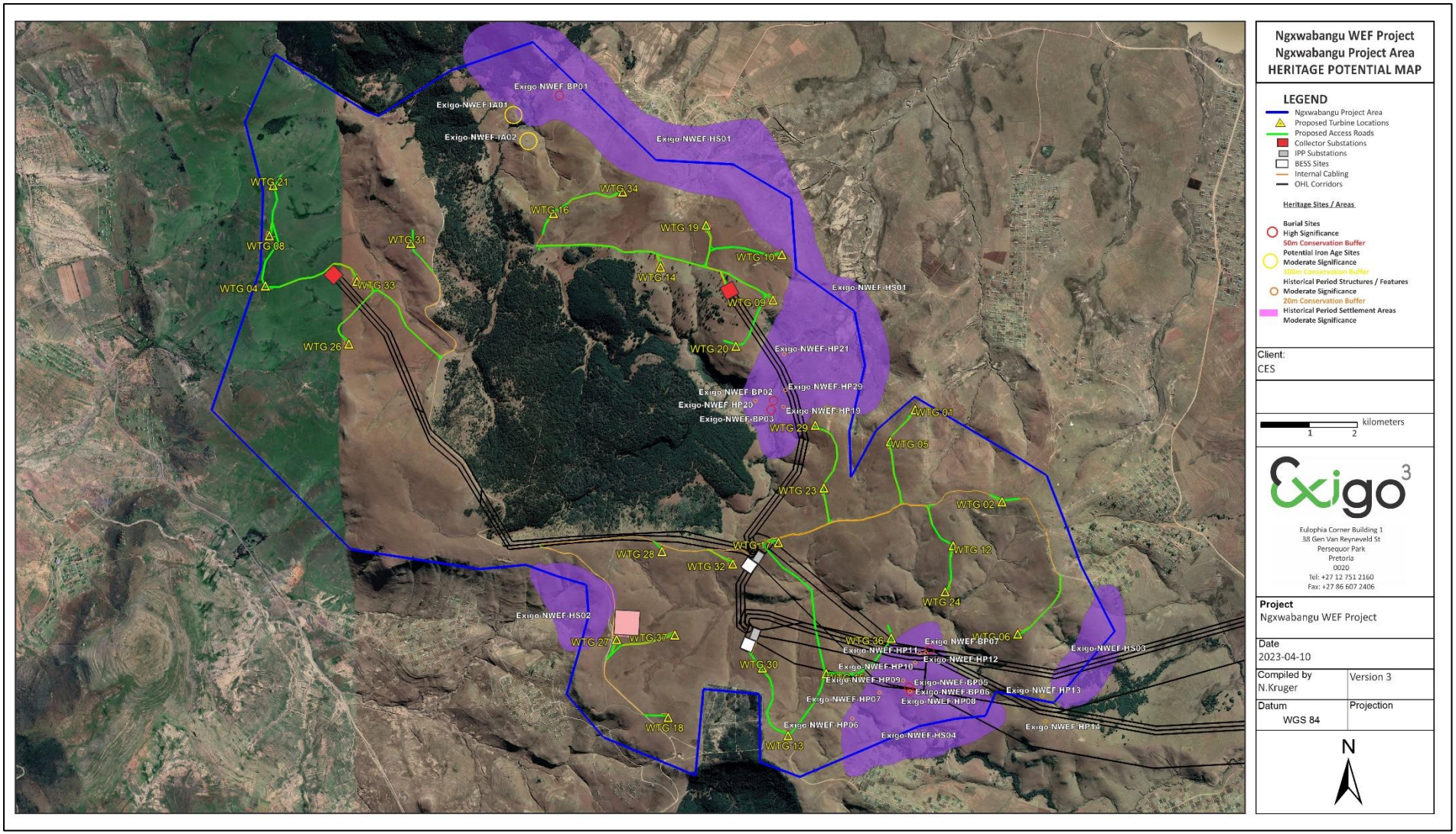

Figure 5-30: Aerial map indicating the locations of occurrences of heritage potential in the Ngxwabangu Project Area, discussed in the text.

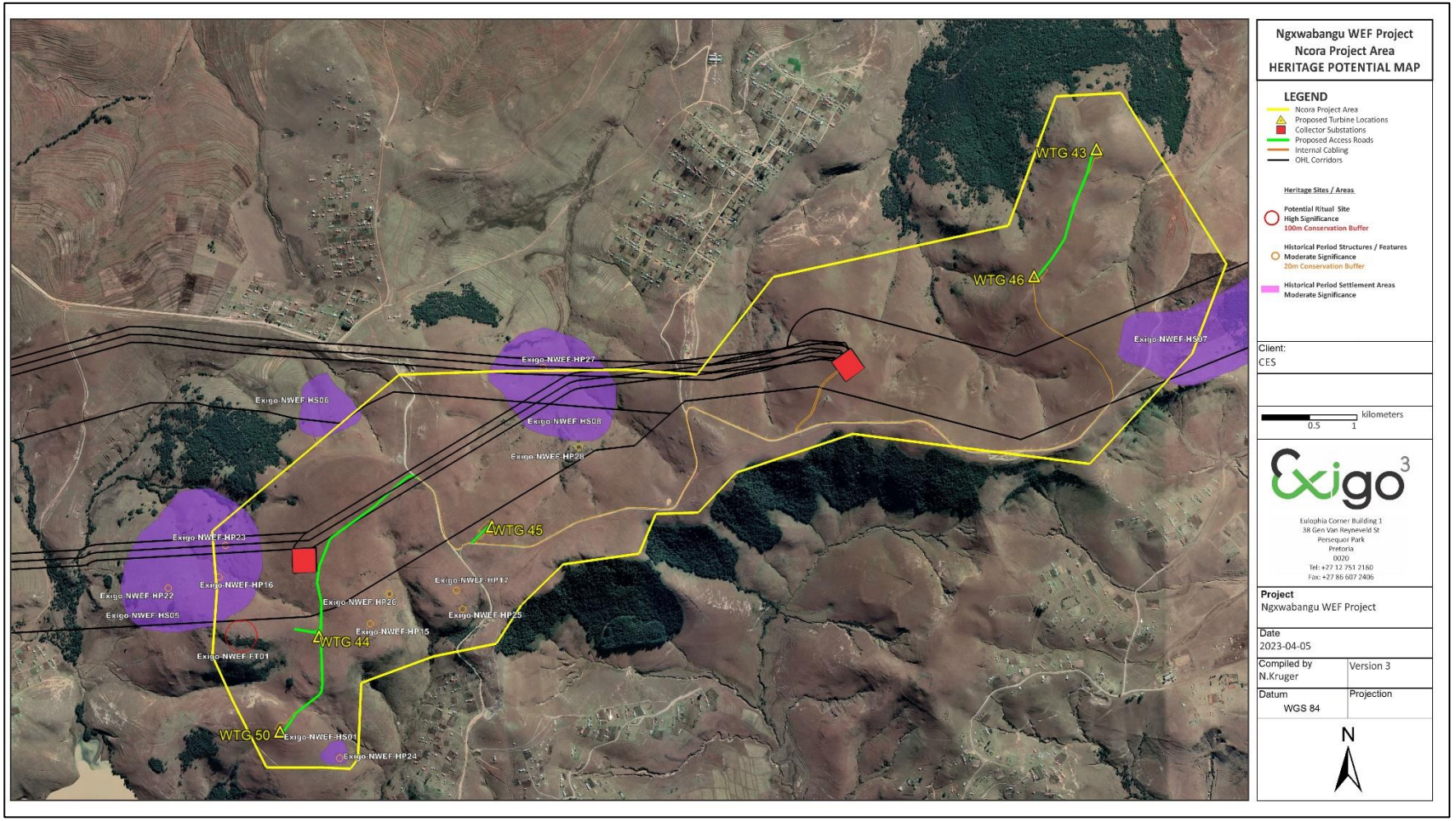

Figure 5-31: Aerial map indicating the locations of occurrences of heritage potential in the Ncora Project Area, discussed in the text.

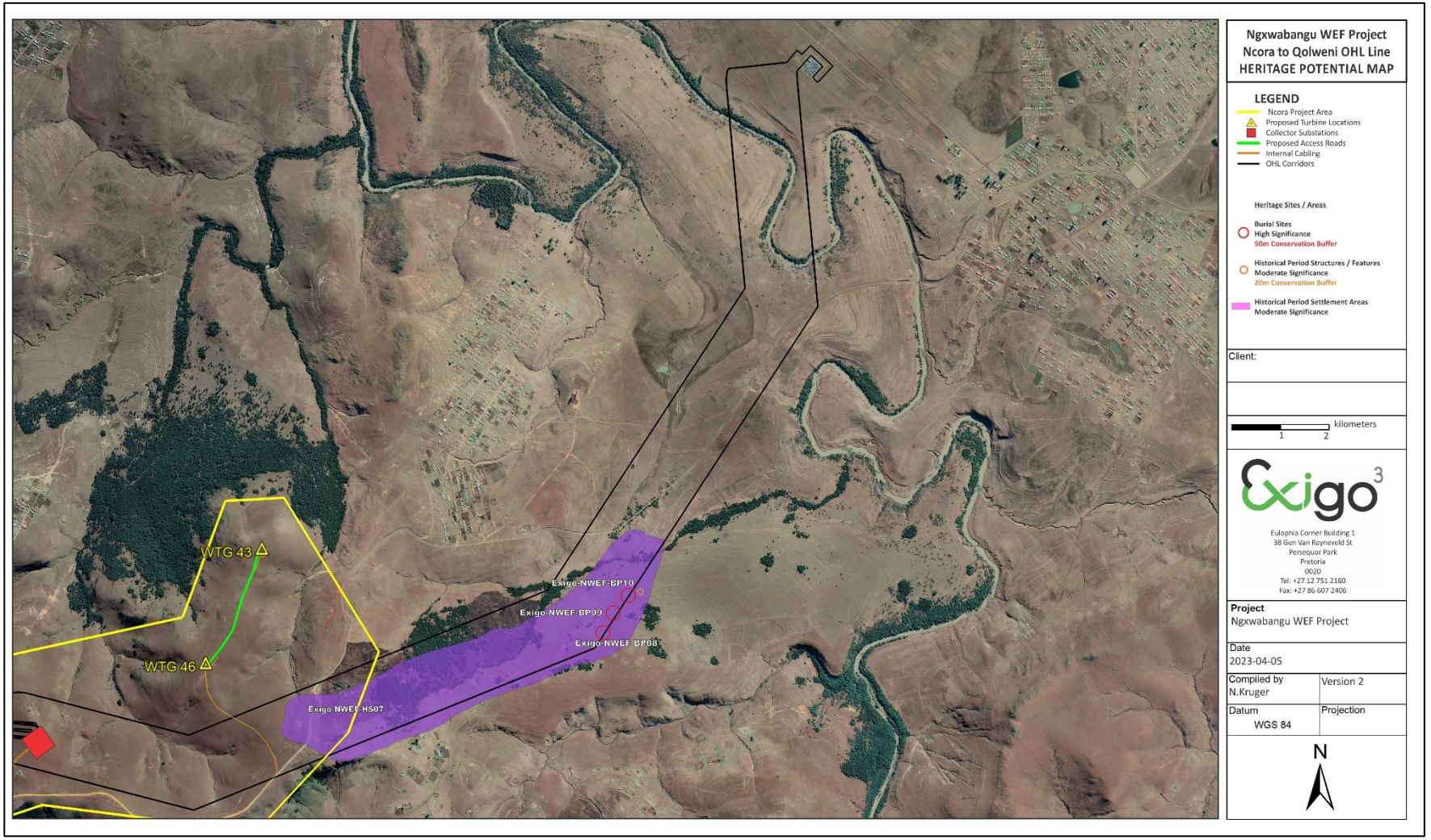

Figure 5-32: Aerial map indicating the locations of occurrences of heritage potential in the Ncora to Qolweni OHL Line Project Area, discussed in the text.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings[2]

The following section provides a background to the identification and assessment of possible impacts and alternatives, as well as a range of risk situations and scenarios commonly associated with heritage resources management. A guideline for the rating of impacts and recommendation of management actions for areas of heritage potential within the study area is supplied in Section 10.2 of Addendum 3.

6.2 General assessment of impacts on resources

Generally, the value and significance of archaeological and other heritage sites might be impacted on by any activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). Thus, the destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. However, in the long run, the proximity of operations in any given area could result in secondary indirect impacts. The EIA process therefore specifies impact assessment criteria which can be utilised from the perspective of a heritage specialist study which elucidates the overall extent of impacts.

6.2.1 Issues Identification Matrix

As noted previously, impacts were rated and assessed using an Impact and Risk Assessment Methodology provided by CES, for the Scoping Phase of the EIA process in accordance with the requirement of EIA Regulations. **Please refer to Addendum 2**.

The following table summarizes impacts to heritage recourse located within and around project impact areas.

[2] Based on: W inter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

Impact Assessment: Archaeology

Criteria	Nature	Temporal Scale	Spatial Scale	Severity	Probability	Overall Significance before mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Overall Significance after mitigation
Impact 1: Loss of Heritage Resources										
Ngxwabangu Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora to Qolweni OHL Line Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE

Impact Assessment: Built Environment

Criteria	Nature	Temporal Scale	Spatial Scale	Severity	Probability	Overall Significance before mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Overall Significance after mitigation
Impact 1: Loss of Heritage Resources										
Ngxwabangu Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora to Qolweni OHL Line Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE

Impact Assessment: Cultural Landscape

Criteria	Nature	Temporal Scale	Spatial Scale	Severity	Probability	Overall Significance before mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Overall Significance after mitigation
Impact 1: Loss of Heritage Resources										
Ngxwabangu Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora to Qolweni OHL Line Project Area	Negative	Short term	Study area	Slight	Definite	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE

Impact Assessment: Human Burial Sites

Criteria	Nature	Temporal Scale	Spatial Scale	Severity	Probability	Overall Significance before mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Overall Significance after mitigation
Impact 1: Loss of Heritage Resources										
Ngxwabangu Project Area	Negative	Permanent	Regional	Severe/ Beneficial	Likely	HIGH NEGATIVE	Irreversible	Resource might be lost	Achievable	HIGH NEGATIVE
Ncora Project Area	Negative	Short term	Study area	Slight/ Slightly Beneficial	Unlikely	LOW NEGATIVE	Irreversible	Resource will not be lost	Achievable	LOW NEGATIVE
Ncora to Qolweni OHL Line Project Area	Negative	Permanent	Regional	Severe/ Beneficial	Likely	HIGH NEGATIVE	Irreversible	Resource might be lost	Achievable	HIGH NEGATIVE

6.3 Evaluation of Impacts

Previous studies conducted in the larger Eastern Cape landscape around the project area suggest a rich and diverse archaeological landscape. The Ngxwabangu landscape has been inhabited continuously in prehistoric and historical times where large portions of land have been transformed for agriculture and ruralisation. Cognisance should be taken of archaeological material that might be present in surface and sub-surface deposits.

- **Archaeology**

The study identified an Iron Age site of heritage significance. The sites are situated away from project development areas and impact on the sites seem unlikely. Mitigation measure will nonetheless apply.

- **Built Environment**

The study noted the remains of the poorly preserved dwellings, buildings and enclosures dating to Historical Period settlement in the area but no notable heritage or historical association to the sites could be established and the sites are of medium-low heritage significance. Some of the features and sites occur around and within areas demarcated for development of **WTG 36** and its associated access roads, associated access roads as well as **OHL corridors** and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains. As for the rest of the project area, the general landscape holds varied significance in terms of the built environment as the area comprises historical farming remnants and relatively newly established settlements and townlands**.**

- **Cultural Landscape**

The larger area comprises a rich cultural horizon and the natural landscape surrounding the proposed project encompasses open grasslands and river valleys, typical of the rural areas of the Eastern Cape. The cultural landscape holds Herder sites, Iron Age remains, Colonial Period farmsteads and Historical towns. Of note is a ceremonial rock in the larger project area which has heritage significance. The feature will not be impacted on by the development. Further away from the project area, the landscape is typical of the Eastern Cape with large flat parcels with occasional undulating hills and mountainous regions.

- **Graves / Human Burials Sites**

A number of burial sites were located in the larger project area. These receptors are of high significance for their social and cultural value but no direct impact on the resources is anticipated. However, some of the burial site occurs in close proximity of areas demarcated for development of **WTG 36** and its associated access roads as well as **OHL corridors** and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains. It should be noted that graves and cemeteries often occur within settlements or around homesteads in the rural areas of the Eastern Cape, and they are also randomly scattered around archaeological and historical settlements. The probability of informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in “lost” graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed

under a permit from SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

Heritage resources occur in the Ngxwabangu WEF Project zones and some of these heritage receptors might be impacted on by the proposed project. WEF developments with linear and narrow components such as OHLs and access roads are generally considered to be lower-risk since localised and spatially confined heritage resources can easily be avoided by project design of individual turbine positions, pylon placements and service roads. As such, impacts can be mitigated and in the opinion of the author of this Archaeological Impact Assessment Report, the proposed project proceed from a culture resources management perspective, provided that mitigation measures are implemented where applicable, and provided that potential previously undetected subsurface heritage remains encountered during any phase of development are subjected to a Chance Find Procedure as part of the EMP.

It is the opinion of the Specialist that the proposed Ngxwabangu WEF will have a low negative cumulative impact on the heritage value of the area for the following reasons:

- The low frequency of significant archaeological resources documented within the project area implies low-severity short and long-term impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads.
- The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.
- It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive

6.4 Management actions

Recommendations for relevant heritage resources management actions are vital to the conservation of heritage resources. A general guideline for recommended management actions is included in Section 10.4 of Addendum 3.

OBJECTIVE: prevent unnecessary disturbance and/or destruction of previously undetected heritage receptors.

For the Iron Age sites of medium heritage significance within the project area the following are required in terms of heritage management and mitigation:

- **Site EXIGO-NWEF-IA01, Site EXIGO-NWEF-IA02**

PROJECT COMPONENT/S	All phases of construction and operation.		
POTENTIAL IMPACT	Damage/destruction of sites.		
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.		
MITIGATION: TARGET/OBJECTIVE	To conserve the historical fabric of the sites and to locate undetected heritage remains as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.		
MITIGATION: ACTION/CONTROL		**RESPONSIBILITY**	**TIMEFRAME**

Fixed Mitigation Procedure (**required**)		
Site Monitoring: Regular examination of trenches and excavations.	ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible.
Preferred Mitigation Procedure		
Avoidance: Implement a heritage conservation buffer of at least 100m around the heritage resource, redesign infrastructure to avoid the heritage resource and the proposed conservation buffer.	DEVELOPER	All phases of construction and operation.
Alterative Mitigation Procedure (**if preferred mitigation procedure is not feasible**)		
Documentation of sites if features are to be impacted on by development (mapping, desktop study Phase 2 site sampling). Permitting if and when required.	HERITAGE ASSESSMENT PRACTITIONER	Prior to the commencement of construction and earth-moving.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

For the Historical Period settlements and sites of low significance within the project area the following are required in terms of heritage management and mitigation:

- **Exigo-NWEF-HS01 - Exigo-NWEF-HS08**
- **Exigo-NWEF-HP06 - Exigo-NWEF-HP13, Exigo-NWEF-HP15 - Exigo-NWEF-HP17, Exigo-NWEF-HP19 - Exigo-NWEF-HP28**

PROJECT COMPONENT/S	All phases of construction and operation.	
POTENTIAL IMPACT	Damage/destruction of sites.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.	
MITIGATION: TARGET/OBJECTIVE	To locate previously undetected heritage remains / graves as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Fixed Mitigation Procedure (**required**)		
Site Monitoring: Regular examination of trenches and excavations in order to detect and preserve previously undocumented heritage receptors. **Avoidance:** Implement a heritage conservation buffer of at least 20m around features, redesign infrastructure to avoid the heritage resource and the proposed conservation buffer.	ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible. Prior to the commencement of construction and earth-moving.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

For the ceremonial / ritual site in the larger project area the following are required in terms of heritage management and mitigation:

- ***Site EXIGO-* NWEF-*FT01***

PROJECT COMPONENT/S	All phases of construction and operation.	
POTENTIAL IMPACT	Damage/destruction of sites.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.	
MITIGATION: TARGET/OBJECTIVE	To locate previously undetected heritage remains / graves as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Fixed Mitigation Procedure (**required**)		
Site Monitoring: Regular examination of trenches and excavations in order to detect and preserve previously undocumented heritage receptors.	ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible. Prior to the

Social Consultation: It is suggested that local communities be consulted with regards to the religious and social meaning of the site and possible impacts / management of the site.		commencement of construction and earth-moving.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

For the highly significant burial sites occurring within the project area the following are required in terms of heritage management and mitigation:

- **Site Exigo-NWEF-BP01 – Site Exigo-NWEF-BP03**
- **Site Exigo-NWEF-BP05 – Site Exigo-NWEF-BP07**
- **Site Exigo-NWEF-BP08 – Site Exigo-NWEF-BP10**

PROJECT COMPONENT/S	All phases of construction and operation.	
POTENTIAL IMPACT	Damage/disturbance to subsurface burials and surface burial features.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.	
MITIGATION: TARGET/OBJECTIVE	To locate human burials as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Preferred Mitigation Procedure		
Avoidance: Implement a heritage conservation buffer of at least 50m from all burials / graves. Where digging / construction encroaches on this buffer, erect a temporary construction barricade around burials to clearly indicate the location of burials. Implement a site management plan detailing strict site management conservation measures.	DEVELOPER QUALIFIED HERITAGE SPECIALIST	Prior to the commencement of construction and earth-moving.
Alterative Mitigation Procedure (**if preferred mitigation procedure is not feasible**)		
Grave Relocation: Relocation of burials and documentation of site, full social consultation with affected parties, possible conservation management and protection measures. Subject to authorisations and relevant permitting from heritage authorities and affected parties.	QUALIFIED HERITAGE SPECIALIST	Prior to the commencement of construction and earth-moving.
Fixed Mitigation Procedure (**required**)		
Site Monitoring: The project site in the vicinity of this receptor should be monitored bi-monthly by the heritage consultant or an ECO familiar with the heritage occurrences of the site: regular examination of trenches and excavations and site clearing in order to detect and preserve previously undocumented heritage receptors.	ECO	Monitor as frequently as practically possible.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

7 RECOMMENDATIONS

The larger landscape of the Eastern Cape Province and the Ngxwabangu area is rich in pre-historical and historical remnants since the area is highly suitable for pre-colonial habitation. The proposed Ngxwabangu WEF Project zones have been transformed by historical and recent farming as well as ruralisation. Here, the landscape seems to have been inhabited continuously for centuries in prehistoric and historical times and a number of sites of heritage potential were noted in the project zones.

The following recommendations are made based on general observations in the proposed Ngxwabangu WEF Project areas in terms of heritage resources management.

- As information on the layout of the OHL corridors was made available to specialists at an advanced stage of this assessment where some these areas could not be included in the site surveys, ground-truthing of unsurveyed development footprint areas should be conducted during the finalisation of the EMP and the project infrastructure layouts.
- Two possible later Iron Age Farmer Period stone walled sites in the Ngxwabangu Project Area (**EXIGO-NWEF-IA01, EXIGO-NWEF-IA02)** have the potential to inform on the spread of Iron Age communities in the interior of the Eastern Cape and the site is of medium heritage significance. The sites are situated away from project infrastructure components and impact on the sites seem unlikely. Conservation buffers of at least 100m around the sites should be implemented and the areas should be monitored on a frequent basis by an informed ECO in order to avoid the destruction of existing and previously undetected heritage remains. Should impact on the sites prove inevitable it should be adequately documented by means of a Phase 2 Specialist Study. Such a study should minimally include the mapping, documentation and possible sampling of the site in order to conserve the historical fabric of the heritage resource. The necessary alteration and/or destruction permits should be obtained from the relevant Heritage Resources Authorities prior to site sampling and destruction.
- The remains of Historical Period settlements in the Ngxwabangu and Ncora Project Areas (**Exigo-NWEF-HS01 - Exigo-NWEF-HS08)** are of low significance due to the poor state of preservation of many of the sites and features. Some of the settlements occur around and within areas demarcated for development of **WTG 36** and its associated access roads as well as **OHL Corridors** and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains and human burials which might occur in association with the settlements.
- The remains of Historical Period structures and features in the in the Ngxwabangu and Ncora Project Areas (**Exigo-NWEF-HP06 - Exigo-NWEF-HP13, Exigo-NWEF-HP15 - Exigo-NWEF-HP17, Exigo-NWEF-HP19 - Exigo-NWEF-HP29)** are of low significance but it should be noted that human burials might occur around these settlements. Some of the features and sites occur around and within areas demarcated for development of **WTG 36** and its associated access roads and **OHL Corridors** and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains. Here, 20m conservation buffers should be maintained around these features in order to avoid the destruction of previously undetected heritage remains.
- A ceremonial / ritual site was noted on a high ridge overlooking the Tsojana Dam (**Site EXIGO-NWEF-FT01**). The site is most probably of high social and cultural value to local residents and it infers a high heritage significance rating. The site occurs away from areas demarcated for development but potential impact on the sites should be monitored to avoid damage to the feature. In addition, the PP and Stakeholder Engagement Process should include consultation

with local communities on the heritage and cultural significance of the site, possible indirect impacts (site access, conservation) and required management measures.

- Graves and burials identified in the Ngxwabangu Project Area (**Site Exigo-NWEF-BP01 - Site Exigo-NWEF-BP10**) are of high significance and some of sites occur in close proximity of areas demarcated for development of **WTG 36** and its associated access roads as well as **OHL Corridors**. As a primary measure, Heritage Authority (SAHRA) guidelines require a conservation buffer of at least 50m around the burial sites and graves. Where construction or digging risk encroaching on this conservation buffer, a temporary construction barricade should be erected around burials at risk in order to clearly demarcate the locations of the burials. A site management plan detailing strict site management conservation measures should be compiled for all burials in the project area. All burials should be monitored on a bi-monthly basis by an informed ECO or by the heritage Specialist in order to detect any impact on the resource at the earliest opportunity.
- **Should impact on any human burial prove inevitable, full grave relocations are recommended for these burial grounds. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials (see Addendum B)**.
- As a large number of burial sites as well as a site of ritual importance have been located in the project area, it is recommended that the EIA public participation and social consultative process (PP and Stakeholder Engagement) address the possibility of further graves and ritual sites occurring in the project area.
- The term “Living Heritage” can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the project area or it surroundings and due cognisance should be taken of these sites of “Living Heritage” in the cultural landscape. In addition, it is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. It is recommended that a **Chance Find Procedure** be included in the EMPR in order to outline measure for the accidental discovery of subsurface palaeontological, archaeological or historical material, or burials not previously documented.
- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided

during all phases of construction and development, including the operational phases of the development.

In addition to these site-specific recommendations, careful cognizance should be taken of the following:

- As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.
- Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits.

8 GENERAL COMMENTS AND CONDITIONS

This AIA report serves to confirm the extent and significance of the heritage resources of the proposed Ngxwabangu WEF Project area. The larger heritage horizon encompasses rich and diverse archaeological landscapes and cognisance should be taken of heritage resources and archaeological material that might be present in surface and sub-surface deposits. If, at any stage, any possible archaeological material culture discoveries are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find. Such material culture might include:

- Formal Earlier Stone Age stone tools.
- Formal MSA stone tools.
- Formal LSA stone tools.
- Potsherds
- Iron objects.
- Beads made from ostrich eggshell and glass.
- Ash middens and cattle dung deposits and accumulations.
- Faunal remains.
- Human remains/graves.
- Stone walling or any sub-surface structures.
- Historical glass, tin or ceramics.
- Fossils.

If such site were to be encountered or impacted by any proposed developments, recommendations contained in this report, as well as endorsement of mitigation measures as set out by AMAFA, SAHRA, the National Resources Act and the CRM section of ASAPA will be required. It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, represent the area's complete archaeological legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)). It must also be clear that Archaeological Specialist Reports will be assessed by the relevant heritage resources authority (SAHRA).

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10 ADDENDUM 1: SPECIALIST CV

NELIUS LE ROUX KRUGER

BHCS Hons. (Archaeology)

(Date compiled: 2022/01/10)

PERSONAL DETAILS

Nationality:	South African
Date of Birth:	3 April 1979
Postal Address:	Postnet Suite 74, Private Bag x04, Menlo Park, 0102
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Telephone numbers:	W: +27 12 751 2160 C: +27 82 967 2131
Identity number:	790403 5029 087
Languages:	English, Afrikaans, Sepedi (Basic)

HIGHER EDUCATION

University Attended:	University of the Pretoria
Degree Obtained:	BA Archaeology *(Cum Laude)* 2002
Major Subjects:	Anthropology, Archaeology, English, Afrikaans
University Attended:	University of the Pretoria
Degree Obtained:	BHCS Hons. Archaeology (*Cum Laude)* 2004

PROFESSIONAL AFFILIATIONS

Member of the Association for South African Professional Archaeologists (ASAPA).

Member of the Council of the Association for South African Professional Archaeologists (ASAPA): CRM Portfolio

Member of the CRM Section of the Association for South African Professional Archaeologists (ASAPA).

Member of the Society of Africanist Archaeologists (SAFA).

Member of the South African Museums Association (SAMA).

Accredited Professional Archaeologist & CRM Practitioner by the Association for South African Professional Archaeologists (ASAPA) & Heritage Natal (AMAFA).

HONOURS AND AWARDS

Aage V. Jensen Development Foundation (Denmark) grant for participation in the joint SAFA/PAA Congress, Dakar, Senegal (2010).

Five Hundred Years Initiative (NRF) Research Grant (2008 – 2009).

University of Pretoria post-graduate Merit Grant for MA studies in Archaeology (2004 – 2008).

University of Pretoria (CINDEK) bursary for post-graduate studies awarded by the Centre of Indigenous Knowledge (2003).

South African Archaeological Society's Hanisch Award for best graduate student in the Department of Anthropology and Archaeology at the University of Pretoria (2003).

University of Pretoria Academic Honorary Colours (2002).

University of Pretoria Graduate Merit Grant (2002).

University of Pretoria honorarium for archaeological collections management at the Department of Archaeology and Anthropology (2001).

CURRENT STATUS

Heritage Resources Manager for CES

SPECIALITY FIELDS

- Integrated Heritage and Archaeological Impact Assessment (Phase 1, 2 & 3), complying to SAHRA, PHRA and industry standards for heritage impact assessments.

- Industry standard Heritage Resources Management Plans, complying to SAHRA & PHRA standards for heritage impact assessments.

- Heritage destruction / alteration / excavation permitting facilitation and associated research.

- General facilitation in consultation and negotiation with heritage resources authorities (SAHRA, PHRA's).

- Heritage-related social consultation and focus group facilitation (for example, with Interested and Affected parties).

- Historical and anthropological studies.

- Heritage and Social Spatial Development Frameworks & Strategic Development Area Frameworks for municipalities.

- Socio-cultural baseline studies and research.

- GIS and geo-spatial referencing and data analysis, heritage and social mapping.

PROFESSIONAL SKILLS & EXPERIENCE

Nelius Le Roux Kruger is an accredited ASAPA (Association of Southern African Professional Archaeologists) archaeologist and Culture Resources Management (CRM) Practitioner with over 15 years' experience in the fields of heritage resources assessment, conservation management and social studies. In addition, he is involved in various aspects of social research and social impact assessment. He holds a BHCS (Hons) Archaeology degree from the University of Pretoria specializing in the Iron Age Farmer and Colonial Periods of South Africa. He has worked extensively on archaeological and heritage sites of the time periods and cultural contexts present in Southern Africa, both in the commercial and academics spheres and he holds vast experience in human remains relocation and related social consultation. Nelius has conducted social research projects across Southern Africa involving Social Impact Assessments as well as the compilation and monitoring of mining social and labor plans, public meeting facilitation and socio-cultural studies. His experience is not limited to South Africa and he has worked on archaeological and socio-cultural research projects across Africa and the Middle East. His publication record includes a number of academic publications in peer reviewed journals and books as well as a vast number of Heritage Management Reports. Nelius' expertise includes CRM assessment and management, applications in heritage legislation, Social Impact Assessment, social consulting as well as geospacing and Geographical Information Systems (GIS) applications in archaeology and CRM. Nelius is a conscientious and committed archaeologist and social scientist who is dedicated to the professionalism of the discipline of archaeology and social studies. He approaches all aspects of his specialst fields with enthusiasm, maintaining best practise at all times. When working with people, he strives to manage interpersonal communication and group dynamics with dedication, promoting positive group cohesion.

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SELECTED PROJECTS

NATIONAL

- Phase 1 Heritage Impact Assessment (HIA) and further heritage management for the upgrading of the Warrenton Anglo Boer War blockhouse, Warrenton, Northern Cape Province

- Phase 1 Heritage Impact Assessment (HIA) and Phase 2 Site Investigation for the restoration of the old Johannesburg Fort, Constitution Hill, Johannesburg, Gauteng Province

- Phase 1 Heritage Impact Assessment (HIA) and further heritage management for the upgrading/refurbishment of the Burgershoop MPCC, Mogale City, Gauteng Province

- Phase 1 Heritage Impact Assessment (HIA) of historical period heritage sites on the farm Roodekrans, Dullstroom area, Mpumalanga Province

- Phase 1 Heritage Impact Assessment (HIA) of a historical bridge on the farm Pienaarspoort 339jr at Delfsand, Gauteng Province

- Phase 1 Heritage Impact Basements (HIAs) for 20 PV Solar Parks on location at Upington, Kimberley, Vryburg, Kuruman, Kathu, Hotazel, Douglas, Groblershoop and Prieska, Northern Cape Province, South Africa.

- Phase 1 Heritage Impact Assessments (HIAs) for 18 large scale water supply projects on location at East London, Mthatha, Ngcobo, Barley East, Elliot, Cathcart, King Williams Town and Mdantsane, Eastern Cape Province, South Africa.

- Phase 1 Heritage Impact Assessments (HIAs) for more than 40 residential infrastructure developments across South Africa.

INTERNATIONAL

- Heritage Impact Assessment for the Kitumba Copper-Gold Project (KCGP), Zambia

- Heritage Scoping Study for the BTR Kitumba Project, Mumbwa, Zambia

- Heritage Scoping Study for the Buckreef Gold Project, Geita, Tanzania

- Phase 2 mitigation and heritage assessment of the Koidu Monkey Hill Iron Age metallurgy site, Koidu Diamond Mine, Sierra Leone

- Phase 2 heritage site mitigation of the Sessenge archaeological site, Kibali Gold Mine,Democratic Republic of the Cong

11 ADDENDUM 2: HERITAGE LEGISLATION BACKGROUND

a. CRM: Legislation, Conservation and Heritage Management

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 palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

i. Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

b. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years. This clause is commonly known as the "60-years clause". Buildings are amongst the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Iron Age settlements. "Tell" refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects, meteorites and rare geological specimens
- visual art objects
- military objects
- numismatic objects
- objects of cultural and historical significance
- objects to which oral traditions are attached and which are associated with living heritage
- objects of scientific or technological interest
- any other prescribed category

With regards to activities and work on archaeological and heritage sites 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 by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

(d) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(e) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(f) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(g) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

(h) 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;

(i) destroy, damage, alter, exhume, 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;

(j) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."

c. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

i. Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

***"38.** (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a*

development categorised as:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site:

(i) exceeding 5 000 m^2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."

And:

"The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(k) The identification and mapping of all heritage resources in the area affected;

(l) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(m) an assessment of the impact of the development on such heritage resources;

(n) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(o) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(p) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(q) plans for mitigation of any adverse effects during and after the completion of the proposed development (38. [3] 1999:64)."

Consequently, section 35 of the Act requires Heritage Impact Assessments (HIAs) or Archaeological Impact Assessments (AIAs) to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than

60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.Heritage resources management and conservation

b. Assessing the Significance of Heritage Resources

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable.* Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity is permanently lost. Archaeological sites have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

- Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the provincial HRA (MP-PHRA).
- Grade 3 or local heritage sites.

Generally protected sites:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 60 years.
- Structures older than 60 years.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally
ranked into the following categories.

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, augering), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinterment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

12 ADDENDUM 3: IMPACT ASSESSMENT METHODOLOGY

12.1.1 Issues Identification Matrix

impacts were rated and assessed using an Impact and Risk Assessment Methodology provided by CES, for the Scoping Phase of the EIA process in accordance with the requirement of EIA Regulations. Here, two parameters and five factors are considered when assessing the significance of the identified issues, and each is scored. ***Significance*** is achieved by ranking the five criteria presented in Table 1 below, to determine the overall significance of an issue. The ranking for the "effect" (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 2 below, to determine the overall significance of the issue. The overall significance is either negative or positive.

- ***Duration*** - The temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

- ***Extent*** - The spatial scale defines the physical extent of the impact.

- ***Consequence*** - The consequence scale is used in order to, as far as possible, objectively evaluate how severe a number of negative impacts associated with the issue
under consideration might be, or how beneficial a number of positive impacts associated with the issue under consideration might be.

- The ***probability*** of the impact occurring - The likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

- ***Reversibility / Mitigation*** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from easily achievable to very difficult. The four categories used are listed and explained in Table 1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

12.1.2 Assessing Impacts

The CES rating scale used in this assessment takes into consideration the following criteria, and includes the new criteria for assessing post mitigation significance (residual impacts), by incorporating the principles of reversibility and irreplaceability:

- **Nature of impact** (Negative or positive impact on the environment).
- **Type of impact** (Direct, indirect and/or cumulative effect of impact on the environment).
- **Duration, Extent, Probability** (see **Table** below)

Duration (Temporal Scale)		Score
Short term	Less than 5 years	1
Medium term	Between 5-20 years	2
Long term	Between 20 and 40 years (a generation) and from a human perspective also permanent	3
Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	4
Extent (Spatial Scale)		
Localised	At localised scale and a few hectares in extent	1
Study Area	The proposed site and its immediate environs	2
Regional	District and Provincial level	3
National	Country	3
International	Internationally	4
Probability (Likelihood)		
Unlikely	The likelihood of these impacts occurring is slight	1
May Occur	The likelihood of these impacts occurring is possible	2
Probable	The likelihood of these impacts occurring is probable	3
Definite	The likelihood is that this impact will definitely occur	4

- **Severity or benefits**

Impact Severity (The severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)		Score
Very severe	**Very beneficial**	**4**
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.	
Severe	**Beneficial**	**3**
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.	
Moderately severe	**Moderately beneficial**	**2**
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.	
Slight	**Slightly beneficial**	**1**
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.	
No effect	**Don't know/Can't know**	
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.	

** In certain cases it may not be possible to determine the severity of an impact thus it may be determined: Don't know/Can't know*

The scores for the three criteria in the Tables above are added to obtain a composite score. They must then be considered against the severity rating to determine the overall significance of an activity. This is because the severity of the impact is far more important than the other three criteria. The overall significance is then obtained by reading off the matrix presented in the table below. The overall significance is either negative or positive (Criterion 1) and direct, indirect or cumulative (Criterion 2).

SEVERITY	COMPOSITE DURATION, EXTENT & PROBABILITY SCORE									
	3	4	5	6	7	8	9	10	11	12
Slight	3	4	5	6	7	8	9	10	11	12
Mod severe	3	4	5	6	7	8	9	10	11	12
Severe	3	4	5	6	7	8	9	10	11	12
Very severe	3	4	5	6	7	8	9	10	11	12

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

OVERALL SIGNIFICANCE *(The combination of all the above criteria as an overall significance)*	
VERY HIGH NEGATIVE	**VERY BENEFICIAL**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. *Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.* *Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.*	
HIGH NEGATIVE	**BENEFICIAL**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. *Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.* *Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.*	
MODERATE NEGATIVE	**SOME BENEFITS**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. *Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.*	
LOW NEGATIVE	**FEW BENEFITS**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. *Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.* *Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.*	
NO SIGNIFICANCE	
There are no primary or secondary effects at all that are important to scientists or the public. *Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.*	
DON'T KNOW	
In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. *Example: The effect of a particular development on people's psychological perspective of the environment.*	

12.1.3 Post Mitigation Significance

Once mitigation measure are proposed, the following criteria are then used to determine the overall post mitigation significance of the impact:

- Reversibility: The degree to which an environment can be returned to its original/partially original state.
- Irreplaceable loss: The degree of loss which an impact may cause.
- Mitigation potential: The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 5 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Reversibility	
Reversible	*The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.*
Irreversible	*The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.*
Irreplaceable loss	
Resource will not be lost	*The resource will not be lost/destroyed provided mitigation measures are implemented.*
Resource will be partly lost	*The resource will be partially destroyed even though mitigation measures are implemented.*
Resource will be lost	*The resource will be lost despite the implementation of mitigation measures.*
Mitigation potential	
Easily achievable	*The impact can be easily, effectively and cost effectively mitigated/reversed.*
Achievable	*The impact can be effectively mitigated/reversed without much difficulty or cost.*
Difficult	*The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs.*
Very Difficult	*The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.*

13 ADDENDUM 4: GRAVE RELOCATION AND SITE MANAGEMENT: STATUTORY MANDATE

a. Archaeology, graves and the law

Note that four categories of graves can be identified. These are:
- Graves younger than 60 years;

- Graves older than 60 years, but younger than 100 years;

- Graves older than 100 years; and

- Graves of victims of conflict or of individuals of royal descent

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 of 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.

Human remains that are less than 60 years old are subject to provisions of the Human Tissues Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925). Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.
A registered undertaker can only handle human remains or an institution declared under the Human Tissues Act (Act 65 of 1983 as amended).

Unidentified/unknown graves are also handled as older than 60 until proven otherwise.
Summary of applicable legislation and legal requirements:

- Human Tissue Act (Act 65 of 1983 as amended).
- Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925)
- Ordinance on Excavations (Ordinance no. 12 of 1980)
- Local and regional provisions, laws and by-laws
- National Heritage Resources Act (Act no. 25 of 1999)
- Permit from SAHRA for removal of human remains

a. Graves: necessary procedures

When graves are located in an area demarcated for development, the following mitigation options might be considered:

- **Conservation:** The establishment of a 50 meter buffer zone around the burial place which is fenced off and, maintained and conserved. *This option is generally recommended as the relocation of burial places is an extremely complicated, time consuming and sensitive process.*

- **Mitigation and relocation:** In the event where impact on the burial place will occur, mitigation measures may entail full grave relocation. Such a relocation process must be undertaken by suitably qualified individuals with a proven track record. The relocation must also be undertaken in full cognisance of all relevant legislation, including the specific requirements of the National Heritage Resource Act (Act no. 25 of 1999). Furthermore, a concerted effort must also be made to identify all buried individuals and to contact their relatives and descendants. Other legislative measures which may be of relevance include the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the Human Tissues Act (Act no. 65 of 1983, as amended), the Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Methodology for grave relocations:

- **Documentation:** Physical documentation of graves and determining context of graves prior to exhumation: Photographic, GPS, Site Map, Historical Background.
- **Public Notices:** In order to locate and notify descendant families, notices (in compliance with the National Heritage Resources Act) must be placed on the site/s, indicating the intent of relocation. These notices, translated into at least 3 languages, have to remain in place for a minimum of 60 days. Additionally, newspaper adverts and notices on local radio stations announcements are required.
- **Social consultation:** If any descendant families were located during initial consultation/public participation phases, a full social consultation action will lodged.
- **Permit application:** Application for a permit from SAHRA can only be obtained after all necessary consent documents from descendant families, landowners and relevant authorities have been secured.
- **Exhumation & relocation**

The exhumation, investigation and reburial of the burial place may commence after SAHRA has issued relevant permits and permissions

14 ADDENDUM 5: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

a. Site Significance Matrix

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the 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. The following matrix is used for assessing the significance of each identified site/feature.

2. SITE EVALUATION			
2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa's history or pre-colonial history.			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			
It has significance relating to the history of slavery in South Africa.			
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			
2.2 Field Register Rating			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			
Specific community			

a. Impact Assessment Criteria

The following table provides a guideline for the rating of impacts and recommendation of management actions for sites of heritage potential.

Significance of the heritage resource

This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to the nature and degree of significance of an impact and thus needs to be thoroughly considered. Consideration needs to be given to the significance of a heritage resource at different scales (i.e. site-specific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

Nature of the impact

This is an assessment of the nature of the impact of the activity on a heritage resource, with some indication of its positive and/or negative effect/s. It is strongly informed by the statement of resource significance. In other words, the nature of the impact may be historical, aesthetic, social, scientific, linguistic or architectural, intrinsic, associational or contextual (visual or non-visual). In many cases, the nature of the impact will include more than one value.

Extent

Here it should be indicated whether the impact will be experienced:

- On a site scale, i.e. extend only as far as the activity;
- Within the immediate context of a heritage resource;
- On a local scale, e.g. town or suburb
- On a metropolitan or regional scale; or
- On a national/international scale.

Duration

Here it should be indicated whether the lifespan of the impact will be:

- Short term, (needs to be defined in context)
- Medium term, (needs to be defined in context)
- Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or
- Permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Of relevance to the duration of an impact are the following considerations:

- Reversibility of the impact; and
- Renewability of the heritage resource.

Intensity

Here it should be established whether the impact should be indicated as:

- Low, where the impact affects the resource in such a way that its heritage value is not affected;
- Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way; and
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

Probability

This should describe the likelihood of the impact actually occurring indicated as:

- Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;
- Probable, where there is a distinct possibility that the impact will occur;
- Highly probable, where it is most likely that the impact will occur; or
- Definite, where the impact will definitely occur regardless of any mitigation measures

Confidence

This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Impact Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts and can be described as:

- Low; where it would have a negligible effect on heritage and on the decision
- Medium, where it would have a moderate effect on heritage and should influence the decision.
- High, where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision;
- Very high, where it would have, or there would be high risk of, an irreversible and possibly irreplaceable negative impact on heritage. Impacts of very high significance should be a central factor in decision-making.

b. Direct Impact Assessment Criteria

The following table provides an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

	TYPE OF DEVELOPMENT			
HERITAGE CONTEXT	**CATEGORY A**	**CATEGORY B**	**CATEGORY C**	**CATEGORY D**
CONTEXT 1 High heritage Value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	Moderate heritage impact expected

NOTE: A DEFAULT "LITTLE OR NO HERITAGE IMPACT EXPECTED" VALUE APPLIES WHERE A HERITAGE RESOURCE OCCURS OUTSIDE THE IMPACT ZONE OF THE DEVELOPMENT.

HERITAGE CONTEXTS	CATEGORIES OF DEVELOPMENT
Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources **Context 2:** Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources. **Context 3:** Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	**Category A: Minimal intensity development** - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. **Category B: Low-key intensity development** - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2

Context 4: Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.	- Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). **Category C: Moderate intensity development** - Rezoning of a site between 5000m2-10 000m2. - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%) **Category D: High intensity development** - Rezoning of a site in excess of 10 000m2 - Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)

c. Management and Mitigation Actions

The following table provides a guideline of relevant heritage resources management actions is vital to the conservation of heritage resources.

No further action / Monitoring

Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.

Avoidance

This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.

Mitigation

This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.

Compensation

Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.

Rehabilitation

Rehabilitation is considered in heritage management terms as a intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:

- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.

Enhancement

Enhancement is appropriate where the overall heritage significance and its public appreciation value are improved. It does not imply creation of a condition that might never have occurred during the evolution of a place, e.g. the tendency to sanitize the past. This

management action might result from the removal of previous layers where these layers are culturally of low significance and detract from the significance of the resource. It would be appropriate in a range of heritage contexts and applicable to a range of resources. In the case of formally protected or significant resources, appropriate enhancement action should be encouraged. Care should, however, be taken to ensure that the process does not have a negative impact on the character and context of the resource. It would thus have to be carefully monitored