

**PHASE 1 HERITAGE IMPACT ASSESSMENT:
CATO RIDGE DEVELOPMENT,
ETHEKWINI MUNICIPALITY, KWAZULU-NATAL**

November 2021

**FOR: Zutari (Pty) Ltd
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I, Jean Beater, act as an independent specialist for this project and I do not have any vested interest either business, financial, personal or other, in the proposed activity other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.

SPECIALIST DETAILS

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1. INTRODUCTION

JLB Consulting was appointed by Zutari (Pty) Ltd on behalf of the Cato Ridge Development Company Limited (CRDC) to undertake a Phase 1 Heritage Impact Assessment (HIA) for three proposed development areas in Cato Ridge.

Assmang, including the CRDC, owns all the properties which comprise the study area, as shown in **Figure 1** below. The study area is mainly zoned for residential and general industry and is currently unused. CRDC and Assmang propose to sell the land and indicate any fatal flaws on the land to future developers. Based on the pre-feasibility studies (PFS), light industry, general industry, warehousing, and logistics land uses are viable land use options from a market perspective.

2. LEGISLATION

As stated above, 547.49 ha have been identified for the development footprint. The size triggers sections 41 (1)(c) (i) (ii) and (iii) of the KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018) which lists developments or activities that may require an HIA. Section 41 (1) (c) refers to:

- any development or other activity which will change the character of a site– exceeding 5000 m² in extent;
- (ii) any development or other activity involving three or more existing erven or subdivisions thereof; and
- (iii) any development or other activity involving three or more erven or divisions thereof which have been consolidated within the past five years.

The proposed development may also impact graves, structures, archaeological and palaeontological resources that are protected in terms of sections 37, 38, 39, and 40 of the KwaZulu-Natal Amafa and Research Institute Act, 2018.

Section 3 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) describes heritage resources as follows:

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;

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

3. PROJECT LOCATION

The study area is located in Cato Ridge near the western boundary of the eThekweni Metropolitan Municipality, KwaZulu Natal and is situated to the north of the N3 highway. Cato Ridge is located approximately 51km west of Durban via the N3 and 29km south-east of Pietermaritzburg. The R103, which acts as an alternative route between Durban and Pietermaritzburg (see **Figure 1**), bisects the study area. A railway line, the Natal Corridor (Natcor), also divides the area and provides general accessibility to the informal and agricultural areas in the north and south. Assmang and its subsidiary company, CRDC, have an operational manganese smelter (Cato Ridge Works) to the west of the study area. Immediately north of the study area, there is the KwaXimba settlement (Zutari 2021:1).

Alternative sites within the Assmang landholdings were assessed through the PFS in terms of the relative development potential. Due to environmental and topographical constraints and regulatory limitations identified in the PFS, such as servitudes, railway lines, floodlines, etc, the project boundary was refined. The project boundary covers a total area of 1263.48 hectares (ha), with 1257.74 ha identified for future land uses. Three proposed development areas were selected, namely Proposed Development Area 1 (blue), Proposed Development Area 2 (red) and Proposed Development Area 3 (pink) which are depicted in **Figure 2**. The total extent of the 3 proposed development areas is 789.02 ha, approx. 62% of the total Assmang landholdings. Based on the exclusion of the non-developable areas within the 3 proposed development areas, a development footprint was selected. The total development footprint within the 3 proposed development areas is 609.46 ha. Within the project boundary, approximately 547.49 ha of land is identified for the total development footprint for light industry/logistics activities. Proposed internal road networks and reserves, including bulk service infrastructure (water, electrical and sewage) to service proposed developments cover a total area of 57.56 ha and approximately 161.81 ha of land has been identified as rural residential (as per current zoning). Approximately 32.52 ha of land will not be developed as it is subject to existing electrical and Right of Way servitudes and the remaining 458.36 ha of land may not be developed and could be considered for conservation purposes if agreed to with the Applicant and relevant environmental authorities (Zutari 2021:3, 6).

Several alternative land use concepts, layouts and designs have been assessed and **Figure 3** shows the current preferred land use options layout.

4. METHODOLOGY

In February 2021, a heritage baseline and sensitivity screening was undertaken by JLB Consulting for the Cato Ridge Asset Transformation Project. The area screened was larger than the current total study area as additional sites to the west of the three proposed development areas and south of the N3 highway were assessed. The screening exercise included a desktop component (including the examination of previous heritage impact assessment reports and cartographic resources, such as topographic maps) as well as fieldwork. The information provided by the screening exercise allowed the CRDC to identify the three proposed development areas under discussion.

Field surveys of the three proposed development areas were undertaken for this Phase 1 HIA on 5 October 2021. Site conditions were generally good. The findings of the desktop palaeontological (fossil) study, undertaken in February 2021, for the heritage baseline and sensitivity screening, are also included in this report.

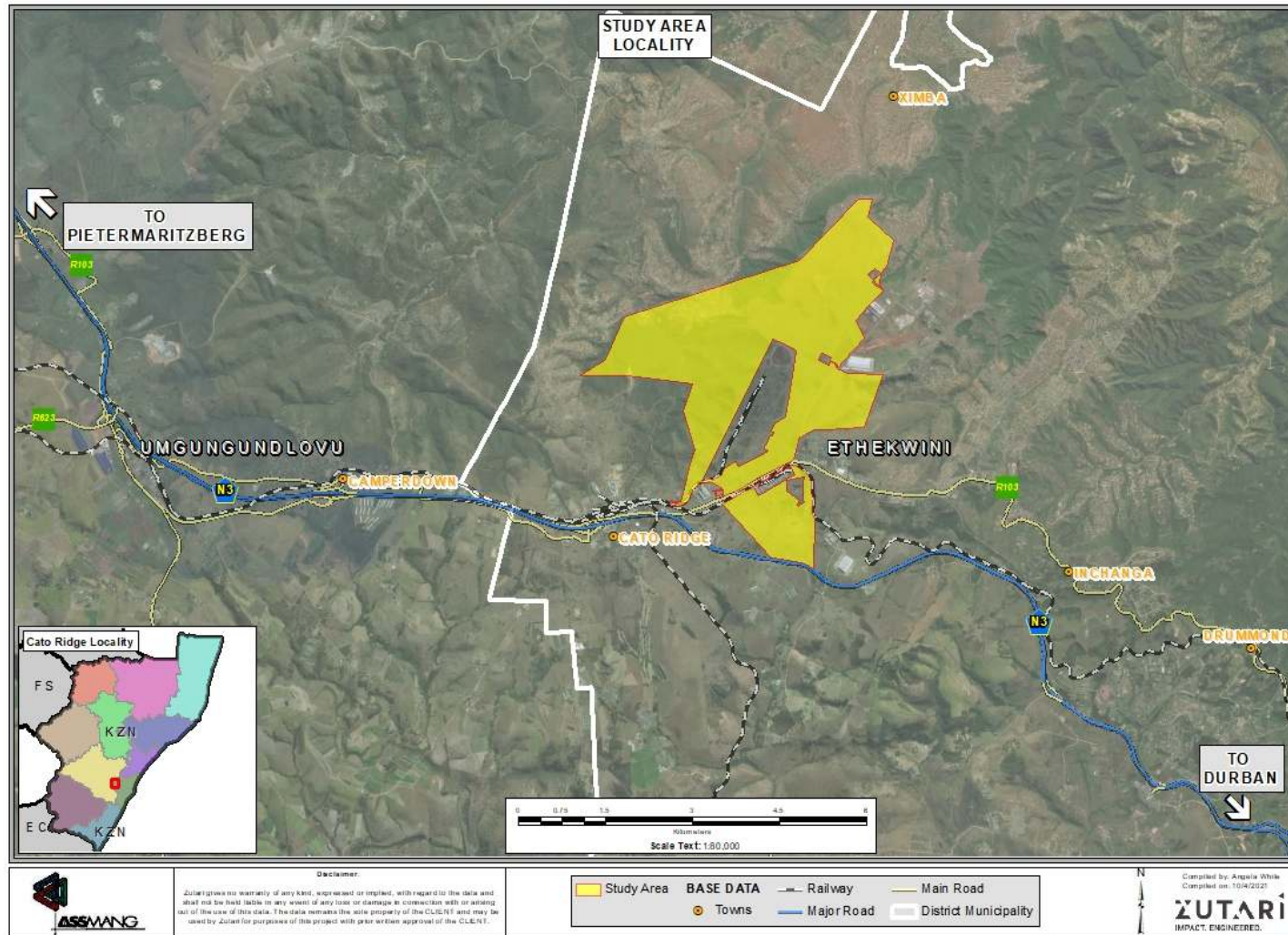


Figure 1: Locality of Project Boundary

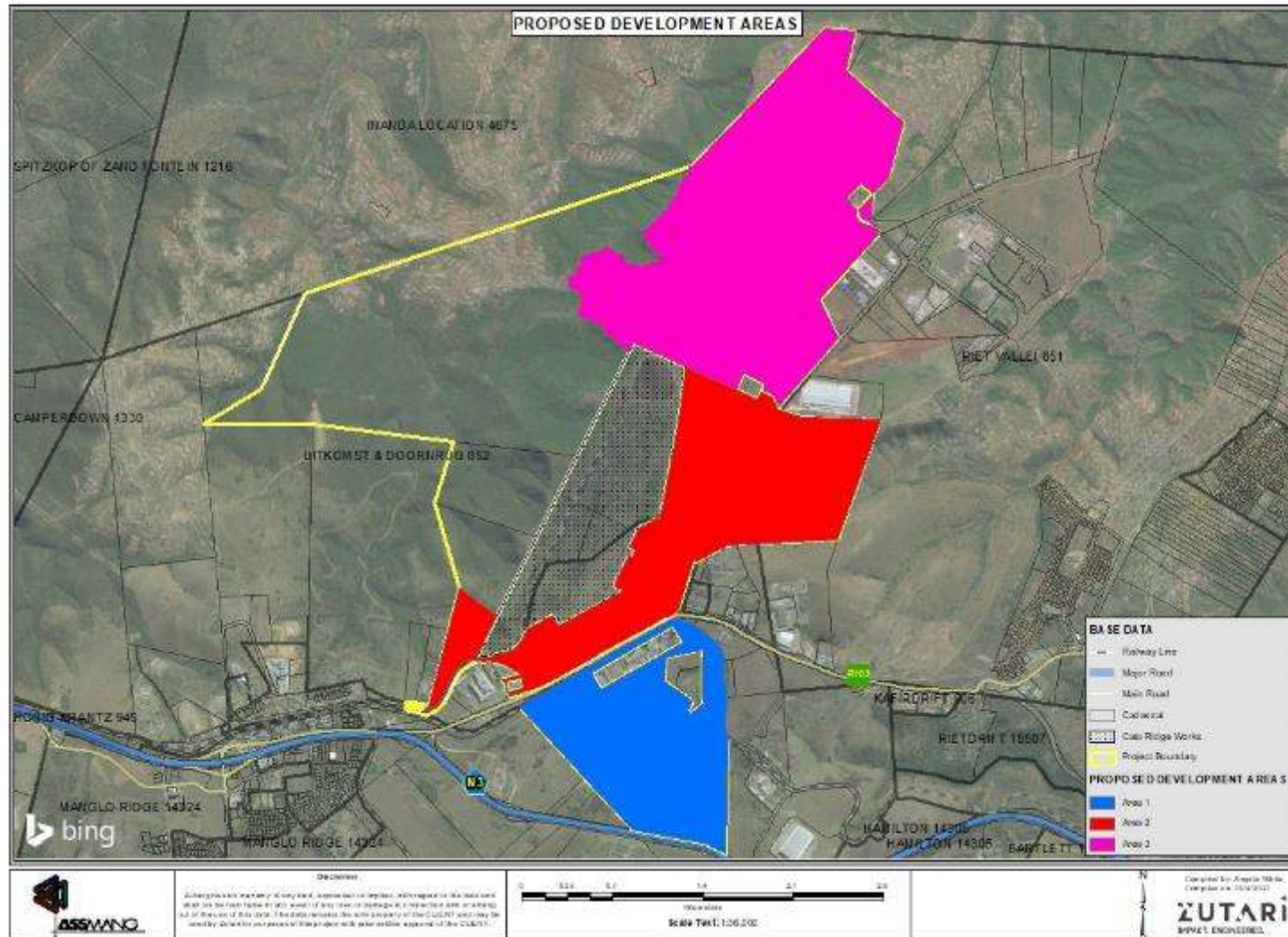


Figure 2: Proposed Development Areas 1, 2 and 3

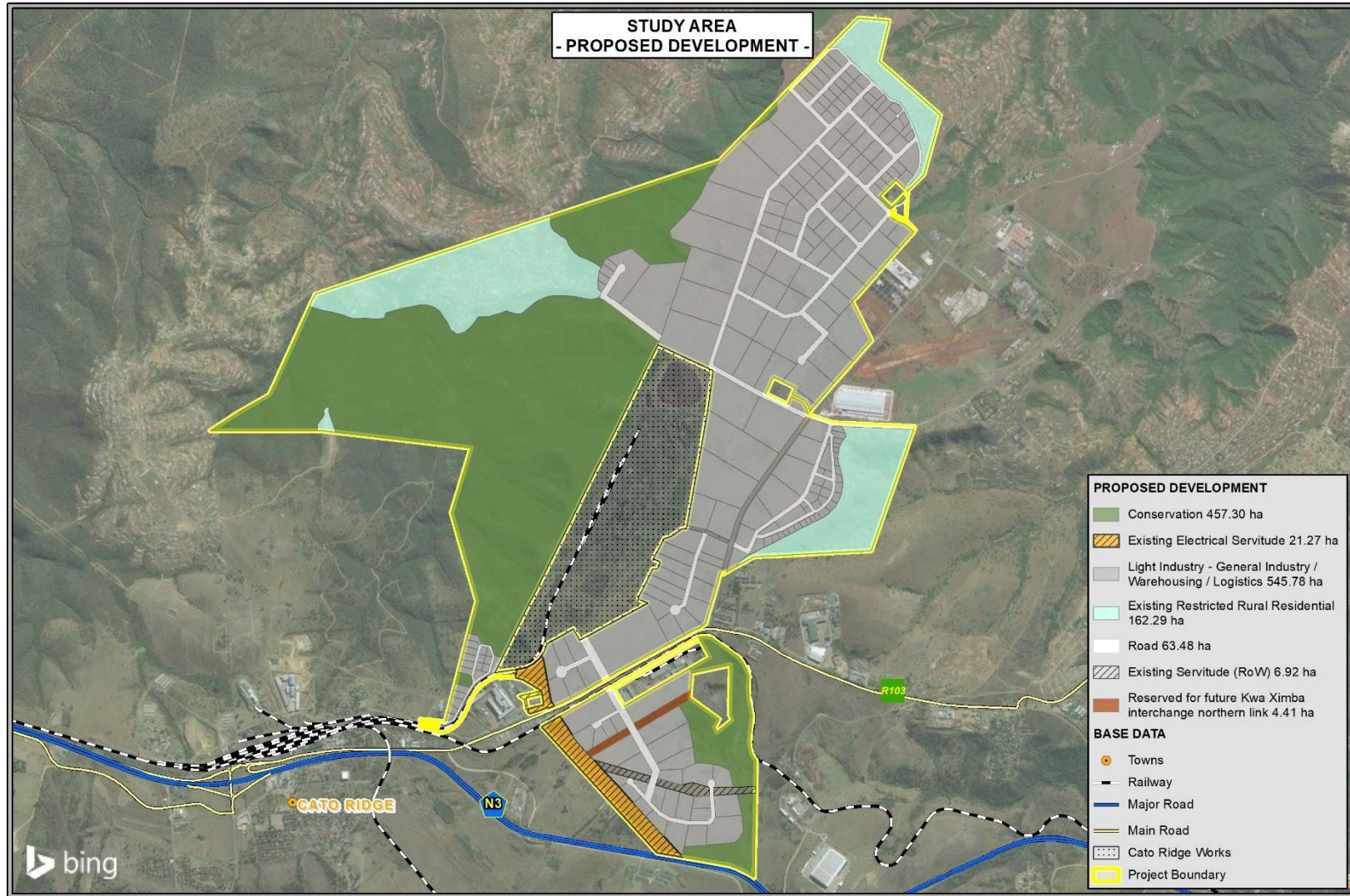


Figure 3: Preferred land use options layout

5. HISTORICAL BACKGROUND

The greater Cato Ridge is relatively well-covered by archaeological surveys conducted in the 1960s and 1970s. The available evidence indicates that the area contains mostly Early Stone Age material. Most of these sites are situated close to waterbodies in an open-air context. Seven sites contain material indicative of the transition between the Early Stone Age and Middle Stone Age periods. One Later Stone Age site and one Later Iron Age site are known from the larger surrounding area (Active Heritage 2015:7).

Stone Age sites of all the main periods and cultural traditions occur in the greater Cato Ridge/Mpumalanga areas. Most of these occur in open-air contexts as exposed by donga and sheet erosion. The occurrence of Early Stone Age tools in the near vicinity of permanent water resources, such as the Umngeni River, is typical of this tradition. These tools were most probably made by early hominins such as *Homo erectus* or *Homo ergaster* who most probably date back to between 300 000 and 1.7 million years ago. The presence of the first anatomically modern people (*Homo sapiens sapiens*) in the area is indicated by the presence of a few Middle Stone Age blades and flakes. These most probably date back to between 40 000 and 200 000 years ago. The later Stone Age flakes identified in the surrounding area most probably date back to between 200 and 20 000 years ago (Active Heritage 2015:8).

By 1500 years ago early Bantu-speaking farmers settled adjacent to the Umngeni River in the greater Camperdown area. Due to the fact that these first farmers introduced metal technology to southern Africa, they are designated as the Early Iron Age (EIA) in the archaeological literature. EIA sites characteristically occur on alluvial or colluvial soil adjacent to large rivers below the 1000m contour. The Early Iron Age farmers originally came from western Africa. Later Iron Age sites occurred as a result of Bantu-speaking agro-pastoralists who arrived in southern Africa 1000 years ago via East Africa. Later Iron Age communities in KwaZulu-Natal were the direct ancestors of the Zulu people. The larger Umngeni Valley area was inhabited by various Nguni-speaking groups at the beginning of the 19th century, with most of these communities being incorporated into the Zulu Kingdom of Shaka in the 1820s (Active Heritage 2015:8-9).

According to Bulpin (undated:170), Cato Ridge consisted at first of small, rented farms on the estate of GC Cato, the first mayor of Durban. Towards the end of 1912, these farms were offered for sale, with the original tenants having the first option. Cato Ridge thereby came into existence.

Various buildings and farmsteads, including trading stores belonging to the Victorian and Edwardian periods, occur in the area.

In order to beneficiate the manganese ore from their mines in the Northern Cape, Assmang established Cato Ridge Works (formerly Feralloys Limited) in 1956 and construction was started on a ferromanganese smelter at Cato Ridge. The first alloy from the Cato Ridge plant was exported in 1959 (Assmang 2016:1). Cato Ridge Alloys (Pty) Ltd is a joint venture between Assmang and the Sumitomo Corporation. The Company was formed in 1996 for the production of refined ferro manganese utilizing high carbon ferromanganese from the Cato Ridge Works as the feedstock. The construction of the plant started in 1997 and the first refined ferromanganese for export was produced at the beginning of 1998 (Assmang 2016:1)

6. PROPOSED DEVELOPMENT AREA 1



Figure 4: Google Earth image of Proposed Development Area 1

The area was inspected on foot. There is a large quarry located just below the structures and near the railway line which is visible in the image above. The 1937 aerial image (**Figure 5**) shows the area as largely undeveloped apart from the railway line that still runs around it; however, between 1937 and 1968, a farmstead with several out-buildings was constructed that can be seen

in **Figure 5** and **Figure 6**. The large quarry is also visible by 1968. The farmstead is located outside Proposed Development Area 1.

The site of the farmstead depicted in **Figure 6** was inspected. It is situated amongst trees and bushes. It is no longer in use and has fallen into disrepair. The remains of several structures were found as well as an intact silo/tower (see **Figures 7 - 9**). An inspection of the surrounding area was undertaken and no graves or other heritage resources were found.

The remainder of Development Area 1 was inspected. An individual walking across the area was asked if he was aware of any graves or other heritage sites on the site. He said that he had not heard of graves on the site but was not from the immediate area. No heritage sites were found during the inspection. The area west of the farmstead complex within Development Area 1 is disturbed by sand mining activities and dumping (see **Figure 10**).

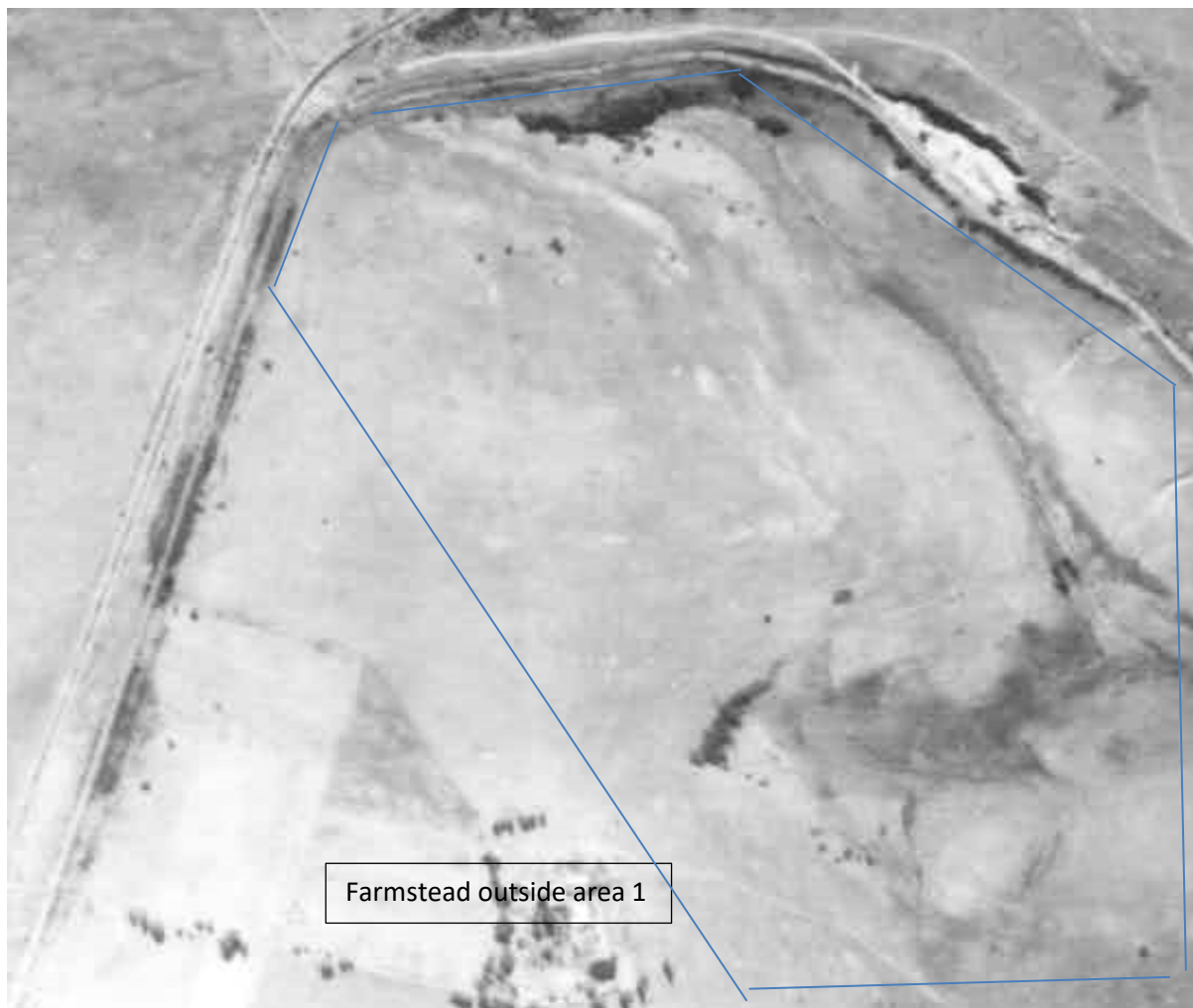


Figure 5: 1937 aerial photograph showing rough outline of Development Area 1



Figure 6: 1968 photograph of Development Area 1



Figure 7: Remains of wall with concrete water tank behind wall



Figure 8: Low stone walling within remains of farmstead complex



Figure 9: Intact silo



Figure 10: Mounds of soil due to sand mining



Figure 11: View from inside existing quarry

Heritage resources found during the site inspection were plotted in the field using a Garmin Etrex GPS device and photographed. A list of the sites is can be found in **Table 1** below.

Table 1: Heritage sites: Development Area 1

Description	Coordinates	Significance	Mitigation
Remains of structure (Figure 7)	29°43'47.2" S 30°36'56.0" E	Low heritage significance	Age of the remains of structures could not be determined. If they are > 60 years they can only be demolished once the relevant permit has been received from the Institute
Silo/water tower (Figure 9)	29°43'46.1" S 30°36'54.9" E	Low heritage significance	Age of silo could not be determined but it is possible that it is > 60 years; it can be demolished once the relevant permit has been received from the Institute

The South African fossil sensitivity map (**Figure 12**) indicates that a large section of Area 1 falls into a zone of low fossil sensitivity zone (indicated by blue colour) and the remaining section falls into an area of moderate fossil sensitivity (indicated by green colour). An area of low fossil sensitivity does not require further studies but a protocol for chance fossil finds is required. This protocol can be found in Chapter 11 of this report.

A moderate fossil sensitivity ranking requires that a desktop palaeontological study is undertaken. Such a study was undertaken in February 2021 in conjunction with the heritage baseline and sensitivity screening. The desktop study found that it is extremely unlikely that any fossils would be preserved in the Natal Group reworked sediments that underlie the area north of the N3 highway as these sediments do not preserve fossils. In addition, there are no records from the Dwyka Group of plant or animal fossils in this region hence it is very unlikely that fossils occur on the site (Bamford: 2021: 8,11).

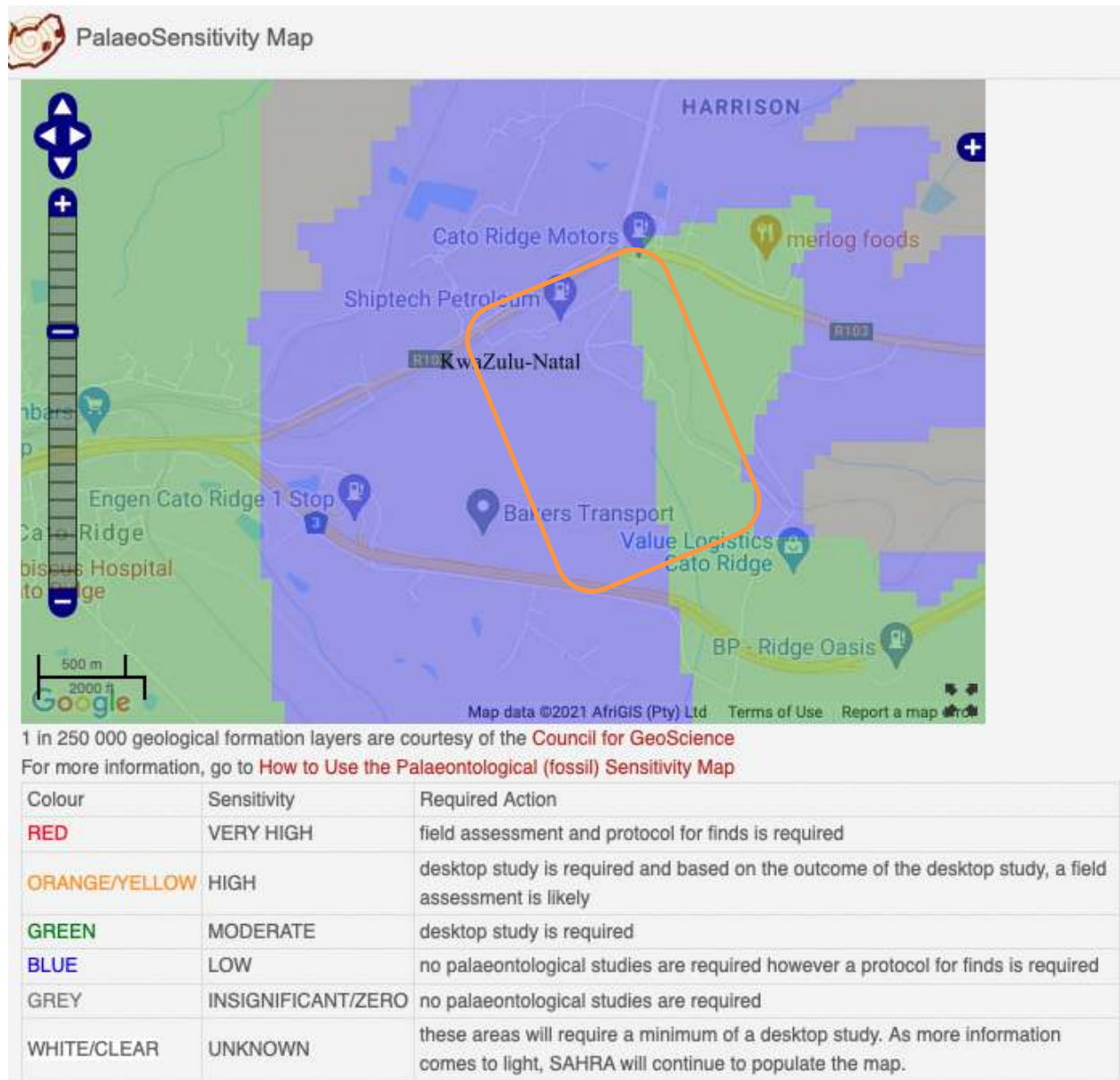


Figure 12: Fossil sensitivity of Proposed Development Area 1

7. PROPOSED DEVELOPMENT AREA 2

The various areas making up Proposed Development Area 2 (**Figure 13**) were inspected on foot. In the 1937 aerial photograph (**Figure 14**) of the northern section of Proposed Development Area 2, there are two farmsteads visible located on either side of Eddie Hagan Drive as well as rows of trees and large tracts of cultivated land. Farmstead 1 was located west of Eddie Hagan Drive and Farmstead 2 was located east of Eddie Hagan Drive.



Figure 13: Proposed Development Area 2



Figure 14: 1937 image of northern section of Proposed Development Area 2

The 1967 aerial photograph (**Figure 15**) still shows the two farmsteads as well as the Assmang Cato Ridge Works on the western boundary of the image and the airstrip between Farmstead 1 and Cato Ridge Works. By 1978, only a few remains of Farmstead 2 on the eastern side of Eddie Hagan Drive are visible whereas structures associated with Farmstead 1 are still intact.



Figure 15: 1967 aerial image

Both the farmstead complex sites were inspected as well as the surrounding area. The specialist was accompanied by a member of the Assmang security staff. He said that he was unaware of heritage sites in Proposed Development Area 2.

No graves were found on the western side of Eddie Hagan Drive during the inspection. Only extensive remains of several structures making up Farmstead 1 were found which can be seen in **Figures 16 - 19**.

In contrast, there are few remains of Farmstead 2 located on the eastern side of Eddie Hagan Drive (**Figure 20**). The site is thickly overgrown with bush with some rubble found within the bush. The outline of what could be a pathway marked out in stone is still visible (**Figure 21**).

During the heritage baseline and sensitivity screening exercise that was undertaken in February 2021, several graves were found on the eastern boundary of Proposed Development Area 2 (**Figure 22**). It was recommended in the screening report that the area east of the old road or railway track be designated a 'no-go' area due to the high heritage sensitivity of graves. This recommendation still stands for this report. This area has been excluded from the development footprint.



Figure 16: Farmstead 1: Remains of structure made from stone



Figure 17: Farmstead 1: Remains of circular structure



Figure 18: Farmstead 1: Remains of structures



Figure 19: Farmstead 1: Remains of structure



Figure 20: Location of Farmstead 2 east of Eddie Hagan Drive

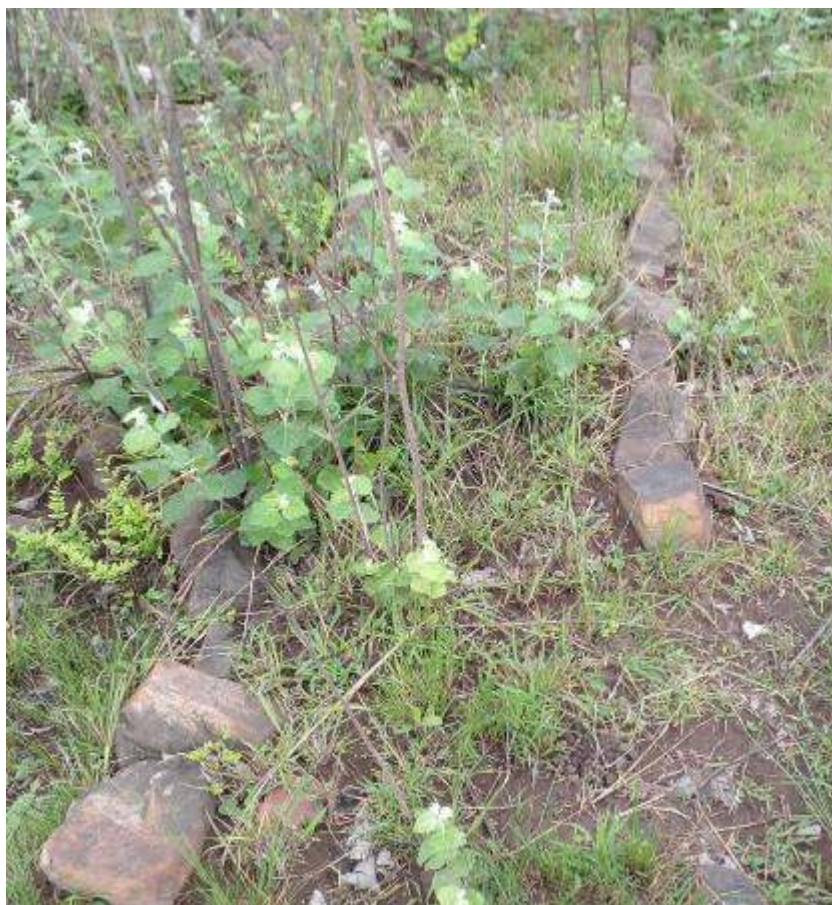


Figure 21: Farmstead 2: Remains of stone-lined pathway



Figure 22: Graves found during screening exercise

The southern-western half of Proposed Development Area 2 was also inspected on foot accompanied by a member of Assmang security. The area between the R103 road and the Assmang Cato Ridge Works was accessed from the delivery entrance to Assmang. The 1967 aerial photograph below indicates structures and cultivated lands alongside the R103 road.



Figure 23: 1967 aerial photograph

The 1968 topo-cadastral map (2930DA) shows several structures and ruins ('murasie') / structures (**Figure 24**).

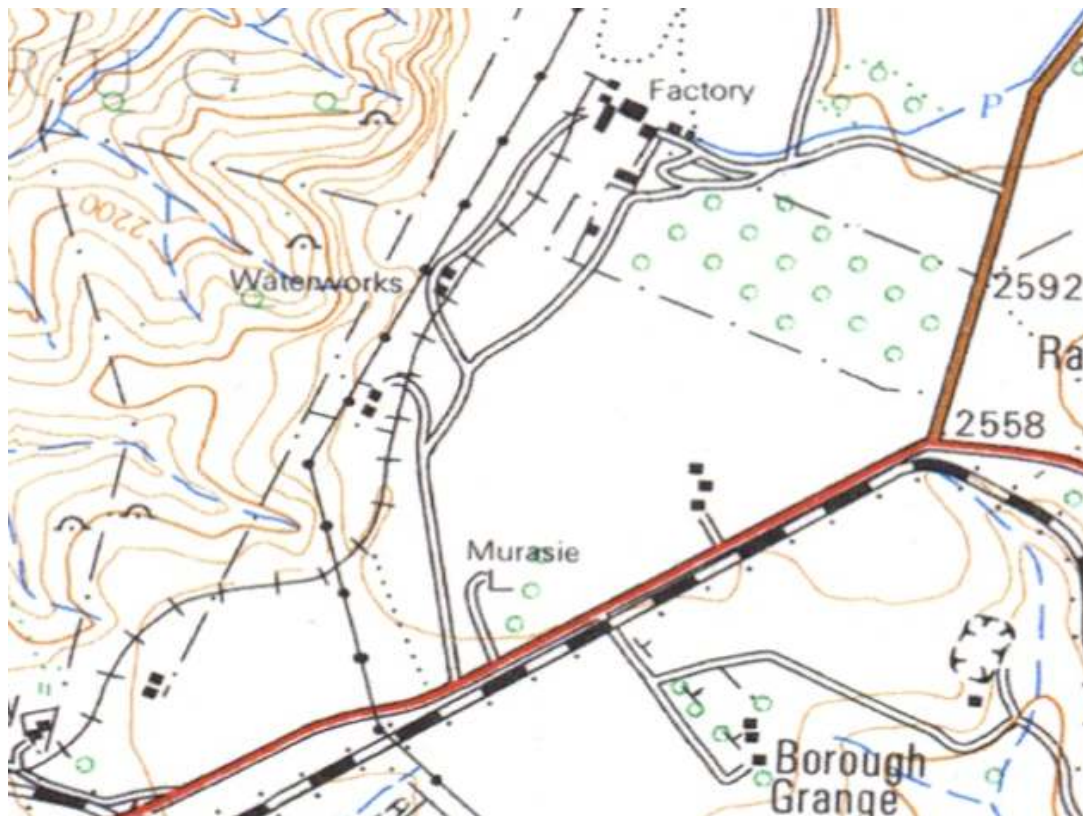


Figure 24: Relevant section of 1968 topo-cadastral map

By 1983, much of the area is under cultivation. Only the remains of a few structures making up structures 1 are still visible as indicated in **Figures 25-26**.



Figure 25: Remains of square structure



Figure 26: Remains of structure looking towards Assmang delivery entrance



Figure 27: View of Proposed Development Area 2 between Assmang plant and R103 road

The ruins or structures (structures 2) indicated in **Figure 24** were investigated. Apart from the remains of walls, a round brick water tank/reservoir and the remains of a structure used for holding

animals (**Figures 28-30**), no other heritage resources were found. The area is overgrown with vegetation.



Figure 28: Remains of walls



Figure 29: Round brick structure with wall behind it



Figure 30: Structure for holding animals

The area west of the railway line that falls within Proposed Development Area 2 (structures 2) were inspected on foot. The topography was steep in places. The remains of structures were found including an intact cattle dip and a stone-lined water canal. The specialist could not find earlier images than 1967 of this specific area hence the age of the structures could not be determined.



Figure 31: Cattle dip



Figure 32: Foundation of demolished structure



Figure 33: Water canal

The list of heritage resources found in Proposed Development Area 2 is provided in **Table 2**.

Table 2: Heritage sites: Proposed Development Area 2

Description	Coordinates	Significance	Mitigation
Remains of structures associated with Farmstead 1 (Figures 16-19)	29°42'40.4" S 30°37'15.3" E	Low heritage significance; protected by section 37 (1)(a)	Age of remains are > 60 years; they can be demolished once relevant permit has been received from the Institute
Remains of structures associated with Farmstead 2 (Figure 21)	29°42'50.8" S 30°37'24.8" E	Low heritage significance; protected by section 37 (1)(a)	Age of remains are > 60 years; can be demolished once relevant permit has been received from the Institute
Two graves (Figure 22)	29°42'53.9" S 30°37'44.6" E	High heritage significance; protected by section 39 (1)(b)	Leave graves <i>in situ</i> ; recommended no-go area to protect graves
Three graves (Figure 22)	29°42'50.8" S 30°37'46.9" E	High heritage significance; as above	Leave graves <i>in situ</i> ; recommended no-go area to protect graves
Single grave within homestead complex	29°42'49.6" S 30°37'47.6" E	High heritage significance	Leave graves <i>in situ</i> ; recommended no-go area to protect grave
Remains of structures 1 (Figures 25 - 26)	29°43'27.5" S 30°36'50.8" E	Low heritage significance; possibly protected by section 37 (1)(a)	Age of structure could not be determined; if area is to be developed then age of remains needs to be determined; if > 60 years then relevant permit is required prior to removal of remains
Remains of buildings associated with structures 2 (Figures 28-30)	29°43'35.2" S 30°36'33.5" E	Low heritage significance; protected by section 37 (1)(a)	> 60 years; can be demolished once relevant permit has been received from the Institute
Cattle dip (Figure 31)	29°43'41.0" S 30°36'02.5" E	Low heritage significance; possibly protected by section 37 (1)(a)	Age of structure could not be determined; if area is to be developed then a built heritage specialist must be consulted to determine age & if permit is required to demolish structure
Remains of structures 3 (Figure 32)	29°43'40.3" S 30°36'02.8" E	Low heritage significance; possibly protected by section 37 (1)(a)	As above
Remains of structures 3	29°43'40.1" S 30°36'01.8" E	Low heritage significance; possibly protected by section 37 (1)(a)	As above
Remains of structures 3	29°43'41.2" S 30°36'03.5" E	Low heritage significance; possibly protected by section 37 (1)(a)	As above

The South African fossil sensitivity map (**Figure 34**) indicates most of Proposed Development Area 2 falls into zone of low fossil sensitivity zone (indicated with blue colour) with only a very

small area on the western boundary of the Proposed Development Area 2 indicated as an area of medium fossil sensitivity (green colour).

An area of low fossil sensitivity does not require further studies but a protocol for chance fossil finds is required. This protocol can be found in Chapter 11 of this report.

A moderate fossil sensitivity ranking requires that a desktop palaeontological study is undertaken. Such a study was undertaken in February 2021 which found that it is extremely unlikely that any fossils would be preserved in the Natal Group reworked sediments as these sediments do not preserve fossils. In addition, there are no records from the Dwyka Group of plant or animal fossils in this region so it is very unlikely that fossils occur on the site (Bamford: 2021: 8,11)

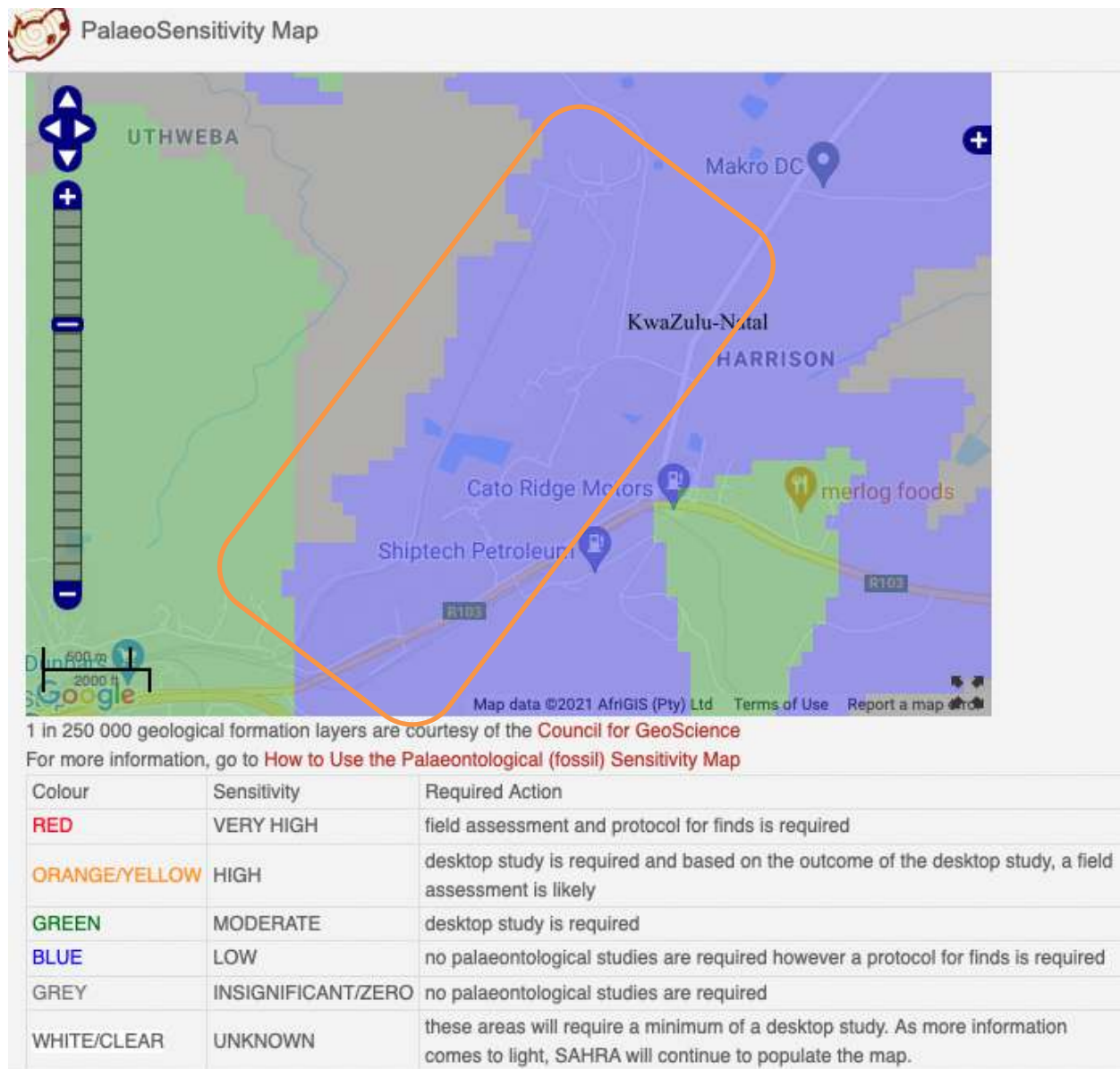


Figure 34: Fossil sensitivity with Proposed Development Area 2 outlined in orange

8. PROPOSED DEVELOPMENT AREA 3



Figure 35: Proposed Development Area 3

The 1937 aerial photograph of Proposed Development Area 3 (**Figure 36**) shows several farmsteads as well as homesteads, the remains of a trading store and large areas under cultivation. The 1953 image (**Figure 37**) shows the same farmsteads, the trading store and more areas under cultivation. Homesteads are not visible apart from their outline. By 1973, the airstrip is visible on the aerial photograph and the buildings associated with farmstead 1 have almost completely disappeared.

The site of farmstead 1 towards the bottom of **Figure 36** was inspected. Only the remains of a wall and the floors of the structures are still visible as well as the remains of a round concrete sunken structure (**Figures 38, 39 and 40**).

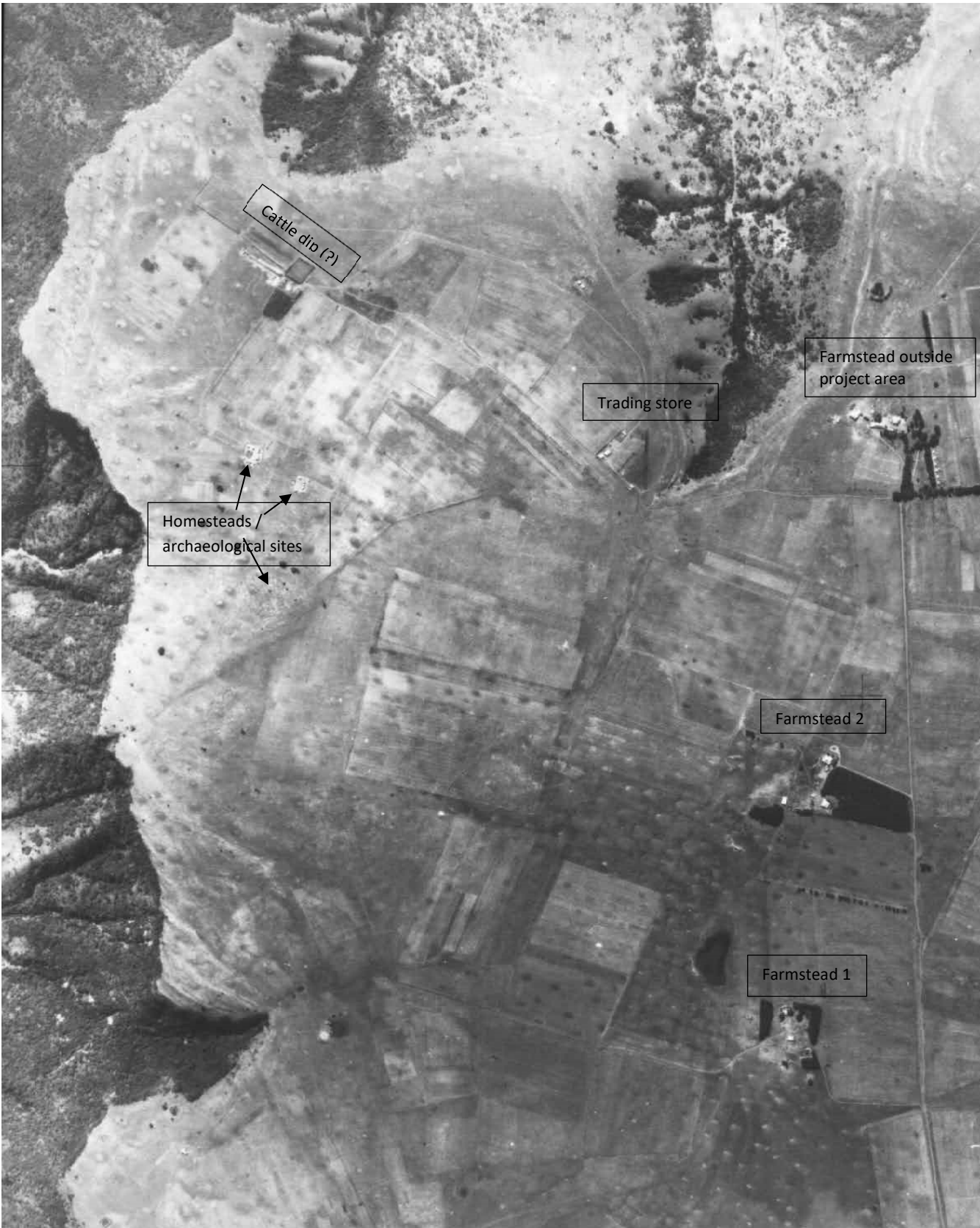


Figure 36: 1937 aerial photograph of Proposed Development Area 3



Figure 37: 1953 image of Proposed Development Area 3



Figure 38: Remains of walls of structure



Figure 39: Concrete floor



Figure 40: Floor of round structure

Several buildings making up farmstead 2 are still intact and inhabited whilst others have been reduced to rubble. The buildings, although inhabited, are in poor condition (**Figure 41**). Those living in the buildings were not at home during the time of the site inspection. According to a HIA report compiled in 2007 (eThembeni Cultural Heritage, 2007), at least three graves are associated with the buildings with the likelihood that more could be found. These graves were not visible during the site inspection due to the thick undergrowth.

The remains of several structures were found close to the intact structures (**Figure 42** and **Figure 43**) which included a round silo or reservoir. The area is overgrown with vegetation but apart from the intact structures and possibility of graves mentioned above, no other heritage sites were found.



Figure 41: Inhabited structure and associated buildings



Figure 42: Remains of a reservoir



Figure 43: Remains of structure beneath larger tree

A cattle dip was discovered in the northern section of Proposed Development Area 3. It is filled with rubble and vegetation. According to the 2007 HIA report (eThembeni Cultural Heritage, 2007), a grave is located near the cattle dip. During the 2007 site inspection, no grave was found. During the 2021 inspection, the immediate and larger surrounding area was inspected but the grave could not be found. The area around the cattle dip and in the eucalyptus tree plantation has been extensively disturbed by sand mining activities which may have led to the destruction of the grave.



Figure 44: Unused cattle dip



Figure 45: Area disturbed by sand mining

The ruins of two structures were found situated about 100m north-west of the trading store. These structures could be associated with the trading store and therefore likely to be over 60 years. Their use could not be established.



Figure 46: Remains of structure with trading store in background

During the 2007 HIA study (eThembeni Cultural Heritage, 2007), four archaeological sites were found which were made up of three cattle byres/enclosures and the outline of foundations of two rectangular and two circular dwellings where there is possibly an unmarked grave. An inspection of these sites was also undertaken for this Phase 1 HIA. The sites were inspected for graves but no evidence could be found which could be due to 'wear and tear' over the years.



Figure 47: Cattle enclosure



Figure 48: Outline of rectangular structure

Heritage sites located in Proposed Development Area 3 are listed below.

Table 3: Heritage sites in Proposed Development Area 3

Description	Coordinates	Significance	Mitigation
Remains of floor of structure (Figure 38)	29°42'19.4" S 30°37'31.3" E	Low heritage significance; protected by section 37 (1)(a).	Remains are > 60 years; they can be demolished once relevant permit has been received from the Institute
Remains of portion of wall of above structure / associated structure (Figure 37)	29°42'20.7" S 30°37'30.6" E		
Concrete circular floor associated with above structure/s (Figure 39)	29°42'20.9" S 30°37'31.3" E		
Remains of ±40m rectangular structure	29°42'21.1" S 30°37'32.4" E		
Farmhouse and other structures (Figure 40)	29°42'06.3" S 30°37'46.6" E	> 60 years, high heritage significance, the structures are occupied & graves associated with the structures	Structures & graves to be left <i>in situ</i> with a 30m buffer around the site; if the structures are to be demolished & graves removed, then the relevant permits will need to be obtained prior to such activity
Remains of structures that could be associated with above farmhouse (Figures 41-42)	29°42'05.4" S 30°37'45.5" E	Low heritage significance; protected by section 37 (1)(a).	Remains are > 60 years; they can be demolished once relevant permit has been received from the Institute
	29°42'05.0" S 30°37'45.3" E		
	29°42'08.0" S 30°37'44.4" E		
Remains of circular structure that could be a silo / reservoir associated with farmstead	29°42'05.6" S 30°37'45.3" E	> 60 years; low heritage significance	Remains are > 60 years; they can be demolished once relevant permit has been received from the Institute
Cattle dip (Figure 43)	29°41'11.5" S 30°37'47.3" E	Low heritage significance; protected by section 37 (1)(a).	> 60 years; can be altered or demolished once permit received from the Institute
Remains of trading store & associated structures	29°41'39.8" S 30°37'56.6" E	> 60 years; low-medium heritage significance due to its association with the area	Can be demolished once permit received from Amafa
Remains of low stone walling	Midpoint: 29°41'31.7" S 30°37'50.9" E	Potentially over 60 years; low heritage significance	Can be altered or demolished once relevant permit received from the Institute

Description	Coordinates	Significance	Mitigation
Remains of stone structure (Figure 45)	29°41'37.3" S 30°37'53.1" E	Low heritage significance; protected by section 37 (1)(a).	Remains are > 60 years; they can be demolished once relevant permit has been received from the Institute
Remains of stone structure	29°41'37.3" S 30°37'53.2" E		
Circular cattle byre, 8m diameter. Possible internal ancestral graves (Figure 46)	29°41'22.0" S 30°37'30.5" E	High heritage significance because of possible presence of graves; protected by sections 39(1)(b) and 40(1)	Leave site in-situ; if development is to take place, then buffer of 30m around site where no construction activity may take place
Rectangular sunken cattle byre	29°41'22.9" S 30°37'27.3" E	Low heritage significance; protected by section 40 (1)	Leave in-situ with a 15m buffer to avoid impacts; however, the site may be altered or demolished with relevant permit from the Institute
Circular stock byre, 3 – 4m in diameter	29°41'22.7" S 30°37'31.3" E	Low heritage significance; protected by section 40 (1)	Leave in-situ with a 15m buffer to avoid impacts; however, if necessary, the site may be altered or demolished with relevant permit from the Institute
Homestead foundation imprints of 2 rectangular & 2 circular dwellings. Former home of Gumede family with possible unmarked ancestral graves present (Figure 47)	29°41'26.1" S 30°37'18.0" E	High heritage significance because of possible presence of graves; protected by sections 39(1)(b) and 40(1)	Leave site in-situ; if development is to take place, then buffer of 30m around site where no construction activity may take place

The South African fossil sensitivity map (**Figure 48**) shows that Proposed Development Area 3 falls into zone of low fossil sensitivity zone (indicated with blue colour). An area of low fossil sensitivity does not require further studies but a protocol for chance fossil finds is required. The chance fossil find protocol can be found in Chapter 11 of this report.

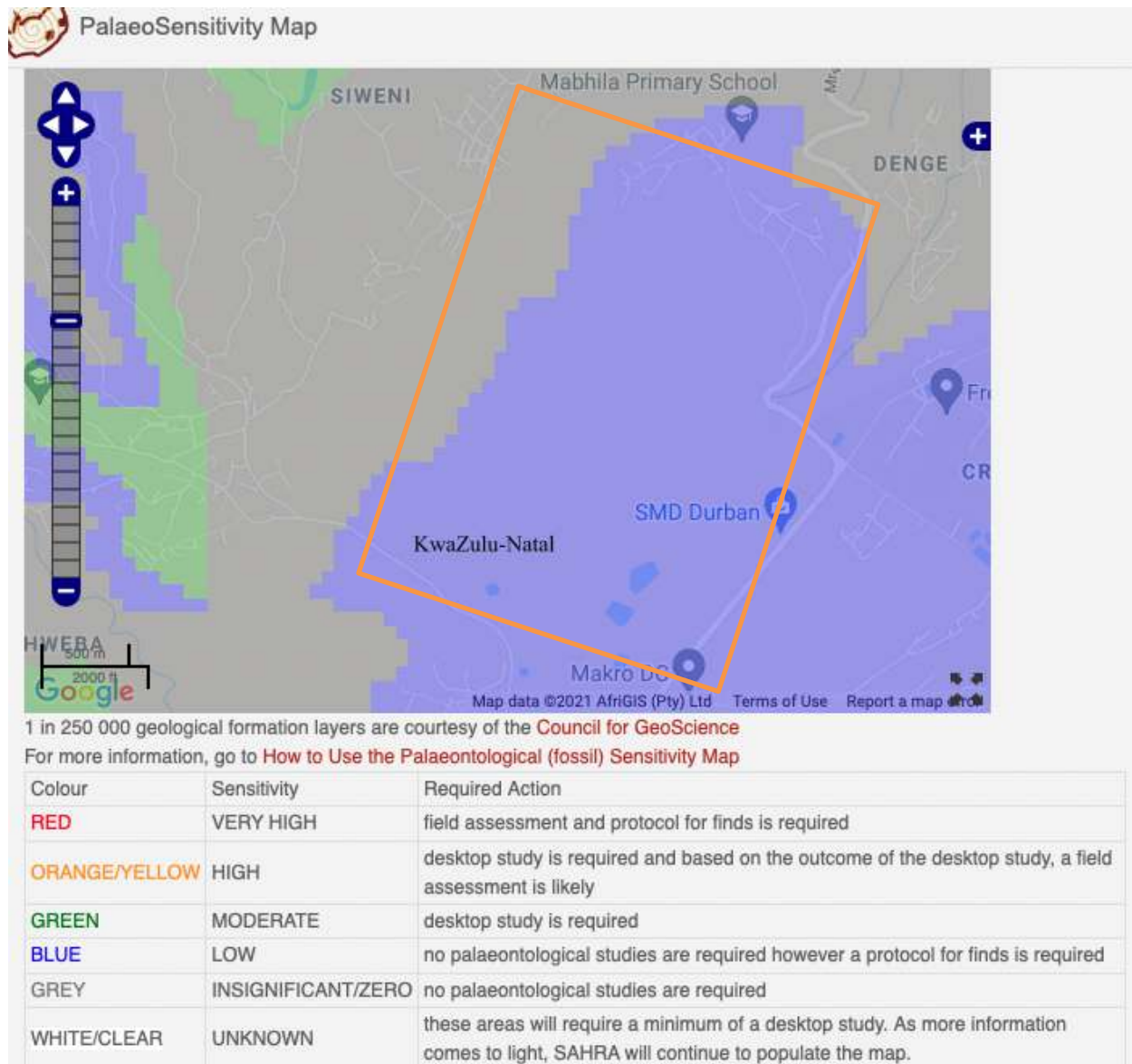


Figure 49: Fossil sensitivity of Proposed Development Area 3

9. ASSESSMENT OF IMPACTS ON HERITAGE RESOURCES

The impact assessment process ensures that all relevant factors are addressed that contribute to significance. For each predicted impact, criteria are applied to establish the significance of the impact based on likelihood and consequence, both without mitigation being applied (pre-mitigation) and with the implementation of the recommended mitigation measure(s) (post-mitigation). “Significant impact” means an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence (Zutari 2021:4).

The criteria that contribute to the **consequence** of the impact are:

- **Intensity** (the degree to which pre-development conditions are changed), which also includes the **type** of impact (being either a positive or negative impact); the **duration** (length of time that the impact will continue); and the **extent** (spatial scale) of the impact.
- The sensitivity of the receiving environment and/or sensitive receptors are incorporated into the consideration of consequence by appropriately adjusting the thresholds or scales of the intensity, duration and extent criteria based on expert knowledge.

The consequence is established using the formula: **consequence = type x (intensity + duration + extent)**. Depending on the numerical result, the impact's consequence would be extremely, highly, moderately or slightly detrimental; or neutral; or slightly, moderately, highly or extremely beneficial.

To determine the significance of an impact, the **probability** (or likelihood) of that impact occurring is also considered hence **significance = consequence x probability**.

Table 4: Definition of intensity ratings

Rating	Criteria	
	Negative (Type of impact = -1) impacts	Positive (Type of impact = +1) impacts
7	Complete destruction (irreversible and irreplaceable loss) of natural or social systems, resources (e.g. species) and human health. No chance of these processes or resources ever being restored to their pre-impact condition.	Noticeable, sustainable benefits that improve the quality and extent of natural or social systems or resources, including formal protection.
6	Very high degree of damage to natural or social systems or resources. These processes or resources may restore to their pre-project condition over very long periods of time (more than a typical human lifetime).	Great improvement to ecosystem or social processes and services or resources.
5	Serious damage to components of natural or social systems or resources and the contravention of legislated standards.	Ongoing and widespread benefits to natural or social systems or resources.
4	High degree damage to natural or social system components, species or resources.	Average to intense positive benefits for natural or social systems or resources.
3	Moderate damage to natural or social system components, species or resources.	Average, ongoing positive benefits for natural or social systems or resources.
2	Minor damage to natural or social system components, species or resources. Likely to recover over time. Ecosystems and valuable social processes are not affected.	Low positive impacts on natural or social systems or resources.
1	Negligible damage to individual components of natural or social systems or resources, such that it is hardly noticeable.	Limited low-level benefits to natural or social systems or resources.

Table 5: Definition of duration ratings

Rating	Criteria
7	Permanent: The impact will remain indefinitely.
6	Beyond project life: The impact will remain for some time after the life of the project.
5	Project life: The impact will cease after the operational life span of the project
4	Long-term: The impact will continue for 6-15 years.
3	Medium-term: The impact will continue for 2-5 years.
2	Short-term: The impact will continue for between 1 month and 2 years.
1	Immediate: The impact will continue for less than 1 month.

Table 6: Definition of extent ratings

Rating	Criteria
7	International: The effect will occur across international borders.
6	National: The impact will affect the entire country.
5	Province/ Region: The impact will affect the entire province or region
4	Municipal Area: The impact will affect the whole municipal area.
3	Local: The impact will extend across the study area and the LAP area.
2	Limited: The impact will be limited to the study area.
1	Very limited: The impact will be limited to the footprint of the development and will not extend to the boundaries of the study area.

Table 7: Definition of probability rating

Rating	Criteria
7	Certain/ Definite: There are sound scientific reasons to expect that the impact will definitely occur.
6	Almost certain/Highly probable: It is most likely that the impact will occur.
5	Likely: This impact has occurred numerous times here or elsewhere in a similar environment and with a similar type of development and could very conceivably occur.
4	Probable: This impact has occurred here or elsewhere in a similar environment and with a similar type of development and could conceivably occur.
3	Unlikely: This impact has not happened yet but could happen.
2	Rare/ improbable: The impact is conceivable, but only in extreme circumstances. The possibility of the impact manifesting is very low due to the design, experience or implementation of adequate mitigation measures.
1	Highly unlikely/None: The impact is expected never to happen or has a very low chance of occurring.

Table 8: Application of consequence rating

Range		Significance rating
-21	-18	Extremely detrimental
-17	-14	Highly detrimental
-13	-10	Moderately detrimental
-9	-6	Slightly detrimental
-5	5	Negligible
6	9	Slightly beneficial
10	13	Moderately beneficial
14	17	Highly beneficial
18	21	Extremely beneficial

Table 9: Application of significance rating

Range		Significance rating
-147	-109	Major - negative
-108	-73	Moderate - negative
-72	-36	Minor - negative
-35	-1	Negligible - negative
0	0	Neutral
1	35	Negligible - positive
36	72	Minor - positive
73	108	Moderate - positive
109	147	Major - positive

Table 10: Impact on protected structures – construction phase: Proposed Development Area 1

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Proposed Development Area	SIGNIFICANCE PRE-MITIGATION Results of application of impact assessment methodology							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Construction of proposed development, access roads, etc.</i>	<i>Destruction of protected structures</i>	Development Area 1: <i>Farmstead complex and intact silo/water tower</i>	-2	2	2	6	-12	Neg	72	Written application to the KZN Amafa & Research Institute for permit/s to destroy & remove remains of farmstead complex & silo with complete photographic record of structures to be destroyed Application approved & permits issued by the Institute	-2	2	2	5	-11	Neg	55

Table 11: Impact on protected structures – construction phase: Development Area 2

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 2: Farmstead complex 1	-2	2	1	6	-11	Neg	66	Written application to the KZN Amafa & Research Institute for permit/s to destroy & remove remains of farmstead complex with complete photographic record of remains Application approved & permit issued by the Institute	-1	2	1	6	-10	Neg	60
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 2: Farmstead complex 2	-1	2	2	6	-11	Neg	66	Written application to the KZN Amafa & Research Institute for permit/s to destroy & remove remains of farmstead complex with complete photographic record of structures to be destroyed Application approved & permit issued by the Institute	-1	2	1	6	-10	Neg	60
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 2: Remains of structures 1	-1	1	1	6	-9	Neg	54	Unclear if structures are protected. If > 60 years, then written application to be made to the Institute for permit/s to destroy & remove remains of structures with complete photographic record of remains Application approved & permit issued by the Institute	-1	1	1	6	-9	Neg	54

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 2: Remains of structures 2	-2	2	2	6	-12	Neg	72	Written application to be made to the Institute for permit/s to destroy & remove remains of structures with complete photographic record of structures to be destroyed Application approved & permit issued by the Institute	-1	2	2	6	-11	Neg	66
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 2: Remains of structures 3	-2	2	2	5	-11	Neg	55	Age of structures to be determined; if > 60 years, then written application to be made to the Institute for permit/s to destroy & remove remains of structures with complete photographic record of structures and remains of structures Application approved & permit issued by the Institute	-1	2	2	5	-10	Neg	50

Table 12: Impact on protected structures – construction phase: Development Area 3

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 3: Intact structures farmstead 2	-5	6	3	4	-18	Neg	72	Although structures are in poor condition, they are inhabited hence it recommended that the structures are not destroyed. 50m buffer to be placed around site If it is decided to demolish intact structures, then written application must be made to the Institute for permit/s to destroy structures with complete photographic record of intact structures Application approved & permit issued by the Institute	-3	5	3	4	-15	Neg	60
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 3: Remains of structures associated with farmstead 2	-2	2	2	6	-12	Neg	72	Written application to be made to the Institute for permit/s to destroy & remove remains of structures with complete photographic record of structures and remains of structures Application approved & permit issued by the Institute	-1	2	2	6	-11	Neg	66

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 3: Remains of trading store & associated structures	-2	2	2	6	-12	Neg	72	Written application to be made to the Institute for permit/s to destroy & remove remains of structures with complete photographic record of remains of trading store structures Application approved & permit issued by the Institute	-2	2	2	6	-12	Neg	72
Construction of proposed development, access roads, etc.	Destruction of protected structures	Development Area 3: Cattle dip	-3	2	3	4	-12	Neg	72	Written application to be made to the Institute for permit/s to destroy cattle dip with complete photographic record of cattle dip Application approved & permit issued by the Institute	-2	2	3	4	-11	Neg	66

Table 13: Assessment of impacts on graves – construction phase – Development Area 2

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc	Destruction of graves	Development Area 2: 5 graves on eastern boundary	-5	6	3	4	-18	Neg	72	Graves are left <i>in situ</i> ; The eastern boundary is designated a 'no-go' area for development in which no activities may take place If graves are damaged by chance, all construction activities must stop within 10 of the damaged grave/s; The Institute must be informed and a heritage specialist called to site to provide recommendations and the way forward; Permits for the repair or demolition of damaged graves must be obtained prior to any work being undertaken	-1	5	3	3	-12	Neg	36

Table 14: Assessment of impacts on graves – construction phase – Development Area 3

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc.	Destruction of graves	Development Area 3: Graves associated with farmstead 2	-5	6	3	5	-19	Neg	95	Graves are left <i>in situ</i> ; A 50m buffer is placed around the intact farmhouses to include the graves in which no development may take place; If graves are damaged, all construction activities within 10m of the damaged grave/s must stop; The Institute must be informed and a heritage specialist called to site to provide recommendations and the way forward; Permits for the repair or demolition of damaged graves must be obtained prior to any work being undertaken	-1	2	1	6	-10	Neg	60

Table 15: Assessment of impacts: archaeological sites – construction phase – Development Area 3

CONSTRUCTION PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION						SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION							
			Results of application of impact assessment methodology							Results of application of impact assessment methodology							
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)		Significance	Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Construction of proposed development, access roads, etc.	Alteration or destruction of archaeological sites & associated graves	Development Area 3: Four archaeological sites; two with possible graves	-5	5	3	6	-19	Neg	114	Archaeological sites are left <i>in situ</i> ; The two sites with possible graves must have a buffer of at least 50m placed around them to avoid any damage to the sites and graves The two archaeological sites 'without' graves should have a 15m buffer These two sites can be demolished if necessary but only once an application has been made to the Institute and the necessary permits issued; If archaeological site/s are damaged, then activities within 10m of the site/s must cease & the Institute informed; A heritage specialist must be appointed to inspect the damage & recommend the way forward; If site/s are to be repaired/altered or destroyed, the necessary permits must be obtained from the Institute prior to any action been taken	-3	5	3	3	-14	Neg	42

Table 16: Assessment of impacts: protected structures – operational phase – Development Area 3

OPERATIONAL PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION Results of application of impact assessment methodology							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
			<i>Operations of development, use of access roads, deliveries, etc</i>	<i>Destruction of protected structures</i>	Development Area 3: <i>Intact structures farmstead 2</i>	-5	5	3	3		-16	Neg	48	Buffer of 50m must be kept in place around the site throughout operational phase; Buffer must be of visible and sturdy; No operational activities may take place within buffer; If the structures are damaged, all operations must cease within 10 of the damaged structures; The Institute must be informed and a heritage specialist called to site to provide recommendations and the way forward; Necessary permits for the repair or demolition of the damaged structure/s must be obtained prior to any work being undertaken	-3	5	3

Table 17: Assessment of impacts: graves – operational phase – Development Area 2

OPERATIONAL PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION						SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION							
			Results of application of impact assessment methodology							Results of application of impact assessment methodology							
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)		Significance	Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Operational activities of development, use of access roads, deliveries, etc</i>	<i>Destruction of graves</i>	Development Area 2: <i>5 graves on eastern boundary</i>	-5	5	3	4	-17	Neg	68	The 'no-go' area recommended must be respected and enforced at all times; If graves are damaged, operations within 10m of the grave/s must cease & the Institute informed A heritage specialist must be appointed to inspect the damage & provide guidance on the way forward; Relevant permits must be obtained from the Institute prior to any work been done	-2	5	3	3	-13	Neg	39

Table 18: Assessment of impacts: graves – operational phase – Development Area 3

OPERATIONAL PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Operational activities of development, use of access roads, deliveries, etc</i>	<i>Destruction of graves</i>	<i>Development Area 3: Graves associated with farmstead 2</i>	-5	5	3	4	-17	Neg	68	A 50m buffer around the farmhouses and graves must be kept in place throughout operations; If graves are damaged, operations within 10m of the grave/s must cease & the Institute informed; A heritage specialist must be appointed to inspect the damage & provide guidance on the way forward; Permits must be obtained from the Institute prior to any work been done	-2	5	3	3	-13	Neg	39

Table 19: Assessment of impacts: archaeological sites – operational phase – Development Area 3

OPERATIONAL PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION						SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION							
			Results of application of impact assessment methodology							Results of application of impact assessment methodology							
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)		Significance	Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Operational activities of development, use of access roads, deliveries, etc</i>	<i>Damage to or destruction of archaeological sites & associated graves</i>	Development Area 3: <i>Four archaeological sites; two with possible graves</i>	-5	5	3	4	-17	Neg	68	The recommended buffers must be kept in place throughout the operational phase & no operational activities may take place within buffers Buffer material must be visible & made from sturdy material; If archaeological site/s are damaged, then operations within 10m of the site/s must cease & the Institute informed; A heritage specialist must be appointed to inspect the damage & recommend the way forward; If site/s are to be repaired/alterd or destroyed, the necessary permits must be obtained from the Institute prior to any action been taken	-3	5	3	3	-14	Neg	42

Table 20: Assessment of impacts: protected structures – decommissioning phase – Development Area 3

DECOMMISSIONING PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Ceasing of all operational activities; removal of machinery, structures, etc., using access roads</i>	<i>Destruction of protected structures</i>	Development Area 3: <i>Intact structures farmstead 2</i>	-4	2	3	3	-12	Neg	36	Buffer of 50m must be kept in place around the site throughout decommissioning phase; No decommissioning activities may take place within buffer; If the structures are damaged during this phase, all activities must cease within 10 of the damaged structures; The Institute must be informed and a heritage specialist called to site to provide recommendations and the way forward; Necessary permits for the repair or demolition of damaged structure/s must be obtained prior to any work taking place	-2	2	3	3	-10	Neg	30

Table 21: Assessment of impacts: graves – decommissioning phase – Development Area 2

DECOMMISSIONING PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION Results of application of impact assessment methodology							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/neg)	Significance
			<i>Ceasing of all operational activities; removal of machinery, structures, etc., using access roads</i>	<i>Damage or destruction of graves</i>	Development Area 2: <i>5 graves on eastern boundary</i>	-5	2	3	3		-13	Neg	39	The 'no-go' area must be respected and enforced even during this phase; If graves are damaged, all activities within 10m of the grave/s must cease & the Institute informed A heritage specialist must be appointed to inspect the damage & provide guidance on the way forward; Relevant permits must be obtained from the Institute prior to any work been done	-2	2	3

Table 22: Assessment of impacts: graves – decommissioning phase – Development Area 3

DECOMMISSIONING PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Ceasing of all operational activities; removal of machinery, structures, etc., using access roads</i>	<i>Damage or destruction of graves</i>	Development Area 3: <i>Graves associated with farmstead 2</i>	-5	2	3	3	-13	Neg	39	The 50m buffer around the farmhouses and graves must be kept in place throughout this phase; If graves are damaged, activities within 10m of the grave/s must cease & the Institute informed; A heritage specialist must be appointed to inspect the damage & provide guidance on the way forward; Permits must be obtained from the Institute prior to any work been done	-2	2	3	3	-10	Neg	30

Table 23: Assessment of impacts: archaeological sites – decommissioning phase -Development Area 3

DECOMMISSIONING PHASE																	
ACTIVITY Description of proposed land use/ activity/ aspect	POTENTIAL ENVIRONMENTAL IMPACT Summary description of impact	APPLICABLE AREA Development Areas	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES Outline of recommended mitigation measures	SIGNIFICANCE POST-MITIGATION						
			Results of application of impact assessment methodology								Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
<i>Ceasing of all operational activities; removal of machinery, structures, etc., using access roads</i>	<i>Damage to or destruction of archaeological sites & associated graves</i>	Development Area 3: <i>Four archaeological sites; two with possible graves</i>	-5	2	2	4	-13	Neg	52	The recommended buffer must be kept in place during the phase & no activities may take place within buffers; If archaeological site/s are damaged, then operations within 10m of the site/s must cease & the Institute informed; A heritage specialist must be appointed to inspect the damage & recommend the way forward; If site/s are to be repaired/altered or destroyed, the necessary permits must be obtained from the Institute prior to any action been taken	-3	2	2	3	-10	Neg	30

10. DISCUSSION AND RECOMMENDATIONS

Development Area 1

The area is disturbed by a large quarry, some sand mining activities and previous farming activity. The remains of the structures that comprised a farmstead complex that include an intact silo / water tower, were built between 1937 and 1968, hence they could be older than 60 years and therefore protected by section 37 (1)(a) of the KwaZulu-Natal Amafa and Research Institute Act, 2018. Such structures cannot be altered, demolished or added to without prior written approval of the Institute having been obtained on written application to the Institute.

It is therefore recommended that either a built heritage specialist be consulted regarding the age of the remains of the structures and the silo or that an application is made to the Institute for permission to demolish and remove the structures on the presumption that the remains of the structures are older than 60 years. The application process for the demolition, alteration or addition to a structure which is, or which may reasonably be expected to be older than 60 years must follow the process as described in section 3 of the draft KwaZulu-Natal & Research Institute Regulations, 2021 or section 2 of the KwaZulu-Natal Heritage Regulations 2012 if the 2021 regulations have not been officially promulgated by the time an application is made.

An assessment of impacts on the structures and remains of structures indicated that the impact would be of minor negative significance. The mitigation measures provided in the tables above and in Chapter 11 below must be implemented where necessary and adhered to.

Development Area 2

Several heritage sites are present in this area. There are several sites with the remains of the farmstead complexes as well as graves. Several of the remains of structures are older than 60 years hence protected by section 37 (1)(a) of the KwaZulu-Natal Amafa and Research Institute Act, 2018. The age of several other structures was more difficult to ascertain.

An application must be made to the Institute for the for the alteration or demolition of structures older than 60 years if this area is to be impacted. In terms of the structures where the age could not be clearly determined, it is recommended that either a built heritage specialist be

consulted regarding the age of the remains of the structures or that an application is made to the Institute for permission to demolish and remove the structures on the presumption that the remains are older than 60 years. The application process for the demolition, alteration or addition to a structure which is, or which may reasonably be expected to be older than 60 years must follow the process as described in section 3 of the draft KwaZulu-Natal & Research Institute Regulations, 2021 or section 2 of the KwaZulu-Natal Heritage Regulations 2012 if the 2021 regulations have not been officially promulgated by the time an application is made.

The assessment of significance of impacts on the structures and remains of structures indicated largely that the impact significance before and after mitigation would be a minor negative rating. The probability that most or all of the structures will be destroyed (once permission is received from the Institute) contributed to the high consequence ratings (between highly and extremely detrimental) which dropped to a moderately detrimental rating post-mitigation.

There are several grave sites in Development Area 2. Graves are protected by section 39 (1) of the KwaZulu-Natal Amafa and Research Institute Act, which states that graves or burial grounds older than 60 years or deemed to be of heritage significance by a heritage authority- (a) not otherwise protected by the above Act and (b) not located in a formal cemetery managed or administered by a local authority, may not be damaged, altered, exhumed, inundated, removed from its original position, or otherwise disturbed without the prior written approval of the Institute having been obtained on written application to the Institute.

It is recommended that because graves are highly significant to people and there are many traditional, cultural and personal sensitivities concerning the relocation of graves, the removal of graves is not advised. If it is decided to remove any of the graves identified, then the procedure provided in section 5 of the draft KwaZulu-Natal & Research Institute Regulations, 2021 must be followed or the process in section 4 of the KwaZulu-Natal Heritage Regulations 2012 if the 2021 regulations have not been officially promulgated by the time an application is made. The grave sites and recommended buffers around them as described in this report have been excluded from the development footprint. Prior to construction and during construction, if there are any chance finds of graves, then work will need to stop in the area of the find and a heritage specialist called to site to ascertain the way forward.

The assessment of significance of impacts on graves indicated that, pre-mitigation, the consequence of impacts would be extremely detrimental which dropped to a rating of moderately detrimental post-mitigation which included the recommendation that the graves be left *in-situ*. The significance rating pre-mitigation was on the boundary between minor negative and moderately negative rating; post-mitigation, this rating was well within the minor negative rating category.

The mitigation measures provided in the tables above and in Chapter 11 below must be implemented where necessary and adhered to.

Development Area 3

Several heritage sites were found including archaeological sites, graves and protected structures. Structures and the remains thereof that are older than 60 years are protected by section 37 (1)(a) of the KwaZulu-Natal Amafa and Research Institute Act. An application must be made to the Institute for the alteration or demolition such structures according to the process as described in section 3 of the draft KwaZulu-Natal & Research Institute Regulations, 2021 or section 2 of the KwaZulu-Natal Heritage Regulations 2012 if the 2021 regulations have not been officially promulgated by the time an application is made.

There is one farmstead complex (farmstead 2) which has intact structures. The assessment of impacts indicated that the consequence of impacts pre-mitigation would be extremely detrimental and post-mitigation would be highly detrimental because the structures are inhabited and there are graves associated with structures. The significance rating, post-mitigation, is a minor negative rating due to the mitigation measures recommended.

Graves are protected by section 39 (1) of the KwaZulu-Natal Amafa and Research Institute Act. It is strongly recommended that graves are not moved due to the high significance allocated to graves and the sensitivities around the relocation of graves. However, if it is decided to relocate any graves in Development Area 3, then the procedure described in section 5 of the draft KwaZulu-Natal & Research Institute Regulations, 2021 must be followed or the process in section 4 of the KwaZulu-Natal Heritage Regulations 2012 if the 2021 regulations have not been officially promulgated by the time an application is made. The grave sites and recommended buffers around them as described in this report have been excluded from the development footprint. Prior to construction and during construction, if there are any

chance finds of graves, then work will need to stop in the area of the find and a heritage specialist called to site to ascertain the way forward.

The assessment of significance of impacts on the graves in this area indicated that, pre-mitigation, the consequence of impacts would be extremely detrimental which dropped to a rating of moderately detrimental post-mitigation which included the recommendation that the graves be left *in-situ*. The significance rating pre-mitigation was moderate negative; with mitigation measures, this rating fell to a minor negative rating.

Archaeological sites are protected by section 40 of the same Act. Section 40 states that no person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without prior written approval of the Institute. If archaeological sites are to be excavated, altered or destroyed, then application must be made to the Institute in terms of the procedure provided in section 6 of the draft KwaZulu-Natal & Research Institute Regulations, 2021 or in terms of the process in section 5 of the KwaZulu-Natal Heritage Regulations 2012 if the 2021 regulations have not been officially promulgated by the time an application is made.

The assessment of significance of impacts on archaeological sites indicated that in terms of consequence, pre-mitigation, impacts would be extremely detrimental with a major negative significance rating. With mitigation measures, the consequence drops to highly detrimental due to graves been present but the significance rating falls to a minor negative rating.

The mitigation measures provided in the tables above and in Chapter 11 below must be implemented where necessary and adhered to.

11. MITIGATION MEASURES

- On Proposed Development Areas 1 and 3, the presence of grave sites requires further verification.
- For any chance heritage finds, all work must cease in the area affected (within at least 10m) and the Applicant / Contractor must be immediately informed.
- A registered heritage specialist must be called to site to inspect the finding/s. The relevant heritage resource agency (the Institute) must be informed about the finding/s.

- The heritage specialist will assess the significance of the resource and provide guidance on the way forward.
- Permits must be obtained from the Institute if heritage resources are to be removed, destroyed or altered.
- Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist.
- Should any human remains be found, the South African Police Service as well as the Institute must be contacted. No SAPS official may remove remains (recent or not) until the correct permit/s have been obtained.
- The following steps / protocol should be implemented in terms of chance fossil finds:
 - When construction activities begin, any rocks disturbed during this process must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, and coal) should be put aside in a suitably protected place.
 - Photographs of possible fossil plants must be provided to the Developer to assist in recognizing the fossil plants. This information should be built into the Environmental Management Programme's (EMPr) training and awareness plan and procedures.
 - Photographs of putative fossils should be sent to a palaeontologist for preliminary assessment.
 - If there is any possible fossil material found by the environmental officer / developer, then a qualified palaeontologist must be sub-contracted in order for them to visit the site to inspect the selected material and check the dumps where feasible.
 - Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site, permit must be obtained from the Institute. Annual reports must be submitted to the Institute as required by the relevant permits.

12. REFERENCES

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