



ARCHAEOLOGICAL DESKTOP STUDY

**for the Proposed National Treasure Minerals Prospecting
Right Application on Several Portions of the Farms Elandsfontein 102 JQ
and Boschhoek 103 JQ, Rustenburg, North West**

For:

Eco Elementum Environmental (Pty) Ltd

Project Ref:

NTM 13389PR

Date:

21/06/2022

**Archaeological Desktop Study for the Proposed National Treasure Minerals Prospecting
Right Application on Several Portions of the Farms Elandsfontein 102 JQ and Boschhoek 103 JQ, Rustenburg,
North West**

Project Ref: NTM 13389PR
 Report No: EE_2106221
 Report Version: 1

I, Tobias Coetzee, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed NTM Prospecting 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, 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.

Author	Qualification	Email	Date	Signature
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Executive Summary

Agri Civils Geo-Tech & Heritage was appointed by Eco Elementum Environmental (Pty) Ltd to undertake an Archaeological Desktop study for National Treasure Minerals (Pty) Ltd on the listed Farm Portions (**Table 1**) within the Rustenburg Local Municipality in the North West Province. The study area is located roughly 27 km northwest of Rustenburg, 50 km east-northeast of Swartruggens and 50 km northeast Koster. The aim of this report is to contextualise the general study area in terms of heritage resources and will provide the developers with general information regarding potentially sensitive areas. This will also shed light on what is to be expected during a Phase 1 Archaeological Impact Assessment (AIA) and aid in interpreting finds.

Elandsfontein 102 JQ

Two potentially historic sites (B02 & B03) appear to be intact on Portions 13 and 18, while three demolished sites are associated with Portions 4, 7 and 13 (Sites B01, B04, B05). Although surface remains are no longer visible on contemporary satellite imagery, subsurface culturally significant material might still be present. The areas associated with the identified sites should therefore be avoided by the proposed prospecting.

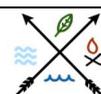
Boschhoek 103 JQ

One potentially historic intact building (Site B08) is located on Portion 85, while one area on Portion 70 (Site B07) is associated with a demolished building that dated to historical times. Subsurface culturally significant material, however, might still exist at site B07. Because the status of the structure associated with Site B10 is unknown, it is recommended that this area, as well as the areas associated with Sites B07 and B08, be avoided by the proposed prospecting. The two remaining sites (B06 & B09) on Portion 103 appear to have been demolished since both areas are currently associated with modern infrastructure.

General

The 500 m water source buffer is considered to be potentially sensitive from a heritage perspective and care should be exercised when prospecting within this area, while areas previously/currently associated with cultivated fields are considered to be disturbed and are less sensitive from a heritage perspective. Although the previously/currently cultivated areas that intersect the 500 m buffer are considered to be disturbed, the potential for subsurface cultural material is slightly higher compared to areas falling outside of the buffer zone and care should therefore also be exercised when prospecting in such areas. The least sensitive areas are therefore areas that are located more than 500 m from a water source, are not located on or near hills, fall within previously/currently cultivated fields and are not located within close proximity of potential heritage sites or contemporary infrastructure. These areas are therefore considered to be more favourable for prospecting activities.

Apart from the identified potential sites, open and undisturbed areas falling outside of the previously/currently cultivated areas, near or on hills and within 500 m of a water source are considered to be the most sensitive, especially due the presence of LIA and Historic sites in the general area. Care should therefore be exercised when prospecting in these



areas. The possibility also exists that culturally sensitive sites, such as burial sites, might have been created after some cultivated fields fell into disuse, meaning that burial sites might be located in disturbed areas as well. Therefore, should uncertainty regarding heritage remains exist, it is advised that a qualified archaeologist be contacted prior to any impact.

A full Phase 1 AIA (Archaeological Impact Assessment) must be done should any development that triggers an AIA result from the prospecting project, including if the cumulative impact of the proposed prospecting exceeds 0.5 ha.



List of Abbreviations

AIA – Archaeological Impact Assessment

CRM – Cultural Resource Management

DMR – Department of Mineral Resources

EIA – Environmental Impact Assessment

ESA – Early Stone Age

ha – Hectare

HIA – Heritage Impact Assessment

km – Kilometre

LIA – Late Iron Age

LSA – Later Stone Age

m – Metre

MASL – Metres Above Sea Level

MEC – Member of the Executive Council

MSA – Middle Stone Age

NHRA – National Heritage Resources Act

NTM – National Treasure Minerals

RBPM – Royal Bafokeng Platinum Mine

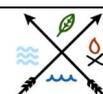
SAHRA – South African Heritage Resources Agency

TSF – Tailings Storage Facility



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1. Project Background

1.1 Introduction

Eco Elementum Environmental (Pty) Ltd appointed Agri Civils Geo-Tech & Heritage to undertake an Archaeological Desktop Study for the proposed National Treasure Minerals (Pty) Ltd prospecting right application on several land parcels intersecting the Farms Elandsfontein 102 JQ and Boschhoek 103 JQ within the Rustenburg Local Municipality in the North West Province. The affected farm portions are listed in **Table 1**. The study area is located roughly 27 km northwest of Rustenburg, 50 km east-northeast of Swartruggens and 50 km northeast Koster (**Figure 1**). The purpose of this study is to contextualise the demarcated study area in order to determine the scope of heritage resources that might be encountered during the prospecting phase and subsequent heritage studies, as well as to provide recommendations for the safeguarding of archaeological resources during prospecting. The aim of this report is to provide the developer with information regarding heritage resources in the vicinity of the study area based on results from previous studies, written historical information and historical topographical maps and aerial photographs.

In the following report, a broad overview of the proposed prospecting is provided and the study area is contextualised in terms of heritage resources. The prospecting application is for chrome ore, copper ore, gold ore, manganese ore, platinum group metals, silver ore and vanadium ore. The legislation section included serves as a guide towards the effective identification and protection of heritage resources and will apply to any such material unearthed during the prospecting phase.



1.2 Legislation

The South African Heritage Resources Agency (SAHRA) aims to conserve and control the management, research, alteration and destruction of cultural resources of South Africa and to prosecute if necessary. It is therefore crucially important to adhere to heritage resource legislation contained in the Government Gazette of the Republic of South Africa (Act No.25 of 1999), as many heritage sites are threatened daily by development. Conservation legislation requires an impact assessment report to be submitted for development authorisation that must include an AIA if triggered.

Archaeological Impact Assessments (AIAs) should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources that might occur in areas of development and (b) make recommendations for protection or mitigation of the impact of the sites.

1.2.1 The EIA (Environmental Impact Assessment) and AIA processes

Phase 1 Archaeological Impact Assessments generally involve the identification of sites during a field survey with assessment of their significance, the possible impact that the development might have, and relevant recommendations.

All Archaeological Impact Assessment reports should include:

- a. Location of the sites that are found;
- b. Short descriptions of the characteristics of each site;
- c. Short assessments of how important each site is, indicating which should be conserved and which mitigated;
- d. Assessments of the potential impact of the development on the site(s);
- e. In some cases a shovel test, to establish the extent of a site, or collection of material, to identify the associations of the site, may be necessary (a pre-arranged SAHRA permit is required); and
- f. Recommendations for conservation or mitigation.

This AIA report is intended to inform the client about the legislative protection of heritage resources and their significance and make appropriate recommendations. It is essential to also provide the heritage authority with sufficient information about the sites to enable the authority to assess with confidence:

- a. Whether or not it has objections to a development;
- b. What the conditions are upon which such development might proceed;
- c. Which sites require permits for mitigation or destruction;



- d. Which sites require mitigation and what this should comprise;
- e. Whether sites must be conserved and what alternatives can be proposed to relocate the development in such a way as to conserve other sites; and
- f. What measures should or could be put in place to protect the sites which should be conserved.

When a Phase 1 AIA is part of an EIA, wider issues such as public consultation and assessment of the spatial and visual impacts of the development may be undertaken as part of the general study and may not be required from the archaeologist. If, however, the Phase 1 project forms a major component of an AIA it will be necessary to ensure that the study addresses such issues and complies with Section 38 of the National Heritage Resources Act.

1.2.2 Legislation regarding archaeology and heritage sites

National Heritage Resource Act No.25 of April 1999

Buildings are among 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 Farming Community settlements. 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;
- books, records, documents, photographic positives and negatives, graphic material, film or video 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), or in a provincial law pertaining to records or archives;
- 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 issued 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 authority:

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

On the development of any area the gazette states that:

“...any person who intends to undertake a development categorised as:

- (a) the construction of a road, wall, power line, 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 5000m² 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 10000m² 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.” (38. [1] 1999:62-64)

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:

- (a) The identification and mapping of all heritage resources in the area affected;
- (b) 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;
- (c) an assessment of the impact of the development on such heritage resources;
- (d) 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;
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.” (38. [3] 1999:64)



The Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) protects graves younger than 60 years. These 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. Graves 60 years or older fall under the jurisdiction of the National Heritage Resources Act as well as the Human Tissues Act, 1983.

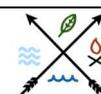
2. Study Area and Project Description

2.1 Location & Physical Environment

The National Treasure Minerals (Pty) Ltd project is situated on the following land parcels (**Table 1, Figures 2 & 3**):

Table 1: Land parcels & coordinates.

Parent Farm	Farm Portion	Map Reference (1:50 000)	Lat (y)	Lon (x)	Total Extent (ha)
Elandsfontein 102 JQ	4	2527 AC	-25.456089	27.095829	± 35.7
Elandsfontein 102 JQ	5	2527 AC	-25.456696	27.091044	± 35.6
Elandsfontein 102 JQ	RE/6	2527 AC	-25.459897	27.078073	± 56.8
Elandsfontein 102 JQ	7	2527 AC	-25.462417	27.074045	± 71.2
Elandsfontein 102 JQ	8	2527 AC	-25.464194	27.070555	± 34.2
Elandsfontein 102 JQ	13	2527 AC	-25.450442	27.090634	± 8.5
Elandsfontein 102 JQ	RE/15	2527 AC	-25.453065	27.073643	± 99.0
Elandsfontein 102 JQ	17	2527 AC	-25.451842	27.094787	± 22.0
Elandsfontein 102 JQ	18	2527 AC	-25.448260	27.088809	± 22.3
Elandsfontein 102 JQ	20	2527 AC	-25.458225	27.081070	± 37.5
Elandsfontein 102 JQ	RE/21	2527 AC	-25.456622	27.083481	± 36.9
Elandsfontein 102 JQ	RE/22	2527 AC	-25.458009	27.086090	± 25.7
Elandsfontein 102 JQ	23	2527 AC	-25.457091	27.088291	± 22.7
Elandsfontein 102 JQ	25	2527 AC	-25.452334	27.085942	± 8.6
Elandsfontein 102 JQ	35	2527 AC	-25.463455	27.083695	± 2.0
Boschhoek 103 JQ	70/103	2527 AC	-25.463473	27.102733	± 30.7
Boschhoek 103 JQ	85/103	2527 AC	-25.466340	27.100188	± 30.5
Boschhoek 103 JQ	103/103	2527 AC	-25.460342	27.096765	± 51.8
Total					± 631.6



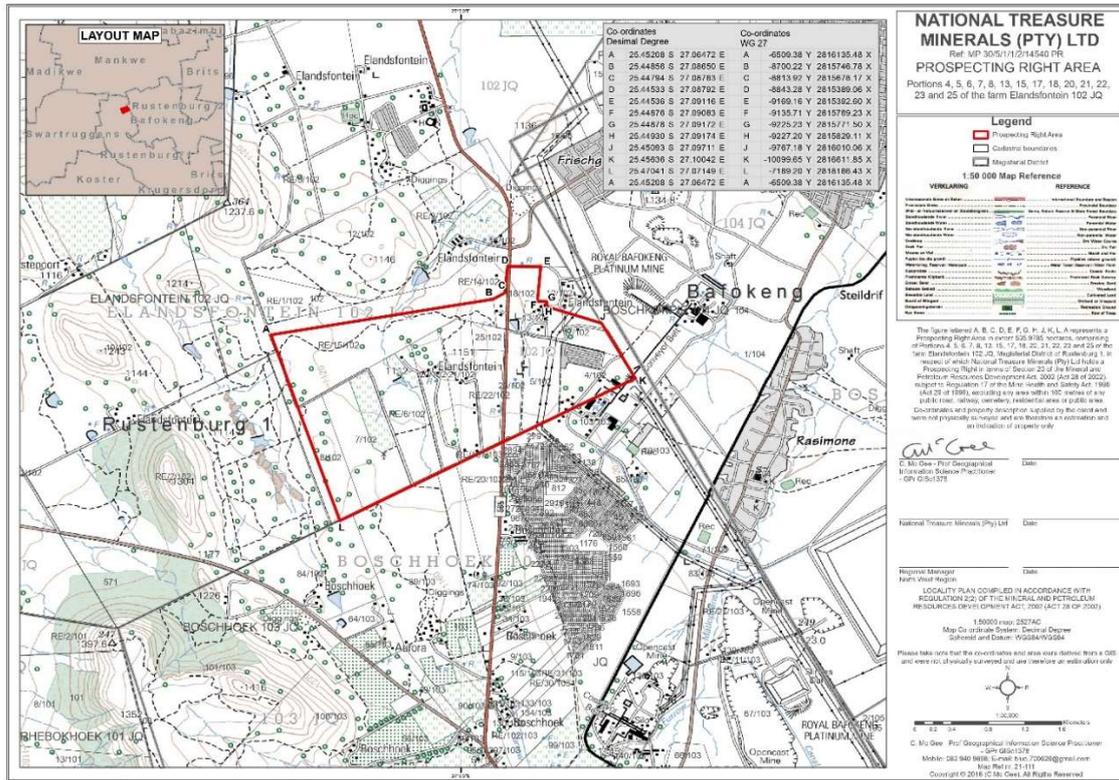


Figure 2: Proposed Elandsfontein section (Provided by Eco Elementum Environmental 2022).

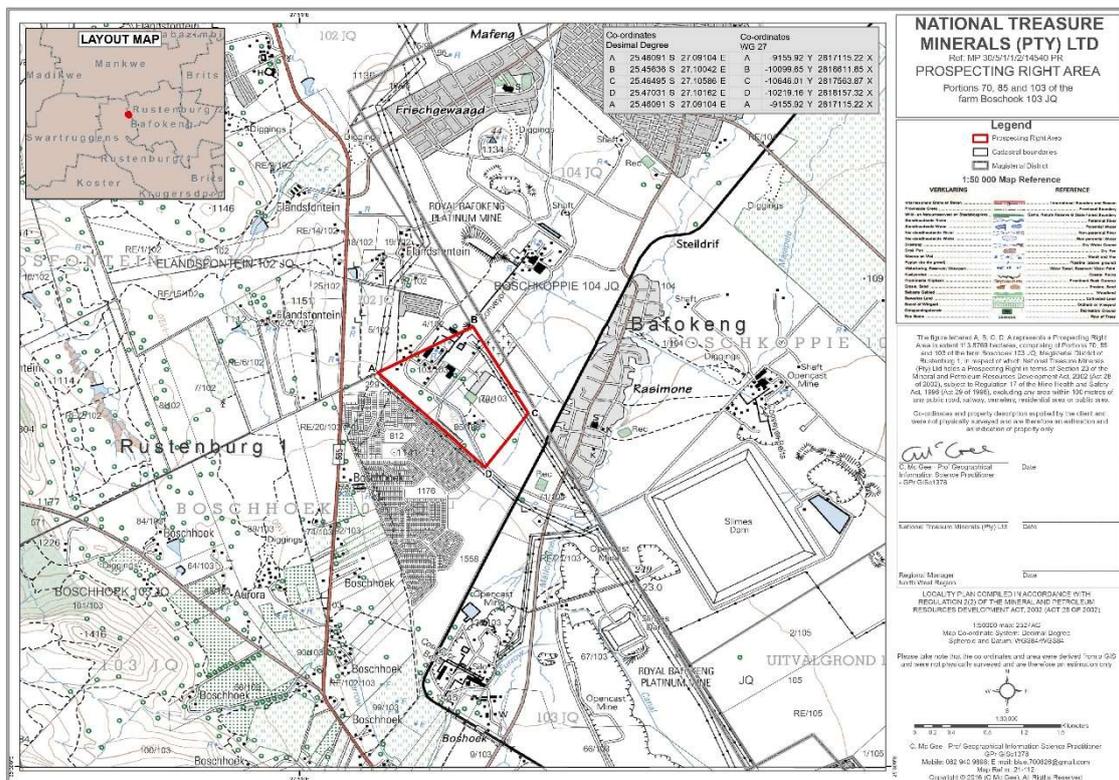


Figure 3: Proposed Boschhoek section (Provided by Eco Elementum Environmental 2022).



Rustenburg is located about 27 km southeast of the proposed prospecting area, while Swartuggens is located 50 km to the west-southwest and Koster 50 km to the southwest. The study area falls within the Rustenburg Local Municipality and the Bojanala District Municipality in the North West Province. The R565 secondary road runs north-south and intersects Portions 18 and 23 of the Farm Elandsfontein 102 JQ.

In terms of vegetation, the study area falls within the Savanna Biome and Central Bushveld Bioregion. On a local scale, Gold Reef Mountain Bushveld covers the majority of the study area, while Zeerust Thornveld covers the eastern section of the study area (Mucina & Rutherford 2006).

Zeerust Thornveld has a conservation status of least threatened with a conservation target of 19%. Less than 4% is conserved in statutory and is spread between four reserves, including the Pienaar and Marico Bushveld Reserves. Zeerust Thornveld stretches from the flats near the Lobatsi River in the west, via Zeerust, Groot Marico and Mabaalstad to the flats between Pilanesberg and the western end of the Magaliesberg. About 16% of this vegetation unit has been transformed by cultivation and urban built-up. Although no serious alien invasive plant species are reported, species such as *Cereus jamacaru* occur in scattered areas. Erosion associated with this vegetation unit vary between low and very low (Mucina & Rutherford 2006).

Gold Reef Mountain Bushveld is distributed between the North West, Gauteng, Mpumalanga and Free State Provinces. This vegetation unit is associated with the rocky quartzite ridges of the Magaliesberg, as well as the parallel ridge to the south from Koster in the west to Bronkhorstspuit in the east. The vegetation unit also includes the west-east ridge of the Witwatersrand from Krugersdorp to Bedfordview. Inner ridges of the Vredefort Dome and part of the Suikerbosrand are included as well. Gold Reef Mountain Bushveld is considered to be least threatened with a conservation target of 24%. About 22% is statutorily conserved in the Magaliesberg Nature Reserve and other nature reserves such as Rustenburg, Wonderboom and Suikerbosrand. Roughly 15% has been transformed by cultivation and urban built-up areas. Some alien vegetation species occur along drainage lines and erosion is considered to vary between low and very low (Mucina & Rutherford 2006).

The average elevation for Zeerust Thornveld varies between 1000 and 1250 MASL (metres above sea level), while the average elevation for Gold Reef Mountain Bushveld varies between 1200 and 1750 MASL (Mucina & Rutherford 2006). The average elevation for the study area is roughly 1116 MASL and slopes from the higher western section to the lower eastern section.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 602 mm per year. The average maximum temperature for the study area is recorded during January when an average of 23 °C is reached. The average minimum temperature is recorded during July when an average of 12 °C is reached (Climate-data.org 07/06/2021).



The study area falls within the A22F Quaternary Catchment in the Crocodile West and Marico Water Management Area. The closest perennial rivers to the study area are the Elands and Selons Rivers. The Elands River flows 4.5 km to the north and the Selons River 9 km to the west of the proposed prospecting area. A non-perennial river, the Leragane, flows 8 km to the east, while the Bospoort Dam is located 25 km to the southeast.

On a local scale, the study area is located on the eastern foot slopes of the Magalies Mountain range. Access to the site appears to be through tertiary roads turning from the R565 secondary road. The majority of Portion 103 of the Farm Boschhoek 103 JQ is associated with built environment, while small sections of Portions 70 and 85 of the Farm Boschhoek 103 JQ are associated with buildings as well. The remainder of the demarcated Boschhoek section appears to be associated with a combination of dense tree cover and disused cultivated fields.

The majority of the demarcated Elandsfontein 102 JQ section appears to be undeveloped land associated with dense vegetation and some mountainous terrain. A few patches of cultivated fields are visible on Portions 5, RE/6, 17, RE/21 and RE/22. A section of Portion 4 is associated with mining infrastructure, while residences and outbuildings are evident on several of the other farm portions.

2.2 Project description

The prospecting right application for chrome ore, copper ore, gold ore, manganese ore, platinum group metals, silver ore and vanadium ore covers about 631.6 ha (**Figures 4 & 5**). For the prospecting phase, however, several sites will be selected for geotechnical drilling. These boreholes and its associated activities will impact on a surface area of between 250 and 625 m². The full extent of the drill site will also be demarcated and no drilling will be done outside of the boundary.

Prospecting activities will include the following:

Current access roads will be used as far as possible, but in cases where access roads to drill sites do not exist, a single track will be selected based on the area where the least environmental impact will occur. The same tracks will be used should repeated access be required. Vegetation and topsoil excavated during the drilling process will be stockpiled next to sumps where it will serve as a storm water diversion berm. On completion of the drilling process, the rehabilitated sumps will be backfilled with the stockpiled material. Because a constant water supply is needed for the drilling process, 15 000l will be stored in tanks. The plastic-lined sumps will be used to recycle water through a filter process in order to maintain a constant clean water source for the purpose of drilling. In terms of potable water for employees and workers, a temporary 260l tank will be placed on-site. Additional facilities will include temporary portable toilets, berms, and a maximum of 60m³ of diesel fuel located on an impermeable surface with bunds.



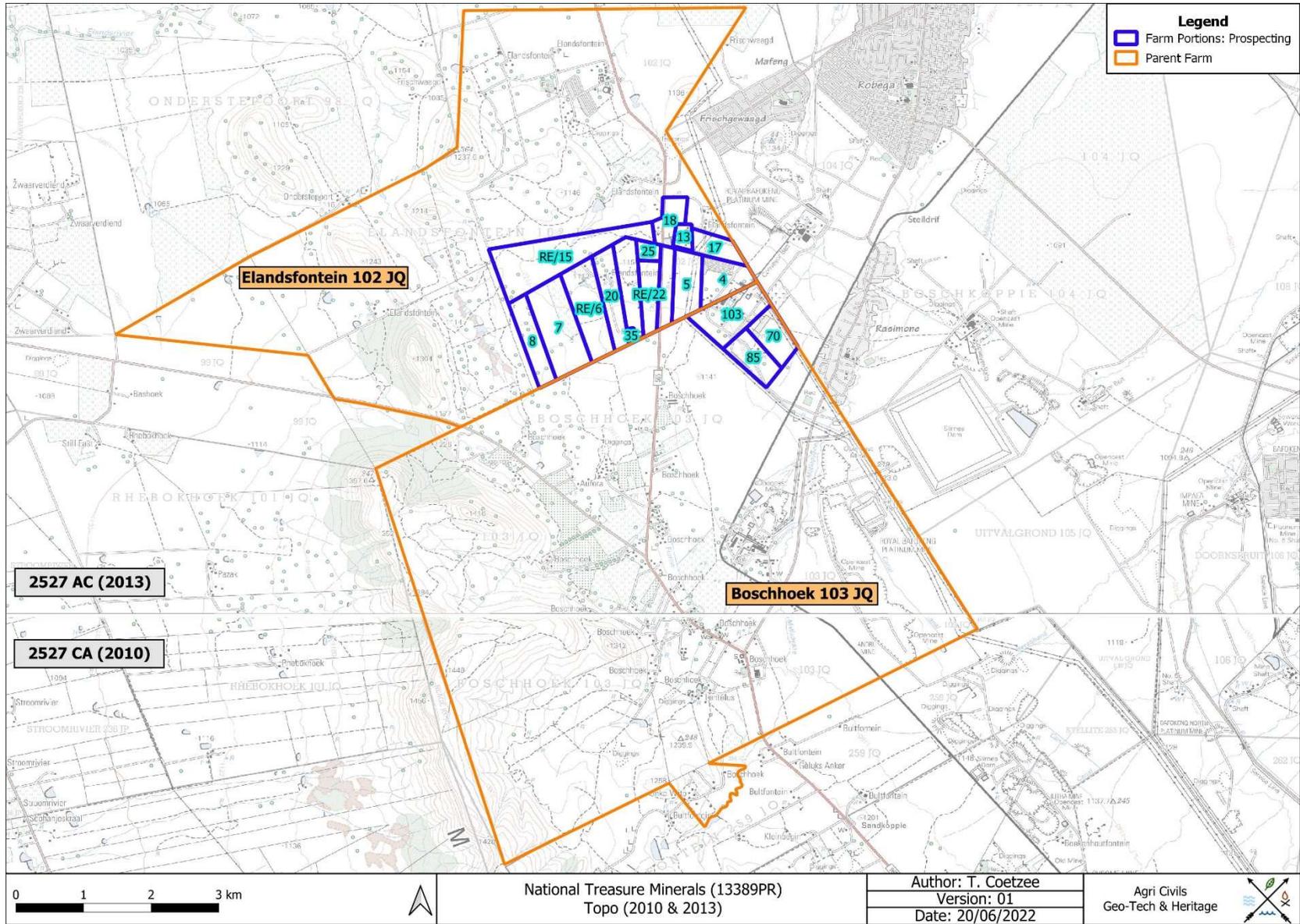


Figure 4: Segment of SA 1:50 000 2527 AC and CA indicating the farm portions demarcated for prospecting.



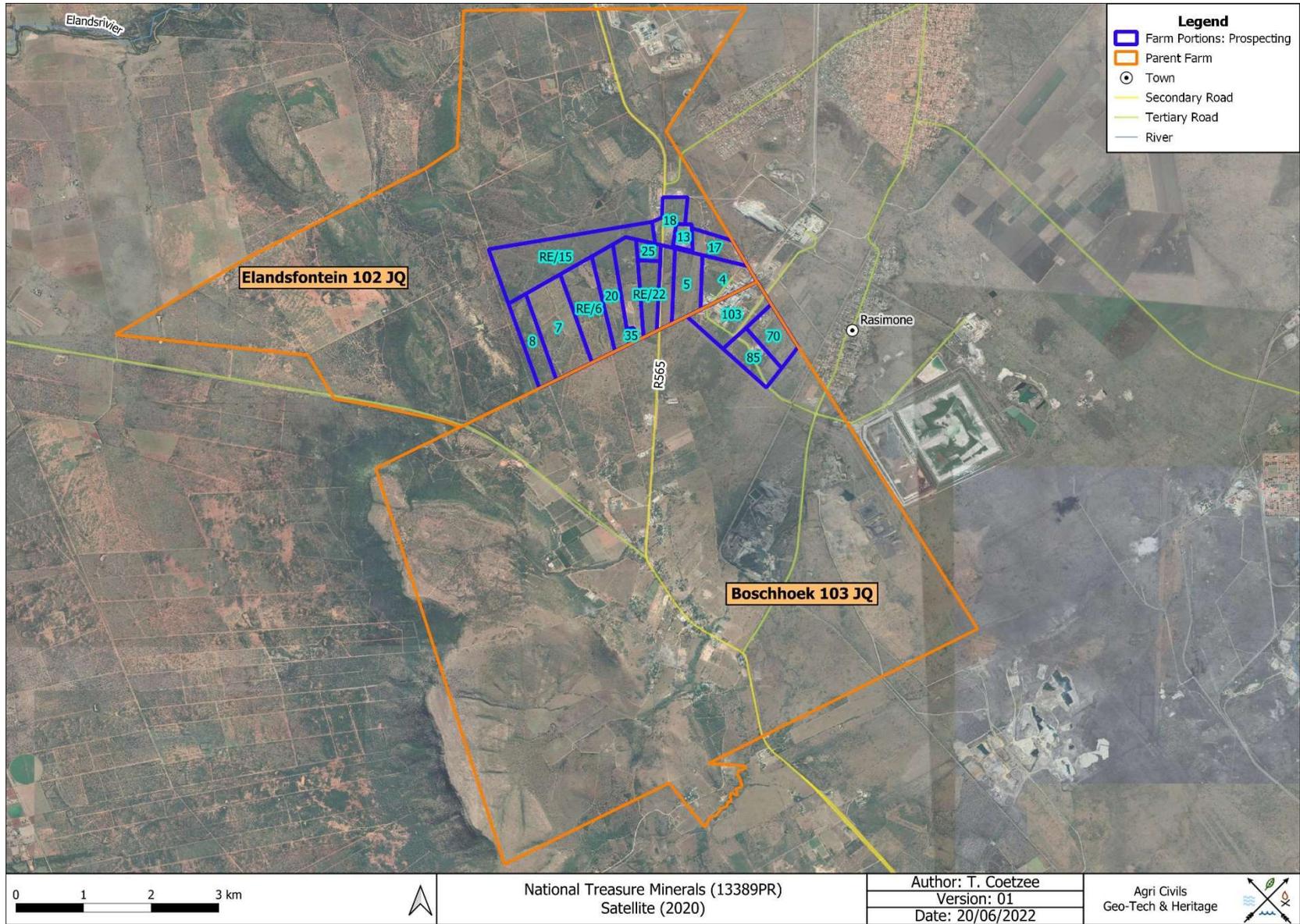


Figure 5: Proposed prospecting area portrayed on a 2020 satellite image.



3. Methodology

Archaeological reconnaissance of the study area was conducted by means of inspecting historical aerial imagery and topographical maps in order to identify potential heritage remains (**Appendix A**). The historical topographical datasets dating to 1943, 1956, 1963, 1979, 1982, 1996 and 2013, as well as the historical aerial images dating to 1948, 1961 and 1969, proved useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. Ten sites were observed within the demarcated boundary (**Table 2 & Figure 6**). It should be noted that the prefix '2527AC' is not used when referring to the site names due to the length of the name, but is recorded as such in **Table 2**. Based on contemporary satellite imagery, six of the sites (B01, B04, B05 – B07, B09) appear to have been demolished since no surface remains could be detected (**Figure 6**). Three of the remaining sites appear to consist of intact surface infrastructure (B02, B03, B08), while the status of one site could not be determined due to dense vegetation cover (B10). The total area inspected was 631.6 ha. Because heritage resources are often associated with water sources such as perennial and non-perennial rivers/streams, these water sources were buffered by a distance of 500 m, indicating a potentially sensitive area (**Figures 6 & 19**). Since hills are also often associated with heritage sites, areas associated with steep gradients were demarcated using contour data and plotted as a gradient buffer (**Figures 6 & 19**). The areas previously/currently associated with cultivated land were traced and plotted as shown on topographical maps, indicating disturbed areas that are less sensitive from a heritage perspective (**Figures 6 & 19**).



Table 2: Potential site location.

Site No	Type	Identification Source	Parent Farm	Farm Portion	Current Status	Estimated Extent (ha)	Lat (y)	Lon (x)
2527AC-B01	Building	1961 Building	Elandsfontein 102 JQ	13/102	Demolished	2.0	-25.451299	27.090489
2527AC-B02	Building	1969 Building	Elandsfontein 102 JQ	13/102	Intact	0.8	-25.449154	27.091182
2527AC-B03	Building	1948 Building	Elandsfontein 102 JQ	18/102	Intact	1.8	-25.450483	27.087283
2527AC-B04	Hut	1963 Hut	Elandsfontein 102 JQ	4/102	Demolished	1.3	-25.457417	27.096031
2527AC-B05	Building	1961 Building	Elandsfontein 102 JQ	7/102	Demolished	2.3	-25.467711	27.074554
2527AC-B06	Building	1948 Building	Boschhoek 103 JQ	103/103	Demolished	0.3	-25.459012	27.096597
2527AC-B07	Building	1961 Building	Boschhoek 103 JQ	70/103	Demolished	0.9	-25.462669	27.099572
2527AC-B08	Building	1961 Building	Boschhoek 103 JQ	85/103	Intact	1.2	-25.465665	27.100603
2527AC-B09	Hut	1963 Hut	Boschhoek 103 JQ	103/103	Demolished	0.8	-25.459051	27.095554
2527AC-B10	Structure	1969 Structure	Boschhoek 103 JQ	103/103	Unknown	0.4	-25.461242	27.098468

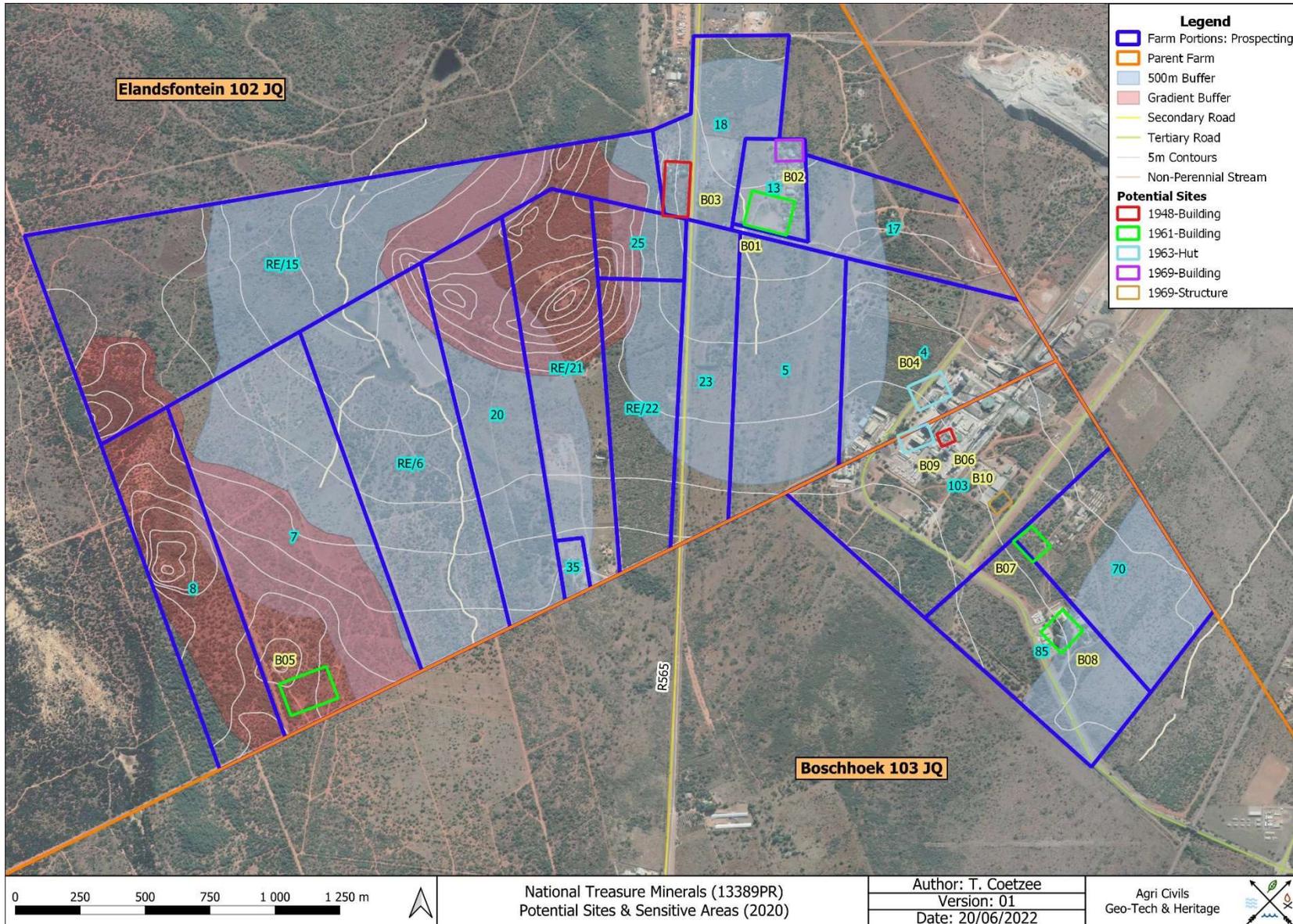


Figure 6: Potential Sites & Sensitive Areas.



3.1 Limitations

Using historical topographical maps and historical aerial images for locating heritage resources have several shortcomings. Potential heritage remains, such as buildings, structures and graves/cemeteries, are not always indicated on topographical maps and are often omitted between different publications. Historical aerial imagery, on the other hand, might have a poor image resolution that renders potential heritage sites invisible. Inaccuracies during the georeferencing process may also lead to some heritage sites not being plotted, as well as dense vegetation obscuring heritage sites. Due to the small size of some heritage sites, such as Stone Age sites, small Iron Age features, rock art sites and burials, such sites are rarely visible on aerial imagery and are generally only detected during pedestrian surveys.

4. Archaeological Background

Southern African archaeology is broadly divided into the Early, Middle and Later Stone Ages; Early, Middle and Later Iron Ages; and Historical or Colonial Periods. This section of the report provides a general background to archaeology in South Africa.

4.1 The Stone Age

The earliest stone tool industry, the Oldowan, was developed by early human ancestors which were the earliest members of the genus *Homo*, such as *Homo habilis*, around 2.6 million years ago. It comprises tools such as cobble cores and pebble choppers (Toth & Schick 2007). Archaeologists suggest these stone tools are the earliest direct evidence for culture in southern Africa (Clarke & Kuman 2000). The advent of culture indicates the advent of more cognitively modern hominins (Mitchell 2002: 56, 57).

The Acheulean industry completely replaced the Oldowan industry. The Acheulian industry was first developed by *Homo ergaster* between 1.8 to 1.65 million years ago and lasted until around 300 000 years ago. Archaeological evidence from this period is also found at Swartkrans, Kromdraai and Sterkfontein. The most typical tools of the ESA (Early Stone Age) are handaxes, cleavers, choppers and spheroids. Although hominins seemingly used handaxes often, scholars disagree about their use. There are no indications of hafting, and some artefacts are far too large for it. Hominins likely used choppers and scrapers for skinning and butchering scavenged animals and often obtained sharp ended sticks for digging up edible roots. Presumably, early humans used wooden spears as early as 5 million years ago to hunt small animals.

Middle Stone Age (MSA) artefacts started appearing about 250 000 years ago and replaced the larger Early Stone Age bifaces, handaxes and cleavers with smaller flake industries consisting of scrapers, points and blades. These artefacts roughly fall in the 40-100 mm size range and were, in some cases, attached to handles, indicating a significant technical advance. The first *Homo sapiens* species also emerged during this period. Associated sites are Klasies River Mouth, Blombos Cave and Border Cave (Deacon & Deacon 1999).



Although the transition from the Middle Stone Age to the Later Stone Age (LSA) did not occur simultaneously across the whole of southern Africa, the Later Stone Age ranges from about 20 000 to 2000 years ago. Stone tools from this period are generally smaller, but were used to do the same job as those from previous periods; only in a different, more efficient way. The Later Stone Age is associated with: rock art, smaller stone tools (microliths), bows and arrows, bored stones, grooved stones, polished bone tools, earthenware pottery and beads. Examples of Later Stone Age sites are Nelson Bay Cave, Rose Cottage Cave and Boomplaas Cave (Deacon & Deacon 1999). These artefacts are often associated with rocky outcrops or water sources.

4.2 The Iron Age & Historical Period

The Early Iron Age marks the movement of farming communities into South Africa in the first millennium AD, or around 2500 years ago (Mitchell 2002:259, 260). These groups were agro-pastoralist communities that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Archaeological evidence from Early Iron Age sites is mostly artefacts in the form of ceramic assemblages. The origins and archaeological identities of this period are largely based upon ceramic typologies. Some scholars classify Early Iron Age ceramic traditions into different “streams” or “trends” in pot types and decoration, which emerged over time in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). Early Iron Age ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. This period continued until the end of the first millennium AD (Mitchell 2002; Huffman 2007). Some well-known Early Iron Age sites include the Lydenburg Heads in Mpumalanga, Happy Rest in the Limpopo Province and Mzonjani in Kwa-Zulu Natal.

The Middle Iron Age roughly stretches from AD 900 to 1300 and marks the origins of the Zimbabwe culture. During this period cattle herding appeared to play an increasingly important role in society. However, it was proved that cattle remained an important source of wealth throughout the Iron Age. An important shift in the Iron Age of southern Africa took place in the Shashe-Limpopo basin during this period, namely the development of class distinction and sacred leadership. The Zimbabwe culture can be divided into three periods based on certain capitals. Mapungubwe, the first period, dates from AD 1220 to 1300, Great Zimbabwe from AD 1300 to 1450, and Khami from AD 1450 to 1820 (Huffman 2007: 361, 362).

The Late Iron Age (LIA) roughly dates from AD 1300 to 1840. It is generally accepted that Great Zimbabwe replaced Mapungubwe. Some characteristics include a greater focus on economic growth and the increased importance of trade. Specialisation in terms of natural resources also started to play a role, as can be seen from the distribution of iron slag which tend to occur only in certain localities compared to a wide distribution during earlier times. It was also during the Late Iron Age that different areas of South Africa were populated, such as the interior of KwaZulu Natal, the Free State, the Gauteng Highveld and the Transkei. Another characteristic is



the increased use of stone as building material. Some artefacts associated with this period are knife-blades, hoes, adzes, awls, other metal objects as well as bone tools and grinding stones.

The Historical period mainly deals with Europe's discovery, settlement and impact on southern Africa. Some topics covered by the Historical period include Dutch settlement in the Western Cape, early mission stations, Voortrekker routes and the Anglo Boer War. This time period also saw the compilation of early maps by missionaries, explorers, military personnel, etc.

4.2.1 Rustenburg Archaeo-History

During the 19th century the Kwena and Kgatla occupied the general area north of Pretoria. These areas included the Apies, Crocodile, and Pienaars Rivers, as well as Magaliesberg, Brits, Rustenburg, Bela-Bela, Modimolle, Pilanesberg and the Waterberg. These groups were disturbed during the difaqane by Mzilikazi's Ndebele but returned afterwards. Examples of Kwena and Kgatla communities during these times include: Mogôpa-Kwena, Kwena, Modimosana ba Maake-Kwena, Modimosana ba Mmatau-Kwena, Modimosana ba Matlhaku-Kwena, Kgafêla-Kgatla, Mosêtha-Kgatla, Mmakau-Kgatla and the Motsha-Kgatla (Bergh 1998a: 106).

Early in the 19th Century the Fokeng was present in the vicinity of present-day Rustenburg as well. Traditionally their territory stretched from the Magaliesberg in the south to probably the Elands River in the north. In the west their territory stretched from the Selons River to the roughly the area where the Mogôpa-Kwena resided near Sterkstroom in the east. Clashes with the Tlokwa, Kgafêla-Kgatla and the Pedi during the first two decades of the 19th Century, however, weakened the position of the Fokeng. With the arrival of Mzilikazi shortly afterwards the Fokeng moved further in a southern direction across the Vaal River. Other groups that resided in the vicinity of Rustenburg during these times were the Taung, Tlokwa, Po and Phiring (Bergh 1998a: 106-107).

According to J. van Schalkwyk (2007: 3), who conducted a phase one HIA (Heritage Impact Assessment) on various farm portions of the farm Waterkloof 305 JQ, the larger farm originally belonged to Paul Kruger during the early 1840s. Kruger resided on the farm until about 1873 when he moved the farm Boekenhoutkloof. Accordingly, his farmstead on the farm Waterkloof 305 JQ still exists. Also, a strong German community was established in the vicinity of the Hermansburg mission station on the farm Kroondal (Van Schalkwyk 2007: 3).

When the Magaliesberg congregation split from Potchefstroom in 1850 plans were made for the establishment of Rustenburg. The suggestion by Andries Pretorius to appoint a landdros in Rustenburg was approved in January 1851 and P.J. van Staden was appointed (Bergh 1998b: 130).



4.2.4 Historical aerial Imagery and topographical maps

Historical images and topographical maps dating to 1943, 1948, 1956, 1961, 1963, 1969, 1979, 1982, 1996 and 2013 (**Appendix A**) were used to determine the location and relative age of the structures and buildings associated with the demarcated farm portions (**Table 2**), as well as to establish historical land uses associated with the land parcels.

4.3 Examples of Heritage Sites

Figures 7 – 18 are examples of heritage sites often encountered. Iron Age and Stone Age sites are often associated with water sources, rocky outcrops and hills and should be avoided by the proposed prospecting activities.

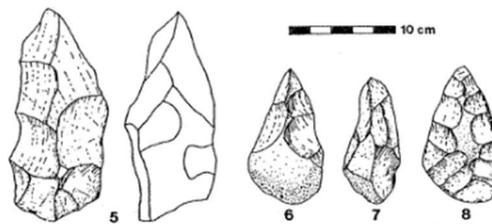


Figure 7: ESA artefacts from Sterkfontein (Volman 1984).

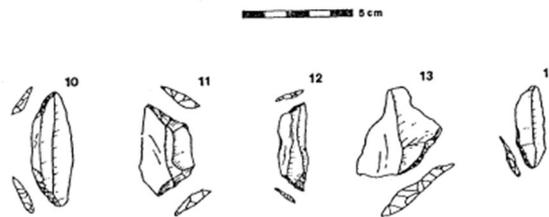


Figure 8: MSA artefacts from Howiesons Poort (Volman 1984).



Figure 9: LSA scrapers (Klein 1984).





Figure 10: Example of undecorated Iron Age potsherds.



Figure 11: Example of a decorated Iron Age potsherd.



Figure 12: Example of a potential Iron Age granary base.



Figure 13: Example of a stone-walled Iron Age site.



Figure 14 : Example of a broken lower grinding stone dating to the LIA.



Figure 15: Example of a dilapidated stone-walled site dating to the LIA.



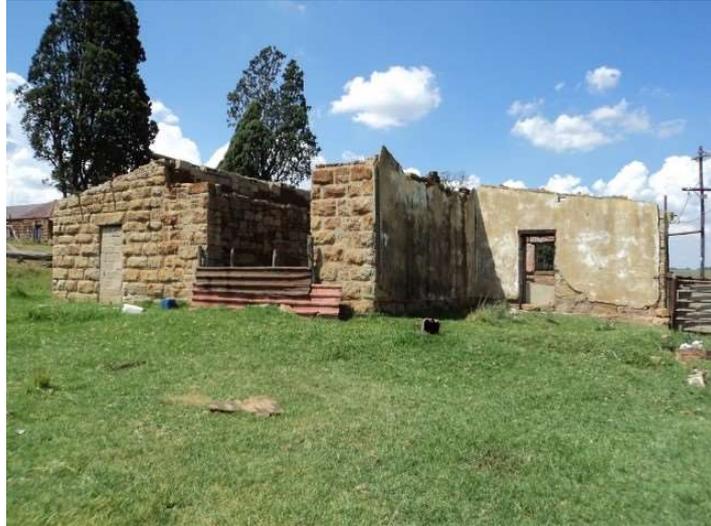


Figure 16: Example of a historical building.



Figure 17: Example of a dilapidated historical kraal.



Figure 18: Example of a potential informal grave.



4.4 Previous Heritage Studies

Ferrochrome's Boshhoek Expansion, Rustenburg, North West

A Heritage Impact Assessment was conducted for SA Ferrochrome & Mining's Boshhoek expansion to the north of Rustenburg in the North West Province by Dr J. Pistorius (2003). The study recorded several structures and features that included a grave, the remains of one dwelling dating to recent times, contemporary cattle kraals and dwellings, a stone cairn, a stone feature located between trees, and remains of previous mining activities. Pistorius (2003) noted that only the grave and mining remains could be considered significant in terms of cultural resources as the remaining features and structures date to contemporary times. The Boshhoek expansion project is located approximately 6 km north of the proposed NTM (National Treasure Minerals) project. Pistorius (2003) also noted the importance of the general study area between the Magaliesberg Mountain range in the west and the Thaba-ea-Maralla range in the east. Accordingly, the area is characterised by densely populated Late Iron Age sites mostly associated with the Fokeng people. Mention is also made of the importance of movement around the northern tip of the Magaliesberg since the first half of the 19th Century. This area, located in the vicinity of the study area, was used as a wagon route to Rustenburg and the eastern parts of the Bankenveld. Early visitors include Schoon and McLuckie (1829), Robert Moffat (1829), Andrew Smith (1835) and Cornwallis Harris (1836). Some of these visitors also visited Mzilikazi of the Ndebele, who occupied at least three villages in the region

Tailings Storage Facility and Infrastructure at Royal Bafokeng Platinum Styldrift Mine Complex

A Cultural Heritage Assessment for the amendment of the Environmental Management Programme for the Tailings Storage Facility (TSF) and associated infrastructure at the Royal Bafokeng Platinum Styldrift Mine Complex near Rustenburg was conducted by Francois Coetzee (2015). Because the original TSF of the RBPM (Royal Bafokeng Platinum Mine) did not have sufficient capacity for the added Styldrift Mine Complex production and because lease agreements for the expansion of the original TSF proved problematic, alternative locations for the TSF had to be investigated. The study, conducted on an area approximately 1.2 km southeast of the proposed National Treasure Minerals prospecting project, revealed no archaeological remains, historical structures or graveyards

Rietvlei Silica Mine

Matakoma-Arm conducted a heritage assessment for the Xstrata Alloys Rietvlei Silica Mine on portions of the Farm Rietvlei 271 JQ near Rustenburg. The study recorded two sites of cultural significance. The first site is the remains of a Rice-type block house with a small stone structure that might have been a sanger utilised as a machinegun placement. The site dates to the South African War of 1899 to 1902. The second site is characterised by a large scatter of Late Iron Age Moloko sequence potsherds that were exposed during grading activities (Fourie 2008). The Rietvlei Silica Mine is located roughly 17 km south of the proposed National Treasure Minerals prospecting project.



5. Archaeological and Historical Remains

This section serves as an indication of heritage material associated with the study area based on previous research, as well as historical aerial images and topographical maps.

5.1 Stone Age Remains

The heritage studies conducted in the vicinity of the study area did not locate any Stone Age remains and according to Bergh (1998c), no prominent Stone Age sites are located in the general vicinity. Because Stone Age sites are often associated with water sources, Stone Age material is more likely to be encountered within the 500 m river buffer zone of the study area.

5.2 Iron Age Farmer Remains

Although stone-walled sites are often detectable on satellite and aerial imagery, none were observed within the demarcated prospecting area. Although not visible on satellite imagery, the presence of such sites might be obscured by dense vegetation and poor preservation and are therefore more likely to be located in the undisturbed sections of the study area. Also, the heritage study conducted by Pistorius (2003) noted that densely populated Late Iron Age sites that are mostly associated with the Fokeng people are found in the greater area. The study conducted by Fourie (2008) recorded the presence of a large scatter of Late Iron Age Moloko sequence potsherds.

5.3 Historical Remains

- Elandsfontein 102 JQ

Although no sites were observed on the 1:250 000 topographical maps (**Appendix A: Figures 20 & 22**), five potential sites were identified on the remaining datasets: One on Portion 4, one on Portion 7, one on Portion 18 and two on Portion 13. The sites on Portion 13 (B01 & B02) were identified respectively on the 1961 and 1969 aerial images (**Appendix A: Figures 23 & 25**) as buildings. Site B01 is also visible on the 1969 aerial image (**Appendix A: Figure 25**) and is indicated on the 1963, 1979 and 1982 topographical maps (**Appendix A: Figures 24, 26 & 27**). The 1996 topographical map (**Appendix A: Figure 28**) indicates the area to be cultivated, suggesting the site was demolished between 1982 and 1996. No indication of a building is visible on contemporary satellite imagery (**Figure 19**). Should any parts of this site still exist, it would be at least 60 years old and would therefore be protected by the NHRA (National Heritage Resources Act) 25 of 1999.

Site B02 appears as a building on the 1969 aerial image (**Appendix A: Figure 25**), although no building or structure is shown on the 1963 and 1979 topographical maps (**Appendix A: Figures 24 & 26**). Two buildings, however, are indicated on the 1982 topographical map (**Appendix A: Figure 27**), one on the 1996 topographical map (**Appendix A: Figure 28**) and two on the 2013 topographical map (**Appendix A: Figure 29**). Buildings are visible on contemporary satellite imagery, but it is unknown whether parts of the original structure are still intact. It is also unlikely that the site exceeds 60 years of age as no structure or building is clearly visible



on the 1961 aerial image (**Appendix A: Figure 23**). Should the building not exceed 60 years of age, it would not be protected by the NHRA 25 of 1999.

The buildings associated with Site B03 on Portion 18 were identified on the 1948 aerial image (**Appendix A: Figure 21**) and are also visible on all subsequent datasets. It should be noted that some of the buildings appear to have been demolished between 1979 and 1982, as well as between 1996 and 2013. Should any part of the original buildings still exist, it would be at least 73 years old and would therefore be protected by the NHRA (National Heritage Resources Act) 25 of 1999.

Site B04, located on Portion 4, was identified as a hut on the 1963 topographical map (**Appendix A: Figure 24**). No structures are visible on the historical aerial image, but a hut is also indicated on the 1979 topographical map and a building on the 1982 and 1996 topographical maps (**Appendix A: Figures 26, 27 & 28**). No building is indicated on the 2013 topographical map (**Appendix A: Figure 29**) and contemporary satellite imagery shows the presence of modern mining infrastructure on a section of the site. Therefore, it is likely that the site was demolished between 1996 and 2013. Should any part of the site still exist, it could exceed 60 years of age and would therefore be protected by the NHRA (National Heritage Resources Act) 25 of 1999.

Site B05, identified as a building on the 1961 aerial image (**Appendix A: Figure 23**), is located in the south-western corner of Portion 7. The site is also visible on the 1969 aerial image (**Appendix A: Figure 25**) and is indicated as a hut on the 1963 and 1979 topographical maps (**Appendix A: Figures 24 & 26**). The 1982 topographical map (**Appendix A: Figure 27**) no longer shows the site, indicating it was demolished between 1979 and 1982. No indication of a building is visible on contemporary satellite imagery (**Figure 19**). Should any parts of this site still exist, it would be at least 60 years old and would therefore be protected by the NHRA (National Heritage Resources Act) 25 of 1999.

- **Boschhoek 103 JQ**

Although no sites were observed on the 1:250 000 topographical maps (**Appendix A: Figures 20 & 22**), five potential sites were identified on the remaining datasets: One on Portion 70, one on Portion 85 and three on Portion 103. The site on Portion 70 (B07), was identified on the 1961 aerial image (**Appendix A: Figure 23**) as a building. The site is indicated on the 1963 topographical map (**Appendix A: Figure 24**) and is visible on the 1969 aerial image (**Appendix A: Figure 25**). The last indication of the site is on the 1979 topographical map (**Appendix A: Figure 26**), suggesting it was demolished between 1979 and 1982. No indications of a building are visible on contemporary satellite imagery (**Figure 19**). Should any parts of this site still exist, it would be at least 60 years old and would therefore be protected by the NHRA (National Heritage Resources Act) 25 of 1999.



The site located on Portion 85 (B08) was identified on the 1961 aerial image (**Appendix A: Figure 23**) as a building. The building is indicated/visible on all subsequent topographical maps and aerial imagery. From 1982 onwards, additional buildings appear in the vicinity of the first building. If the building has not been demolished and rebuilt, it would exceed 60 years of age and would therefore be protected by the NHRA 25 of 1999.

Sites B06, B09 and B10 are located on Portion 103. The building associated with Site B06 was identified on the 1948 aerial image (**Appendix A: Figure 21**), and is visible on the 1961 and 1969 aerial images as well (**Appendix A: Figures 23 & 25**). The site, however, is not indicated on any of the topographical maps and contemporary aerial imagery shows that the general area consists of modern buildings. The general development associated with this area appears to have happened between 1996 and 2013 (**Appendix A: Figure 29**).

Site B09, also located on Portion 103 and next to Site B06, was identified as a hut on the 1963 topographical map (**Appendix A: Figure 24**). Some structures are visible on the 1969 aerial image (**Appendix A: Figure 25**) and a hut is shown on the 1979 topographical map (**Appendix A: Figure 26**). The last indication of the site is as a building on the 1982 topographical map (**Appendix A: Figure 27**), whereafter it appears to have been demolished and replaced by modern development.

Site B10 appears as a structure on the 1969 aerial image (**Appendix A: Figure 25**), but might have been constructed after 1961. The first structure on a topographical map is shown as a reservoir on the 1982 and 1996 topographical maps (**Appendix A: Figures 27 & 28**). The status of this structure is unknown since contemporary satellite imagery shows the area to be covered by trees. It is likely that this area was disturbed by the development that took place between 1996 and 2013 as well.

In terms of historical sites identified by previous heritage studies conducted in the general area, Pistorius (2003) mentions the presence of historical mining activities, while Fourie (2008) recorded a rice-type block house with a small stone structure that might have been a sanger utilised as a machinegun placement during the South African War of 1899 to 1902.

5.4 Contemporary Remains

Since 1979, several buildings were constructed on the farm portions demarcated for prospecting. Since these buildings do not exceed 60 years of age, they were not plotted.

The heritage study conducted by Pistorius (2003) mentioned the presence of a contemporary dwelling and cattle kraals.



5.5 Graves

No graves, cemeteries or burial grounds were observed on historical aerial imagery and topographical maps. However, such sites are rarely visible on aerial imagery and are not always indicated on topographical maps. Such sites are also often associated with historical buildings and the possibility therefore exists that graves may be associated with the identified sites.

The heritage study conducted by Pistorius (2003) recorded the presence of one grave.

6. Evaluation

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.

A fundamental aspect in the conservation of a heritage resource relates to whether the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. There are many aspects that must be taken into consideration when determining significance, such as rarity, national significance, scientific importance, cultural and religious significance, and not least, community preferences. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and if appropriate mitigated in order to gain data / information which would otherwise be lost. Such sites must be adequately recorded and sampled before being destroyed.

6.1 Field Ratings

All sites should include a field rating in order to comply with section 38 of the National Heritage Resources Act (Act No. 25 of 1999). The field rating and classification in this report are prescribed by SAHRA.

Table 3: Prescribed Field Ratings

Rating	Field Rating/Grade	Significance	Recommendation
National	Grade 1		National site
Provincial	Grade 2		Provincial site
Local	Grade 3 A	High	Mitigation not advised
Local	Grade 3 B	High	Part of site should be retained
General protection A	4 A	High/Medium	Mitigate site
General Protection B	4 B	Medium	Record site
General Protection C	4 C	Low	No recording necessary

*These site ratings can only be assigned following a Phase 1 AIA.



7. Statement of Significance & Recommendations

7.1 Statement of Significance

The study area: Several portions of the Farms Boschhoek 103 JQ and Elandsfontein 102 JQ.

As can be seen from previous research conducted in the area, the general region is significant from a heritage perspective. Heritage sites are likely to include LIA sites, cemeteries/burial sites and historical structures. Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features, care must be exercised when prospecting.

Figure 19 indicates demolished sites and sites associated with surface remains that potentially date to the Historic Period, as well as a 500 m buffer area around water sources and areas associated with steep gradients/hills. The 500 m buffer area and gradient buffer are considered to be potentially sensitive from a heritage perspective since archaeological sites are often located within these zones. Areas previously/currently associated with cultivated fields are indicated as well. These areas are considered to be less sensitive from a heritage perspective due to the areas being disturbed. The least sensitive areas are therefore areas that are located more than 500 m from a water source, not on/near hills or areas with steep gradients, within previously/currently cultivated fields and are not within close proximity of potential heritage sites or contemporary infrastructure. From a heritage perspective, these areas are considered to be more favourable for the proposed prospecting activities. Although the previously/currently cultivated areas that intersect the 500 m river buffer/gradient buffer are also disturbed, the potential for subsurface cultural material is slightly higher compared to areas falling outside of the buffer zone. Apart from the identified potential sites, open areas falling outside of the previously/currently cultivated areas are considered to be sensitive as well, especially due to the potential presence of Iron Age stone-walled sites in the general area. The possibility also exists that culturally sensitive sites, such as burial sites, might have been created after some of the cultivated fields fell into disuse, meaning that burial sites might be located on disturbed areas as well.

Sites B01, B04, B05, B06, B07 and B09 are associated with demolished historical infrastructure while sites B02 B03 and B08 are associated with potentially intact historical infrastructure. The status of site B10 is unknown due to dense vegetation. The identified sites are likely to exceed 60 years of age and are therefore considered to be sensitive from a heritage perspective. Should building remains dating to the Historic Period be present, such buildings might be protected under the NHRA (25 of 1999). The remaining built environment associated with the demarcated farm portions, whether intact or demolished, are of contemporary origin and are unlikely to be sensitive from a heritage perspective.



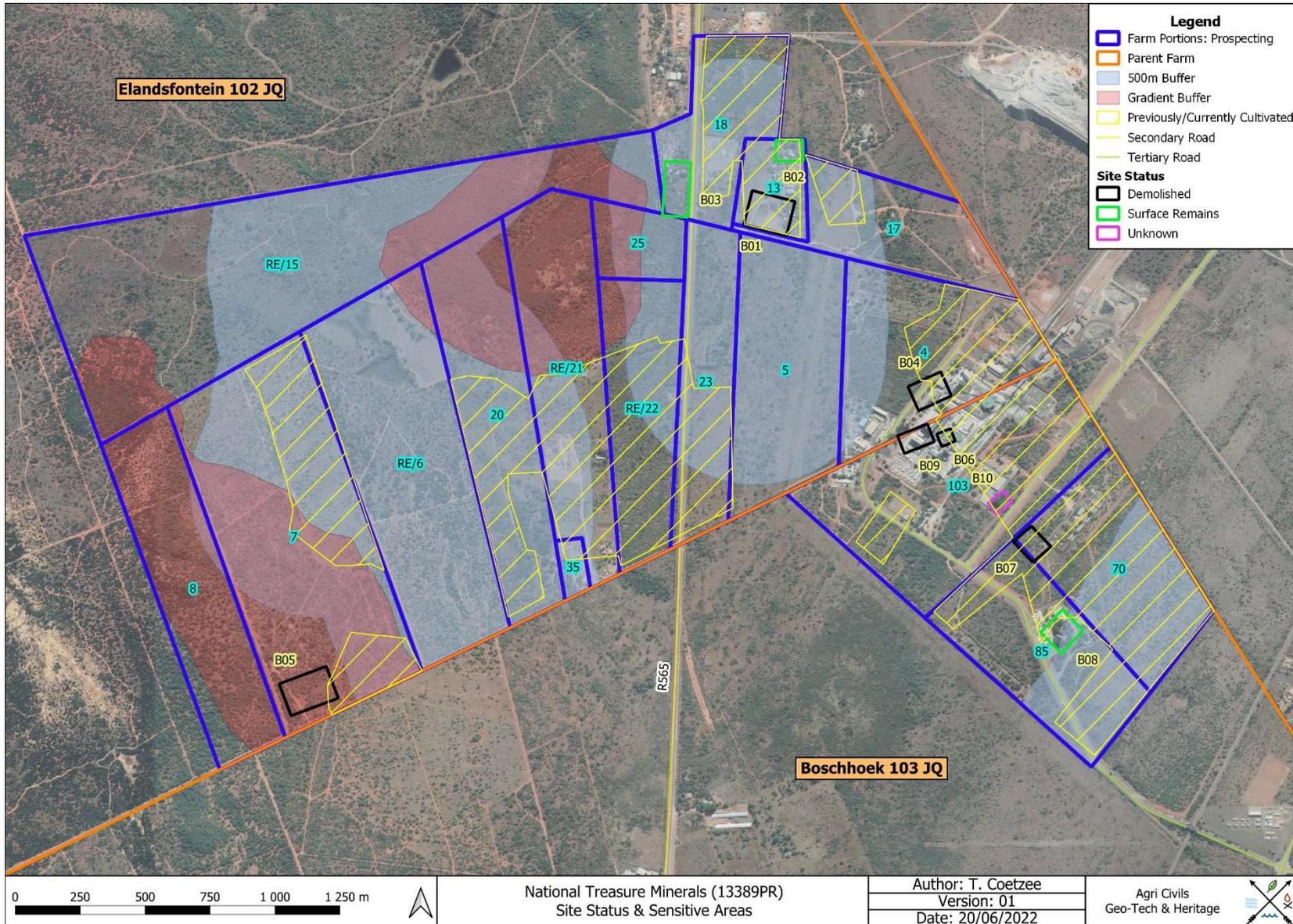


Figure 19: Site Status & Sensitive Areas.



7.2 Recommendations

The following recommendations are made in order to avoid the destruction of heritage remains within the area demarcated for prospecting:

- Although Sites B01, B04, B05 and B07 appear to have been demolished, subsurface culturally significant material might be present. Therefore, it is recommended that these sites be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should be present on-site during prospecting in order to limit potential impact on heritage resources.
- Sites B02, B03 & B08 might be of cultural significance since the possibility exists that the associated buildings exceed 60 years of age. It is therefore recommended that these areas be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should be present on-site during prospecting in order to limit potential impact on heritage resources.
- Sites B06 & B09 have been demolished, are currently associated with a modern built-up area and are not considered to be culturally significant.
- Because the status of Site B10 is unknown, it is recommended that the associated demarcated area be avoided by the proposed prospecting.
- Care should be exercised when prospecting within the gradient buffer and 500 m river buffer zones. Although a significant section of these areas have been disturbed by cultivation, subsurface culturally significant material might be unearthed during prospecting in which case a qualified archaeologist must be contacted.
- It is advised that a qualified archaeologist be contacted whenever uncertainty regarding potential heritage remains are encountered.
- Prospecting should not take place in the vicinity of stone cairns, potential burial sites, stone-walling, building ruins or any other heritage material or structures.
- Should the prospecting outcome result in further development or construction, a full Phase 1 Archaeological Impact Assessment must be conducted on the affected area if triggered. Also, a full Phase 1 AIA must be done should the cumulative impact of the proposed prospecting exceed 0.5 ha.



- Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the prospecting phase, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).
- From a heritage point of view, prospecting may proceed on the demarcated portions, subject to the abovementioned conditions and recommendations

8. Conclusion

The proposed NTM project that consists of the prospecting of chrome ore, copper ore, gold ore, manganese ore, platinum group metals, silver ore and vanadium ore on the demarcated farm portions of the Farms Boschhoek 103 JQ and Elandsfontein 102 JQ covers approximately 631.6 ha. The general area is characterised by open veldt, previously/currently cultivated fields and built environment. The Archaeological Desktop Study examined the area using a combination of historical aerial imagery, historical topographical maps, contemporary satellite imagery, as well as written sources and previous heritage studies conducted in the area. Ten potentially historical intact/demolished building sites were noted. These areas should be avoided by the proposed prospecting activities. Since potential Iron Age/Historical sites have been recorded by previous heritage studies in the greater area, other potentially sensitive areas include the 500 m buffer zone surrounding rivers, areas associated with hills/steep gradients, as well as open and undisturbed sections.

Should the recommendations made in this study be adhered to, the proposed NTM prospecting project may proceed.



9. Addendum: Terminology

Archaeology:

The study of the human past through its material remains.

Artefact:

Any portable object used, modified, or made by humans; e.g. pottery and metal objects.

Assemblage:

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

Context:

An artefact's context usually consist of its immediate *matrix* (the material surrounding it e.g. gravel, clay or sand), its *provenience* (horizontal and vertical position within the matrix), and its *association* with other artefacts (occurrence together with other archaeological remains, usually in the same matrix).

Cultural Resource Management (CRM):

The safeguarding of the archaeological heritage through the protection of sites and through salvage archaeology (rescue archaeology), generally within the framework of legislation designed to safeguard the past.

Excavation:

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and other material covering and accompanying it.

Feature:

An irremovable artefact; e.g. hearths or architectural elements.

Ground Reconnaissance:

A collective name for a wide variety of methods for identifying individual archaeological sites, including consultation of documentary sources, place-name evidence, local folklore, and legend, but primarily actual fieldwork.

Matrix:

The physical material within which artefacts is embedded or supported, i.e. the material surrounding it e.g. gravel, clay or sand.

Phase 1 Assessments:

Scoping surveys to establish the presence of and to evaluate heritage resources in a given area.

Phase 2 Assessments:

In-depth culture resources management 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.

Sensitive:

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.



Site:

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity.

Surface survey:

There are two kinds: (1) unsystematic and (2) systematic. The former involves field walking, i.e. scanning the ground along one's path and recording the location of artefacts and surface features. Systematic survey by comparison is less subjective and involves a grid system, such that the survey area is divided into sectors and these are walked ally, thus making the recording of finds more accurate.

10. References

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Appendix A: Historical Aerial Imagery & Topographical Maps



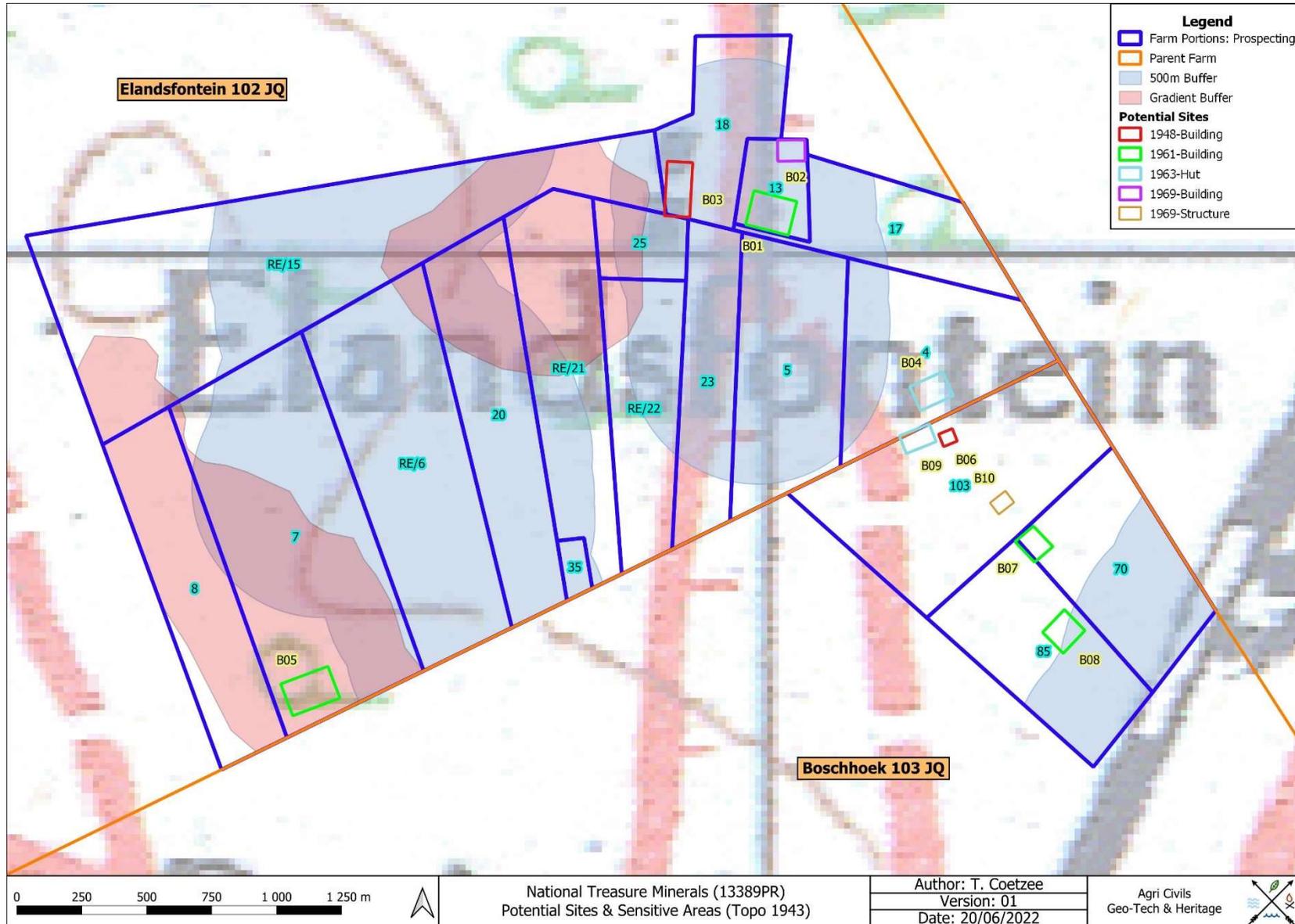


Figure 20: Segment of 1943 SA 1:250 000 2526 indicating the study area.



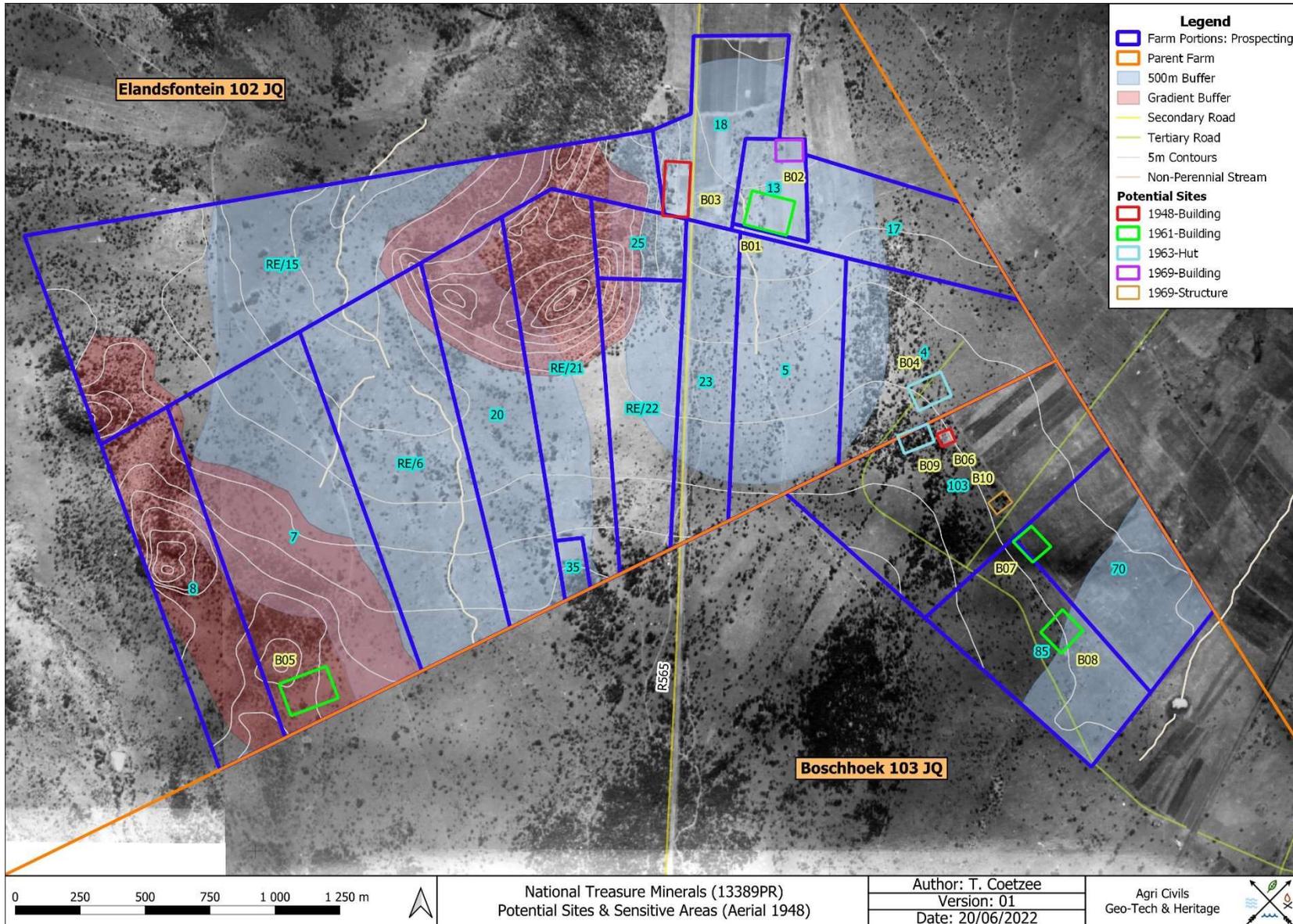
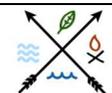


Figure 21: 1948 Aerial image of the study area.



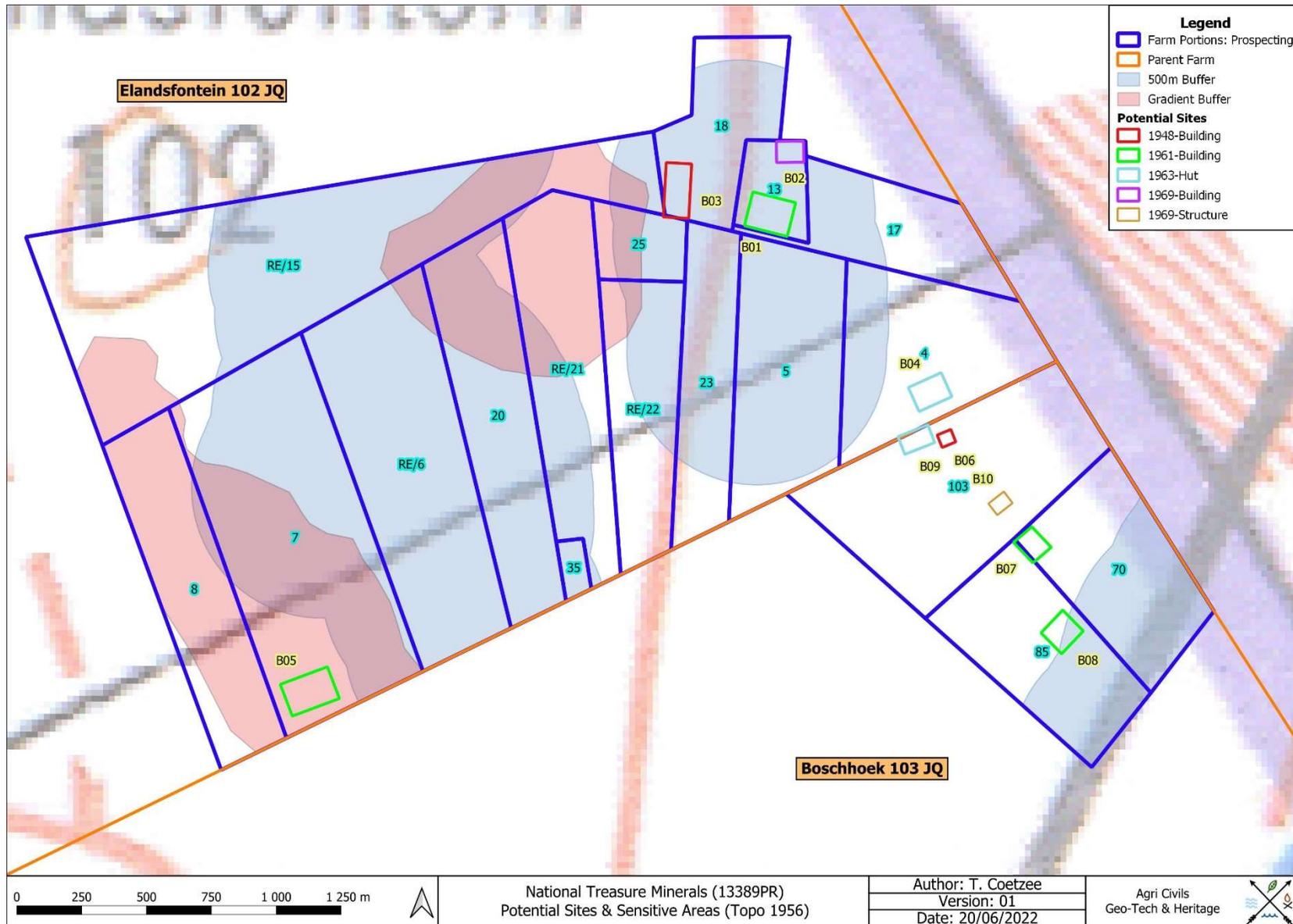


Figure 22: Segment of 1956 SA 1:250 000 2526 indicating the study area.



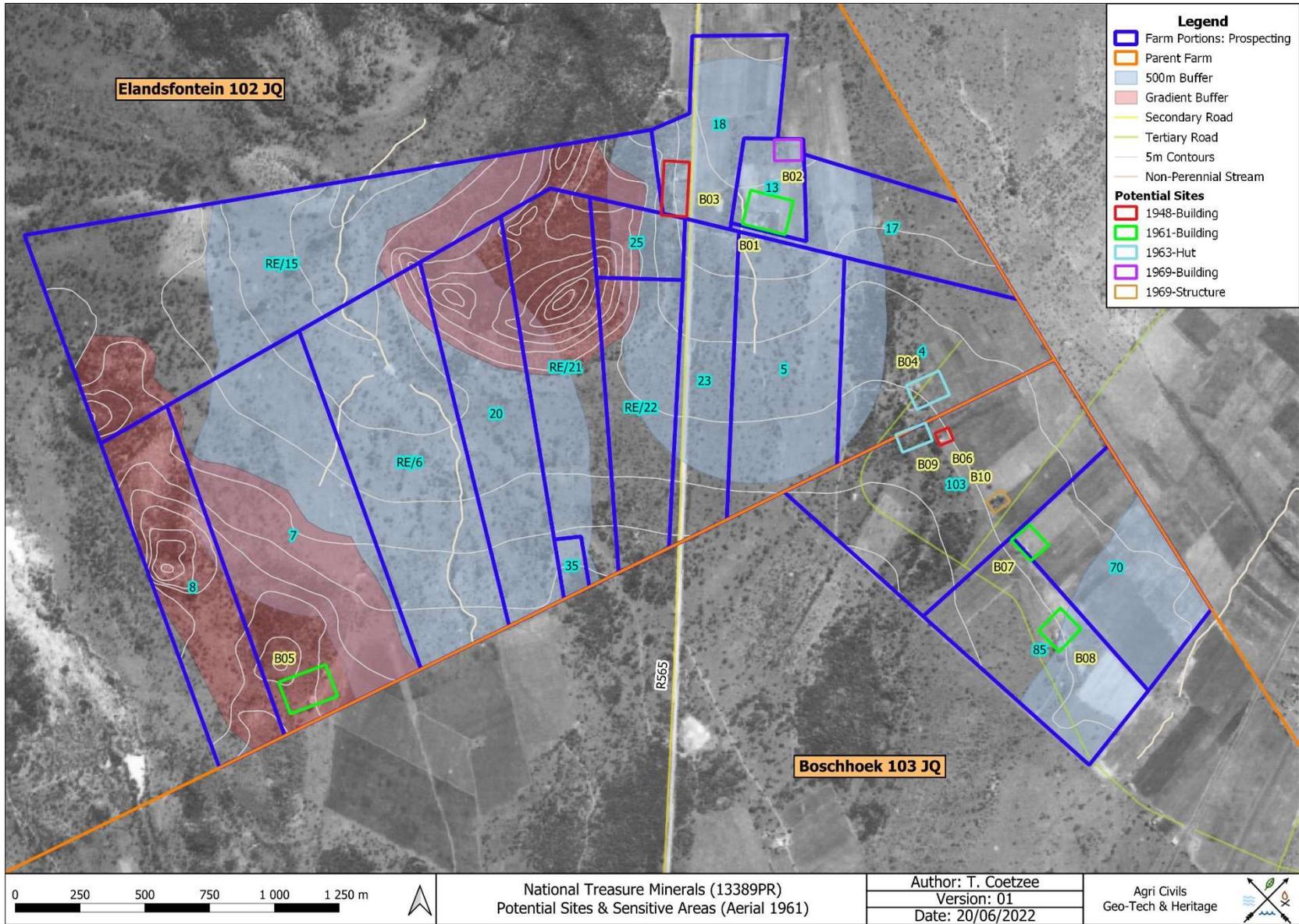


Figure 23: 1961 Aerial mage of the study area.



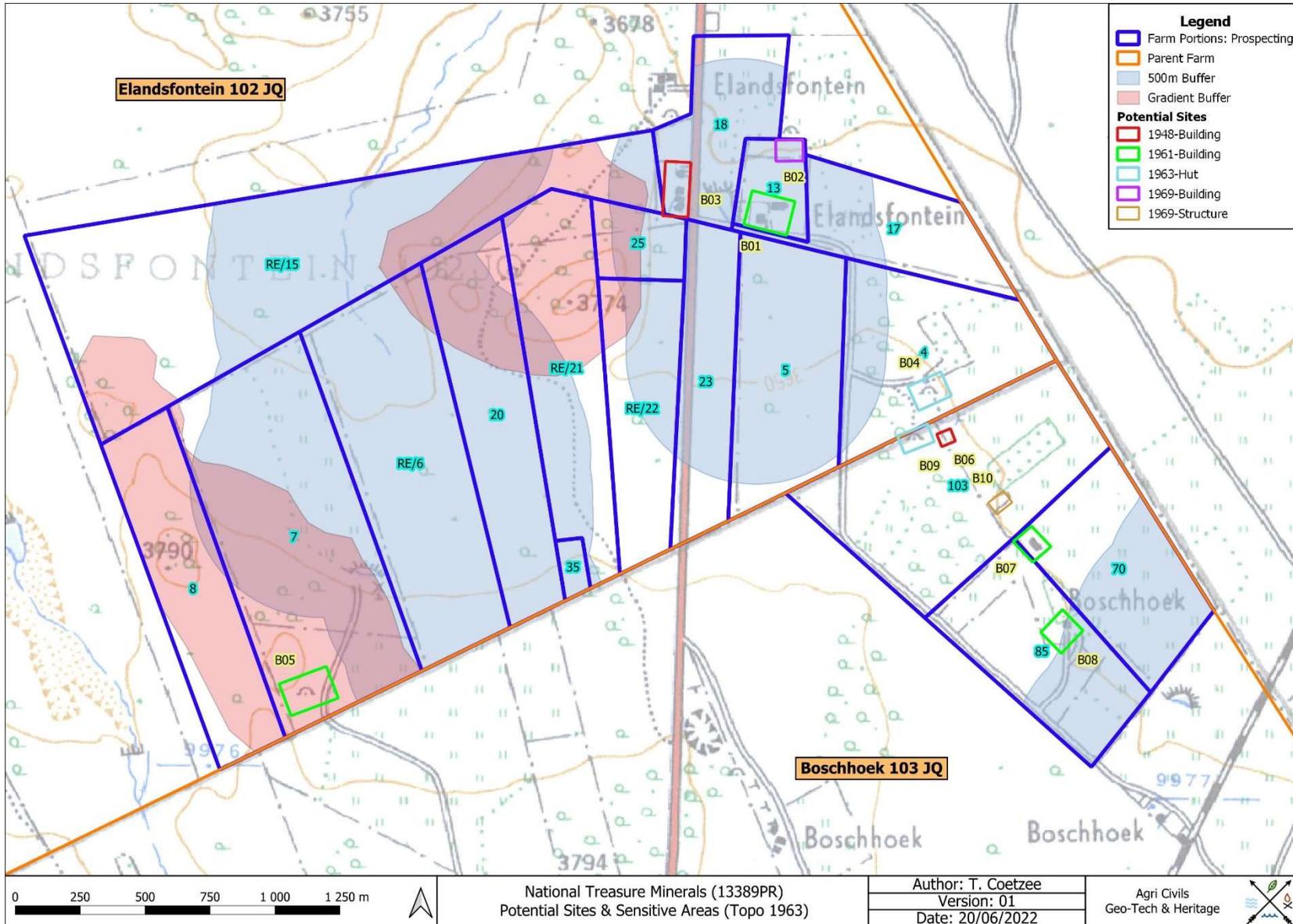


Figure 24: Segment of 1963 SA 1:50 000 2527 AC indicating the study area.



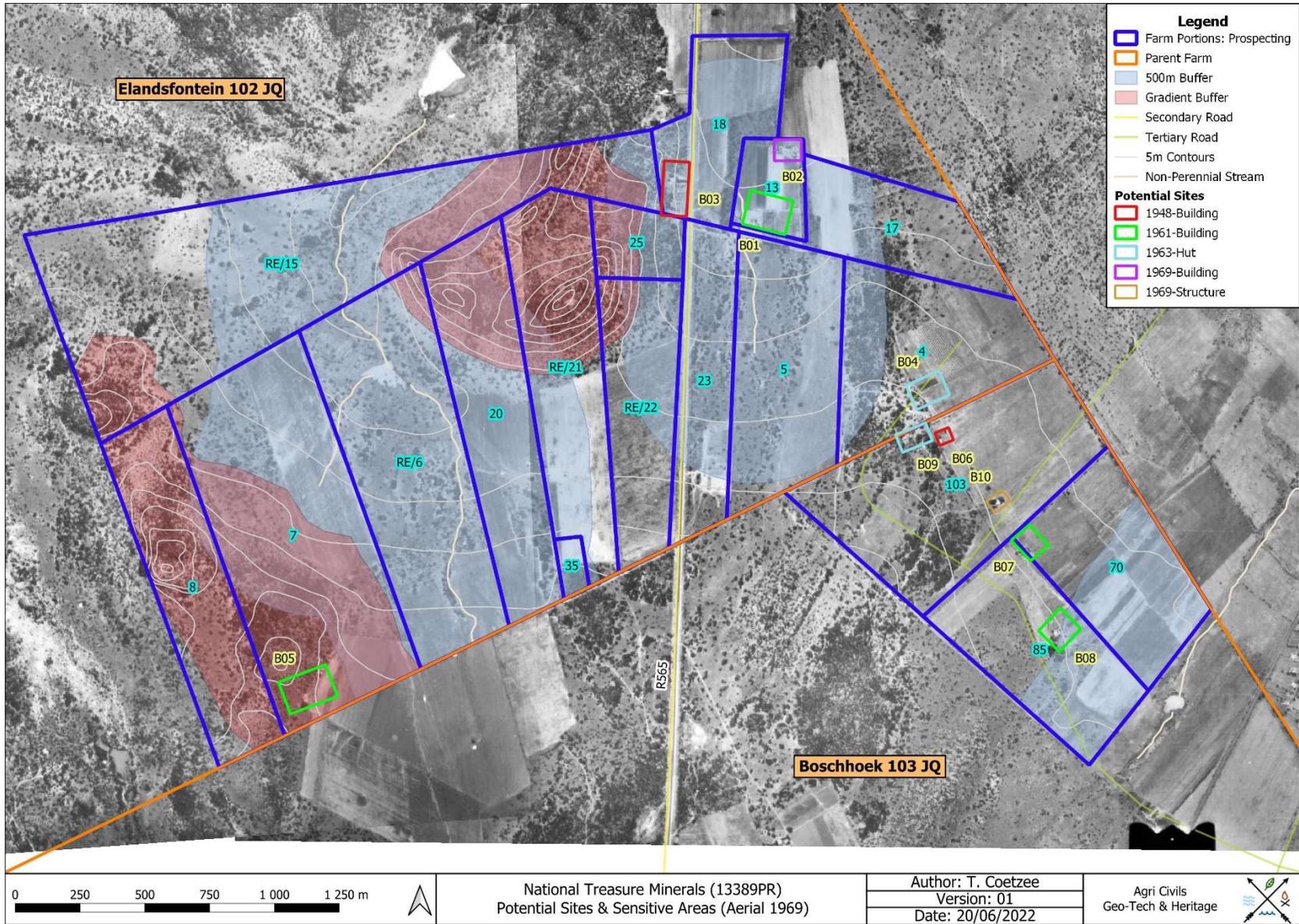


Figure 25: 1969 Aerial mage of the study area.



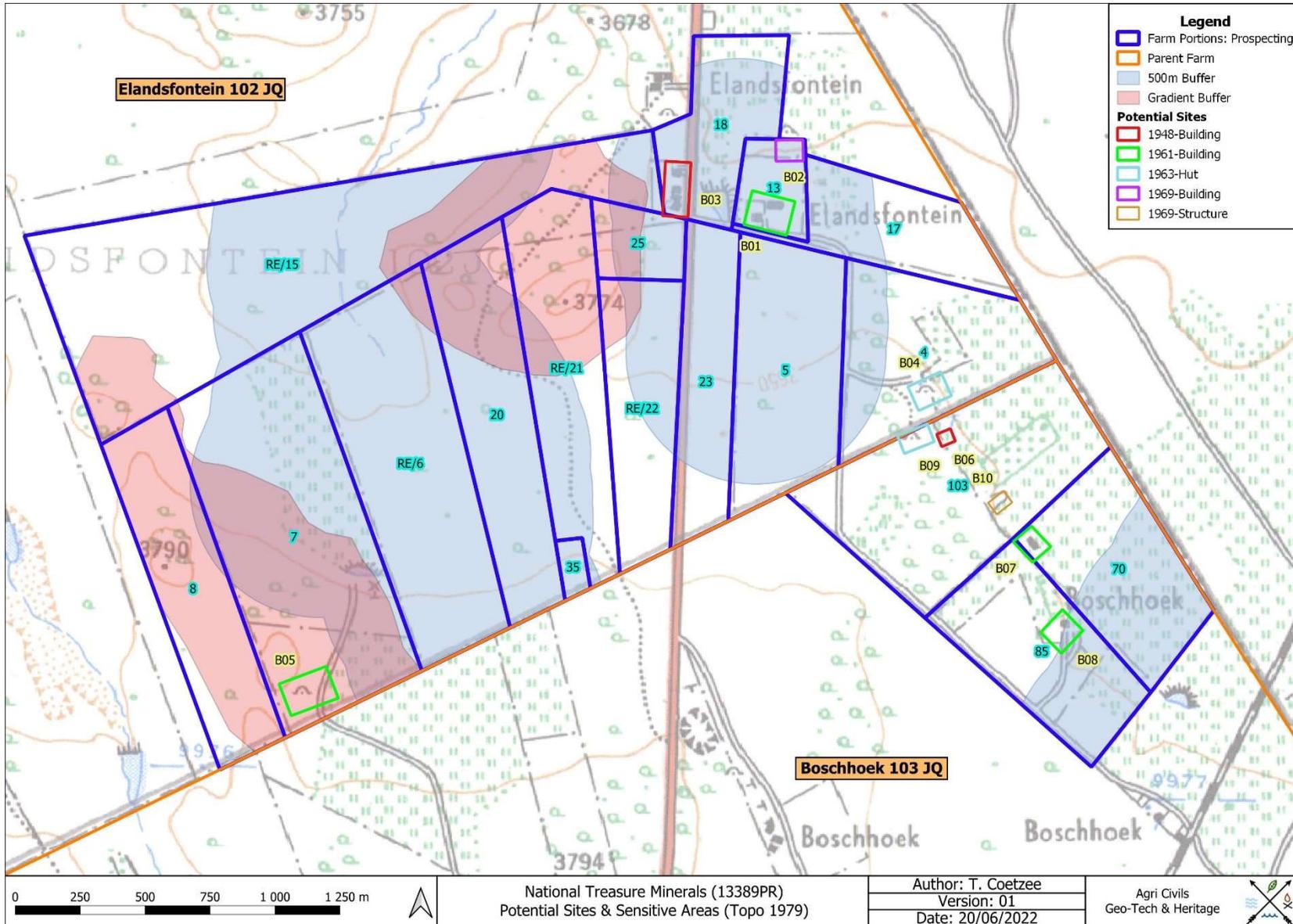


Figure 26: Segment of 1979 SA 1:50 000 2527 AC indicating the study area.



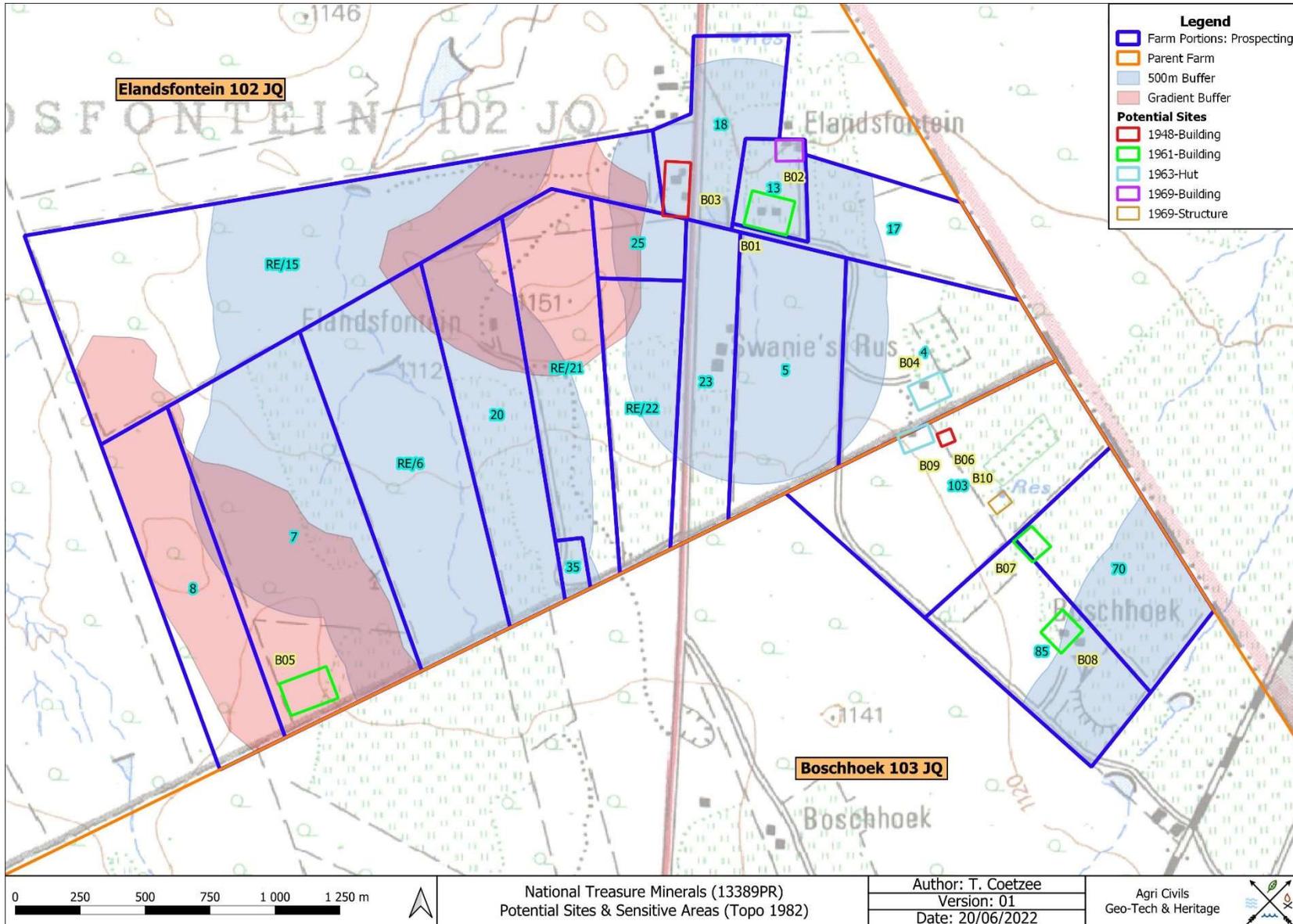


Figure 27: Segment of 1982 SA 1:50 000 2527 AC indicating the study area.



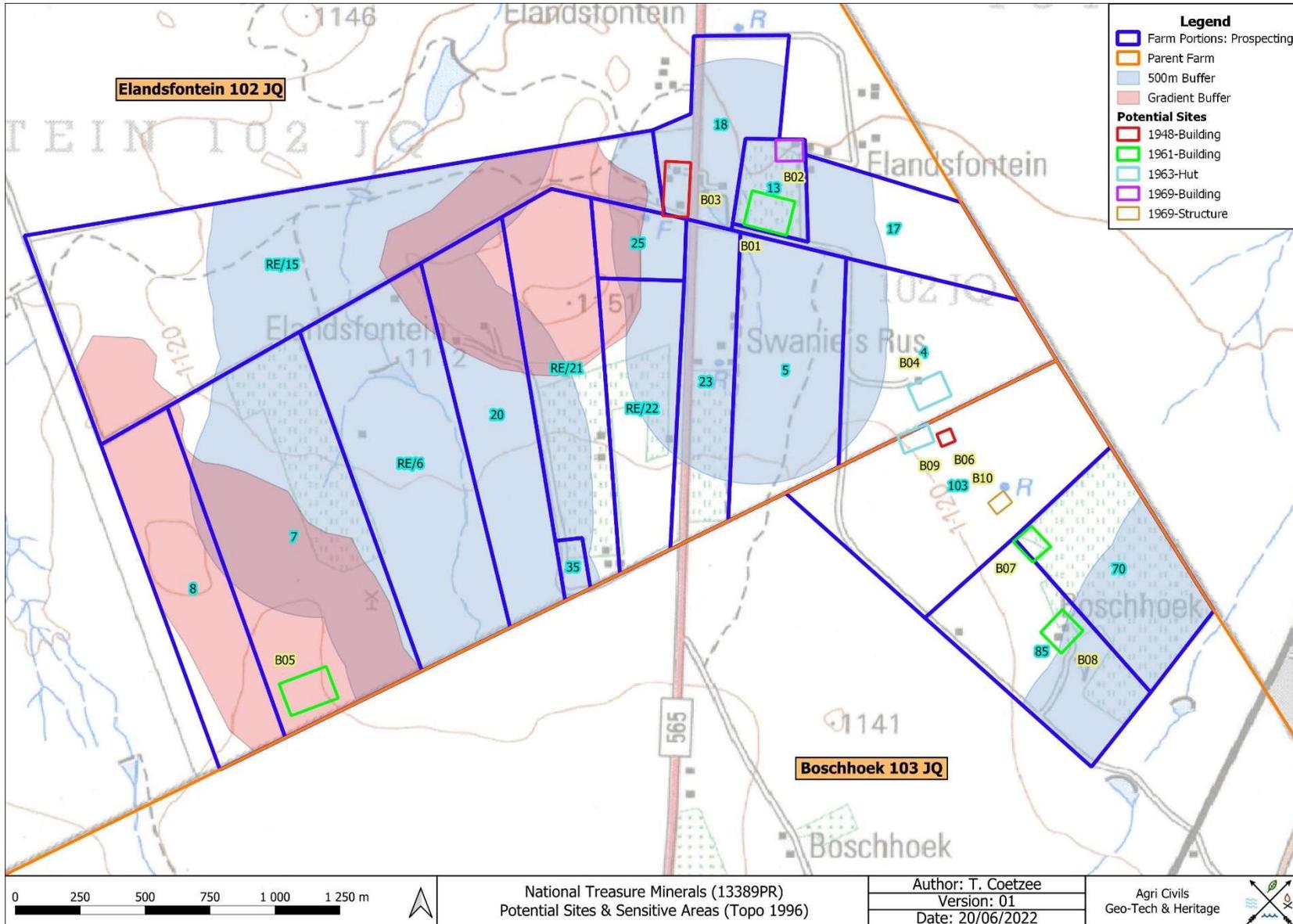


Figure 28: Segment of 1996 SA 1:50 000 2527 AC indicating the study area.



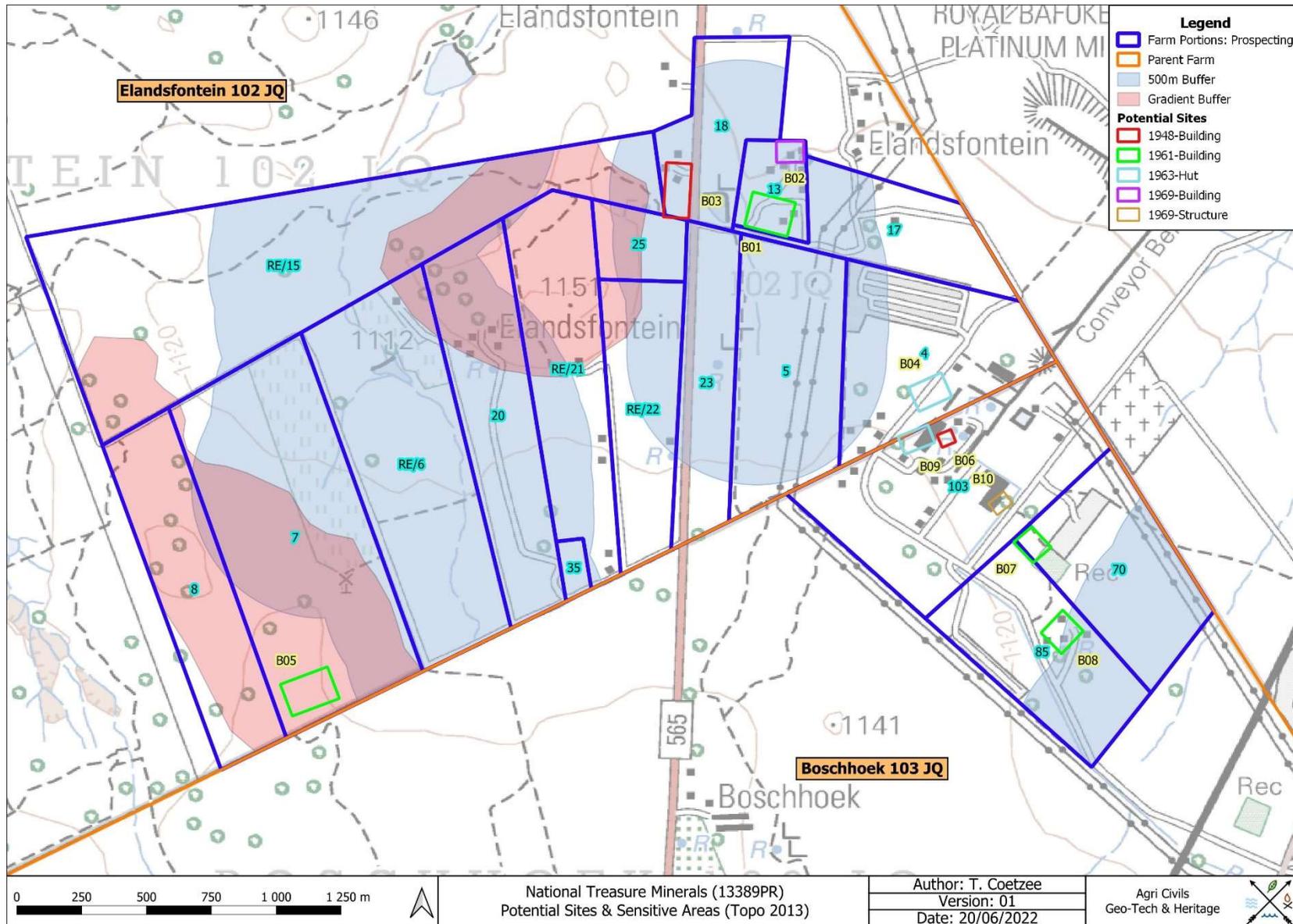


Figure 29: Segment of 2013 SA 1:50 000 2527 AC indicating the study area.

