Archaeological Resources at Geel Vloer, Bushmanland: A Phase 1 Archaeological Impact Assessment

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Introduction

The archaeology of the Northern Cape is rich and varied, covering long spans of human history. The Karoo is particularly bountiful. Concerning Stone Age sites here, C.G. Sampson has observed: "It is a great and spectacular history when compared to any other place in the world" (Sampson 1985). Of course some areas are richer than others, and not all sites are equally significant. Heritage impact assessments are a means to facilitate development while ensuring that what should be conserved is saved from destruction, or adequately mitigated and/or managed.

The present report concerns areas to be impacted upon by proposed gypsum mining on the margins of the Geel Vloer, which lies about 100 km west of Kenhardt. This report provides background information on the archaeology of the wider region against which observations at Geel Vloer may be assessed; a detailed tabulation of observations made; and recommendations for mitigation work.

Terms of reference

Terms of reference were that this survey should identify archaeological and other heritage sites within the areas to be impacted by mining, assessing significance and recommending such mitigation as may be deemed necessary.

Legislation

The National Heritage Resources Act (No 25 of 1999) provides protection for archaeological resources.

It is an offence to destroy, damage, excavate, alter, or remove from its original position, or collect, any archaeological material or object (defined in the Act), without a permit issued by the South African Heritage Resources Agency (SAHRA).

Section 35 of the Act protects all archaeological and palaeontological sites and requires that anyone wishing to disturb a site must have a permit from the relevant heritage resources authority. Section 36 protects human remains older than 60 years. In order for the authority to assess whether approval may be given for any form of disturbance, a specialist report is required. No mining, prospecting or development may take place without heritage assessment and approval.

Methods and limitations

A background literature/museum database search provides indications of what might be expected in the region.

During the field survey, based on surface traces, site positions were measured by way of GPS readings. These are correlated with land forms such as the vloer margin and are believed to be sufficiently accurate for present purposes.

Surface indications were regarded as providing a fair estimate of the nature and range of material present, given the deflation regime that typifies local recent geological history. Accumulations of aeolian dunes are quite limited in extent, and even on these deflation is exposing late Holocene artefact scatters and older palaeodune surfaces. This said, it is to be noted that subsurface traces and features may occur. In the event that any major feature is encountered, for example a burial or a cache of ostrich eggshell flasks, then work should be halted and a professional archaeologist consulted.

Criteria for archaeological significance assessment in this report

In addition to guidelines provided by the Act, archaeological criteria for use in assessing relative significance of archaeological resources have been developed and found to be suitable in Northern Cape settings (Morris 2000).

Estimating site potential

Table 1 is a classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon nd, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential. There are notable exceptions, such as the renowned rock art site Driekopseiland, near Kimberley, which is on landform L1 Type 1. Generally, moreover, the older a site the poorer the preservation. Estimation of potential, in the light of such variables, thus requires some interpretation.

Assessing site value by attribute

The second matrix (Table 2) is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes. While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near feature such as hill	On old river terrace
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Sloping floor or small area	Flat floor, high ceiling
Class	**Archaeo-logical traces**	**Type 1**	**Type 2**	**Type 3**
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell or bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick

Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)

Class	Attribute	Type 1	Type 2	Type 3
1	Length of sequence/context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte/ecofacts
2	Presence of exceptional items (incl regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

Background

Archaeological investigations in the wider region have shown that a wide cross-section of sites can be found in the kinds of environmental settings that occur west of Kenhardt. The earliest archaeological traces consist of Acheulean and Middle Stone Age occurrences, including workshop site situations in the swathe of Dwyka tillites that lie in a broad band across the landscape in these parts. The tillites provide a range of raw materials, particularly quartzites, favoured by the makers of handaxes. Middle Stone Age material has also been found in a palaeodune beside a pan at T'Boop, north west of Commissioners' Pan. A remarkable cf Fauresmith site distinguished by large blades is known from Kalkgaten north east of Kenhardt.

Later Stone Age material, particularly that of late Holocene age, is probably the most widespread of precolonial traces in this landscape, and has been documented (though only partially described) at numerous sites (Beaumont *et al.* 1995; Smith 1995; McGregor Museum records).

Rock art occurs in the wider region (Morris 1988).

Directly comparable settings with archaeological occurrences could well be those at Waterkuil in the Calvinia area to the south (Morris 1996), Klawer Vlei near Commissioners Pan (McGregor Museum records), and vlei and dune settings near Gamsberg (Morris 2001). At these locales Ceramic Later Stone Age surfaces traces include large accumulations of ostrich eggshell pieces (some decorated), ostrich eggshell beads (large and small), pottery fragments, and a variety of stone artefacts of mainly amorphous technology.

Observations

The following tables indicate observations made during a survey of the areas due to be impacted by mining.

Topographically the area could be divided into three zones: that of the Geel Vloer itself which is not intended to be mined and where surface archaeological traces are virtually absent; the vloer margin where beds of gypsum occur and also where dunes feature at the south eastern end of the Geel Vloer; and undulating plains at varying elevations above the Vloer. Artefacts were noted both in the vloer margin and further away on the plains. The most important artefact densities consisted of late Holocene Ceramic Later Stone Age surface scatters associated with dunes in the vloer margin zone, while sporadic Pleistocene material was found further upslope and across the plains, in sometimes almost continuous spreads of mainly low to extremely low densities.

The main focus of the survey was on the undisturbed dune areas at the south east end of Geel Vloer, where part of the main mining impact is due to be sited, on the farm Hendrik zyn Puts. Adjacent portions of the farm Geel Vloer have been disturbed by farming activity so that any archaeological traces there comparable to those noted on the dunes would be somewhat displaced.

Hendrik zyn Puts 1. (Table 3a) This site represents a cluster of local scatters of Ceramic Later Stone Age material on a dune immediately at the vloer edge. In terms of the regional archaeology, this cluster is considered to be of high significance, inter alia on account of the range of artefacts found and the preservation of bone. Apparent spatial patterning means that a reflection of domestic use of space may be preserved. The age of the site is estimated to be within the last millennium. Sites such as this could be significant in the current debate on pastoralism vs foragers with sheep (Sadr 2003). Abbreviations used in this and subsequent tables: OES = ostrich eggshell; UGS = Upper Grindstone; LGS = Lower Grindstone. Significance is assessed in terms of criteria given in Tables 1 and 2.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 1A	29.31.574 20.07.747	Sand dune at edge of Geel Vloer. A hard palaeodune is overlain by a few centimetres of sand. Cultural material occurs on and within the superficial sand, as well as on the older deflated surface. High density surface scatter of [Ceramic] Later Stone Age material including lithics, ostrich eggshell, OES bead (small), decorated OES fragment, UGS, quartz crystal. One potsherd was seen a little way off. The following additional features were noted:	Landform: L3 Type 2 Archaeology: A2 Type 1 A3 Type 1 Site attributes: Class 1: 1 Class 2: 3 Class 3: 3 Class 4: 2 Overall: MEDIUM TO HIGH (See discussion below: preservation of bone is significant).
Hendrik zyn Puts 1B	29.31.569 20.07.758	Bone feature embedded in and eroding from harder sand.	
Hendrik zyn Puts 1C	29.31.578 20.07.741	Bone feature embedded in and eroding from harder sand.	
Hendrik zyn Puts 1D	29.31.580 20.07.740	Stone cluster feature – may be a grave?	

Hendrik zyn Puts 2. (Table 3b) This locality represents a much larger set of site clusters/local scatters of Ceramic Later Stone Age material on, and deflating from, dunes about 100 m upslope from the vloer. Comparable with Site 1, and in terms of the regional archaeology, these clusters are considered to be of high significance, again on account of the range of artefacts present, and the spatial patterning that seems evident. As to age, it appears to be contemporary with Site 1. The association of this site cluster and Hendrik zyn Puts 4, on either side of a leegte that leads down to the vloer, may be significant.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 2A	29.31.828 20.08.092	Sand dune several hundred metres away from the edge of Geel Vloer and adjacent to (north of) a leegte. A hard palaeodune is overlain by a few centimetres of sand. Cultural material occurs on and within the superficial	Landform: L3 Type 2 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 3 Class 3: 2 Class 4: 2

		sand, as well as on the older deflated surface. Surface scatter of [Ceramic] Later Stone Age material including lithics, ostrich eggshell.	Overall: MEDIUM TO HIGH (See discussion below).
Hendrik zyn Puts 2B	29.31.809 20.08.085	'Hotspot' including quartz crystal and small UGS.	
Hendrik zyn Puts 2C	29.31.794 20.08.091	'Hotspot' at crest of dune, thinning out to the east (away from Vloer).	
Hendrik zyn Puts 2D	29.31.799 20.08.057	Cluster of potsherds, with lithics and OES.	
Hendrik zyn Puts 2E	29.31.792 20.08.046	OES, bone and lithics	
Hendrik zyn Puts 2F	29.31.765 20.08.002	Glass and metal	
Hendrik zyn Puts 2G	29.31.759 20.07.986	Lithics, OES, one pot sherd, glass, porcelain	
Hendrik zyn Puts 2H	29.31.719 20.07.995	Lithics, OES, ceramics, bone fragments, broken UGS.	
Hendrik zyn Puts 2I	29.31.710 20.07.995	Burnt OES, stone – hearth?	
Hendrik zyn Puts 2J	29.31.721 20.07.985	Big bead	
Hendrik zyn Puts 2K	29.31.731 20.07.965	OES decorated on inside, lithics.	
Hendrik zyn Puts 2L	29.31.733 20.07.956	Grass-temp & grit-temp sherds, very dense scatter, UGS with dimple, on south crest of dune facing Vloer. Masses of OES. LGS about 5 m from UGS	
Hendrik zyn Puts 2M	29.31.753 20.07.937	'Hotspot' mostly OES	
Hendrik zyn Puts 2N	29.31.779 20.07.900	'Hotspot' masses of OES, grit-temp sherds, fragmented bone	
Hendrik zyn Puts 2O	29.31.788 20.07.922	LGS, big bead.	
Hendrik zyn Puts 2P	29.31.774 20.07.972	2 UGS, lithics, OES, broken LGS.	
Hendrik zyn Puts 2Q	29.31.808 20.07.972	UGS	
	29.31.888 20.08.004	Approx middle of Leegte.	

Hendrik zyn Puts 3. (Table 3c) Very low density of Middle Stone Age material within the Vloer margin zone.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 3	29.31.618 20.07.558	cf. Middle Stone Age – facetted butt, cores. Between Site 2 complex and Vloer edge. Very low density.	Landform: L1 Type 1 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 1 Class 3: 1 Class 4: 1 Overall: LOW

Hendrik zyn Puts 4. (Table 3d) This is a relatively smaller set of site clusters/local scatters of Ceramic Later Stone Age material on dunes south of and across a leegte from Hendrik zyn Puts 2. It is comparable with both Sites 1 and 2, but is not as rich.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 4	29.32.008 20.07.987	[Ceramic] Later Stone Age lithics, OES, LGS, some glass, porcelain, metal. Dune area south of leegte.	Landform: L3 Type 2 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 2 Class 3: 1 Class 4: 2 Overall: MEDIUM

Hendrik zyn Puts 5. (Table 3e) Very low density of Acheulean material within a dense scatter of stones some hundreds of metres away from the vloer.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 5	29.32.170 20.07.627	Acheulean flakes and cores. Dense scatter of stones but very low density of artifacts.	Landform: L1 Type 1 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 1 Class 3: 1 Class 4: 1 Overall: LOW

Hendrik zyn Puts 6. (Table 3f) Like site 5, a very low density of Acheulean material within a dense scatter of stones some hundreds of metres away from the vloer.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 6	29.32.748 20.07.657	Acheulean flakes and cores. Dense scatter of stones but very low density of artifacts.	Landform: L1 Type 1 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 1 Class 3: 1 Class 4: 1 Overall: LOW

Hendrik zyn Puts 7. (Table 3g) A fairly small set of local scatters of [Ceramic] Later Stone Age material on a dune area, with one 'hotspot'. It is comparable with Sites 1 and 2, and noteworthy in terms of small backed microliths found amongst the lithic artefacts.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 7	29.32.141 20.07.881	[Ceramic] Later Stone Age lithics (two backed pieces), OES, dimpled UGS. Low dune area away from Vloer.	Landform: L3 Type 2 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 2 Class 3: 1 Class 4: 2 Overall: MEDIUM

Hendrik zyn Puts 8 and 9. (Table 3h & i) On a dune directly at the edge of the vloer, with extremely sparse archaeological traces (site 8) probably comparable in age and context with Sites 1 and 2; and (site 9), a little distance away, a feature that may represent a grave.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 8	29.31.899 20.07.488	Very low density of OES, lithics, manuports, near edge of Vloer on small dune area.	Landform: L3 Type 2 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 1 Class 3: 1 Class 4: 1 Overall: LOW

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 9	29.31.879 20.07.525	Possible grave?	? Potentially high

Hendrik zyn Puts 10. (Table 3j) Like sites 5 and 6, a very low density of Acheulean material set back some hundreds of metres from the vloer.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 10	29.31.946 20.07.676	Scattered Acheulean mainly cores. Very low density of artefacts.	Landform: L1 Type 1 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 1 Class 3: 1 Class 4: 1 Overall: LOW

Hendrik zyn Puts 11. (Table 3k) A very low density of Acheulean material, including a handaxe, within a dense scatter of stones in the upslope/undulating plain zone, and representative of vast tracts in the surrounding landscape, where similarly very sparse 'sprinklings' of Pleistocene age material has been documented.

Site No	Lat-Long	Description	Significance
Hendrik zyn Puts 11	29.31.381 20.09.156	Acheulean cores, flakes, handaxe, very low density. This site is situated at some distance upslope from the vloer.	Landform: L1 Type 1 Archaeology: A3 Type 1 Site attributes: Class 1: 1 Class 2: 1 Class 3: 1 Class 4: 1 Overall: LOW

Discussion

The material of Pleistocene age consists of extremely low density scatters and isolated finds comprising mainly flakes and cores, with only one handaxe having been noted on Site 11. As noted above these occurrences are probably comparable to material found within the swathe of Dwyka tillites, which were a

source of raw materials such as quartzite, on which most of these artefacts are made. None of the Pleistocene finds around Geel Vloer are regarded as being of greater than low significance.

Late Holocene sites documented above have a far greater degree of archaeological integrity, including internal spatial patterning, and preservation of organic materials, that makes them regionally significant. The stone tool component includes cores, flakes and blades based on cryptocrystalline silicate, chert, quartz, and quartzite. Formal elements noted were miscellaneous backed pieces/blades. Raw materials used are in many instances foreign to the immediate vicinity. Ceramics were found, though not in any abundance and often in localized spots. These were mainly thin grit tempered sherds, while one sherd with grass filler was found. As at sites such as Klawervlei and Waterkuil, the pottery component is a fairly small part of the total assemblage, and in this the sites differ from those nearer the Orange River such as Renosterkop and Biesje Poort (Morris & Beaumont 1991).

By far the dominant archaeological trace on these sites consists of ostrich eggshell fragments. This has led farm-owner, Mr Louw, to suggest that this was an ostrich nesting area, whereas it is here suggested that these are the remains largely of Later Stone Age utilization of ostrich eggshells as, initially, a food source, then recycled as water flasks and decorative items including beads. The eggshell fragments are clearly deflating out of the superficial coarse sand layer, along with Later Stone Age stone artefacts, almost exactly overlapping the spatial spread of the latter. The presence of beads and decorated pieces of eggshell point conclusively to human agency, rather than that of ostriches, in these localized scatters.

The presence of large ostrich eggshell beads on the site is consonant with a second millennium AD age estimate for the site: sites that are more than 1000 years old tend to have consistently smaller beads. Just how these and similar sites in the region would be articulated relative to forager and herding lifestyles and associated socio-cultural configurations remains to be assessed (sheep and pottery appear at sites such as Spoegrivier on the Namaqualand coast around 2000 BP). In this respect the preservation of bone at some of the Hendrik zyn Puts sites makes them particularly significant.

Beaumont *et al.* (1995) have shown, in relation to this question, that "virtually all the Bushmanland sites so far located appear to be ephemeral occupations by small groups in the hinterland on both sides of the [Orange] river" (1995:263). This was in sharp contrast to the substantial herder encampments along the Orange River floodplain itself, which reflected the "much higher productivity and carrying capacity of these bottom lands". "Given choice," they add, "the optimal exploitation zone for foragers would have been the Orange River". The advent of herders in the Orange River Basin, Beaumont *et al.* argue, led to competition over resources and ultimately to marginalisation of foragers, some of whom then occupied Bushmanland, probably mainly in the last millennium, and focussed their foraging activities on the limited number of water sources in the region. "Surveys of large areas away from [such water sources] have failed to yield any signs of human occupation, except around

the granite inselbergs extruding above the peneplain, the red dunes which produced clean sand for sleeping, or around the seasonal pans" (Beaumont *et al.* 1995:264). It is clear that, possibly following good rains, herders themselves moved into the hinterland (sites near Aggeneys (Morris 2000; 2001) reflect this archaeologically). A further process attested by Thompson in the 1820s, for herder groups settled at the stronger springs such as Pella, is that such groups would disperse during periods of drought (Morris 2000). At such times competition between groups over resources, and stress within already marginalised forager society, must have intensified.

Twentieth and possibly late nineteenth century traces include porcelain, glass and metal objects on the dunes and may reflect recent farming-related visits as well as possibly earlier Trekboer herding.

Recommendations

<u>All archaeological sites are protected: permit required</u>:

All the sites and material traces of human activity recorded in this report, excepting the most recent twentieth century remains, are protected by the National Heritage Resources Act.

Before these sites are impacted upon by the proposed mining, a permit would need to be obtained from SAHRA.

<u>Phase 2 mitigation required</u>:

In addition, the following Phase 2 mitigation measures are recommended, namely:

Salvage excavation of portions of Hendrik zyn Puts Sites 1 and 2:

It is recommended that excavation, mapping and systematic sampling be carried out to recover an adequate reflection of Sites 1 and 2, namely the significant Ceramic LSA dune-associated sites adjacent to Geel Vloer on Hendrik zyn Puts.

An archaeologist should be engaged to carry out this mitigation work, which would need to be done in terms of a permit to be sought from SAHRA.

<u>General precautions</u>:

As noted, sites or features not visible at the surface may be encountered during development/mining. In the event that any major feature is found in this way – for example a burial or a cache of ostrich eggshell flasks – then work should be halted and a professional archaeologist consulted.

Acknowledgements

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CONSTRUCTION PHASE	PHASE 1 MINING	PHASE 2 MINING	PHASE 3 MINING	PHASE 4 MINING	PHASE 5 MINING
Logistical Area	Mining -Mine Block 1 2007 - 2010 (4years) ±30.2ha	Mining -Mine Block 2a+b 2011-2015 (5years) ± 44ha	Mining -Mine Block 3 2016-2021 (6years) ± 67.5ha	Mining -Mine Block 4 2022-2024 (3years) ± 45ha	Mining -Mine Block 5 2025 (1years) ± 8.6ha

Initial Logistical Facilities

- Access roads & intersection with main road.
- Erection of staff accommodation.
- Fencing of mining block and logistical/housing areas.
- Establish offices, laboratory and ablution facilities.
- Workshop
- Water, & sewer system.
- Processing plant
- Ore/Gypsum stockpile areas.
- Diesel tank & power generator & power lines.

Reserve Yield

- High Yield
- Medium Yield
- Low Yield

Archaeological Sites

2(C) Sites

- A Acheulean
- M Middle Stone Age
- C Later Stone Age

Note: Mine block boundaries shown for phasing purposes. Detail boundaries will be subject to change following bulk sampling and mining of the previous block.

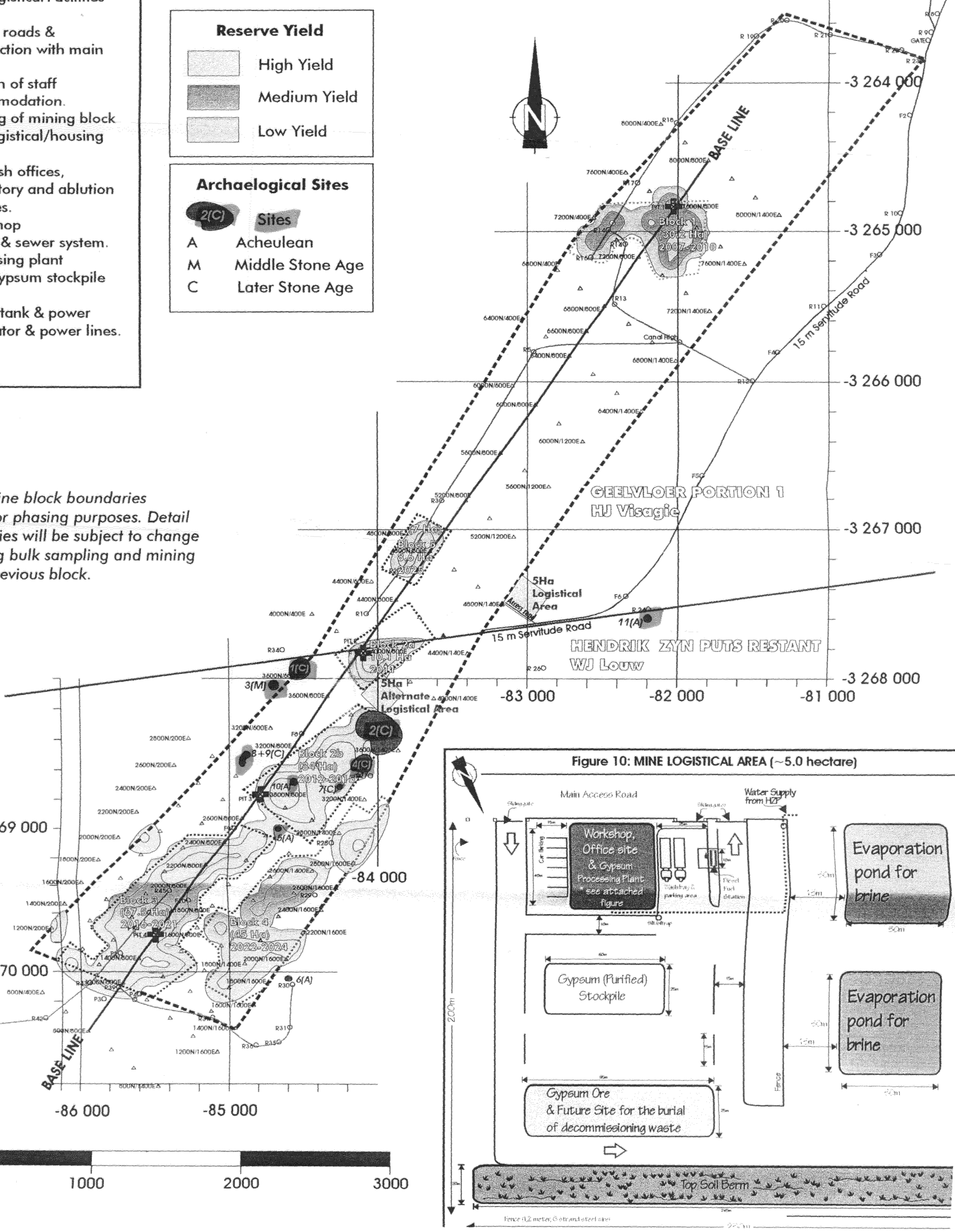

Figure 10: MINE LOGISTICAL AREA (~5.0 hectare)