

**Phase 1 Heritage Impact Assessment of a proposed new
subsurface water pipeline between the Van Wyksvlei
reservoir and Saaipoort, near Carnarvon, NC
Province.**



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Executive Summary

A Phase 1 heritage impact assessment was carried out the construction of a proposed new water pipeline between Van Wyksvlei and Saaipoort near Carnarvon in the Northern Cape Province. The proposed new subsurface water pipeline will run within the road reserve of the R361 between two existing reservoirs from Van Wyksvlei to Saaipoort, located about 12 km north of Carnarvon. Two new pump stations will be placed on high ground on Karoo dolerite outcrop along the route. Results of the survey indicate that the proposed pipeline route has been degraded by the construction of an existing pipeline between the Van Wyksvlei reservoir and the R361 road, as well as a result of previous road construction activities along the R361 going south to Carnarvon. The survey was divided into five parts. All the linear sections as well as the two proposed pump station localities are rated Generally Protected C (GP.C).

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Introduction

A Phase 1 heritage impact assessment was carried out the construction of a proposed new water pipeline between Van Wyksvlei and Saaipoort near Carnarvon in the Northern Cape Province (**Fig. 1**).

The National Heritage Resources Act (NHRA) (No 25 of 1999) requires that all heritage resources (all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance) are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures over 60 years of age, living heritage and the collection of oral histories, historical settlements, landscapes, geological sites, palaeontological sites and objects. The Act identifies what is defined as a heritage resource, the criteria for establishing its significance, and lists specific activities for which a heritage specialist study may be required. In this regard, categories of development listed in Section 38 of the NHRA are:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site;
- Exceeding 5000 m² in extent;
- Involving three or more existing erven or subdivisions thereof;
- Involving three or more subdivisions thereof which have been consolidated within the past five years;
- Costs of which will exceed a sum set in terms of regulations by the South African Heritage Resources Agency (SAHRA).
- The rezoning of a site exceeding 10 000 m².
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

Methodology

The heritage significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant heritage information, aerial photographs and site records were consulted and integrated with data acquired during the on-site inspection. A site visit was conducted in May 2015.

The task also involved identification and assessment of possible heritage within the proposed project area, in accordance with section 9(8) and appendix 6 (“Specialist reports”) of the NEMA EIA Regulations, 2014 , whereby the specialist report takes into account the following terms of reference:

- Identify and map possible heritage sites and occurrences using available resources.
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

The study area is rated according to field rating categories as prescribed by SAHRA , as well as according to a probability of impact methodology for assessing the Duration (time scale), Extent (spatial scale) and the Probability of occurrence of potential impacts (**Table 1**).

Description of the Affected Area

Locality data

1:50 000 scale topographic maps:

3021BD Van Wyksvlei

3021DB Jagersberg

3021DD Konka

Pipeline coordinates (**Fig. 1 & 2**):

A) 30°20'50.24"S 21°48'36.07"E (Van Wyksvlei reservoir)

B) 30°50'51.89"S 22° 6'0.56"E (Saaipoort)

Pump station 1: 30°30'55.87"S 21°54'19.59"E

Pump station 2: 30°46'29.03"S 22° 3'45.15"E

The proposed new subsurface water pipeline route will run within the road reserve of the R361 between two existing reservoirs from Van Wyksvlei to Saaipoort, located about 12 km north of Carnarvon. The town of Van Wyksvlei was founded in 1882 and named after a farmer by the name of Van Wyk. Carnarvon was laid out in 1860 on the farms *Harmsfontein* and *Schietfontein*, which belonged to the Rhenish Missionary Society and was named after the British Colonial Secretary, the Earl of Carnarvon, Henry Howard Molyneux Herbert in 1874. It became a municipality in 1882 (Rosenthal 1967). The footprint is located next to an existing pipeline route that traverses the townlands, bordering a dry spruit west of Van Wyksvlei to join the R361 road that goes to Carnarvon (**Fig. 2 - 5**). From here the pipeline will run to Saaipoort within the road reserve of the R361 (**Fig. 6 & 7**). Two new pump stations will be placed on high ground on Karoo dolerite outcrop along the route (**Fig. 8 & 9**)

Geology

The pipeline route along the road reserve is for the most part underlain by Tierberg Formation sediments (Ecca Group, Karoo Supergroup), made up of shales and subordinate siltstone and sandstone layers (Prinsloo, 1989). The sequence, which represents the uppermost unit of the Ecca Group, contains a diversity of trace fossils, microvertebrate remains, sponge spicules and plant remains that occasionally include petrified wood. The Tierberg Formation is considered to be of moderate palaeontological significance and sensitivity. Both pump station localities are located on Karoo dolerite outcrop, which are not considered to be palaeontologically significant.

Background

Paleogene fossil assemblages are known from a crater-lake deposit within a volcanic pipe at Stompoor, located about 65 km due north of Van Wyksvlei, and include a diversity of fish, frogs, reptiles, insects, and palynological remains (Smith 1988). Fluvial deposits from the ancient Koa Valley have yielded fossil vertebrate bone as well as fossil wood (Maglio 1978; De Wit 1996; De Wit and Bamford 1993; Partridge and Maud 2000). A fossilized horn core of an extinct alcelaphine has been retrieved

from alluvial sediments along the Ongers River near Britstown, while Florisian type faunal remains have been excavated from an archaeological site at Bundu Farm Pan near Copperton (Brink *et al.* 1995; Kiberd 2006). Quaternary fossil sites are mostly localized and generally sparsely distributed in the region.

The Northern Cape landscape is generally characterized by low density surface scatters, while a number of Middle and Later Stone Age sites have been associated with pans and pan-related sediments (Beaumont 1986; Kiberd 2006). The archaeological footprint in the Van Wyksvlei region is largely represented by Stone Age hunter-gatherer living sites and abundant rock engraving localities attributed to the /Xam, which is an extinct group of the San who occupied the Bushmanland and Upper Karoo regions until about 120 years ago (Deacon 1988) (**Fig. 10**). A fine example of rock engraving sites is found on a hill at Springbok Oog, northwest of Van Wyksvlei where a large concentration of rock engravings, including those of 19th century European settlers, have been recorded (van Riet Low 1941; Deacon 1988).

Results and Impact Statement

Results of the survey indicate that the proposed pipeline route has been degraded by the construction of an existing pipeline between the Van Wyksvlei reservoir and the R361 road, as well as a result of previous road construction activities along the R361 going south to Carnarvon. The survey was divided into five parts. Features identified within the vicinity of the development footprint are presented in **Table 2**.

Linear Section 1: Van Wyksvlei reservoir to the R361

Except for a house (that is still in use) situated next to the existing pipeline route below the reservoir (**Fig. 11 & Fig. 12 no. 1**), as well as a few isolated, informal stone tools recorded on alluvial sediments derived from a nearby dry spruit (**Fig. 11 & Fig. 12 no. 2**), no evidence was found of *in situ* Stone Age archaeological material, rock engraving sites, prehistoric structures, graves or historical buildings older than 60 years within the boundary of the footprint area along the section. The section is rated Generally Protected C (GP.C)

Linear Section 2: R361 road reserve outside Van Wyksvlei to the Pump Station 1 locality.

No evidence were found of *in situ* Stone Age archaeological material, rock engraving sites, prehistoric structures, graves or historical buildings older than 60 years within

the boundary of the footprint along this section. The section is rated Generally Protected C (GP.C).

Section 3: Pump Station 1 locality

A foot survey of the site revealed no evidence of *in situ* Stone Age archaeological material, rock engraving sites, prehistoric structures, graves or historical buildings older than 60 years within the boundary of the footprint. The site is rated Generally Protected C (GP.C)

Linear Section 4: R361 road reserve from the Pump Station 1 locality to Saaipoort

There is no evidence of *in situ* Stone Age archaeological material, capped or distributed as surface scatters, rock engraving sites, prehistoric structures, graves or historical buildings older than 60 years within the boundary of the footprint that runs within the road reserve of the R361 to Saaipoort. The section is rated Generally Protected C (GP.C).

Section 5: Pump Station 2 locality

Three isolated OES fragments, two weathered microliths and faint traces of several engraved lines were recorded at three different localities, south of the affected area, which may suggest that human occupation in the area was most likely of an ephemeral nature. (**Fig. 13 - 16**). The engraved markings of several short horizontal lines, were found on one dolerite boulder, about 40m to the south-west of the affected area. No other rock engravings could be found within a 50 m radius of the proposed pump station site. Construction of the proposed pump station will not impact on the stone tool and engraving locality. The site is rated Generally Protected C (GP.C)

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Tables and Figures

Table 1. Field rating categories as prescribed by SAHRA.

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	Field Rating IV A	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	Field Rating IV B	Medium significance	Recording before destruction
Generally Protected C (GP.C)	Field Rating IV C	Low significance	Destruction

Table 2. Features recorded in vicinity of the development footprint.

Loc.	Feature	Coordinates	
#852	House near Van Wyksvlei reservoir	30°20'54.31"S	21°48'49.70"E
#854	Isolated flake	30°21'5.39"S	21°48'59.65"E
#869	OES	30°46'29.45"S	22° 3'45.47"E
#870	Marking on dolerite	30°46'30.15"S	22° 3'44.18"E
#872	Isolated microlith scatter	30°46'30.85"S	22° 3'45.92"E



Figure1. Layout and aerial view of the proposed new pipeline.

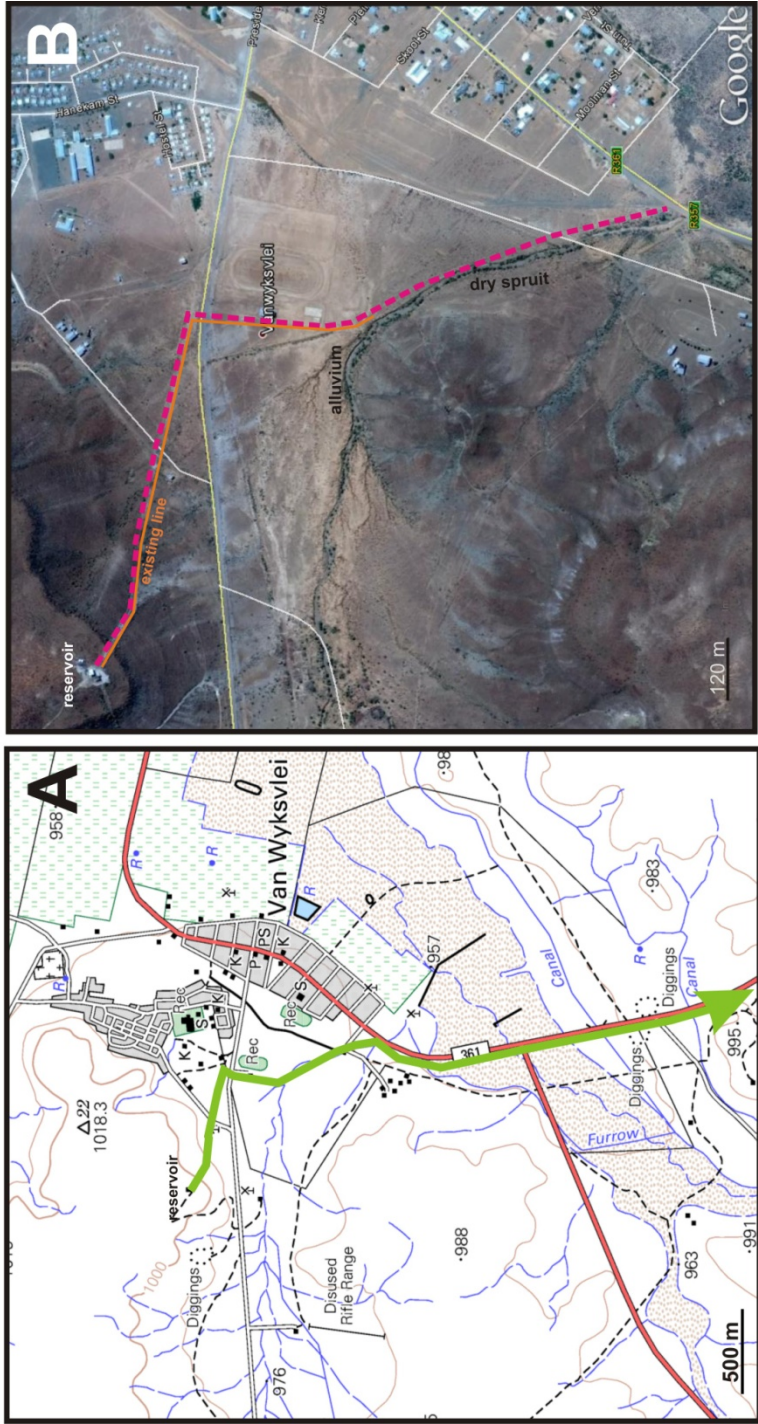


Figure 2. (A) Layout of the proposed pipeline section between the Van Wyksvlei reservoir and the R361 road (portion of 1:50 000 scale topographic map 3021BD Van Wyksvlei); (B) Aerial view of the proposed pipeline section between the Van Wyksvlei reservoir and the R361 road.

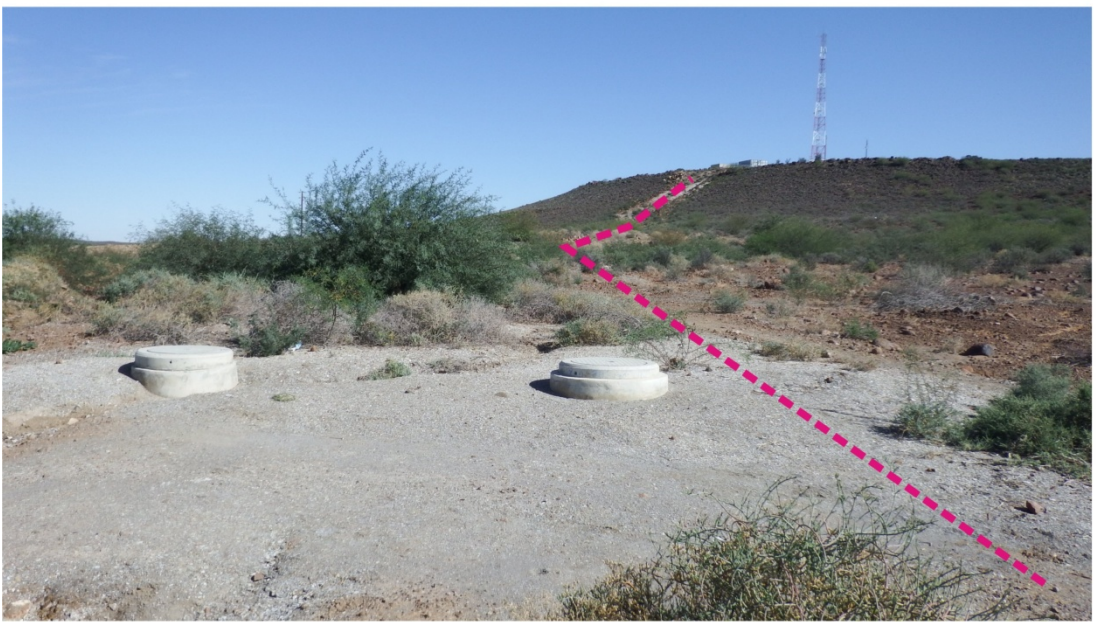


Figure 3. Looking north towards the Van Wyksvlei reservoir. The proposed new route is marked in red.



Figure 4. The proposed route crosses degraded open veld (top) and then flanks a dry spruit west of the town before it joins up with the R361.



Figure 5. Junction where the proposed pipeline route joins the R361 (top) where after it turns south to follow the R361 along the road reserve (bottom).



Figure 6. General view of the proposed footprint at different points along the R361



Figure 7. General view of the proposed pipeline route along the R361. The road has largely been constructed using locally available bedrock sediments (Ecca shales) for raw material (center and bottom).
Scale 1 = 10 cm.

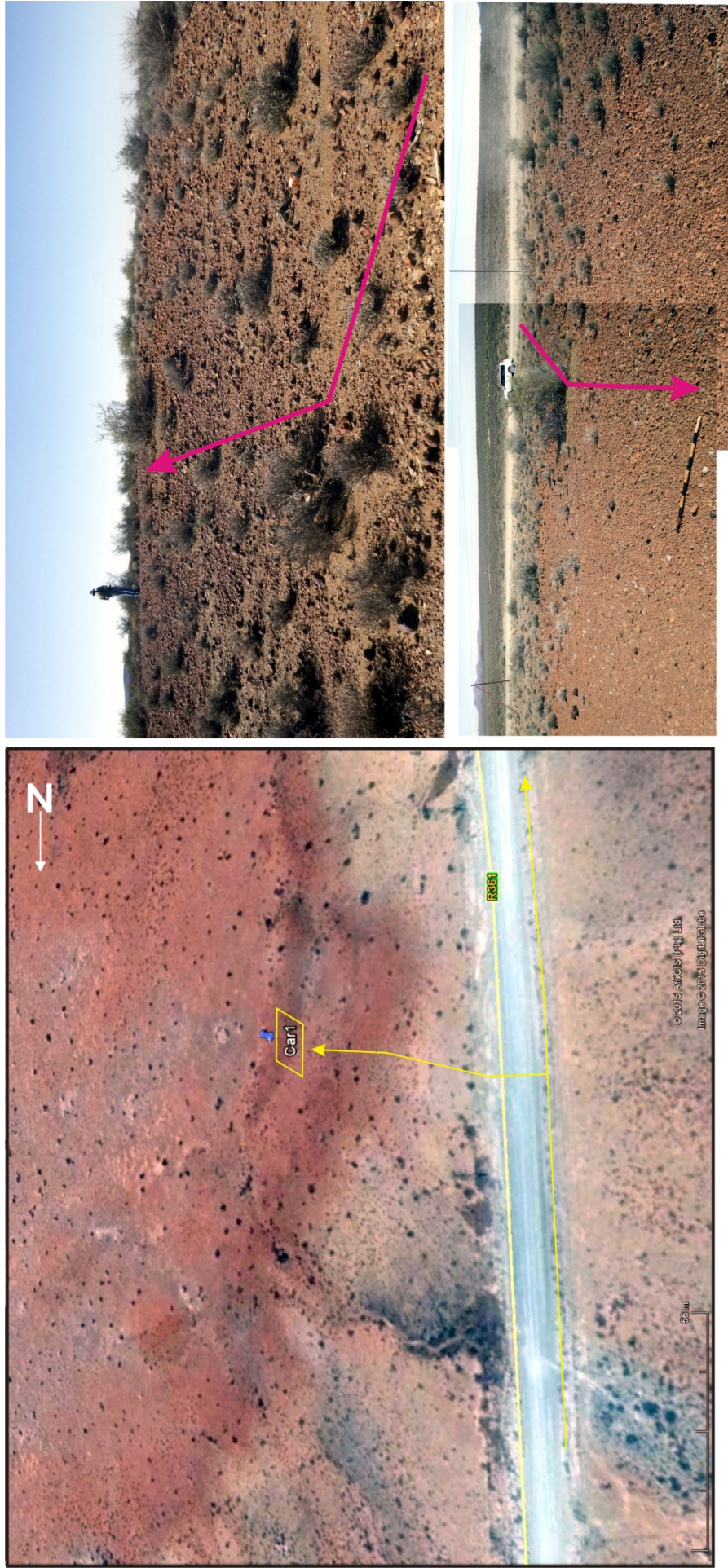


Figure 8. Aerial view of the proposed Pumpstation 1 site (left) and general view of the area, looking east-southeast (top right) and west towards the R361 (bottom right).

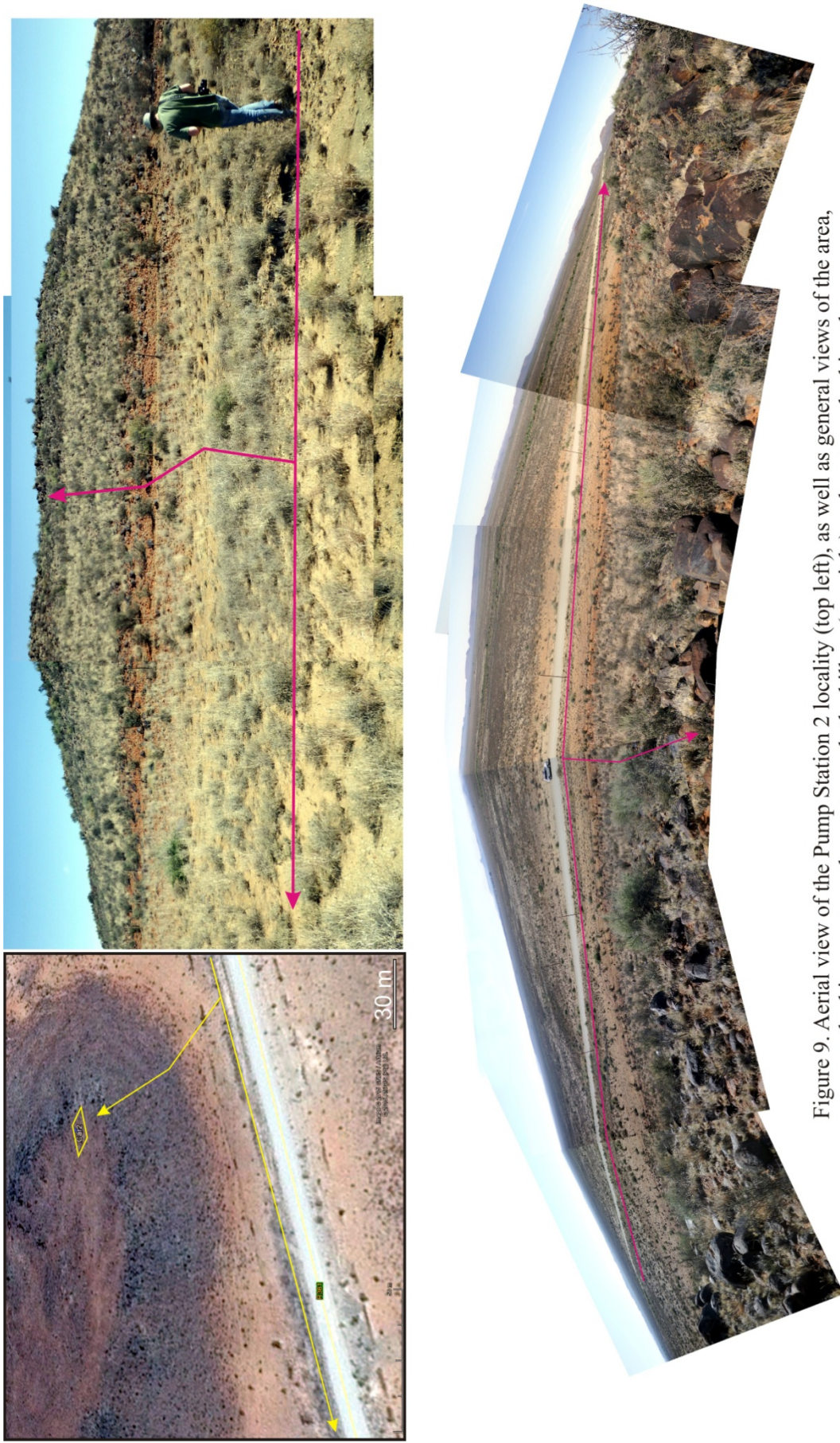


Figure 9. Aerial view of the Pump Station 2 locality (top left), as well as general views of the area, looking west-southwest towards the hilltop (top right) and east overlooking the plain below the site (bottom).

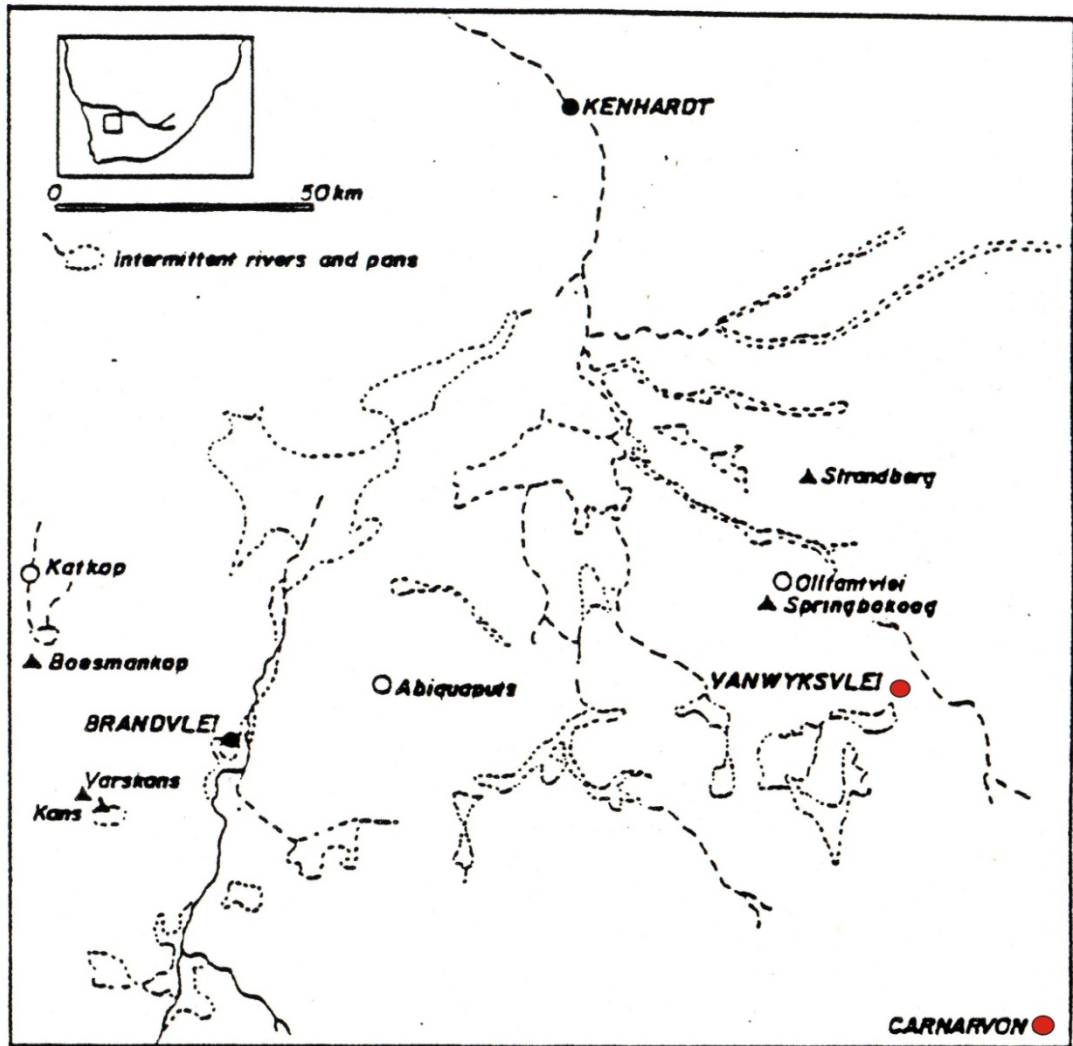


Figure 10. Map of Stone Age hunter-gatherer living sites and abundant rock engraving localities in the region (after Deacon 1988).



Figure 11. Relevant features recorded within the vicinity of the proposed pipeline route during the field assessment: (A) house and yard still in use; (B) isolated flake made from hornfels; (C) shale fragment with evidence of trace fossils; (D) small dolerite outcrop next to the R361 with no sign of engravings ($30^{\circ}41'33.91''S$ $22^{\circ}1'15.85''E$); (E) dry spruit at the Van Wyksvlei townlands with well-developed alluvial overburden. Scale 1 = 10 cm.



Figure 12. Aerial view and location of the house (1) and isolated stone tool find (2) recorded in the vicinity of the proposed pipeline route.



Figure 13. Boulder-strewn terrain at the Pump Station locality, looking west.

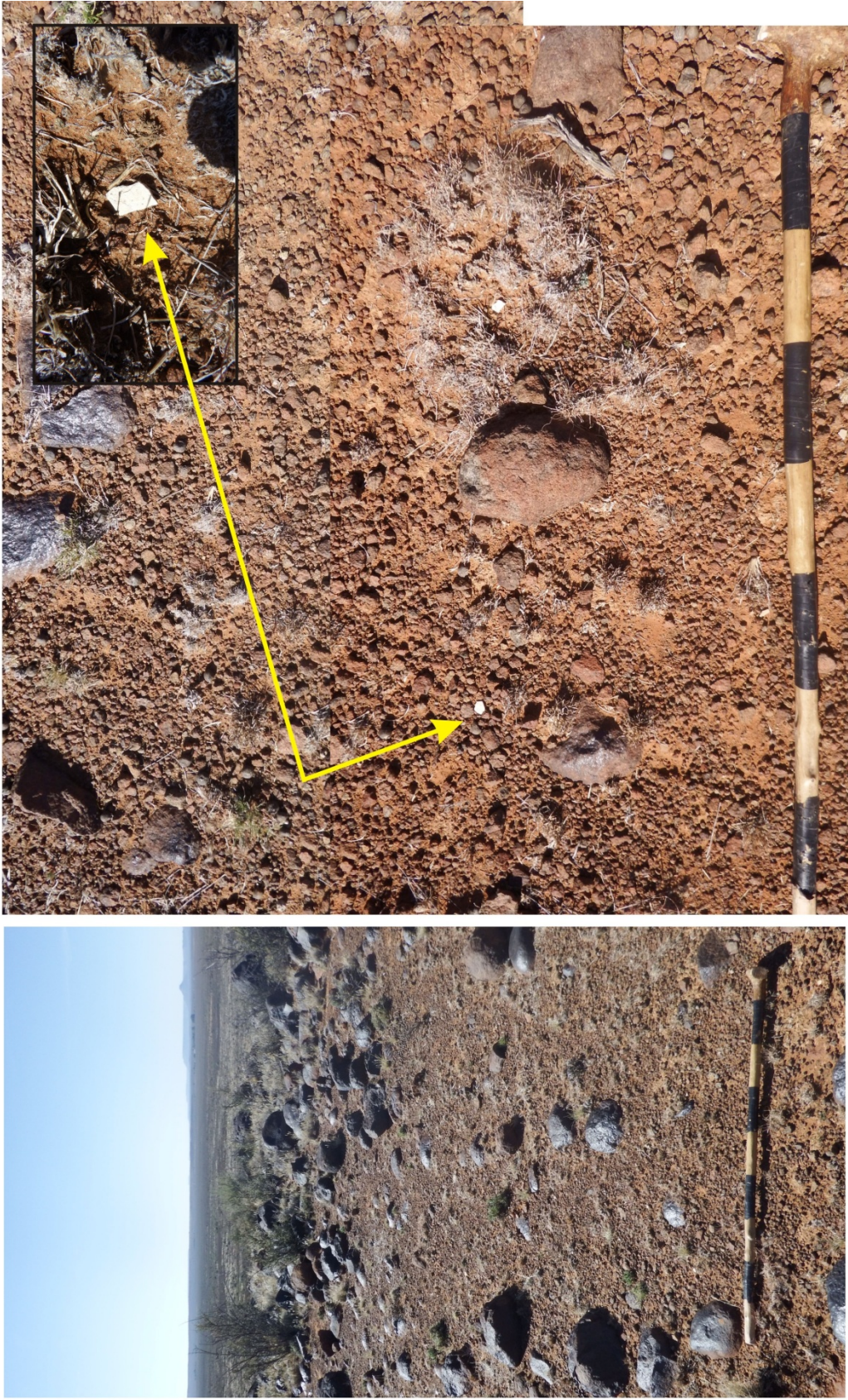


Figure. 14. The proposed new Pump Station 2 facility, looking east (left) and isolated OES fragments recorded nearby (right). Scale 1 = 10 cm).



Figure 1.5. Location of features identified near the Pump Station 2 site.



Figure 16. A small core/debitage waste product made from hornfels (top) and faint markings on one dolerite boulder (Center and bottom) located near the proposed Pump Station 2 site.
Scale 1= 10 cm.