

HERITAGE IMPACT ASSESSMENT

PROPOSED POSTMASBURG WASTE WATER TREATMENT PLANT, POSTMASBURG NORTHERN CAPE PROVINCE

Assessment conducted under Section 38 (8) of the
National Heritage Resources Act 25 of 1999

Prepared for:

ENVIROAFRICA

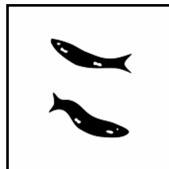
Att: Mr Clinton Geyser
PO Box 5367
Helderberg
7135

E-mail: Clinton@enviroafrica.co.za

Client

Tsantsabane Municipality

By



Agency for Cultural Resource Management
5 Stuart Road, Rondebosch, 7700
Ph/Fax: 021 685 7589
Mobile: 082 321 0172
E-mail: acrm@wcaccess.co.za

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Executive summary

ACRM was appointed to conduct a Heritage Impact Assessment (HIA) for the proposed Postmasburg Waste Water Treatment Plant (WWTP) in Postmasburg near Kimberley, in the Northern Cape.

The HIA forms part of the EIA process that is being undertaken by independent environmental consultants, EnviroAfrica cc.

The applicant is the Tsantsabane Municipality.

An increase in housing developments in Postmasburg, mainly due to a major increase in mining activities in the area, has necessitated the need to upgrade the existing WWTP in Postmasburg. New housing developments mean that the existing WWTP must either be upgraded to accommodate envisaged increased flows, or alternatively, a new sewerage plant must be considered.

It is therefore proposed to extend the existing main sewer pipeline downstream of the Groenwater Spruit, south of the town, to a point where it would daylight, and then construct a new WWTP on a hilltop site overlooking the stream.

The new sewer pipeline will be extended from the existing Tuinstraat Pump Station, following the Groenwater Spruit to a point approximately 1.3 km downstream of the town.

The footprint area required for the new WWTP is about 10ha, although the physical footprint area will only be about 2.0 ha in extent.

The riparian vegetation alongside the Groenwater Spruit comprises thick grass and reed beds. Sections of the river bank are also waterlogged with overflowing waste water due to existing capacity constraints. The remainder of the proposed sewer pipeline route alongside the spruit is infested with dense stands of thorny Swarthaak (*acacia mellifera*) vegetation.

The receiving environment for the proposed new WWTP (a flat hilltop site overlooking the Groenwater Spruit) comprises very dense Swarthaak, on a substrate of hard stony gravel.

The National Heritage Resources Act (No. 29 of 1999) requires that a HIA must be undertaken when an area exceeding 5000 m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

Section 38 (1) (a) of the Act also indicates that any person constructing a pipeline exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether a HIA is needed before development can take place.

A survey of the proposed activities (i. e. the sewer pipeline & the WWTP) took place on the 16th June 2014 in which the following observations were made

- Small numbers of Middle (MSA) and Later Stone Age (MSA) tools in banded ironstone were recorded on the north bank of the Groenwater Spruit alongside the proposed new sewer pipeline. Most of the tools were recorded in a strip of vegetation that has been cleared inside a fence line, adjacent the proposed new pipeline.
- Only eight flake tools were recorded in the footprint area of the proposed WWTP which is covered in dense Swarthaak vegetation.
- No visible graves were encountered during the study.
- There are no old buildings, structures or features older than 60 years that will be impacted by the proposed activities.

Low density scatters of the similar types of tools were recorded in the same area during an HIA for the proposed Postmasburg treated effluent outfall pipeline, in 2012. The discarded tools most likely represent flake debris.

Significance of the archaeological finds

The very small numbers and isolated context in which they were found means that the archaeological remains recorded during the study are rated as having low (3C) local significance.

According to specialist palaeontologist Dr John Almond, the impact significance of the proposed development as far as palaeontological heritage resources is concerned is assessed as LOW, and no further specialist palaeontological studies are recommended.

Conclusions

The results of the study indicate that the proposed new Postmasburg Waste Water Treatment Plant and sewer pipeline alongside the Groenwater Spruit will not impact on significant archaeological heritage.

The receiving environment is not a sensitive archaeological or palaeontological landscape.

The following recommendations are made

- No archaeological mitigation is required.
- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or Ms Mariagrazia Galimberti at the South African Heritage Resources Agency (021 462 4502). Burials, etc must not be removed or disturbed until inspected by the archaeologist.

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1. INTRODUCTION

ACRM was appointed by EnviroAfrica, on behalf of the Tsantsabane Municipality, to conduct a Heritage Impact Assessment (HIA) for the proposed new, Postmasburg Waste Water Treatment Plant (WWTP) in Postmasburg, about approximately 180 kms south west of Kimberley, in the Northern Cape Province (Figure 1).

The HIA forms part of the EIA process that is being undertaken by independent environmental consultants, EnviroAfrica cc.

An increase in housing development in Postmasburg, mainly due to a major increase in mining activities in the area, has necessitated the need to upgrade the existing WWTP in Postmasburg. New housing developments mean that the existing WWTP must either be upgraded to accommodate envisaged increased flows, or alternatively, a new sewerage plant must be considered.

Currently, all wastewater in Postmasburg drains to the Postmasburg Pump Station No.1 which is located to the south of the town within the Groenwater Spruit. The logical extension therefore would be to extend the existing main sewer downstream of the Spruit to a point where it would daylight, and then construct a new WWTP (Figure 2).

It is therefore proposed that a new sewer pipeline will be extended from the current position of the pump station (in Tuin Street) in a southerly direction following the Groenwater Spruit to a point approximately 1.3 km downstream of the town¹. The total footprint area required for the new WWTP (on Portion 3 of Farm 475 Olyn Fontein) is about 10ha, although the physical footprint area will only be about 2.0 ha in extent.

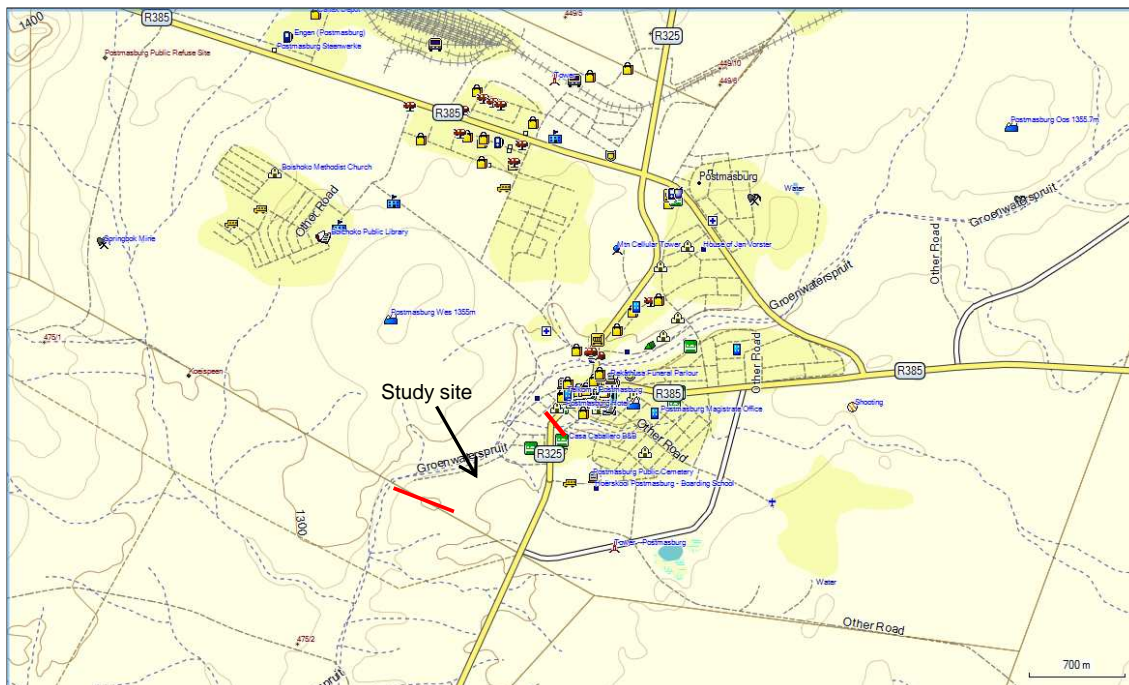


Figure 1. Locality Map. The study area is located between the two red lines

¹ The following erven will be crossed by the proposed pipeline: Erf 1, Erf 89 & Erf 764



Figure 2. Proposed infrastructure for the Postmasburg WWTP. The orange line is the proposed new sewer pipeline

2. TERMS OF REFERENCE

The Terms of Reference for the archaeological assessment were to:

- Determine whether any archaeological heritage will be impacted by the proposed activities;
- Determine the importance of archaeological resources that will be impacted by the proposed project, and
- Recommend measures to minimise impacts associated with the proposed development.

3. HERITAGE LEGISLATION

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

Section 38 (1) (a) of the Act also indicates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The riparian vegetation alongside the Groenwater Spruit comprises thick grass and reed beds. Sections of the river bank are also waterlogged with waste water overflow due to existing capacity constraints. The remainder of the proposed sewer route alongside the spruit is infested with dense stands of extremely thorny Swarthaak (*acacia mellifera*) vegetation (Figures 4-17).

The receiving environment for the proposed new WWTP (a flat hilltop site overlooking the Groenwater Spruit) comprises very dense, virtually impenetrable, Swarthaak, on a substrate of hard stony gravel (Figures 18 & 19).

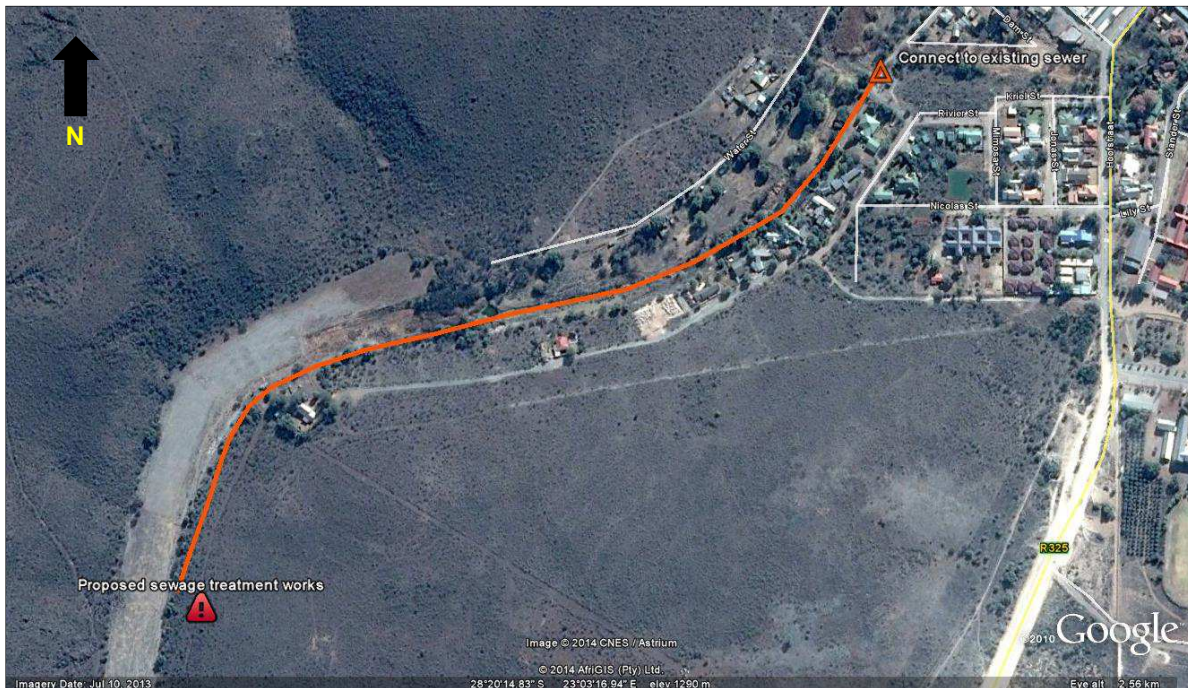


Figure 3. Google aerial photograph of the proposed activities



Figure 4. Existing sewer in Tuinstraat. View north



Figure 7. Proposed route view facing north



Figure 5. Arrow indicates the existing sewer in Tuinstraat



Figure 8. Proposed route view facing north



Figure 6. Proposed route alongside Groenwater Spruit.

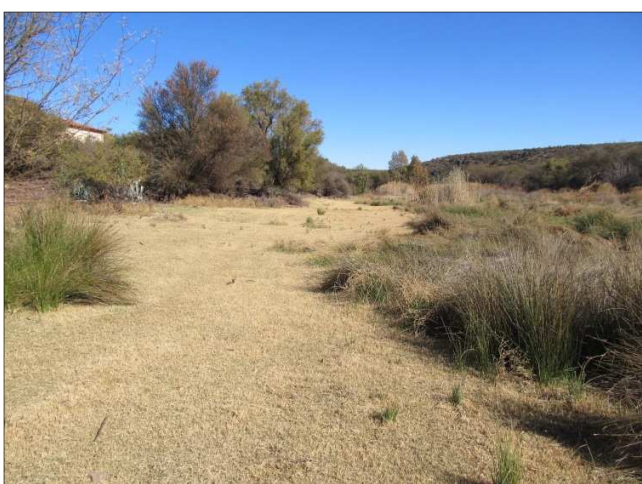


Figure 9. Proposed route view facing north



Figure 10. Proposed route view facing south



Figure 13. Proposed route view facing north



Figure 11. Proposed route view facing north



Figure 14. Proposed route view facing north



Figure 12. Proposed route view facing north



Figure 15. View facing north. The actual proposed route is to the right of the fence line, but is infested with Swarthaak vegetation



Figure 16. The actual proposed route is to right of the fence line, but is infested with Swarthaak vegetation



Figure 17. The actual proposed route is to right of the fence line, but is infested with Swarthaak vegetation



Figure 18. Footprint area for the proposed new Postmasburg WWTP. View facing south east. Note the dense stands of Swarthaak.



Figure 19. Footprint area for the proposed new Postmasburg WWTP. View facing south. Not the dense stands of Swarthaak.

5. STUDY APPROACH

5.1 Method of survey

The entire route for the proposed new sewer pipeline, from the existing pump station in Tuinstraat, till the proposed new WWTP was walked and searched for archaeological heritage. The footprint area for the proposed WWTP was also searched.

The archaeologist was also requested to assess a possible alternative route (for the sewer pipeline) alongside a gravel road, above the houses overlooking the Groenrivier Spruit.

Archaeological remains located during the survey were mapped *in-situ* using a Garmin Oregon 300 hand held GPS device set on the WGS 84 map datum. The survey took place on 16th June, 2014. A track path of survey was captured. A desk top study was also done. The SAHRIS content management site was consulted.

5.2 Constraints and limitations

The proposed sewer pipeline route alongside the Groenrivier Spruit is covered in very thick grass, reed beds, and large stands of thorny Swarthaak (*acacia mellifera*). The banks of the Spruit are also water logged, overflowing with waste water, which is a potential health hazard. Apart from a strip of vegetation cleared inside a fence line alongside the proposed route (refer to Figures 15-17), archaeological visibility ranges from low to zero. Most of the proposed site for the new WWTP is also covered in Swarthaak, but the archaeologist was able to negotiate his way around the flat, rocky kopje that overlooks the spruit.

5.3 Identification of potential risks

The results of the study indicate that there are no archaeological risks associated with the proposed activities. Unmarked human remains and buried ostrich eggshell caches may be uncovered during the construction phase, but this is considered to be very unlikely.

According to the specialist palaeontologist, Dr John Almond (email correspondence dated 31 October, 2014), the impact significance of the proposed development as far as palaeontological heritage resources is concerned is assessed as LOW.

5.4 Results of the desk top study

Very little archaeological work has taken place in Postmasburg. A previous study by Kaplan (2011) recorded a very small sample of Later Stone Age (LSA) and Middle Stone Age (MSA) tools in banded ironstone and chert between the Groenrivier Spruit and the R325 during a HIA for the proposed Postmansberg treated effluent outfall pipeline. A very small number of MSA and LSA tools were also recorded by Pelser (2013) during a Phase 1 AIA for a proposed township housing development north of the railway line.

The proliferation of solar energy farms and extensive mining prospecting activities in the Northern Cape has seen a large number of heritage related studies being undertaken in the region. Numerous HIAs have been done in the Postmasburg/Olifantshoek area, where solar array is excellent and significant iron ore, manganese, haematite and even diamondiferous deposits occur.

Generally speaking, archaeological sites in the area comprise mostly sparse scatters of MSA tools near pans, rivers, streams and watercourses, on hill slopes and colluvial fans. While the majority of remains appear to be dominated by MSA lithics, Early (ESA) and Later Stone Age (LSA) remains have also been recorded. Most of the sites comprise ephemeral traces/low density scatters of tools (probably debris discard), although larger numbers/medium to higher density scatters, possibly representing occupation and/or workshop sites, have been identified.

While caves and shelters are rare in the vast open plains, they have been recorded in nearby hills and valleys (Morris 2008; Küsel 2013).

Webley (2010) documented small numbers of ESA, MSA and LSA flakes on a farm 30 kms east of Postmasburg, indicating the long antiquity of the archaeological heritage in this part of the Northern Cape Province, which stretches back more than 1 million years (Beaumont & Morris 1990; Morris & Beaumont 2004a). Webley and Halkett (2010a, b, c), Webley *et al* (2010), Küsel (2013), De Jong (2010), Hutton & Hutton (2013), Morris (2008, 2005) and PGS (2011) have all recorded small scatters of ESA, MSA and LSA tools on numerous farms surrounding Postmasburg and Olifantshoek during a string of mining prospecting HIA surveys. Küsel (2013) also identified outcroppings of banded ironstone formations that he argues were targeted by Stone Age people for their superior raw material/stone tool making qualities.

Beaumont and Boshier (1974) excavated a prehistoric pigment (specularite) mine on the farm Doornfontein north of Postmansberg. The Doornfontein site consists of a number of chambers which have been dug into a hillside. Archaeological excavations on the farm

uncovered large numbers of stone artefacts as well as pottery, decorated ostrich eggshell pieces, beads and bone implements. Radiocarbon dates place the mining activities to 1200 years ago or 800 AD. Fragmentary human remains from the Blinkklipkop mine, 5km to the north-east of Postmansberg suggest that the early miners were of Khoisan physical type rather than representing Iron Age settlement.

Rock engraving sites are prolific in the Northern Cape (Morris 1998) with some well-known sites being recorded near Danielskuil about 60kms north east of Postmasburg (Morris 2009). Morris (2001) also reports on the presence of rock engraving sites within the area around Postmasburg and from Beeshoek about 10 kms north west of the town (Morris 2008).

6. FINDINGS

6.1 Archaeology

Thirty-four stone implements were recorded during the baseline study, but none were found in the proposed sewer pipeline alongside the Groenwater Spruit (refer to Table 1 in Appendix I & Figure 26).

A few isolated, banded ironstone MSA and LSA retouched/utilized flakes and chunks (Sites 037, 138, 039 & 041) were found on a small outcropping and gravel hill slope alongside the Groenrivier Spruit below a row of houses (Figure 20). The gravel hills are covered in broken glass, rusted metal, broken tiles, building rubble and hard plastic that have been discarded by residents over their boundary fences (Figure 21). A banded ironstone core and chunk (Site 044) was found among a pile of rocks cleared from alongside the spruit.

A handful of banded ironstone MSA and LSA flakes were recorded in strip of land cleared alongside (i. e. inside) the fence line adjacent to the proposed sewer pipeline (refer to Figures 22-24). All the tools, including several blades, are utilized and/or retouched, but no formal tools such as scrapers, points or adzes were found.

Eight banded ironstone flakes were found in the proposed footprint area for the WWTP overlooking the Groenwater Spruit (refer to Figures 25). The entire kopje is covered with Swarthaak vegetation (refer to Figures 18 & 19). The tools comprised retouched and utilized flakes (Sites 061, 062, 064 & 065), two chunks (Sites 068 & 069) and two cores including one MSA disc/prepared core (Site 067).

A banded ironstone chunk (Site 070) was encountered in the alternative pipeline route, which runs directly alongside the gravel road above the existing houses overlooking the Groenwater Spruit.

6.2 Significance of the archaeological remains

The small numbers and isolated context in which the tools were found mean that the archaeological remains have been rated as having low (Grade 3C) significance.

The small traces of tools most likely represent flake debris or discarded flakes.



Figure 20. Collection of tools from Sites 037-041. Scale is in cm



Figure 21. Sites 037 & 038, overlooking the Groenrivier Spruit



Figure 22. Collection of tools from Sites 045-059. Scale is in cm



Figure 23. Cleared strip of land inside the fence line, adjacent to proposed sewer pipeline



Figure 24. Collection of tools from Sites 045-059. Scale is in cm



Figure 25. Collection of tools from Sites 061-069. Scale is in cm

6.3 Graves

No visible graves or typical surface grave markers were found in the study area.

6.4 Buildings and structures

There are no old buildings, structures or features older than 60 years that will be impacted by the proposed activities.

6.5 Palaeontological heritage

According to specialist palaeontologist, Dr John Almond², the study area is underlain at depth by Precambrian carbonate rocks of the Campbell Rand Subgroup (Ghaap Group & Transvaal Supergroup) that may contain well-preserved stromatolites (fossil microbial mounds). However, these older bedrocks are mantled here by near-surface calcretes and alluvial deposits of Late Caenozoic age that are generally of low palaeontological sensitivity.

7. CONCLUSION

Construction of the proposed sewer pipeline alongside the Groenwater Spruit will not impact on any important archaeological heritage. A small number of MSA and LSA tools were recorded in a strip of land inside the fence line, alongside the proposed sewer route.

Construction of the proposed WWTP on the kopje overlooking the Spruit will also have a very limited impact on archaeological remains.

No evidence of any factory or workshop site, or the result of any human settlement was identified. No organic remains such as bone, pottery, or ostrich eggshell were found. The tools recorded probably represent discarded flakes or flake debris.

Indications are that in terms of archaeological heritage, the receiving environment is not a sensitive archaeological landscape.

The impact significance of the proposed development as far as palaeontological heritage resources is concerned is assessed as LOW

8. RECOMMENDATIONS

With regard to the proposed new, Postmasburg pipeline and Waste Water Treatment Plant, the following recommendations are made

- No further archaeological mitigation is required

² Email correspondence dated 31st October, 2014

- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or Ms Mariagrazia Galimberti at the South African Heritage Resources Agency (021 462 4502). Burials, etc must not be removed or disturbed until inspected by the archaeologist

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Appendix I

Spreadsheet of waypoints & description of archaeological remains

Site	Name of Farm	Lat/Long	Description of finds	Grading	Suggested mitigation
	Proposed new Postmasburg WWTP & sewer pipeline				
037		S28 20.223 E23 03.282	Banded ironstone flake	3C	None required
038		S28 20.228 E23 03.263	Ironstone MSA flake & chunk	3C	None required
039		S28 20.238 E23 03.212	A few ironstone flakes & chunks on a hill slope – also glass, rusted metal, broken tiles, hard plastic	3C	None required
041		S28 20.241 E23 03.192	Burnished MSA ironstone flake and small ironstone chunk	3C	None required
044		S28 20.300 E23 03.005	Ironstone core and chunk among pile of cleared rock alongside spruit.	3C	None required
045		S28 20.312 E23 03.009	Flat, bladey retouched & utilized snapped MSA ironstone flake in cleared strip alongside fence	3C	None required
046		S28 20.290 E23 03.033	Adze like step retouch on ironstone blade	3C	None required
047		S28 20.298 E23 03.029	Banded ironstone retouched/utilized flake	3C	None required
048		S28 20.305 E23 03.024	Ironstone chunk & retouched MSA flake	3C	None required
049		S28 20.309 E23 03.022	Ironstone chunk/minimal core	3C	None required
050		S28 20.352 E23 03.000	Ironstone LSA flake	3C	None required
051		S28 20.389 E23 02.988	Burnished ironstone MSA flake	3C	None required
052		S28 20.404 E23 02.983	Small round burnished ironstone core	3C	None required
053		S28 20.427 E23 02.978	LSA retouch on MSA ironstone flake	3C	None required
054		S28 20.431 E23 02.978	Misc. retouched ironstone MSA flake	3C	None required
055		S28 20.439 E23 02.975	MSA pointed retouched flake	3C	None required
056		S28 20.452 E23 02.972	Ironstone core	3C	None required
057		S28 20.466 E23 02.970	Ironstone MSA flake	3C	None required
059		S28 20.505 E23 02.971	Retouched ironstone LSA flake	3C	None required
061		S28 20.432 E23 02.987	MSA ironstone flake at	3C	None required

			large boulder		
062		S28 20.441 E23 03.062	Chunky partially retouched/utilized MSA flake, & small misc. retouched & utilized flake	3C	None required
064		S28 20.383 E23 03.083	Large utilized ironstone flake	3C	None required
065		S28 20.376 E23 03.121	Ironstone chunk and small misc. retouched flake	3C	None required
066		S28 20.397 E23 03.139	Ironstone chunk/minimal core	3C	None required
067		S28 20.428 E23 03.110	Worked out disc core MSA	3C	None required
068		S28 20.430 E23 03.131	Ironstone chunk	3C	None required
069		S28 20.391 E23 03.143	Ironstone chunk	3C	None required
070			Ironstone chunk	3C	None required

Table 1. Spreadsheet of waypoints and description of archaeological finds

Appendix II

Track paths and waypoints

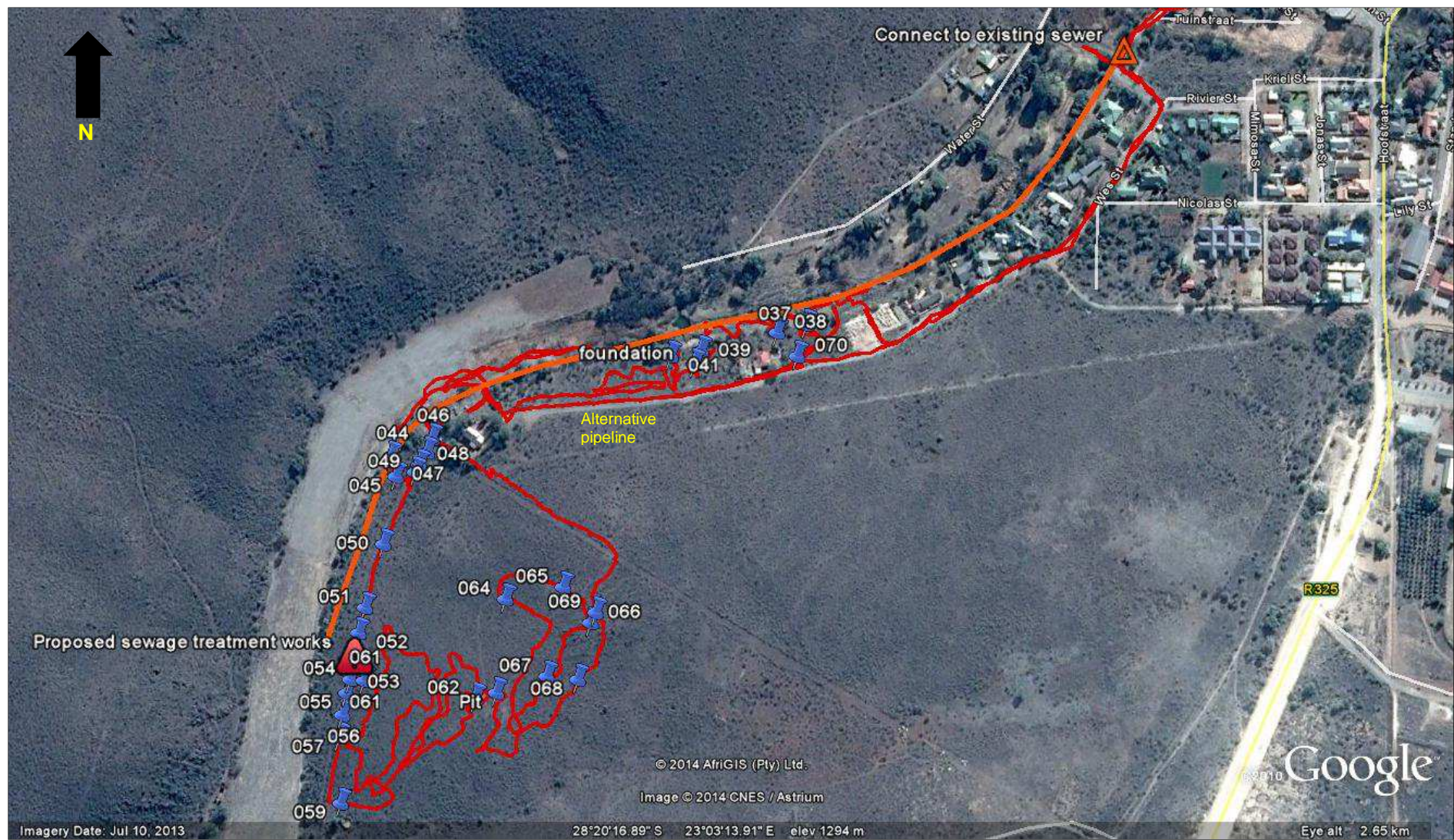


Figure 26. Track paths and waypoints. The orange line is the proposed sewer pipeline. The red lines are track paths.