

HERITAGE IMPACT ASSESSMENT OF THE IMPACTS RESULTING FROM THE RAISING OF THE EXISTING KEEROM DAM, SITUATED BETWEEN MONTAGU AND TOUWS RIVER, WESTERN CAPE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act as part of an EIA.)

Prepared for

Holland and Associates Environmental Consultants

On behalf of

Nuy River Irrigation Board



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EXECUTIVE SUMMARY

Following the comment on the NID for the proposed project compiled by ACO Associates cc (see Appendix 1) we have been appointed by Holland and Associates on behalf of the Nuy River Irrigation Board to undertake a Heritage Impact Assessment, as part of the EIA process, that addresses particularly archaeological material, existing structures, and informal graves. The dam is situated between Worcester, Montagu and Touws River.

The fieldwork was conducted on the 15th March 2012. It involved a survey of the impact footprints conducted on foot and vehicle.

Archaeological Indicators:

Isolated ESA and MSA artefacts were found around the periphery of the dam. There are no clearly definable "sites" and no associated organic material meaning that the artefacts have little scientific value. No mitigation is required.

Other heritage Indicators:

A no longer functioning extensive water furrow traverses the hills to the west of the dam basin. This is indicative of the early farming landscape, which is also dotted with small stone ruins. A single farm complex may be affected by the re-alignment of the road which crossed the Koo River. A partial ruin, foundations of outbuildings, stone embankment walls, a dump, and a number of stone features (perhaps graves) make up the complex.

Palaeontology

No palaeontological study was required.

Conclusions:

- No limitations were identified in terms of Stone Age archaeology;
- Some mitigation of the farm complex is required if the Koo River road re-alignment is approved;
- No limitations with regard to the water furrow were identified and no mitigation is required.

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1. INTRODUCTION

ACO Associates cc have been appointed by Holland and Associates on behalf of the Nuy River Irrigation Board to undertake a Heritage Impact Assessment as part of the EIA process, that addresses particularly archaeological material, existing structures, and informal graves in the inundation zone resulting from the raising of the dam wall. The dam is situated on a number of farms consisting of the Remainder and Portion 3 of Keeroms (Berg) 2, and Portion 2 of Rheboks Vlakte 45 located some 15 km off the R318 between the towns of Montagu and Touws River as indicated on Figure 1. According to the commemorative plaques at the dam, it was first constructed in 1954, and the wall was first raised in 1990.



Figure 1: The study site in regional context (red polygon).

1.1 Development Proposals

The proposed project entails the raising of the Keerom Dam spillway by 3 m, to reclaim the loss in water storage capacity due to ongoing siltation. The dam was constructed in 1954, with a storage capacity of 8.4 Mm³ and the wall was raised in 1989 to increase the storage capacity to 9.8 Mm³. Subsequently, siltation reduced the storage capacity to approximately 9.1 Mm³ by 2006. The Nuy Irrigation Board would therefore like regain the lost storage capacity by raising the spillway. The proposed raising therefore includes an increase in water storage capacity from less than 9.1 Mm³ to 9.8 Mm³ and in water surface from approximately 92 ha to 112 ha. The maximum wall height from dam crest to river bed level will remain 38 m. Given that the existing lawful use for the dam (i.e. the actual available use during the period September 1996 to September 1998) allows for the storage of 9.8 Mm³, the proposed raising will remain within the existing lawful use. The raising of the dam will result in the inundation of two existing low level bridges, and will therefore require the realignment of access roads at the affected locations. Furthermore, approximately four sections of the access road to the dam would need to be raised to accommodate the new Full Supply Level (Figure 2). Contour information, farm names and feature names are shown on Figure 3.



Figure 2: Detail showing the existing dam wall (green) and increased FSL (red). Road re-alignments (yellow).

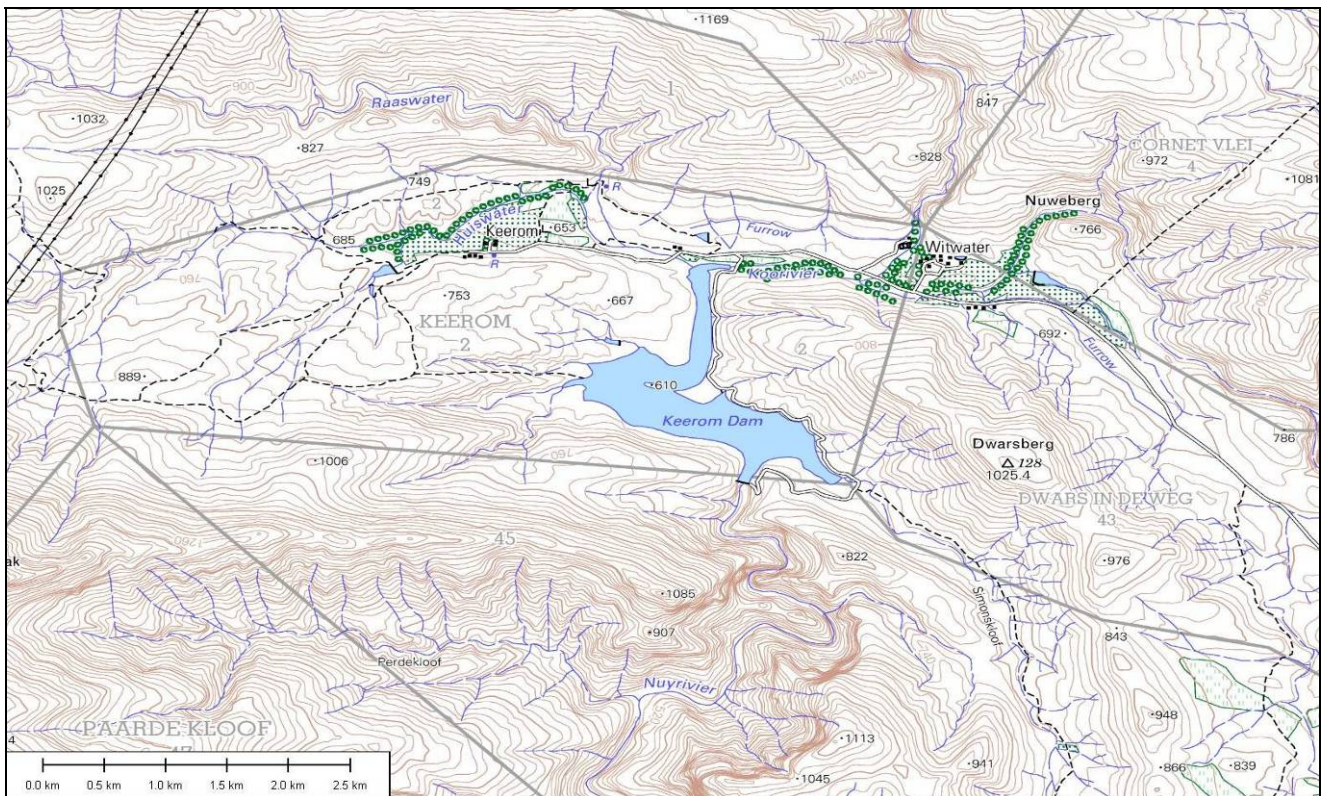


Figure 3: Contour information, farm and feature names. 3319DA Nuy: (Chief Directorate of Surveys and Mapping)

2. METHODOLOGY

This study has been commissioned as the HIA component of an EIA. It assesses the identified range of impacts on heritage resources including archaeological material, structures and graves within the areas to be affected by the increased inundation zone.

The locations of the proposed impact footprints were loaded onto handheld GPS receivers (set to the WGS84 datum) to facilitate the identification of the search area during field work. Drive and walk search paths were recorded with the GPS and numerous photographs were captured to characterise the local receiving environment and heritage resources.

2.1 Other heritage studies

We have consulted the SAHRA database for previous heritage related projects in the area and can report that the area of the dam itself remains largely unexplored. Although not listed in the SAHRA database, an application was recently submitted by Ms M. Patrick of Cape Archaeological Services to HWC to exhume a burial found on a hiking trail at the nearby Simonskloof Mountain Retreat, about 4 km to the east of the Keerom Dam. Ms Leslie, the Chairperson of HWC visited the site to assess the burial and reported that it lay close to a small overhang containing rock paintings and surface LSA artefactual material¹. We further consulted Mr Jurgen Wolfharter of Simonskloof with reference to the dam project as he runs hiking trips down the Nuy River Gorge below the dam wall. He indicated that rock paintings are present in the gorge downstream of the dam although not at the wall itself. He referred me to the Simonskloof website where some of the rock paintings are presented². In addition, we spoke to Mr Louis Engelbrecht who leases land from the Irrigation Board, and asked about known graves and structures in the area, and about the irrigation canal/s that traverse parts of the valley.

2.2 Limitations

There were no real limitations to conducting the study. Access was unobstructed by fences and the dam wall and eastern side of the dam was easily accessed by road. No tracks exist on the western side of the dam so access was on foot. The southern section of the dam, to the west of the dam wall is fairly steep and due to the limited nature of the impact of inundation there, and the general lack of archaeological material elsewhere, we did not search that particular area.

3. FINDINGS

Additional context is shown in Plates 1 - 15 at the end of the report. A table listing all the heritage sites and features located during the survey is shown in Appendix 2. The walk/drive paths are shown on Figure 4

3.1 Roads

3.1.1 Eastern dam access road modifications

Minor adjustments that are required to small sections of the existing dam access road were inspected on foot. The adjustments can be accommodated within the existing footprint by raising the road surface. We did also look along the edge of the road beyond the existing reserve in the event it is necessary to utilise some of that area. No heritage impacts were identified.

3.1.2 Farm road re-alignments

Two more substantial road alignments will be required where the farm roads cross the Huis/Raaswater River (west) and the Koo River (east). At present the crossings are via simple concrete low water bridges (Plate 8), both of which will become impassable when the dam is raised. Two new "bypass" routes have been proposed to resolve the access issues (Figure 2).

3.1.2.1 The Huis/Raaswater River re-alignment

The new alignment runs for some distance on an old track on the northern side of the river after which it crosses and cuts diagonally up to meet the existing farm road. Apart from crossing an old water furrow (d011), no issues were identified in a broad corridor either side of the alignment centreline. The

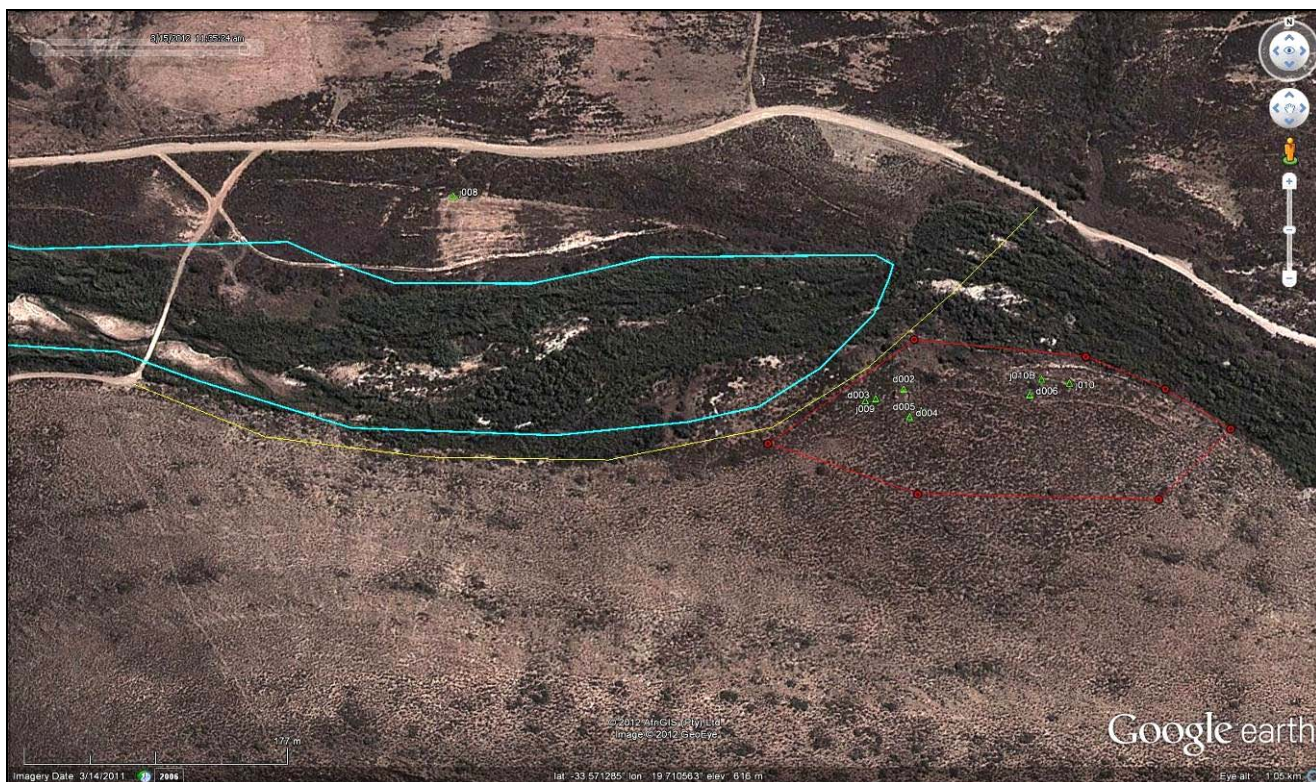
¹ Lavin, J. 27 June 2011- Farm Simonskloof: Heritage Western Cape site inspection report.

² <http://www.simonskloof.com/nature-gallery/>

furrow is extensive, though nowadays inoperative, and given these circumstances, the impact on the feature is considered to be acceptable (the furrow is discussed more fully in section 3.2).

3.1.2.2 The Koo River re-alignment

This alignment is moderately more difficult from a heritage perspective. The proposed route will have to cross steep rocky slopes, particularly closer to the main dam, forcing it to be as close to the river as possible. A fairly extensive old farm complex is located on the flatter ground (d002-d006, j009, j010 and j010B) at a bend in the river. The remains include a partially standing ruin, foundations of sub-buildings, a dump, retaining walls, fields and remnant tree lines (now only stumps for the most part). This complex probably dates to the late 19th /early 20th c based on the artefactual material, but probably was in use until the 1970's(?). Apart from obvious retaining walls, there are a number of enigmatic stone features, which we believe may be graves. They do not however contain the usual diagnostic characteristics in terms of shape, or any obvious headstones. Nevertheless, caution is advised in this area. Figure 5 shows the proposed alignment in relation to the heritage sites. We have proposed a no go area within the defined red polygon (see Appendix 3 for polygon co-ordinates), which means that if the road remains on the centreline at this point, it will be possible to proceed with minimal impact to heritage. At its closest there is probably a space of about 15-20 m between road and the old farm complex.



Mitigation: There is a narrow margin for manoeuvre where construction machinery is concerned and so we would propose that the eastern edge of the no go area be well demarcated prior to construction and the alignment shifted as far as possible to the west in this area. No machinery is to enter the no go area. An additional caution is that unmarked graves could be present between the farm complex and river. Construction crews will need to be aware of the possibility and know what action to take if graves or human remains are encountered.

3.2 Inundation zone

Changes to the inundation zone are variable due to prevailing topography. In some areas where slopes are steep, changes are minimal and so most effects are felt in low lying areas with gentle slopes. Steep slopes are unlikely to contain heritage material of any type and were not searched.

3.2.1 Water furrow

In preparing the NID, we had noticed an extensive linear feature running along the western edge of the dam (see Plate 7). We interpreted this a stone wall, but as we now know, it is in fact a water furrow that carried water from the Huis/Raaswater River into an area now submerged by the existing dam. Whatever features may have been associated with it are thus invisible. Most of the feature lies well above the new FSL, although a small section will be flooded. As it is cut into rock, the feature will not necessary be destroyed in the process. A small breached earth dam (j012) is associated with the furrow.

3.2.2 Stone Age archaeological material

Although we have recorded a number of stone age artefacts around the periphery of the dam, the majority of these are isolated finds (probably ESA or MSA) amongst which no diagnostic formal elements were noted. Areas around d008, j015 and j016 contain multiple artefacts, though none of these constitute significant scatters. A single apparent LSA lower grindstone fragment, broken and with its margin flaked, was found at d008. No other LSA material was observed. No significant impacts are envisioned due to increased water level.

There are no rockshelters or overhangs present within the higher FSL and so despite the presence of rock paintings in the Nuy river gorge below the dam, and on neighbouring farms, there is no chance of such material occurring here.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Stone age material

- No significant impacts on such material have been identified. No mitigation is required.

4.2 Historical remains

- An **old farm complex** has been identified along the Koo River road re-alignment. As it stands, the proposed alignment can probably be entertained as is although there is little margin for manoeuvre. A no go area has been proposed around the historic remains and features. Mitigation: The alignment should be placed as far west as possible in the area of the historic remains. The length of the no go area closest to the road alignment should be clearly demarcated with physical markers during the construction phase, and no machinery is to enter the area.
- **Unmarked graves** could be present between no go area and the river. If graves or human remains are found, work must cease immediately at that place and HWC must be informed of the finds. They would probably request that an archaeologist inspect and recover the remains.
- **The old water furrow** is marginally impacted by the Huis River road re-alignment and the increased FSL. Significant parts are still preserved well above the FSL and as such the impacts are considered to be acceptable. No mitigation is proposed.

Table 1: Impacts on the pre-colonial archaeology of the study area

	Construction Phase	Operation Phase
Magnitude	n/a	Local
Frequency	n/a	n/a
Duration	n/a	Permanent
Probability	n/a	Definite
Significance	n/a	Very low
Level of confidence	n/a	High
Significance of predicted impacts		Local
Reversibility	n/a	Partial
Mitigation: Although some archaeological material will be impacted, the impact is considered minor . No mitigation has been suggested as the material is found as isolated artefacts. Lack of associated organic remains or discrete site boundaries reduces scientific value greatly		

Table 2: Impacts on the historical features of the study area

	Construction Phase	Operation Phase
Magnitude	Local	n/a
Frequency	n/a	n/a
Duration	Permanent	n/a
Probability	Definite	n/a
Significance	Low	n/a
Level of confidence	High	n/a
Significance of predicted impacts	Local	n/a
Reversibility	Partial	n/a
Mitigation: Although some historical features will be impacted, the impact is considered minor and mitigation is not required. In some cases mitigation has been suggested and if complied with, minimal impact on resources is anticipated.		



Plate 1: Looking south across the dam to the Nuy River gorge and site of the existing dam wall



Plate 2: The access road along the eastern side of the dam **Plate 3:** Looking to the north west from a position above the dam wall. Note the steep slope along the southern bank of the dam.



Plate 4: The dam wall showing the nature of the geology of the upper Nuy River. **Plate 5:** The more gentle topography in the upper part of the dam close to the confluence of the Huis and Koo Rivers.



Plate 6: A selection of quartzite flakes from j016 **Plate 7:** The water furrow cut into the softer Karroo rocks on the western edge of the site **Plate 8:** The simple concrete low water bridge crossing the Koo River



Plate 9: The Huis River road alignment will cross the slope diagonally beyond the trees to link up with the existing road **Plate 10:** Looking towards the west towards the partially ruined building at d002. **Plate 12:** The proposed road would be situated at approximately the position of the large bush in the background (not the palm).



Plate 13: One of numerous stone retaining walls to the east of the ruins **Plate 14:** A selection of artefacts found in the dump area **Plate 15:** An early 20th c bottle base

APPENDIX 1

Our Ref: HMICAPE WINELANDSIBREEDE VALLEYWORCESTERIKEEROM DAM

Enquiries Jenna Lavin
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Email: jenna.lavin@pgwc.gov.za

Date: 07 March 2012
Case No: 120228JL28
Auto IDs: 1758 - 1755



RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP
In terms of section 38(8) of the National Heritage Resources Act (Act 25 of 1999)
and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

Attention: Ms Nicole Holland
Holland and Associates
PO Box 31108
Tokai
7966

CASE NUMBER: 120228JL28

NID: PROPOSED RAISING OF THE KEEROM DAM ON REMAINDER AND PORTION 3 OF FARM KEEROMS (BERG) 2, PORTION 4 OF FARM DWARS IN DIE WEG 43 AND PORTION 2 OF FARM RHEBOKS VLAKTE 45 NEAR WORCESTER

The matter above has reference.

Your NID dated 28 February 2012 was tabled and the following was discussed;

1. The application is to raise the Keerom Dam spillway by 3m to increase the surface area from 92ha to 112ha
2. Water will inundate 2 existing low level bridges and will therefore require the realignment of these access roads at various locations
3. Possible 19th C stone walling exists to the west and south of dam inundation area
4. Earlier, Middle and Later Stone Age artefacts are likely to be impacted
5. Possible impact to farm graves by the raised dam level has been identified

Decision:

Since there is reason to believe that heritage resources will be impacted upon, HWC requires an HIA that satisfies S. 38(3) of the NHRA (Act 25 of 1999) assessing the impacts on the following heritage resources which it has identified;

1. All archaeological material
2. All existing structures to be impacted
3. Any informal graves to be impacted

Terms and Conditions:

Heritage Western Cape reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number above.

Yours faithfully

Andrew B Hall
Chief Executive Officer
Heritage Western Cape

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APPENDIX 2

LABEL	LATITUDE (S) (dec deg)	LONGITUDE (E) (dec deg)	DESCRIPTION	GRADE	MITIGATION
d001	33.58693900	19.71448100	Isolated qz fl	ungraded	no mitigation required
d002	33.57122700	19.71223800	Ruin, vernacular, mud brick on stone foundation. Part of a complex of features including dump, additional foundations, retaining walls, terraces and possible graves	IIIc? To include all features	
d003	33.57128300	19.71204000	Stone foundation with soil infill	"	
d004	33.57138900	19.71227800	Stone features (possible graves)	"	
d005	33.57135200	19.71235900	Stone features (possible graves)	"	
d006	33.57126000	19.71312000	Stone features and embankment wall	"	
j009	33.57129350	19.71196720	Dump/scatter of historical material from cottage ruin. Graphite, glass, ceramic, mostly 20 th C but probably some late 19 th C too. Some bone. Occasional artefacts all over the terrace around the ruin.	"	
j010	33.57119050	19.71340070	Stone wall on terrace near ruin.	"	
j010B	33.57116870	19.71320560	"	"	
d007	33.57018300	19.70061200	Ruin, vernacular, mud brick on stone foundation. Glass and ceramics in evidence	ungraded	
d008	33.57448800	19.70362100	Isolated lower grindstone fragment with flaked edge, 1 core ESA? There are moderately more artefacts scattered about here than elsewhere, though it does not comprise a significant scatter.	ungraded	no mitigation required
d009	33.57075200	19.70702200	Low water bridges, concrete, post 1950	ungraded	no mitigation required
d010	33.56999300	19.70245000	Low water bridges, concrete, post 1950	ungraded	no mitigation required
d011	33.56949700	19.69753800	Water furrow		
j001	33.58075940	19.70780810	Isolated qz fl and core on hilltop.	ungraded	no mitigation required
j002	33.58162970	19.70927710	Isolated qz fl in dam.	ungraded	no mitigation required
j003	33.58566780	19.71379040	Isolated qz fl.	ungraded	no mitigation required
j004	33.58674180	19.71333560	"Road" in area of sandstone rocks (ends at small stream then begins again in shale area at 005). May have to do with the original dam construction ie a drag road for drilling equipment on a sled? Old machine parts found alongside the dam with numerous rock cores.	ungraded	no mitigation required
j004B	33.58624070	19.71249830	"	ungraded	no mitigation required
j005	33.58555780	19.71166460	"	ungraded	no mitigation required
j005B	33.58496410	19.71098790	"	ungraded	no mitigation required
j005C	33.58507010	19.70970990	"	ungraded	no mitigation required
j006	33.58654790	19.70845300	building platforms, foundations and quarry from dam construction. Also 2 plaques commemorating the building and raising of the dam (post 1954)	ungraded	no mitigation required
j007	33.57987280	19.70404160	Isolated 2 qz fl and 2 cores.	ungraded	no mitigation required
j008	33.57008790	19.70905630	Isolated qz fl.	ungraded	no mitigation required
j011	33.57607740	19.69842030	End of furrow.		
j012	33.57641290	19.69844630	Earth dam (breached).	ungraded	no mitigation required
j013	33.57648420	19.69912340	Smaller furrow.		no mitigation required
j013B	33.57685170	19.69927100	"		no mitigation required
j013C	33.57768360	19.69667690	"		no mitigation required
j014	33.57662080	19.69926700	Isolated horse shoe fragment	ungraded	no mitigation required
j015	33.57753710	19.70108370	Several qz flakes in a concentrated area	ungraded	no mitigation required
j016	33.57799500	19.70275260	Several qz flakes in a concentrated area	ungraded	no mitigation required
j017	33.57113760	19.70303220	3 m x 6 m shale ruin with mud mortar. Dug into shale bedrock to create building platform. 3 glass fragments inside.	ungraded	no mitigation required
j018	33.57085510	19.70254270	2 dark green wine bottle fragments.	ungraded	no mitigation required
j019	33.57046610	19.70098390	Larger furrow continues west from here.	ungraded	no mitigation required

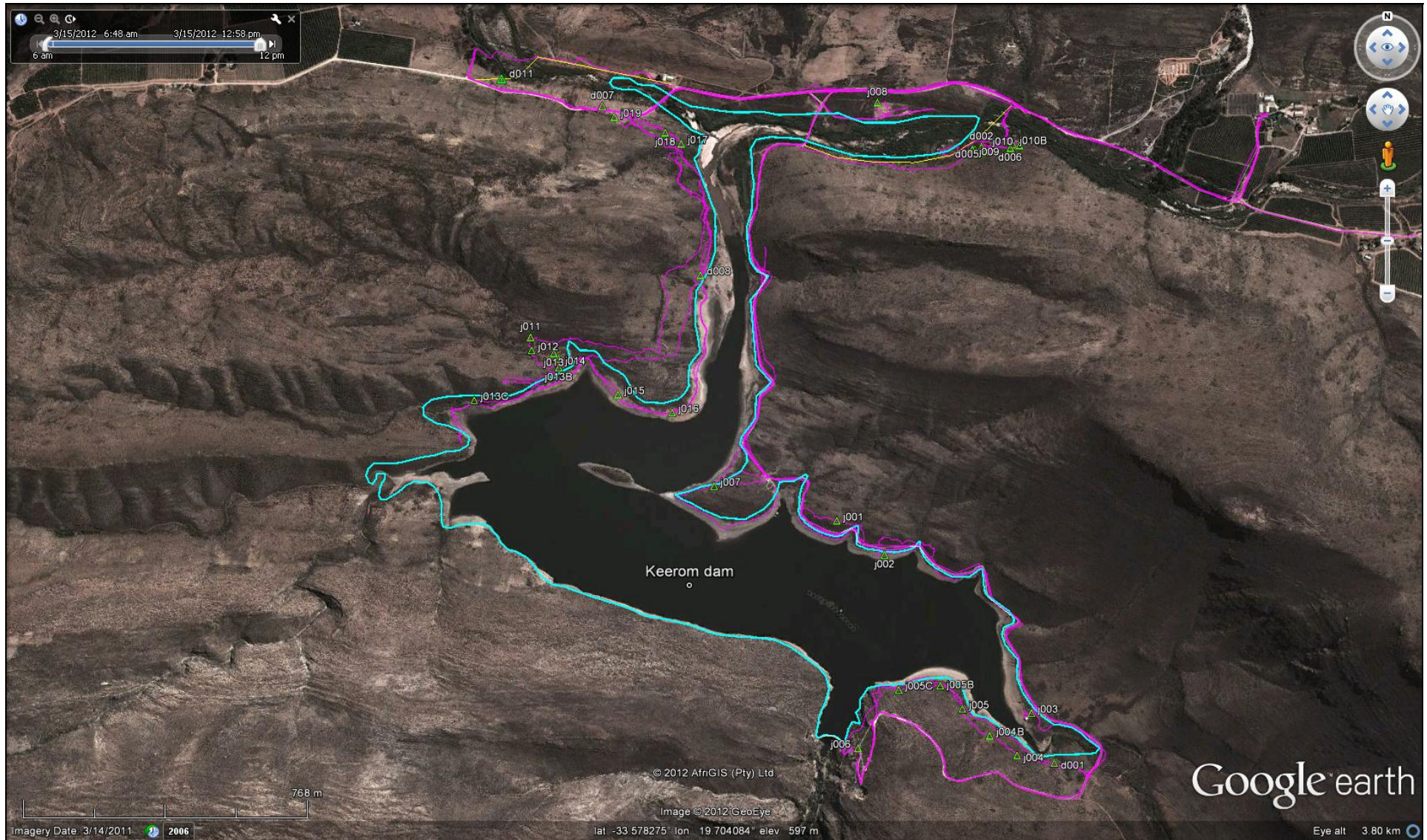


Figure 4: Heritage features and sites (green triangles), walk/drive paths (purple), FSL (blue)

APPENDIX 3

LATITUDE (S) (dec deg)	LONGITUDE (E) (dec deg)	
33.570933	19.712319	no go area
33.571035	19.713524	no go area
33.571225	19.714081	no go area
33.571458	19.714543	no go area
33.571864	19.713995	no go area
33.571836	19.712322	no go area
33.571544	19.711283	no go area