



# CONSTRUCTION OF A WATER SUPPLY PIPELINE AND SCOUR PIPELINE, LENASIA SOUTH, GAUTENG PROVINCE

## Heritage Impact Assessment

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## EXECUTIVE SUMMARY

Nemai Consulting has been appointed by Johannesburg Water to compile an Environmental Screening Report for the proposed construction of a water supply pipeline and a 200mm scour line that will connect to the proposed new 15Ml concrete reservoir in Lenasia South in Gauteng Province. There is only one route for the water supply pipeline; there are two route options for the proposed scour pipeline.

The length of the water supply pipeline is approximately 1.2km in length; the two route options for the scour pipeline are well over 300m in length hence the development triggers Section 38 of the National Heritage Resources Act 1999 (Act No 25 of 1999) that states the following:

*“(1) Subject to the provisions of subsections (7), (8) and (9), 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*

*must notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

A site visit of the routes of the proposed pipelines was conducted on 20 November 2014. Disturbance to the site can be attributed to its location close to the existing Lenasia reservoir and to an existing power line that is situated close to the north eastern boundary of the reservoir. In addition, there are gravel roads or tracks crossing the area as well as the dumping of rubbish.

A trench has been dug near the proposed route or alignment of the water supply pipeline and the preferred route for the scour pipeline that runs parallel to the water pipeline. The trench appears to have been dug a few years ago and a short concrete pipeline has been left in the veld close to the trench. The topography of all the pipeline routes is hilly with a number of rocky outcrops.

No visible heritage resources including archaeological material or sites were found during the site inspection. Due to the undisturbed nature of the site, it is possible that once excavations occur, sub-surface archaeological remains may be found but there was no surface indication of this. Mitigation measures if such finds are made are provided in the body of this report.

From a heritage perspective, the preferred route for the scour pipeline would be Route 1 as it will be laid on top of the water supply pipeline for a distance hence the area that will be disturbed will be restricted to one corridor / area.

The project area falls in a high fossil sensitivity zone and therefore a desktop paleontological impact assessment (PIA) was carried to assess whether the excavations associated with laying the water supply pipeline and scour pipeline would damage or destroy significant fossils.

The PIA established that the dominant rocks in the region were those of the Chuniespoort Group (the Malmani Subgroup) and the Pretoria Group (Timeball Hill, Rooihoogte and Hekpoort Formations) and that these rocks are too old to contain fossils and are also not of the correct lithology. The report concluded that since the rocks are too old (Archaean in age) to contain fossils it is extremely unlikely that any fossils will be found along the routes for the proposed water supply pipeline and scour pipeline.

Both the HIA and PIA will be submitted to the PHRA-G for comment as per the requirements of the National Heritage Resources Act 1999.

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**AUTHOR DETAILS**

<b>Verification</b>	<b>Name</b>	<b>Qualification</b>	<b>Professional Registration</b>
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## 1. INTRODUCTION

Nemai Consulting has been appointed by Johannesburg Water to compile an Environmental Screening Report for the proposed construction of a water supply pipeline as well as a scour pipeline that will connect to the Lenasia High Level reservoir in Lenasia South in Gauteng Province.

As the water supply pipeline and the route alternatives for the scour pipeline are longer than 300m, the proposed development triggers Section 38 of the National Heritage Resources Act 1999 (Act No 25 of 1999) that states the following:

*“(1) Subject to the provisions of subsections (7), (8) and (9), 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*

*must notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

The heritage impact assessment was therefore undertaken to assess the routes of the proposed pipelines in order to ascertain whether heritage resources will be impacted by the proposed development. If the assessment establishes that heritage resources will be impacted by the development, then this report will provide mitigation measures to either avoid or limit the impact/s.

According to Section 3 of the National Heritage Act 25 of 1999, heritage resources include the following:

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including—
  - (i) ancestral graves;
  - (ii) royal graves and graves of traditional leaders;
  - (iii) graves of victims of conflict;
  - (iv) graves of individuals designated by the Minister by notice in the *Gazette*;

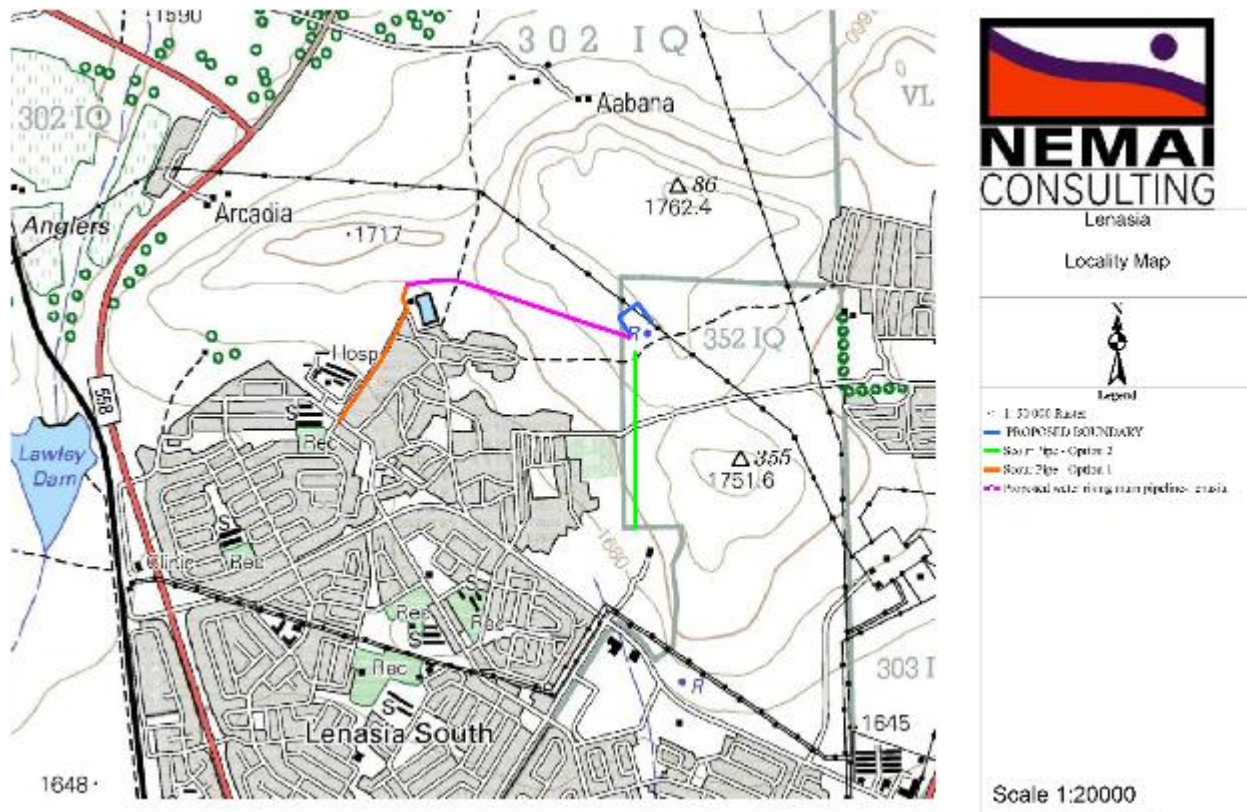
- (v) historical graves and cemeteries; and
- (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including:
  - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - (ii) objects to which oral traditions are attached or which are associated with living heritage;
  - (iii) ethnographic art and objects;
  - (iv) military objects;
  - (v) objects of decorative or fine art;
  - (vi) objects of scientific or technological interest; and
  - (vii) books, records, documents, photographic positives and negatives, graphic, film or video material 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).

## 2. TERMS OF REFERENCE (ToR)

- Undertake a Heritage Impact Assessment in order to determine the possible existence of archaeological and historical sites or features in the project area that could be impacted by the proposed activity
- Provide mitigation measures if it is found that the proposed new pipelines will impact on heritage resources.

## 3. LOCATION AND DESCRIPTION OF THE STUDY AREA

The proposed pipelines are situated close to the existing High Level reservoir that is situated in the township of Lenasia South which is situated in the City of Johannesburg Metropolitan Municipality in Gauteng Province (**Figure 1**). Lenasia is approximately 35km south west of the Johannesburg central business district.



**Figure 1: Locality map**

It is proposed that the water supply pipeline (depicted in pink in above) will be situated between the Lenasia High Level reservoir and Hospital Hill Reservoir. The alignment of the pipeline is depicted below in **Figure 2**. The water supply pipeline is a ND600 pipeline that is approximately 1045 m in length.

The existing reservoir drains any overflow and scour water to a scour pond located on the south-western side of the reservoir. However, the current pond is not adequate and has overflowed into the informal settlement in the past. It was therefore decided that the overflow water will be drained to a stormwater system hence the need for the construction of a scour pipeline.

There are two routes proposed for the scour pipeline. The preferred (or proposed) route, referred to as Route 1, is approximately 1725 m in length and is indicated in blue in **Figure 2**. It is proposed that this pipeline will be laid on top of the new water supply pipeline between the scour pond at the existing reservoir and Hospital Hill reservoir.

Once the water supply terminates at the Hospital Hill Reservoir, Route 1 will skirt the reservoir terrain and then run alongside an existing road to Cosmos street where it will discharge into the



stormwater system. The road is bordered by an informal settlement as well as open areas that are disturbed (**Figures 9 and 10**).



**Figure 2: Pipeline alignments**

The alternative route, Route 2, is shorter than Route 1 in length at 784 m and is indicated as the green line in **Figure 2**. This alternative runs directly south from the reservoir to a residential area where it will discharge scour water into the stormwater system.

Formal and informal residential areas are found to the south west, south and east of project area and the topography of all the pipeline routes is hilly with a number of rocky outcrops.

A trench has been dug near the proposed alignment of the water supply pipeline (see **Figure 4**). The trench appears to have been dug a few years ago and a short concrete pipeline has been left in the veld close to the trench. A number of concrete squares indicating the possible route of a cable were also found (see **Figure 6**).

Closer to Hospital Hill reservoir and next to the route of the water supply pipeline, an old dam wall was discovered (see **Figure 7**). There is also evidence of dumping of building rubble closer to the Hospital Hill reservoir that is fairly old as grass has grown over the mounds of rubble (**Figure 8**).

The alignment of scour pipeline Route 2 runs for some distance along an existing vehicle track and through an area that is used to dump rubbish (**Figures 11 - 13**).

## 4. METHODOLOGY

A survey of literature, including other Heritage/Archaeological Impact Assessment Reports completed in the area, was undertaken in order to place the development area in an archaeological and historical context. The sources consulted in this regard are indicated in the bibliography.

A site inspection was undertaken on 20 November 2014 where the proposed routes of the pipelines were inspected by foot. Visibility was good with low grass cover and few thickets of bush.

## 5. HISTORICAL BACKGROUND OF THE STUDY AREA

### Archaeological

The archaeology of Gauteng, like that of most of southern Africa covers several archaeological periods including the Stone Age (Early, Middle & Late) and the Iron Age and more recent historic archaeology (the last 500 years).

The Stone Age is a time period that dates between 2 million years ago (ya) to 2000 ya. Due to the vast character found within stone tools of this period, it was then divided into three phases; Early Stone Age (ESA), Middle Stone Age (MSA) and the Late Stone Age (LSA). ESA dates between 2 million ya and 2 00 000 (Pelsler: 2009).

The Iron Age marks the early evidence of farming community in southern Africa. Due to technological discrepancies and settlement pattern within this period, it was divided into three. The Early Iron Age (EIA) dates to AD 200 – 900, Middle Iron Age (MIA) dates to AD 900 – 1300, and the Late Iron Age (LIA) dates to AD 1300 – 1840 (Huffman 2007).

It is believed that Bantu peoples settled at the Soutpansberg Mountains in Limpopo, 400 kilometres north of Johannesburg, around 350 AD. In another wave of migration, people settled again in Limpopo, about 1 000 years ago. Another group reached the Soutpansberg in the Northern Province about 1300 AD and spread further into the Magaliesberg about 1400 AD. These settlements grew southwards to the Witwatersrand.<sup>1</sup>

These settlers were pastoralists and as pastures in the Magaliesberg were exploited, they moved into the grasslands of Johannesburg and beyond. According to Prins (2006), the Vaal Triangle which is situated south of Lenasia, is endowed with a prehistory that commenced c. 1.5 million years ago, when a succession of Stone Age cultures flourished in the fertile Vaal-Klip valley in the environs of the modern industrial city of Vereeniging. Stone artefacts scattered throughout the Vaal Triangle area, attest to these settlements.

According to Pelser (2012), there is no indication of known Stone Age sites nor EIA sites in the greater geographical area although extensive stone-walled sites are known to exist on the Klipriviersberg north of the project site.

## **Historical<sup>2</sup>**

After the National Party won the 1948 election on an apartheid ticket, the government introduced new laws to separate race groups and deposit them in racially exclusive locations. The first step was the passing of the Group Areas Act in 1950.

Indians had been living in various suburbs in and around Johannesburg for decades. In towns such as Turffontein little pockets forming small communities had taken root, while in others there were larger communities, such as in Fordsburg, Doornfontein, Vrededorp, Sophiatown, Newclare and other areas.

The Nationalist Government at first proposed an alternative to re-housing the Indians by offering them a free passage back to India, but very few took up this offer. So the plan was for the Indians to be moved to a suburb populated only by Indians. The government at first offered the community the area today known as Robertsham, about 10km from the city, but community leaders refused to be housed there. Eventually some accepted relocation to an area known as Lenz from where Lenasia developed.

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<sup>1</sup> [http://www.joburg.org.za/index.php?option=com\\_content&task=view&id=292&Itemid=52](http://www.joburg.org.za/index.php?option=com_content&task=view&id=292&Itemid=52)

<sup>2</sup> <http://www.sahistory.org.za/indian-community-lenasia>

Working class people in areas such as Sophiatown and Newlands, were evicted from their lodgings by the authorities, with no alternative accommodation, their possessions dumped onto pavements. The Reverend Sigamany, a prominent figure in the Indian community, arranged for these people to take up accommodation at a military barracks in Lenz.

The surrounding property was owned by a German national by the name of Lenz. He had acquired the property and settled there much earlier but he eventually sold the property to the government for housing developments.

At first, the entirety of Lenasia consisted of the people living at the military barracks. Later the government sold plots for around R60 each, in the first extension to be established. By 1955, the first school was established, the Lenasia High School. In 1958, Lenasia was proclaimed an Indian township under the Group Areas Act.

## 6. RESULTS AND DISCUSSION

### **Archaeological**

No visible archaeological sites were discovered during the site assessment. Due to the undeveloped nature of the area, there is a possibility that once excavations start on the site, sub-surface archaeological remains or sites may be found. See Section 8 of this report regarding measures to be undertaken if such finds are made.

### **Historical**

No heritage resources such as buildings or structures of significance were noted during the site inspection as well as no graves or other historical sites were observed.



Figure 3: Terrain along alignment of water supply pipeline and scour pipeline Route 1



Figure 4: Existing trench



Figure 5: Abandoned length of pipeline



Figure 6: Concrete square indicating presence of cables



**Figure 7: Old dam wall**



**Figure 8: Old dumping site for building rubble**



**Figure 9: Scour pipeline Route 1 after Hospital Hill reservoir**



**Figure 10: Scour pipeline Route 1 after Hospital Hill reservoir**





Figure 11: View along alignment of scour pipeline Route 2 looking south



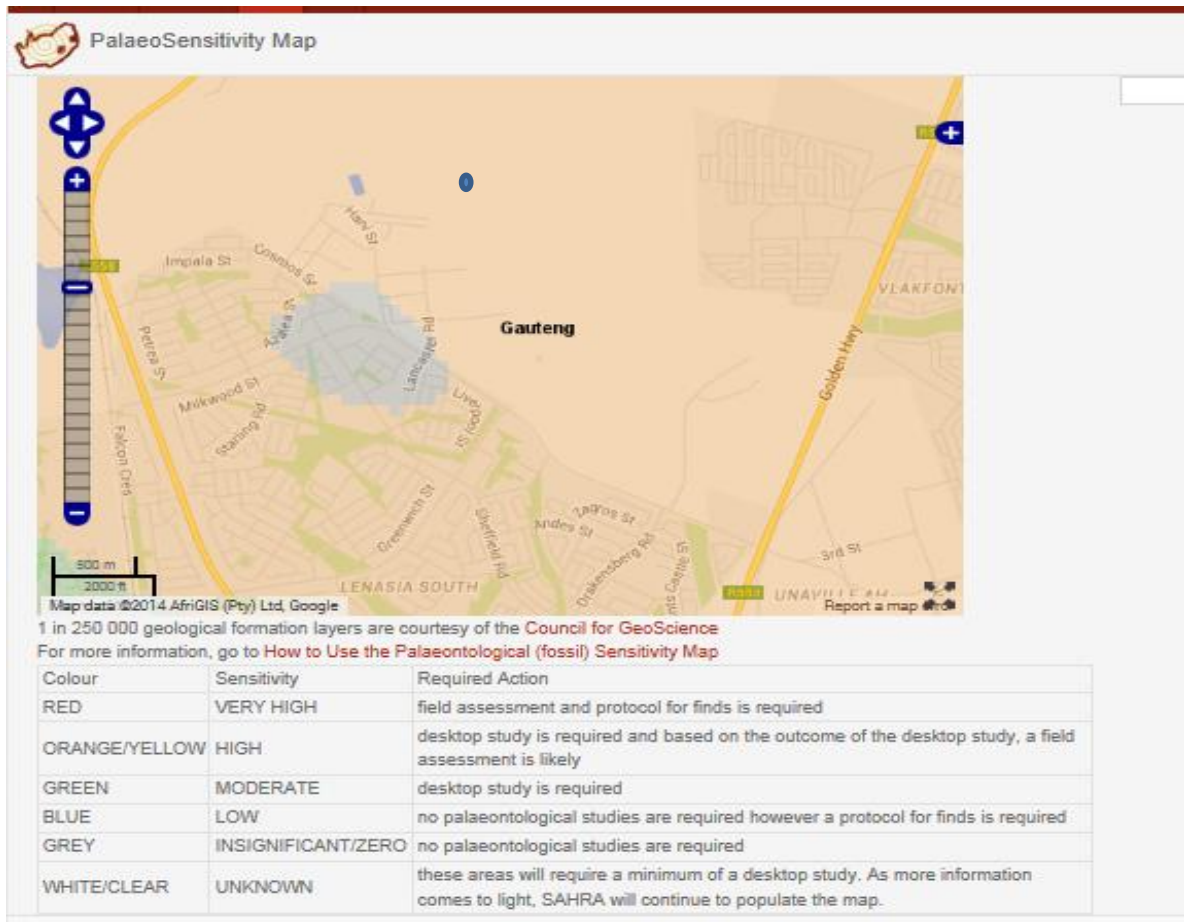
Figure 12: Existing gravel track and dumped rubbish along Route 2 looking south



**Figure 13: Exposed areas and vegetation looking north along Route 2**

### **Palaeontological**

The South African Heritage Resources Agency's (SAHRA) Fossil Sensitivity Map indicates that the project area is situated in an area of high palaeontological or fossil sensitivity. See **Figure 14** below. A palaeontological desk top study was undertaken and established that the dominant rocks in the region were those of the Chuniespoort Group (the Malmani Subgroup) and the Pretoria Group (Timeball Hill, Rooihogte and Hekpoort Formations) and that these rocks are too old to contain fossils and are also not of the correct lithology.



**Figure 14: Fossil sensitivity of project area**

The report concluded that since the rocks are too old (Archaean in age) to contain fossils it is extremely unlikely that any fossils will be found along the routes for the proposed water supply pipeline and scour pipeline.

Scour pipeline alternatives

In terms of the route alternatives for the scour pipeline, it is recommended that Route 1 is utilised. Route 1 will be laid for some distance on top of the new water supply pipeline between the existing Lenasia reservoir and the Hospital Hill reservoir. The water supply pipeline has to connect the two reservoirs hence there are no alternative alignments for this pipeline hence it makes sense that potential impact of this proposed linear development is kept to one area or corridor and not two which would be the case if Route 2 is used.

## 7. RECOMMENDATIONS AND CONCLUSIONS

According to the assessment, no visible significant cultural heritage and archaeological sites were found during the site visit. However, it should be noted that archaeological sites that may have remained undisturbed could be found beneath the surface once excavations take place hence care must be taken when the site is excavated. Mitigation measures described below deal with such chance finds.

As far as the palaeontology is concerned, the specialist recommended that the proposed development can go ahead due to the low probability of fossils been found in the area. It is recommended however that if, in the extremely unlikely chance of fossils being found during construction, a palaeontologist must be called to the site in order to assess the fossils and rescue them if necessary (with a SAHRA permit). The fossils must then be housed in a suitable, recognized institute.

This report as well as the desktop palaeontological impact assessment report will be submitted to the PHRA-G for comment and approval as required by the National Heritage Resources Act of 1999.

## 8. MITIGATION MEASURES

- For any chance finds, all work will cease in the area affected and the Contractor will immediately inform the Project Manager. A registered heritage specialist must be called to site for inspection. The relevant heritage resource agency (PHRA-G) must be informed about the finding.
- The heritage specialist will assess the significance of the resource and provide guidance on the way forward.
- Permits to be obtained from PHRA-G if heritage resources are to removed, destroyed or altered.
- All heritage resources found in close proximity to the construction area to be protected by a 10m buffer in which no construction can take place. The buffer to be highly visible to construction crews.
- Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist.

- Should any remains be found on site that is potentially human remains, the South African Police Service should also be contacted.
- If there are chance finds of fossils during construction, a palaeontologist must be called to the site in order to assess the fossils and rescue them if necessary (with a SAHRA permit). The fossils must then be housed in a suitable, recognized institute

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