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**PHASE 1 HIA REPORT FOR THE PROPOSED
RAW WATER PIPELINE BETWEEN LINDLEY & ARLINGTON,
NKETOANA LOCAL MUNICIPALITY, FREESTATE PROVINCE**

For:

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REPORT: **APAC019/28**

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SUMMARY

APelser Archaeological Consulting (APAC) was appointed by NSVT Consultants (Environmental & Social Scientists) to conduct a Phase 1 HIA for the Raw Water Pipeline between Lindley & Arlington in the Nketoana Local Municipality of the Free State Province. The proposed pipeline route follows the R707 road between the two towns for the most part using the existing servitudes and reserves. Small sections of the proposed pipeline traverse the urban settings of the two towns between the respective existing water treatment plants and reservoirs that will be connected by the new pipeline.

Background research indicates that there are a number of cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls. The assessment of the specific study area identified some sites and features of cultural heritage origin or significance along the pipeline route. This report discusses the results of both the background research and physical assessment.

It is recommended that the proposed development be allowed to continue, taking into consideration the recommendations put forward at the end of the report.

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1. INTRODUCTION

APelser Archaeological Consulting (APAC) was appointed by NSVT Consultants (Environmental & Social Scientists) to conduct a Phase 1 HIA for the Raw Water Pipeline between Lindley & Arlington in the Nketoana Local Municipality of the Free State Province. The proposed pipeline route follows the R707 road between the two towns for the most part using the existing servitudes and reserves. Small sections of the proposed pipeline traverse the urban settings of the two towns between the respective existing water treatment plants and reservoirs that will be connected by the new pipeline.

Background research indicates that there are a number of cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls. The assessment of the specific study area identified some sites and features of cultural heritage origin or significance along the pipeline route.

The client indicated the location and boundaries of the study area and the assessment concentrated on this portion.

2. TERMS OF REFERENCE

The Terms of Reference for the study was to:

1. Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the portion of land that will be impacted upon by the proposed development;
2. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
3. Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions;
4. Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
5. Review applicable legislative requirements;

3. LEGISLATIVE REQUIREMENTS

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

3.1. The National Heritage Resources Act

According to the above-mentioned act the following is protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The National Estate includes 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 features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Sites of Archaeological and palaeontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources. An HIA must be done under the following circumstances:

- a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- b. The construction of a bridge or similar structure exceeding 50m in length
- c. Any development or other activity that will change the character of a site and exceed 5 000m² or involve three or more existing erven or subdivisions thereof
- d. Re-zoning of a site exceeding 10 000 m²
- e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

Structures

Section 34 (1) of the mentioned act states that no person may demolish any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Alter means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or the decoration or any other means.

Archaeology, palaeontology and meteorites

Section 35(4) of this act deals with archaeology, palaeontology and meteorites. The act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial)

- a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- b. destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- c. trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- d. bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
- e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

Human remains

Graves and burial grounds are divided into the following:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict
- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

- a. destroy, damage, alter, exhume or remove from its original position of otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- b. destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c. bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Excavations (Ordinance no. 12 of 1980)** (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated to) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the **Human Tissues Act (Act 65 of 1983 as amended)**.

3.2. The National Environmental Management Act

This act states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made.

Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

4. METHODOLOGY

4.1. Survey of literature

A survey of available literature was undertaken in order to place the development area in an archaeological and historical context. The sources utilized in this regard are indicated in the bibliography.

4.2. Field survey

The field assessment section of the study was conducted according to generally accepted HIA practices and aimed at locating all possible objects, sites and features of heritage significance in the area of the proposed development. The location/position of all sites, features and objects is determined by means of a Global Positioning System (GPS) where possible, while detail photographs are also taken where needed.

4.3. Oral histories

People from local communities are sometimes interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography.

4.4. Documentation

All sites, objects, features and structures identified are documented according to a general set of minimum standards. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS). The information is added to the description in order to facilitate the identification of each locality.

5. DESCRIPTION OF THE AREA

The study area and proposed Raw Water pipeline route is located between the towns of Lindley and Arlington/Leratswana in the Ntekoana Local Municipality of the Free State Province. The pipeline route extends for approximately 20km along the R707 Road connecting to the two towns, with small sections traversing urban settings between the Lindley Water Treatment Plant and Reservoir & the R707 connection and the Arlington Water Treatment Plant and Reservoir and the R707 connection.

The topography of the study area is generally flat and open and follows the existing R707 road between the towns. There are a number of stream/river crossings along the way. The general area is characterized by agricultural activities (ploughed field and crops such as maize). In general the study area (the pipeline route) has been extensively changed and impacted by agriculture, urban development and road & other infrastructure. If any sites of cultural heritage (archaeological and/or historical) nature or significance did exist here in the past it would have been disturbed or destroyed to a large degree.

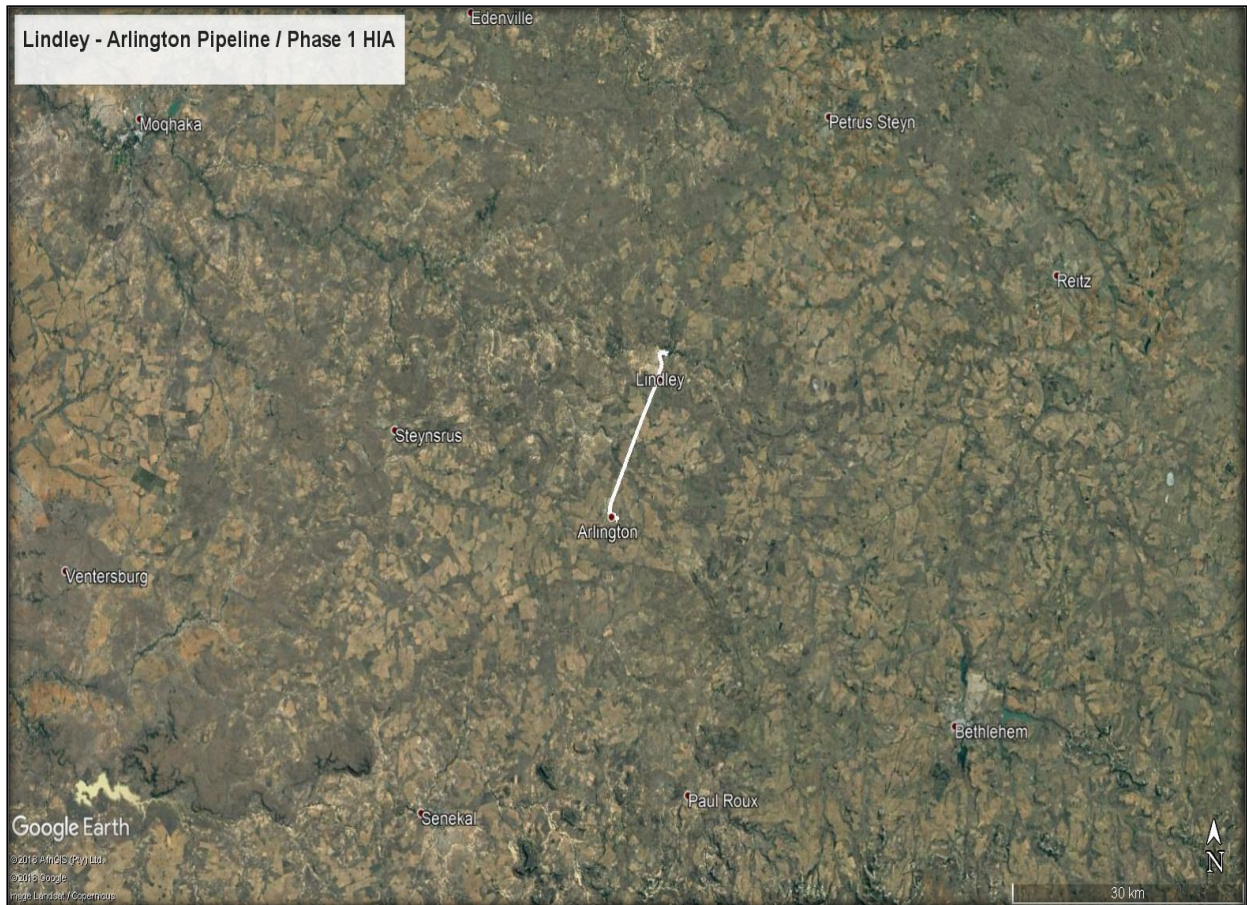


Figure 1: General location of study area and pipeline route (Google Earth 2019).

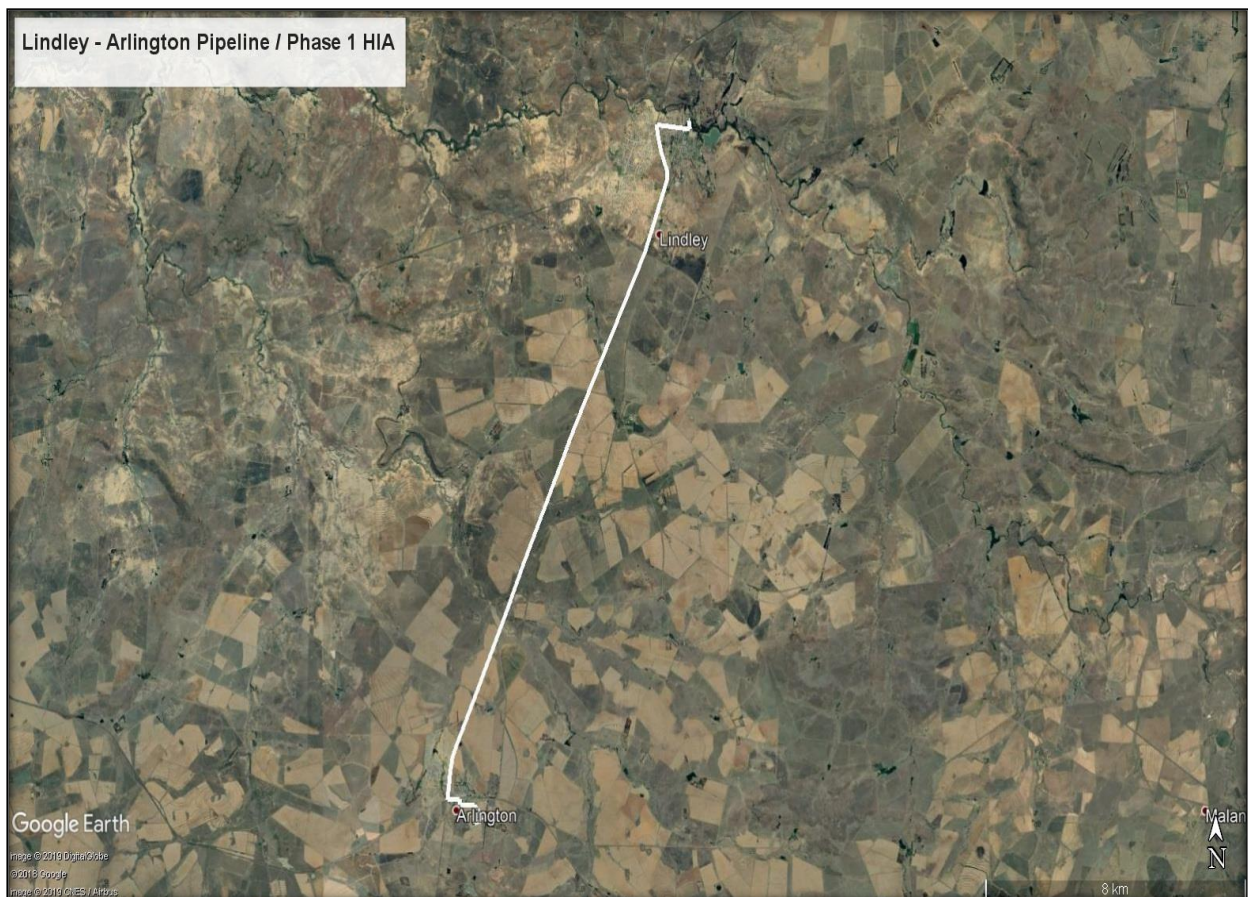


Figure 2: Closer view of location of study area and pipeline route (Google Earth 2019).

6. DISCUSSION

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools. In South Africa the Stone Age can be divided in basically into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. A basic sequence for the South African Stone Age (Lombard et.al 2012) is as follows:

Earlier Stone Age (ESA) up to 2 million – more than 200 000 years ago

Middle Stone Age (MSA) less than 300 000 – 20 000 years ago

Later Stone Age (LSA) 40 000 years ago – 2000 years ago

It should also be noted that these dates are not a neat fit because of variability and overlapping ages between sites (Lombard et.al 2012: 125).

There are no known Stone Age sites (including rock engravings) in the study area, with the closest located near Sasolburg & Vereeniging to the north of the study area (Bergh 1999: 4-5).

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artifacts. In South Africa it can be divided in two separate phases (Bergh

1999: 96-98), namely:

Early Iron Age (EIA) 200 – 1000 A.D

Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007: xiii) however indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

Early Iron Age (EIA) 250 – 900 A.D.

Middle Iron Age (MIA) 900 – 1300 A.D.

Late Iron Age (LIA) 1300 – 1840 A.D.

Iron Age sites are known to occur in the larger geographical area (Bergh 1999: 7). So-called Leghoya huts or Sedan Beehive stone huts are also found in several towns in the Lindley District including Heilbron and Arlington (www.wikipedia.org.za).

Based on Tom Huffman's research LIA sites, features or material that could be present in the larger area will be related to the Ntsuanatsatsi facies of the Urewe Tradition dating to between AD1450 & AD1650 (Huffman 2007: 167), as well as the Makgwareng facies of the same Tradition, dating to between AD1700 and AD1820 (Huffman 2007: 179).

No Iron Age sites, features or cultural material was identified during the assessment of the study area.

The historical age started with the arrival of the first European travellers, missionaries and farmers to the area. The earliest were the groups of Cornwallis Harris in 1836 and Krebs on 1838 (Bergh 1999: 13). They were closely followed by the Voortrekkers after that and up to 1844 (Bergh 1999: 14).

“Lindley is a small town situated on the banks of the Vals River in the eastern region of the Free State province of South Africa. It was named after an American missionary, Daniel Lindley, who was the first ordained minister to the Voortrekkers in Natal. The settlement of Lindley was laid out in 1875 on the farm Brandhoek and was proclaimed a town in 1878. The main route to the town is the R707. Lindley, together with its neighbouring towns of Reitz, Petrus Steyn and Arlington form the Nketoana Local Municipality.

During the Anglo-Boer War (1899-1902) the area also saw some action. Following British Major-General, Paget's, success in the Free State, Boer General, Christiaan de Wet retired to Leeuwkop, a rocky hill about ten kilometers to the south-east of Lindley where he established a new defensive position along a ridge line running north-east, which had Bakenkop as its most prominent feature. On 3 July Paget moved his infantry and two guns into the intervening valley towards Leeuwkop, while sending 800 of his mounted troops with six guns against Bakenkop on the left. The commander of the latter detachment, Colonel A.M. Brookfield, took his men onto a ridge 4 000 meters from his objective and returned fire on the five Boer guns which had begun to engage him.

During the ensuing conflict, an artillery officer managed to mount a horse and gallop to the rear. He came upon a detachment of South Australians, under Captain A.E.M. Norton, who had been ordered to retire. These he led back to the ridge line just in time to prevent the Boers from carrying away the captured guns. When confronted with the Australians' fire, the burghers promptly retreated taking some of the captured gunners with them as prisoners. The enemy party attacking the left gun section also broke contact and withdrew. In the meantime Paget had seized Leeuwkop and was now able to direct flanking fire from his guns against the Boer artillery. De Wet soon abandoned Bakenkop and made off towards Bethlehem.

During the short but sharp battle, Major Rose and about a dozen South Australians were wounded. The Tasmanian squadron, having been kept on other duty near Lindley, did not join in the fighting until the action was in its final stages with the Boers already driven off”.

The above information on Lindley was taken from Wikipedia (www.wikipedia.org.za).

Arlington was established primarily as an agricultural rail-link between the Lindley and Senekal Line and the Bethlehem and Steynrus Line. When the Harrismith-Bethlehem line was extended in 1903/1904 and taken through to Kroonstad, a siding was established on the farm Port Arlington to service the towns of Senekal and Lindley. A village started to develop and by 1910 it already had a police station, a post office, a bank, a few shops and residential houses. It was named Arlington and officially became a town in 1930 (www.pathfinda.com).

Results of the study area assessment

The study was conducted mainly by travelling down the proposed pipeline route and stopping at predetermined points on it, focusing on stream/river crossings, bridges and road intersections. Focus in the urbanized sections was to see if there is any possible structures/houses that might be impacted. For the purposes of the assessment the pipeline route was divided into 7 sections. The sites identified and recorded are indicated on the maps and discussed separately.

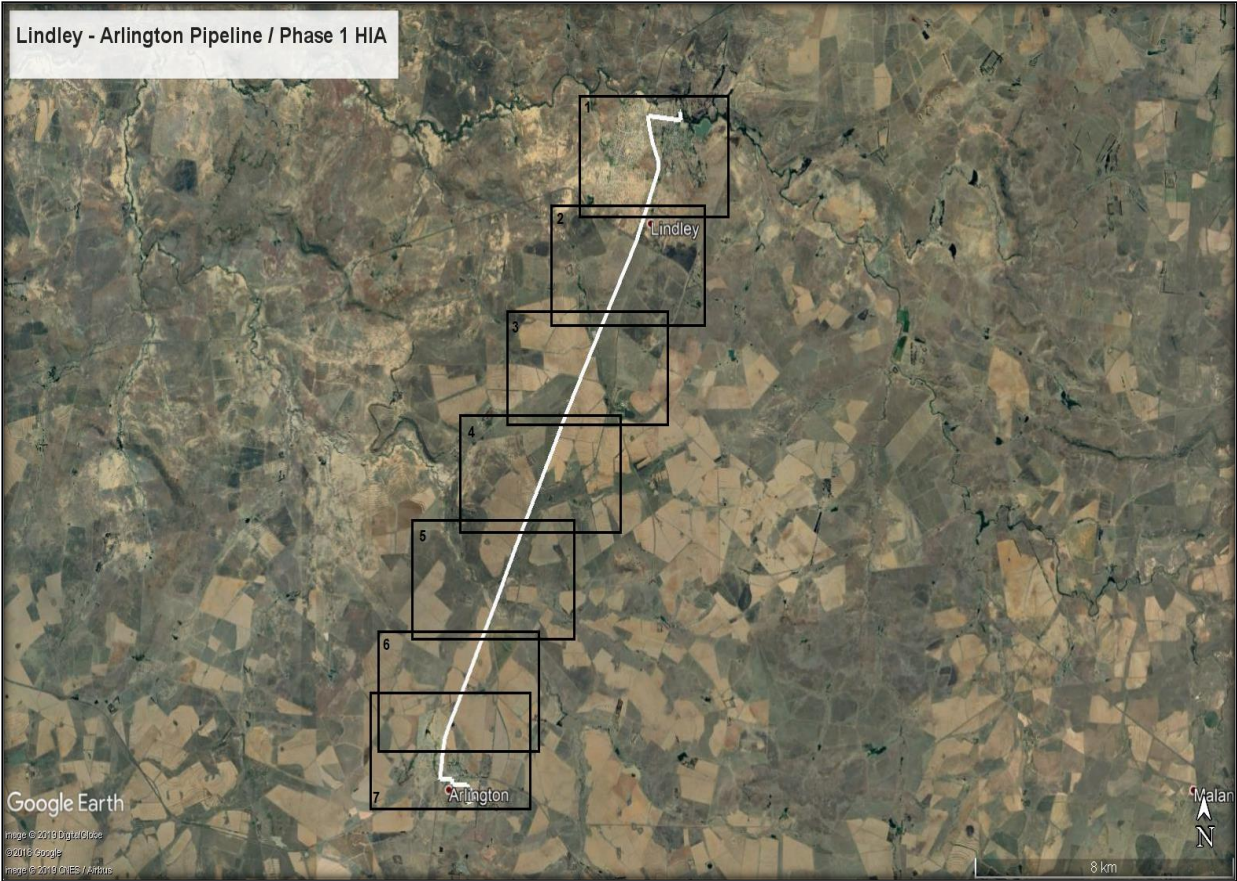


Figure 3: Aerial view of study area showing 7 sections that were assessed.



Figure 4: 1st section of pipeline route (between Lindley WTP & R707). Google Earth 2019.

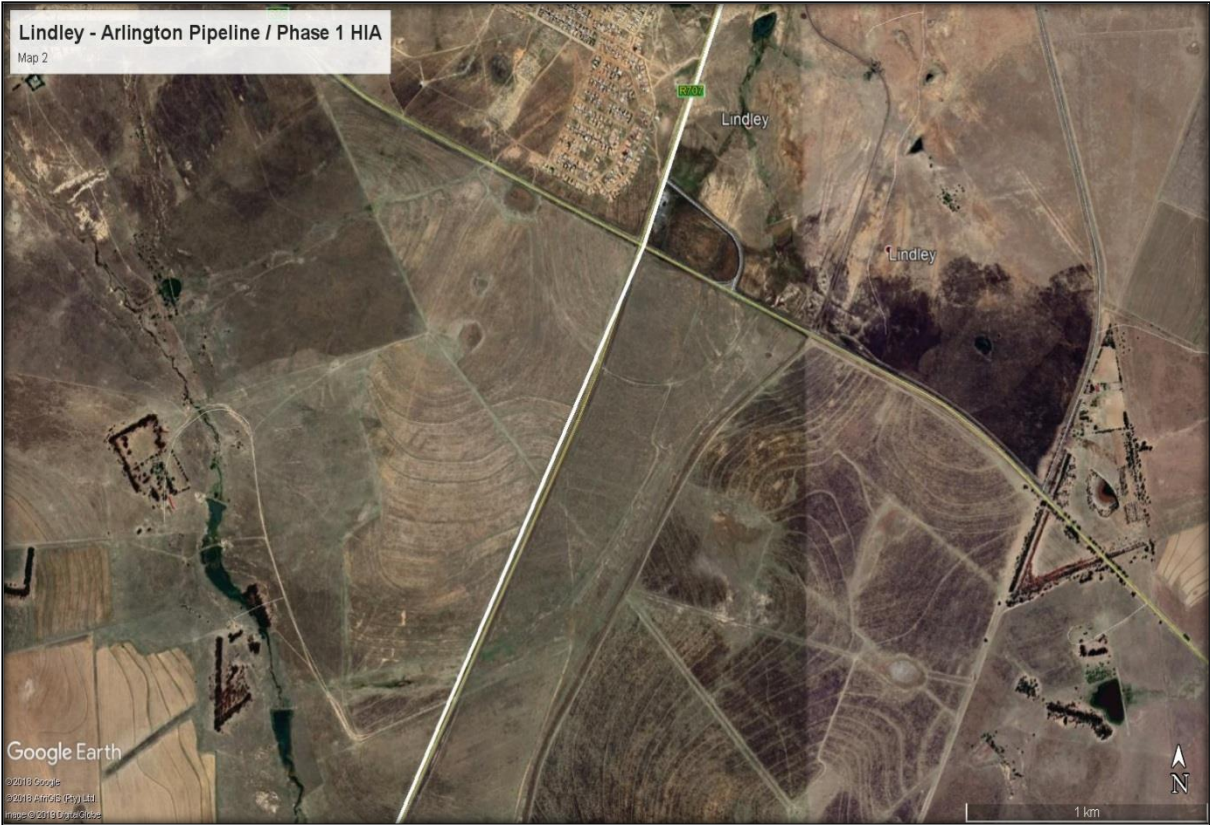


Figure 5: Map 2 of the pipeline route (Google Earth 2019).



Figure 6: Map 3 (Google Earth 2019).



Figure 7: Map 4 (Google Earth 2019).



Figure 8: Map 5 (Google Earth 2019).



Figure 9: Map 6 showing Leratswana Township bordering (Google Earth 2019).



Figure 10: Map 7 showing Leratswana and Arlington WTP & Reservoir end of line (Google Earth 2019).



Figure 11: Start of pipeline route in Lindley at the Water Treatment Plant.



Figure 12: A section of the route in Lindley close to the WTP.



Figure 13: A section of the pipeline route follows an existing road through Lindley.



Figure 14: Old (historic) house in Lindley adjacent to a section of the pipeline. The proposed pipeline route will not impact on it.



Figure 15: View down the R707 from Lindley towards Arlington. The pipeline will follow the existing servitude and road reserve.



Figure 16: View of one of the bridges on the route. This bridge is fairly recent in age and of no heritage significance.



Figure 17: Another section of the route down the R707.



Figure 18: A view down the R707 towards Lindley. The flat open nature of the study area & the agricultural fields that characterize the area is evident.



Figure 19: An old drainage ditch where the pipeline route will cross.



Figure 20: Another view of the agricultural nature of the study area, as well as a section of the Old railway line between Lindley & Arlington.



Figure 21: A view of a sandstone ridge close to one of the railway bridge crossings on the pipeline route. Areas such as these should be avoided by the route as it might contain archaeological sites, features or material.



Figure 22: View of another recent bridge crossing near Arlington.



Figure 23: A view of a section of the pipeline route into Arlington.



Figure 24: Another view of a section of the pipeline route in Arlington.



Figure 25: A view of the line route towards the Arlington Water Treatment Plant/Reservoir. The route traverses a maize field here.

Sites 1 & 2: Historic Railway Bridges

Both these sites are located on the route between Lindley and Arlington and relatively close to the proposed pipeline. As these bridges are older than 60 years of age (more than likely

older than 100 years of age) they are deemed historically significant and should not be negatively impacted by the proposed development.

GPS Location of Sites: 1 = S27 59 03.36 E27 52 03.18 & 2 = S27 59 24.09 E27 57 53.04

Cultural Significance: High – Graves always carry a High Significance rating

Heritage Significance: Grade III: Other heritage resources of local importance and therefore worthy of conservation.

Field Ratings: Local Grade IIIB: should be included in the heritage register and may be mitigated (High/Medium significance).

Mitigation: Avoid impact by the development and preserve intact. If these features cannot be avoided by the proposed pipeline route then the features should be documented in detail through mapping, drawing and photographic recording.



Figure 26: Site 1 Railway Bridge.



Figure 27: Site 2 Railway Bridge.

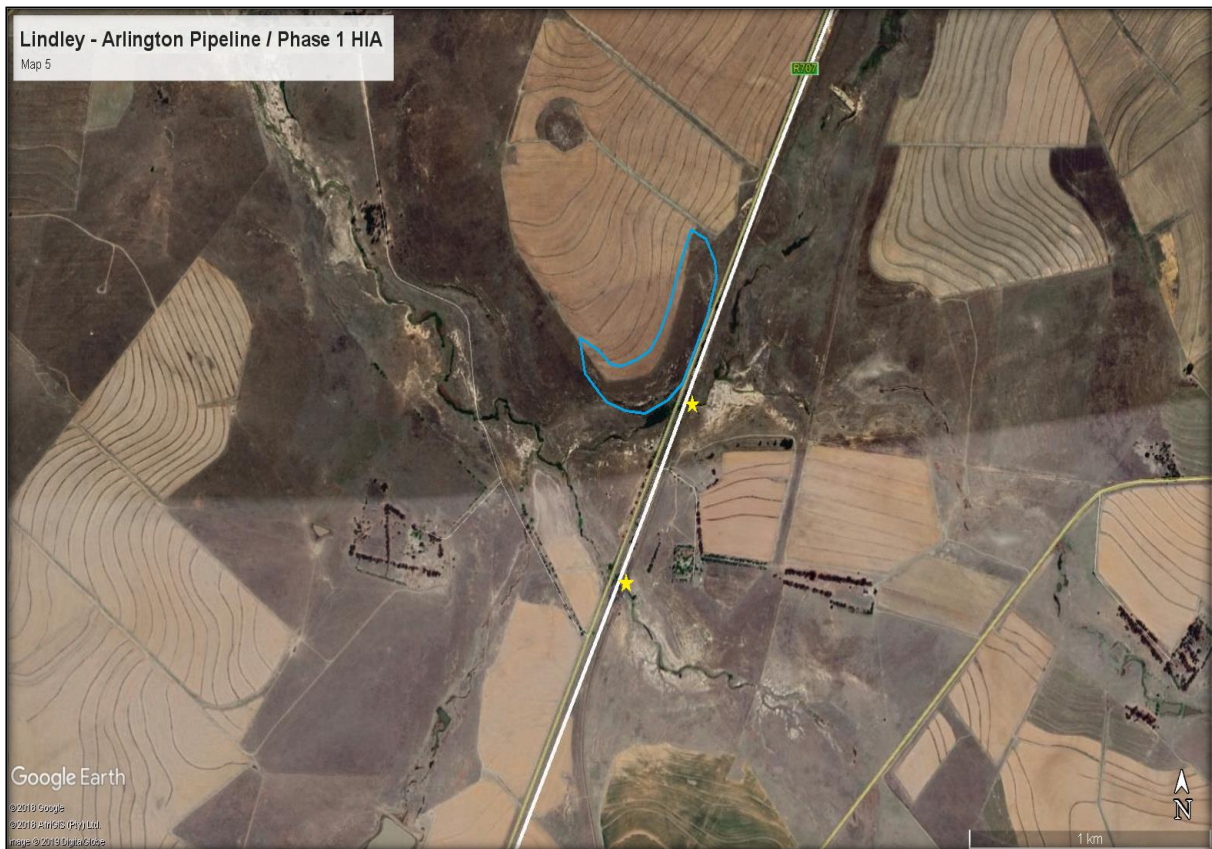


Figure 28: Aerial view showing location of two Railway Bridge sites on the pipeline route. The blue polygon shows the sandstone outcrop near the one bridge crossing that should be avoided as well (Google Earth 2019).

It should be noted that although all efforts are made to cover a total area during any assessment and therefore to identify all possible sites or features of cultural (archaeological and/or historical) heritage origin and significance, that there is always the possibility of something being missed. This will include low stone-packed or unmarked graves. This aspect should be kept in mind when development work commences and if any sites (including graves) are identified then an expert should be called in to investigate and recommend on the best way forward.

7. CONCLUSIONS AND RECOMMENDATIONS

In conclusion it is possible to say that the Phase 1 HIA for the Raw Water Pipeline between Lindley & Arlington in the Nketoana Local Municipality of the Free State Province was completed successfully. The proposed pipeline route follows the R707 road between the two towns for the most part using the existing servitudes and reserves. Small sections of the proposed pipeline traverse the urban settings of the two towns between the respective existing water treatment plants and reservoirs that will be connected by the new pipeline.

Background research indicated that there are a number of cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls. The assessment of the specific study area identified some sites and features of cultural heritage origin or significance along the pipeline route.

The two sites that were identified during the assessment are both represented by historic Railway Bridges on the Lindley-Arlington rail line. Both sites are located relatively close to the proposed pipeline and as these bridges are older than 60 years of age (more than likely older than 100 years of age) they are deemed historically significant and should be avoided by the proposed development and preserved intact. If these features cannot be avoided by the proposed pipeline route then the features should be documented in detail through mapping, drawing and photographic recording.

It should be noted that although all efforts are made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that some might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward.

Finally, from a Cultural Heritage (archaeological & historical) point of view the proposed Raw Water Pipeline between Lindley and Arlington should be allowed to continue keeping the above recommendations in mind.

8. REFERENCES

General and Closer views of study area location & Pipeline Route: Google Earth 2019.

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Other sources: www.pathfinda.com .

APPENDIX A: DEFINITION OF TERMS:

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artifacts, found on a single location.

Structure: A permanent building found in isolation or which forms a site in conjunction with other structures.

Feature: A coincidental find of movable cultural objects.

Object: Artifact (cultural object).

(Also see Knudson 1978: 20).

APPENDIX B: DEFINITION/ STATEMENT OF HERITAGE SIGNIFICANCE

Historic value: Important in the community or pattern of history or has an association with the life or work of a person, group or organization of importance in history.

Aesthetic value: Important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

Scientific value: Potential to yield information that will contribute to an understanding of natural or cultural history or is important in demonstrating a high degree of creative or technical achievement of a particular period

Social value: Have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

Rarity: Does it possess uncommon, rare or endangered aspects of natural or cultural heritage.

Representivity: Important in demonstrating the principal characteristics of a particular class of natural or cultural places or object or a range of landscapes or environments characteristic of its class or of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province region or locality.

APPENDIX C: SIGNIFICANCE AND FIELD RATING:

Cultural significance:

- Low: A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.
- Medium: Any site, structure or feature being regarded less important due to a number of factors, such as date and frequency. Also any important object found out of context.
- High: Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorized as of a high importance. Also any important object found within a specific context.

Heritage significance:

- Grade I: Heritage resources with exceptional qualities to the extent that they are of national significance
- Grade II: Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate
- Grade III: Other heritage resources of local importance and therefore worthy of conservation

Field ratings:

- i. National Grade I significance: should be managed as part of the national estate
- ii. Provincial Grade II significance: should be managed as part of the provincial estate
- iii. Local Grade IIIA: should be included in the heritage register and not be mitigated (high significance)
- iv. Local Grade IIIB: should be included in the heritage register and may be mitigated (high/medium significance)
- v. General protection A (IV A): site should be mitigated before destruction (high/medium significance)
- vi. General protection B (IV B): site should be recorded before destruction (medium significance)
- vii. General protection C (IV C): phase 1 is seen as sufficient recording and it may be demolished (low significance)

APPENDIX D: PROTECTION OF HERITAGE RESOURCES:

Formal protection:

National heritage sites and Provincial heritage sites – Grade I and II

Protected areas - An area surrounding a heritage site

Provisional protection – For a maximum period of two years

Heritage registers – Listing Grades II and III

Heritage areas – Areas with more than one heritage site included

Heritage objects – e.g. Archaeological, palaeontological, meteorites, geological specimens, visual art, military, numismatic, books, etc.

General protection:

Objects protected by the laws of foreign states

Structures – Older than 60 years

Archaeology, palaeontology and meteorites

Burial grounds and graves

Public monuments and memorials

APPENDIX E: HERITAGE IMPACT ASSESSMENT PHASES

1. Pre-assessment or Scoping Phase – Establishment of the scope of the project and terms of reference.
2. Baseline Assessment – Establishment of a broad framework of the potential heritage of an area.
3. Phase I Impact Assessment – Identifying sites, assess their significance, make comments on the impact of the development and makes recommendations for mitigation or conservation.
4. Letter of recommendation for exemption – If there is no likelihood that any sites will be impacted.
5. Phase II Mitigation or Rescue – Planning for the protection of significant sites or sampling through excavation or collection (after receiving a permit) of sites that may be lost.
6. Phase III Management Plan – For rare cases where sites are so important that development cannot be allowed.