Draft Basic Assessment Report (DBAR) as part of the Environmental Authorisation Application for the proposed upgrade and expansion of the Nigel Bulk Water Pipeline (Phase 2)
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14 May 2019

Conducted on behalf of:
Lamela Consulting (Pty) Ltd

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<td>Spatial Development Framework</td>
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<td>With Mitigation</td>
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<tr>
<td>WOM</td>
<td>Without Mitigation</td>
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<td>WULA</td>
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EXECUTIVE SUMMARY

1. BACKGROUND

Exigo Sustainability (Pty) Ltd, “Exigo” was appointed by Lamela Consulting (Pty) Ltd (hereafter referred to as Lamela Consulting) to facilitate the Environmental Basic Assessment (BA) for an Environmental Authorisation for the proposed Phase 2 upgrade and expansion of a bulk water supply pipeline in Nigel, Gauteng.

The application has been awarded the following reference number by the Gauteng Department of Agriculture and Rural Development (GDARD): GAUT 002/18-19/E0237.

This Basic Assessment Report (BAR) follows the official template as provided by the GDARD for all Basic Assessments.

2. PROJECT DESCRIPTION

The proposed project is an upgrade and expansion of the existing bulk water pipeline providing water to the Nigel area from the Dunnottar reservoir. The existing pipeline will be upgraded to a 710mm High-density polyethylene (HDPE) Class 12.5 PE100 line and steel pipes with a diameter of 600mm will also be installed. The peak throughput of the bulk water infrastructure will increase to 500 litres/second at a velocity of 1.7 meters/second. It is important to note that a section of the proposed pipeline has already been installed as part of Phase 1 of the pipeline development and therefore, the proposed project will entail Phase 2 which will complete the remainder of the pipeline. Furthermore, Phase 2 of the proposed project will commence in two segments namely Phase 2 Part 1 spanning over 1296 m and Phase 2 Part 2 spanning over 4325 m. The proposed pipeline will be located in a road reserve for part of the way but will also cross vacant land in some areas.

In essence, the proposed expansion and upgrade activities which trigger the requirement for an Environmental Authorisation will be:

- The installation of HDPE Class 12.5 PE100 pipes with a diameter of 710mm;
- The installation of steel pipes with a diameter of 600mm;
- An increase in the peak throughput of the bulk water infrastructure of 500 litres/second at a velocity of 1.7 meters/second.

3. LOCALITY

The proposed pipeline development will take place to the north west of Nigel and east of Duduza and to the south of Dunnottar. This pipeline crosses Proton Road in the south and runs partly parallel to Carr Road and the M63 (Nigel-Dunnottar Road) before crossing the M45 (Vlakfontein Road) in the north. The pipeline ends at the existing reservoir in Dunnottar which has a capacity of 20ML.
The proposed pipeline development will start from 26°23'14.34"S; 28°26'36.78"E and end at 26°21'6.04"S; 28°25'55.26"E for part 2. Part 1 of the pipeline will start at 26°24'54.87"S; 28°28'9.88"E and end at 26°24'52.96"S; 28°27'27.40"E.

Aerial locality maps are included in Figure 1 to 3 below.
Figure 1: Regional Locality Map
Figure 2: Aerial Locality Map – Phase 2 Part 1
Figure 3: Aerial Locality Map - Phase 2 Part 2
4. NEED & DESIRABILITY

In a water scarce country, water is a major vulnerability for human settlements. Apart from the need to deliver piped water to the approximately 4.5 million people who currently lack it, South Africa faces challenges of rapidly deteriorating infrastructure for those who already have water.

The main purpose of the bulk water pipeline upgrade and expansion is to improve the overall water supply to relief the strain due to new developments in the Greater Nigel area. The proposed pipeline will not only relief the strain of the current demand for water supply, but will also cater for future developments in the greater area. The proposed expansion of the pipeline will also improve the service infrastructure in the greater area.

During the expansion of the bulk water pipeline, temporal employment opportunities for both the skilled and unskilled labour will be created. The project may contribute to skills training for the local labour appointed.

5. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Environmental Impact Assessment (EIA) process (in this case a Basic Assessment (BA) process) is an essential planning tool for any development. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The key issues listed in the following sections have been determined through the following avenues:

- Legislation; and
- Professional understanding of the project team, environmental assessment practitioners and specialist consultants.

6. LISTED ACTIVITIES

An Environmental Basic Assessment (BA) in terms of the National Environmental Management Act (Act No 107 of 1998) (NEMA) read with the EIA Regulations, 2014 (GN R 982 of 4 December 2014 as amended) is being undertaken for the proposed upgrade and expansion project.

The following listed activities are applicable to the proposed project:

- Activity 45 of Listing Notice 1 of GN R 983 of 4 December 2014 (as amended)

The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure—

(i) has an internal diameter of 0.36 metres or more; or

(ii) has a peak throughput of 120 litres per second or more; and
(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or

(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;

excluding where such expansion—

aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or

bb) will occur within an urban area.

• Activity 12 of Listing Notice 3 of GN R 985 of 4 December 2014 (as amended)

The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. In-
c. Gauteng

i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;

ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or

iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

• Activity 23 of Listing Notice 3 of GN R 985 of 4 December 2014 (as amended)

The expansion of—

(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or

(ii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such expansion occurs—

a) within a watercourse;

b) in front of a development setback adopted in the prescribed manner; or

c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;

excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. In-
c. Gauteng

i. A protected area identified in terms of NEMPAA, excluding conservancies;
ii. National Protected Area Expansion Strategy Focus Areas;

iii. Gauteng Protected Area Expansion Priority Areas;

iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;

v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);

vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;

vii. Sites or areas identified in terms of an international convention;

viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;

ix. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or

x. Sites zoned for conservation use or public open space or equivalent zoning.

The environmental authorisation application has been submitted for approval to the Gauteng Department of Agriculture and Rural Development (GDARD) on 25 March 2019.
Figure 4: Map of Critical Biodiversity Areas (CBA’s) and Ecological Support Areas (ESA’s) in relation to the proposed pipeline.
7. SPECIALIST STUDIES

The following specialist studies were conducted as part of the Environmental Basic Assessment Process:

- Biodiversity and Wetland Impact Assessment – Appendix G.1
- Archaeological Impact Assessment – Appendix G.2

8. ALTERNATIVES

The assessment of alternatives is an objective of the EIA Regulations 2014 (GN R 982 of 4 December 2014 as amended). The Integrated Environmental Management (IEM) procedure requires that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, the Department of Environmental Affairs (DEA) (previously Department of Environmental Affairs and Tourism (DEAT)) requires that a number of possible proposals or alternatives for accomplishing the same objectives should be considered. To ensure that the proposed development enables sustainable development, feasible alternatives must be explored.

Alternative 1 – Proposal

Alternative 1 follows the initial route as proposed by the Applicant taking into account the proximity of available connection points to the reservoir, avoidance of any sensitivities on site as initially determined and alignment with surrounding land uses where possible.

Alternative 2 – Preferred

Upon further investigation of the proposed pipeline development area, informal graves were found to be located in close proximity to part 2 of the proposed pipeline route (Alternative 1). The Heritage Specialist informed the South African Heritage Resources Agency (SAHRA) Burial Grounds and Graves (BGG) Unit of the graves and requested a relaxation of the standard 100m conservation buffer for graves, to 50m, cognisant of the fact that an existing ESKOM powerline with a cleared servitude constructed in the early 1970’s, traverses the project area directly west of the cemetery and Alternative 1 follows the margin of this servitude. The SAHRA BGG Unit accepted the proposal to have the buffer zone reduced to 50 m and the pipeline route was therefore realigned to fall outside this 50m conservation buffer. Figure 6. The alignment of part 1 of the pipeline route however remains the same as that of Alternative 1. Refer to

The realigned pipeline route is considered the preferred alternative as this will prevent any destruction of graves and subsequent conflict with local communities.

Alternative 1 was therefore not further considered.
8.1. No-Go Alternative

One of the options to be considered as part of the study is that of the no development option. This would entail leaving the site in its present state and not going ahead with the proposed development. If the development does not take place the following advantages and disadvantages are foreseen:

Advantages of no-go:

1. The site will remain as is without any of the anticipated ecological, air quality and noise impacts

Disadvantages of no-go:

1. Negative implications for the sustainability of the water network system within the area. Should any other future residential developments be constructed, there will not be a sufficient water network to meet this demand
2. Inability to meet the current capacity demands of residential developments in the area
3. Not undertaking the project means there will be no opportunity for job creation and skills development within the local community
4. No water services provided to the area will not support the provincial and municipal plans

The no-go alternative would mean that no development would occur and the status quo would remain. Should the mitigation measures proposed in the EMP be implemented the impact on the environment can be considered to be of negligible to low significance. The no-go option is therefore not the preferred option as the benefits accrued from going ahead with the development will not be obtained.

9. PUBLIC PARTICIPATION PROCESS

The following process was undertaken to facilitate the public participation for the proposed project:

9.1. Newspaper Advertisement

An advertisement, notifying the public of the Environmental Authorisation application and Basic Assessment process, and requesting Interested and Affected Parties (I&APs) to register their comments with Exigo, was placed in the Nigel Rekord on 14 May 2019. The advertisement was placed in accordance with regulation 41(2)(c) of the EIA Regulations of 2014 (as amended).

9.2. Site Notices

In order to inform surrounding communities and adjacent landowners of the proposed development, site notice boards in accordance with regulation 41(2)(a) and 41(3) of the EIA Regulations (as amended) were placed at the following locations 14 May 2019:
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<td>Site Notice 3</td>
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</tr>
<tr>
<td>Site Notice 4</td>
<td>26°21'4.54&quot;S; 28°25'55.88&quot;E</td>
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9.3. **Direct Notification of Identified I&AP’s**

Key stakeholders, who included the following sectors, were informed by means of emails, faxes or registered post on 8 March 2019 of the proposed development:

- The owners of directly affected property where the activity is to be undertaken;
- Ekurhuleni Metropolitan Municipality;
- Department of Water and Sanitation (DWS);
- Gauteng Department of Roads and Transport;
- Gauteng Department of Economic Development;
- Department of Public Works; and
- Gauteng Provincial Heritage Resources Agency (G-PHRA).

9.4. **Draft BAR**

The EIA Regulations specify that I&AP’s must have an opportunity to comment, in writing, on all reports or plans submitted to such party during the public participation process. A period of 30 days (14 May 2019 until 13 June 2019) is being made available to allow for public comment on the Draft BAR. The availability of the Draft BAR was announced via personal notification letters distributed via hand delivery, post, fax, or emails to all the identified stakeholders on the distribution list. The following methods will be made available for I&AP’s to access the reports:

- Published on the Dropbox website;
• Hard copies and electronic copies were distributed upon request.

9.5. Final BAR

The comments received on the Draft BAR will be included and addressed in the Final BAR to be submitted to GDARD.

10. SUMMARY OF SPECIALIST FINDINGS

The following section includes information extracted from the specialist studies conducted as part of the BA process. For more information please refer to the respective specialist studies attached in Appendix G of this report.

10.1. Biodiversity and Wetland Impact Assessment

Following the investigation of potential ecological impacts of the proposed bulk water supply pipeline development on the fauna and flora of the area, the following conclusions can be made:

• The proposed development will potentially impact and modify the vegetation and faunal habitats in the footprint areas to a varying extent according to the current state of the environment (vegetation and fauna habitats).

• Most sensitive sections: It is evident from the distribution of biodiversity, presence of threatened species and sites of scientific interest, that the proposed bulk water supply pipeline development has the potential for negative impact on the flora and fauna of the study area. Impacts are anticipated at the more natural drainage crossings or wetlands, although in general most of the area has been extensively degraded.

• Most sensitive habitats: Many threatened species are grassland and wetland dependant, linked to these habitats either for breeding, feeding or shelter. Major impacts on wetlands should be avoided wherever possible during construction. Existing hydrodynamics must be protected to ensure that water regimes are maintained.

• Monitoring of wetlands: Ecological monitoring is recommended for the construction phase of the development considering the presence of wetlands that are linked to the Blesbokspruit, a Ramsar site at Marievale Bird Sanctuary which is located 4.9 km east of the proposed site.

• The importance of rehabilitation and implementation of mitigation processes to prevent negative impacts on the environment during and after the construction phase of the bulk water supply pipeline development should be considered a high priority. The proposed site for the development has been degraded through alien species invasion, human settlements, crop cultivation and overgrazing.
A sensitivity analyses was conducted to identify the most suitable site for the development. From this investigation and ecological survey, the following main observations was made:

- Most of the area has a low sensitivity due to the degraded state of the vegetation (exotic bushclumps, cultivated land, built up land, degraded grassland, roadsides);
- The Valley Bottom wetlands have a high sensitivity. Where the bulk water supply pipeline cross wetlands or drainage channels, a Water Use Licence Application (WULA) should form part of the proposed development;
- The secondary grassland areas have a Medium Sensitivity;
- The man-made canal has a Medium-Low Sensitivity due to still being connected and having limited functionality;
- No red data plant species were found on the site due to the state of the vegetation and physical environment of the larger area mostly not being suitable for any of the red data plant species that may be found in the area.
- According to the Gauteng Conservation Plan (CPlan Version 3.3) compiled by the Gauteng Department of Agriculture and Rural Development (GDARD), a Critical Biodiversity Area (CBA) category “Important” as well as an Ecological Support Area (ESA) occur to the north east of the pipeline route. The CBA and ESA are located between 25 and 35 meters north of the proposed pipeline alignment. A 200-meter buffer area along the pipeline route was surveyed. The CBA and ESA areas were found to be degraded and modified land with built-up areas that have a low sensitivity and consists of exotic bushclumps. Refer to the sensitivity map below in Figure 5.
- Part 2 of the proposed pipeline route is situated in mostly CBA areas category “Important” and partially in an ESA. The CBA and ESA areas were found to consist of degraded grasslands, built-up and modified land, cultivated land, exotic bushclumps and an artificial wetland area, all of which had a low sensitivity. There are also some areas of secondary indigenous grassland with medium sensitivity in the project area. The pipeline route also crosses two valleybottom wetlands of high sensitivity and a hillslope seep wetland with medium to high sensitivity. Refer to the sensitivity map below in Figure 6.

A number of potential impacts were identified and assessed, of which the highest significance was assessed to be medium including the following:

- Destruction or disturbance to sensitive ecosystems leading to reduction in the overall extent of a particular habitat;
- Increased soil erosion;
• Impairment of the movement and/or migration of animal species resulting in genetic and/or ecological impacts;
• Destruction/permanent loss of individuals of rare, endangered, endemic and/or protected species;
• Soil and water pollution through spillages;
• Establishment and spread of declared weeds and alien invader plants;
• Impacts of human activities on fauna and flora of the area during construction;
• Air pollution through dusts and fumes from construction vehicles (construction phase).

Mitigation measures are provided that would reduce these impacts from a moderate significance to a low or negligible significance. Any impact on the wetlands should be kept to a minimum.

10.2. Archaeological Impact Assessment

In terms of heritage resources, the landscape around the project area is primarily well known for the occurrence of Iron Age farmer sites and a Colonial frontier denoting industrial expansion in Gauteng. The landscape around Nigel has been inhabited, developed and exploited continuously for centuries, the remnants of which are visible in transformed agriculture and rural settlements as well as mining areas. The following conclusions are made based on general observations in project area pertaining to a number of identified occurrences of heritage potential:

• The poorly preserved remains of Historical Period buildings and structures occur at various locations along the project footprint (Site EXIGO-NBP-HP03, Site EXIGO-NBP-HP04, Site EXIGO-NBP-HP04). The sites are rated as medium-low heritage significance but legislation requires that alteration permits be obtained from the relevant heritage resources authority (SAHRA, SAHRA Built Environment Unit) prior to the alteration of the structures, should the structure be altered. A 20m conservation buffer is advisable as well as monitoring of the respective sites during development in order to avoid the destruction of previously undetected heritage remains.

• A vehicular bridge in the Nigel Central Business District (CBD) dating to the Historical Period (Site EXIGO-NBP-HP02) occurs in the project area. The structure might contribute to an understanding of the industrial and architectural development of bridge and culvert structures in the historical landscape of Nigel. **It is not foreseen that the structure will be altered during the pipeline development.** However, should any alteration be planned, careful documentation of the structure by a suitably qualified cultural historian/architect will be necessary prior to the development. Legislation also requires that an alteration permit be obtained from the relevant heritage resources authority (SAHRA, SAHRA Built Environment Unit) prior to any alteration of the structure.
• A Historical Period building of medium significance (Site Exigo-NBP-HP01) occurs in the Nigel CBD in close proximity to the project area. The structure has the potential to provide an understanding of architectural, industrial and social developments in the Nigel landscape and the receptors are rated as of medium significance. It is primarily recommended that a conservation buffer of at least 20m around the site be implemented in order to avoid impact. However, should impact on the building prove inevitable, the structure should be adequately documented by means of a Phase 2 Specialist Study. Such a study should minimally include the mapping, documentation and possible sampling of the feature in order to conserve the historical fabric of the heritage resources. The necessary alteration permit should be obtained from the relevant Heritage Resources Authorities prior to site alteration. Generally, the site should be monitored by an informed Environmental Control Officer (ECO) in order to avoid the destruction of previously undetected heritage remains.

• An informal cemetery (Site Exigo-NBP-BP01) occurs south of Dunnottar in close proximity to the project area. The cemetery, which is highly significant in terms of heritage value, might contain graves which are to be older than 60 years and thus protected by the National Heritage Resource Act (NHRA 1999). It is primarily recommended that the site be avoided by means of a 100m conservation buffer, however cognisant of the fact that the pipeline follows the already transformed ESKOM servitude, a relaxation of this buffer to 50m has been requested and approved by the SAHRA BGG Unit. In this instance, the strict and continuous monitoring of the cemetery is essential where a heritage consultant should assess the site on a bi-weekly basis for the duration of construction in this area, in order to detect any impact at the earliest opportunity. The burial site should be fenced off in such a way as to restrict access and to clearly demarcate the margins of the cemetery prior to commencement of construction. A heritage Site Management Plan (SMP) detailing a plan of action and measures for the long-term conservation and management of the burial site should be compiled and implemented by the heritage consultant. Should impact on the burial site prove inevitable, a full grave relocation process should be effected. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and.

• Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO is recommended during the construction phase of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately. Should impact on any human burial occur, development should be suspended and the heritage specialist should be consulted. The conservation of burial sites should be ensured and full grave relocations are recommended should impact be unavoidable.
This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that the possibility of undetected archaeological remains occurring elsewhere in the project area should not be excluded. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.
Figure 5: Ecological and Heritage sensitivities of Part 1 of the proposed pipeline
Figure 6: Ecological and Heritage sensitivities of Part 2 of the proposed pipeline
11. ENVIRONMENTAL IMPACT PREDICTION AND EVALUATION

An assessment of potential impacts identified for the proposed upgrade and expansion of the Nigel Phase 2 Bulk Water Supply Pipeline was undertaken according to the Plomp methodology (Plomp, 2004). The impacts identified for further assessment were assessed within the respective specialist studies. The specialist studies undertaken to this effect are listed above. The specialist studies recommended mitigation measures in order to reduce or eliminate any impacts identified.

All impacts identified were also analysed according the following key considerations, a description of which is included in Section E (2):

**Probability:** This describes the likelihood of the impact actually occurring.

**Duration:** The lifetime of the impact

**Scale:** The physical and spatial size of the impact

**Magnitude/Severity:** Does the impact destroy the environment, or alter its function.

**Significance:** This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Below is a summary of the potential environmental impacts associated with the project through the different phases:

**Table A-1: Impact Assessment Table**

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Impact</th>
<th>Without or With Mitigation</th>
<th>Nature (Negative or Positive Impact)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Score</td>
<td>Magnitude</td>
</tr>
<tr>
<td><strong>Planning Phase</strong></td>
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<tr>
<td><strong>Heritage Impact</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>EXIGO-NBP-HP01 EXIGO-NBP-HP02</td>
<td>Potential damage to Colonial Period structures due to planned alignment of pipeline route</td>
<td>WOM</td>
<td>Negative</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
</tr>
<tr>
<td>2</td>
<td>EXIGO-NBP-HP03 EXIGO-NBP-HP04 EXIGO-NBP-HP05</td>
<td>Potential damage to Colonial Period structures due to planned alignment of pipeline route</td>
<td>WOM</td>
<td>Negative</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
</tr>
<tr>
<td>3</td>
<td>Site Exigo-NBP-BP01</td>
<td>Potential damage to informal burial site due to</td>
<td>WOM</td>
<td>Negative</td>
<td>22</td>
</tr>
<tr>
<td>No.</td>
<td>Activity Description</td>
<td>Impact Description</td>
<td>Method</td>
<td>Result</td>
<td>Intensity</td>
</tr>
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<td>-----</td>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
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</tr>
<tr>
<td>1</td>
<td>Planned alignment of pipeline route</td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Clearing of vegetation for pipelines and infrastructure, access roads etc.</td>
<td>Habitat modification</td>
<td>WOM</td>
<td>Negative</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Biodiversity and Wetland Impact</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>Clearing of vegetation for pipelines and construction of infrastructure, access roads etc.</td>
<td>Habitat fragmentation</td>
<td>WOM</td>
<td>Negative</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Exposure of soils to rainfall and wind during construction</td>
<td>Soil erosion and sedimentation</td>
<td>WOM</td>
<td>Negative</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant)</td>
<td>Spillages of harmful substances, such as hydrocarbons and sewage leading to soil and water pollution</td>
<td>WOM</td>
<td>Negative</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>Continued movement of personnel and vehicles on and off the site during the construction phase</td>
<td>Spread of alien invasive species</td>
<td>WOM</td>
<td>Negative</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>Construction of infrastructure, access roads etc.</td>
<td>Negative effect of human activities on flora</td>
<td>WOM</td>
<td>Negative</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Construction of pipelines and roads at crossings and on floodplains</td>
<td>Impact on drainage regime</td>
<td>WOM</td>
<td>Negative</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>Continued movement of vehicles on and off the site during the construction phase</td>
<td>Fauna mortality on roads</td>
<td>WOM</td>
<td>Negative</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
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<td></td>
<td>Heritage Impact</td>
<td>WOM</td>
<td>WM</td>
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</tr>
<tr>
<td>12</td>
<td>EXIGO-NBP-HP01 EXIGO-NBP-HP02 Potential damage to Colonial Period structures during construction</td>
<td>Negative</td>
<td>24</td>
<td>Low</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Negligible</td>
<td></td>
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<tr>
<td>13</td>
<td>EXIGO-NBP-HP03 EXIGO-NBP-HP04 EXIGO-NBP-HP05 Potential damage to Colonial Period structures during construction</td>
<td>Negative</td>
<td>10</td>
<td>Negligible</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Negligible</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Site Exigo-NBP-BP01 Potential damage to informal burial site due to planned alignment of pipeline route</td>
<td>Negative</td>
<td>64</td>
<td>High</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Negligible</td>
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<td></td>
<td>Negligible</td>
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<tr>
<td></td>
<td><strong>Air Quality Impacts</strong></td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>Excavation and stockpiling and vehicular movement Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic</td>
<td>Negative</td>
<td>65</td>
<td>High</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Negligible</td>
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<td>Negligible</td>
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<td></td>
<td><strong>Visual impact</strong></td>
<td></td>
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<tr>
<td>16</td>
<td>Construction activities relating to installation of the pipeline The largest part of the proposed pipeline will be situated belowground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles during construction.</td>
<td>Negative</td>
<td>40</td>
<td>Low</td>
<td></td>
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<td></td>
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<td></td>
<td>Negligible</td>
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<td></td>
<td></td>
<td>Negligible</td>
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<tr>
<td></td>
<td><strong>Noise Impacts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Construction activities and operation of machinery and vehicles Noise pollution from excavation activities and construction vehicles.</td>
<td>Negative</td>
<td>65</td>
<td>High</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
<td></td>
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<tr>
<td></td>
<td><strong>Traffic Impacts</strong></td>
<td></td>
<td></td>
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<tr>
<td>18</td>
<td>Excavation and installation of pipeline and use of The presence of construction vehicles on site and installation of the</td>
<td>Negative</td>
<td>52</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>Construction vehicles</td>
<td>pipeline alongside public roads will have an impact on the traffic situation of the neighbouring area although this will be kept to a minimum.</td>
<td>WM</td>
<td>Negative</td>
<td>22</td>
<td>Low</td>
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<tr>
<td><strong>Socio-economic Impacts</strong></td>
<td></td>
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</tr>
<tr>
<td>Employment</td>
<td>The creation of temporary jobs during construction will have a positive impact. It will provide temporary employment in the area and further training and skills development in the area.</td>
<td>WOM</td>
<td>Positive</td>
<td>24</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WM</td>
<td>Positive</td>
<td>60</td>
<td>Moderate</td>
</tr>
<tr>
<td>Service Provision</td>
<td>The increased capacity of water provision will provide in the need of water provision and future growth.</td>
<td>WOM</td>
<td>Positive</td>
<td>60</td>
<td>Moderate</td>
</tr>
<tr>
<td>Safety, security and fire hazards</td>
<td>Construction activities will result in increased traffic by heavy vehicles in the area that can result in disruptions to traffic flow and accidents. Construction activities such as excavation of trenches, movement of construction vehicles, the use of equipment and the congregation of workers and staff on site, further increase the risk of injury. The activities of construction personnel on site may contribute to an increase in the risk for fires and crime in the area.</td>
<td>WM</td>
<td>Negative</td>
<td>26</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>11</td>
<td>Negligible</td>
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<tr>
<td><strong>Operational Phase</strong></td>
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<tr>
<td>Biodiversity and Wetland Impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movement of vehicles on site during operations for maintenance purposes</td>
<td>Spillages of harmful substances leading to soil and water pollution</td>
<td>WOM</td>
<td>Negative</td>
<td>26</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>Continued movement of personnel and vehicles on and off the site during the occasional delivery of materials required for maintenance during the operational phase</td>
<td>Spread of alien invasive species</td>
<td>WOM</td>
<td>Negative</td>
<td>26</td>
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<td>23</td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Continued movement of vehicles on and off the site during the occasional delivery of materials required for maintenance during the operational phase</td>
<td>Fauna mortality on roads</td>
<td>WOM</td>
<td>Negative</td>
<td>22</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>12</td>
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<tr>
<td></td>
<td>Pipe failure or leaks</td>
<td>Increased flows due to leaks or pipe failure</td>
<td>WOM</td>
<td>Negative</td>
<td>28</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>16</td>
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<tr>
<td></td>
<td>Subsidence</td>
<td>Erosion due to subsidence along pipeline</td>
<td>WOM</td>
<td>Negative</td>
<td>28</td>
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<tr>
<td>26</td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td><strong>Heritage Impact</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIGO-NBP-HP01</td>
<td>Potential damage to Colonial Period structures due to maintenance activities</td>
<td>WOM</td>
<td>Negative</td>
<td>12</td>
</tr>
<tr>
<td>27</td>
<td>EXIGO-NBP-HP02</td>
<td></td>
<td>WM</td>
<td>Negative</td>
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<td></td>
<td>EXIGO-NBP-HP03</td>
<td>Potential damage to Colonial Period structures due to maintenance activities</td>
<td>WOM</td>
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<tr>
<td>28</td>
<td>EXIGO-NBP-HP04</td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>5</td>
</tr>
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<td></td>
<td>EXIGO-NBP-HP05</td>
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<tr>
<td></td>
<td>Site Exigo-NBP-BP01</td>
<td>Potential damage to informal burial site due to planned alignment of pipeline route</td>
<td>WOM</td>
<td>Negative</td>
<td>16</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>16</td>
</tr>
</tbody>
</table>

- **WOM**: Without Mitigation
- **WM**: With Mitigation

Without mitigation the following impacts were rated as “high” significance during construction and include:

1. Increase in dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic
2. Noise pollution from excavation activities and movement of vehicles

With mitigation the following impacts were rated as “moderate” significance during operations (maintenance) and include:

1. Spillages of harmful substances leading to soil and water pollution
2. Spread of alien invasive species
3. Fauna mortality on roads

All of the above impacts can however be mitigated to low or negligible significance, apart from the noise impact due to excavation activities and movement of vehicles. However, this impact will be limited to the construction phase and of medium duration.

The following positive impacts were identified for the proposed development:

1. The creation of temporary jobs during construction which will further training and skills development in the area.
2. The increased capacity of water provision will provide in the need of water provision and future growth.

12. CONCLUSIONS & RECOMMENDATIONS

The findings of the specialist studies and impact assessment conducted under this environmental process provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. Provided that the recommended management and mitigation measures are implemented, there are no environmental fatal flaws that should prevent the proposed project from commencing.

To achieve appropriate environmental management standards and to ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from the report have been included in an Environmental Management Programme Report (EMPr) which is included in Appendix H.

The EMPr should be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for key phases such as construction and operation of the proposed development is considered to be fundamental in achieving the appropriate environmental management standards as detailed for this project.

It is also recommended that the process of communication and consultation with the surrounding landowners is maintained after the closure of the Basic Assessment Process.
Therefore, based on the results of this report, Exigo recommends that this report is accepted by the competent authority.

Kindly note that:

1. This Basic Assessment Report is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.

4. A draft Basic Assessment Report (1 hard copy and two CD’s) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.

5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.

6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.

10. The use of “not applicable” in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.

11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500
If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Is a closure plan applicable for this application and has it been included in this report?  [ ] NO  [ ] YES

If not, state reasons for not including the closure plan.

The proposed development is an expansion and upgrade of a bulk water pipeline only and as such does not require a closure plan.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity?  [ ] YES  [ ] NO

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person?  [ ] YES  [ ] NO

If no, state reasons for not attaching the list.

This Draft Basic Assessment Report (DBAR) will be made available to identified Interested and Affected Parties (I&AP’s) for comment. All comments will be included to the Final Basic Assessment Report (FBAR).

Have State Departments including the competent authority commented?  [ ] YES  [ ] NO

If no, why?

Refer to Appendix E.6: Comments and Response Report.
SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

Environmental Basic Assessment (BA) for an Environmental Authorisation for the proposed Phase 2 upgrade and expansion of the bulk water pipeline in Nigel, Gauteng.

Select the appropriate box

- The application is for an upgrade of an existing development
- The application is for a new development
- Other, specify

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES ☐ NO ☐

If yes, describe the legislation and the Competent Authority administering such legislation:

Water Use License Application (WULA): A Water Use Licence is required for water uses in terms of section 21 (c) and (i) of the National Water Act (Act no. 36 of 1998) (NWA). A risk assessment will however be undertaken and should the risk class of the proposed pipeline be low, it will be motivated for a general authorisation registration in terms of Government Notice Regulation (GN R 509 of 26 August 2016) for the water uses. This motivation and supporting documentation will be submitted to the Department of Water and Sanitation (DWS).

If yes, have you applied for the authorisation(s)?

YES ☐ NO ☐

If yes, have you received approval(s)? (attach in appropriate appendix)

YES ☐ NO ☐

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

<table>
<thead>
<tr>
<th>Title of legislation, policy or guideline:</th>
<th>Administering authority:</th>
<th>Promulgation Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Department of Agriculture and Rural Development (GDARD)</td>
<td></td>
</tr>
<tr>
<td>Environmental Impact Assessment Regulations, 2014 (as amended)</td>
<td>Department of Environmental Affairs (DEA) and Gauteng</td>
<td>4 December 2014 as amended on 7 April 2017</td>
</tr>
<tr>
<td></td>
<td>Department of Agriculture and Rural Development (GDARD)</td>
<td></td>
</tr>
<tr>
<td>The National Heritage Resources Act (NHRA) (Act No 25 of 1999)</td>
<td>South African Heritage Resources Association (SAHRA)</td>
<td>28 April 1999</td>
</tr>
<tr>
<td>Conservation of Agricultural Resources Act (Act No. 43 of 1983)</td>
<td>Department of Agriculture</td>
<td>1 June 1983</td>
</tr>
<tr>
<td>National Environmental Management Biodiversity Act (NEMBA: Act 10 of 2004)</td>
<td>Department of Environmental Affairs (DEA) and Gauteng</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>Department of Agriculture and Rural Development (GDARD)</td>
<td></td>
</tr>
<tr>
<td>The National Forest Act (Act 84 of 1998)</td>
<td>Department of Forestry and Fisheries (DAFF)</td>
<td>1998</td>
</tr>
<tr>
<td>Gauteng Nature Conservation Bill</td>
<td>Department of Environmental Affairs (DEA) and Gauteng</td>
<td>2014</td>
</tr>
<tr>
<td></td>
<td>Department of Agriculture and Rural Development (GDARD)</td>
<td></td>
</tr>
<tr>
<td>Gauteng Conservation Plan Version 3.3 (CPlan)</td>
<td>Department of Environmental Affairs (DEA) and Gauteng</td>
<td>2011</td>
</tr>
<tr>
<td></td>
<td>Department of Agriculture and Rural Development (GDARD)</td>
<td></td>
</tr>
<tr>
<td>Gauteng Provincial Environmental Management Framework (GPEMF)</td>
<td>Department of Environmental Affairs (DEA) and Gauteng</td>
<td>2018</td>
</tr>
<tr>
<td></td>
<td>Department of Agriculture and Rural Development (GDARD)</td>
<td></td>
</tr>
<tr>
<td>City of Ekurhuleni Metropolitan Municipality Integrated Development Plan (IDP) 2017/18 to 2020/21</td>
<td>Ekurhuleni Metropolitan Municipality (EMM)</td>
<td>3 April 2017</td>
</tr>
</tbody>
</table>
### Description of compliance with the relevant legislation, policy or guideline:

<table>
<thead>
<tr>
<th>Legislation, policy of guideline</th>
<th>Description of compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Constitution of the Republic of South Africa (Act 108 of 1996)</td>
<td>This report has been prepared, submitted and considered within the constitutional framework set by inter alia section 24 and 33 of the Constitution.</td>
</tr>
<tr>
<td>The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)</td>
<td>The provisions of this legislation will be heeded throughout the public participation process.</td>
</tr>
<tr>
<td>Environmental Impact Assessment Regulations, 2014 (as amended)</td>
<td>The Basic Assessment process followed is in compliance with the Environmental Impact Assessment Regulations of 2014 (Government Notice No R982 of December 2014, as amended). This report has been prepared, submitted and considered in line with Appendix 1 of the above EIA Regulations.</td>
</tr>
<tr>
<td>The National Heritage Resources Act (Act No 25 of 1999) (NHRA)</td>
<td>The legislation was taken into account during the compilation of the Draft Basic Assessment Report. It is deemed not applicable as the expansion area is less than 0.5ha.</td>
</tr>
</tbody>
</table>
| National Water Act (Act No 36 of 1998) (NWA) | In terms of the NWA a person may only use water without a license under certain circumstances. All other use, provided that such use qualifies as a use listed in section 21 of the Act, require a water use licence. A person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA. The following Section 21 water uses will be applicable to the project:  
- impeding or diverting the flow of water in a water course (section 21(c));  
- altering the bed, banks, course or characteristics of a water course (section 21(i)). |
| Conservation of Agricultural Resources Act (Act No. 43 of 1983) | This Act regulates the utilization and protection of wetlands, soil conservation and all matters relating thereto; control and prevention of veld fires, control of weeds and invader plants, the prevention of water pollution resulting from farming practices and losses in biodiversity.  
The legislation was heeded during the compilation of the Biodiversity Impact Assessment and Wetland Impact Assessment. Refer to Error! Reference source not found. and Appendix G.2: . |
| National Environmental Management Biodiversity Act (NEMBA: Act 10 of 2004) | The National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEMBA) aims to provide for the management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act, 1998. The NEMBA provides for the publishing of various lists of species and ecosystems by the Minister of Environmental Affairs and Tourism (now the Minister of Water and Environmental Affairs) as well as by a Member of the Executive Council responsible for the conservation of biodiversity of a province in relation to which certain activities may not be undertaken without a permit.  
No protected plant species were observed during the specialist surveys but the legislation will be heeded throughout the process and was taken into account during the compilation of the Biodiversity Impact Assessment. Please refer to Appendix G.1: Biodiversity and Wetland Impact Assessment. |
| The National Forest Act (Act 84 of 1998) | The project may involve the cutting, disturbing, damaging or destroying of any protected trees declared in terms of section 12 of the National Forest Act (NFA) (Act 84 of 1998). Should the presence of these trees on site be confirmed after receipt of the Environmental Authorisation (EA), a licence in terms of section 15 of the NFA will be required.  
No protected trees occur on site but the legislation will be heeded throughout the process and was taken into account during the compilation of the Biodiversity Impact Assessment. Please refer to |
Gauteng Nature Conservation Bill

This Act deals with the following:
- To provide for the sustainable utilisation and protection of biodiversity within Gauteng;
- To provide for professional hunting;
- To provide for the preservation of caves and cave formations;
- To provide for the establishment of zoos and similar institutions;
- To provide for the appointment of nature conservators;
- To provide for the issuing of permits and other authorisations;
- To provide for offences and penalties for contravention of the Bill;
- To implement the provisions of the Bill; and to provide for matters connected therewith.

The legislation was heeded during the compilation of the Biodiversity Impact Assessment. Refer to Error! Reference source not found..

Gauteng Conservation Plan 3.3

According to the Gauteng C-Plan the site is located partially in an Ecological Support Area (ESA), as well as a Critical Biodiversity Area (CBA), categorized as “Important”. The C-Plan was heeded during the compilation of this Basic Assessment Report (BAR).

Gauteng Provincial Environmental Management Framework (GPEMF)

The GPEMF is seen as part of a pro-active framework that will inform planning on provincial and municipal level. The Environmental Management Zones (EMZ) were derived from the desired state, the environmental sensitivity as well the unique control areas as identified in sections 1, 2 and 3. The EMZs were presented to the Gauteng Planning Forum where it was generally accepted as a suitable contribution to facilitate appropriate development in Gauteng. The EMZs also took the Gauteng Growth and Management Perspective, 2014, into account and is therefore aligned to the general development policy for Gauteng. Five EMZs were identified and overlaying those a further six Special Management Areas were identified where specific planning and policy measures are necessary to achieve the development objective of those areas.

The site falls partly in Zone 1: Urban development zone

Intention

The intention with Zone 1 is to streamline urban development activities located in these areas and to promote development infill, densification and concentration of urban development within the urban development zones as defined in the Gauteng Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas. Certain currently listed activities (see section 5) may be exempted from environmental assessment requirements at the discretion of the competent authority.

Conditions
- Development in this area must be sustainable in respect to the capacity of the environment and specifically the hydrological system to absorb additional sewage and stormwater loads as a result of increased densities;
- Existing open spaces and urban parks should be retained as open space to cater for the open space needs of the foreseen increased densities; and

City of Ekurhuleni Metropolitan Municipality Integrated Development Plan (IDP) 2018/19 to 2020/21

The IDP was heeded during the compilation of this Basic Assessment Report (BAR).

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.
The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not include the no go option into the alternative table below.**

**Note:** After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below.

The assessment of alternatives is an objective of the EIA Regulations 2014 (as amended). The Integrated Environmental Management (IEM) procedure requires that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, DEA (previously DEAT) requires that a number of possible proposals or alternatives for accomplishing the same objectives should be considered. To ensure that the proposed development enables sustainable development, feasible alternatives must be explored.

Provide a description of the alternatives considered.

<table>
<thead>
<tr>
<th>No.</th>
<th>Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of “other”)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alternative 1- Proposal</td>
<td>Alternative 1 follows the initial route as proposed by the Applicant taking into account the proximity of available connection points to the reservoir, avoidance of any sensitivities on site as initially determined and alignment with surrounding land uses where possible.</td>
</tr>
<tr>
<td>2</td>
<td>Alternative 2 (Preferred)</td>
<td>Upon further investigation of the proposed pipeline development area, informal graves were found to be located in close proximity to part 2 of the proposed pipeline route (Alternative 1). The Heritage Specialist informed the South African Heritage Resources Agency (SAHRA) Burial Grounds and Graves (BGG) Unit of the graves and requested a relaxation of the standard 100m conservation buffer for graves, to 50m, cognisant of the fact that an existing ESKOM powerline with a cleared servitude constructed in the early 1970’s, traverses the project area directly west of the cemetery and Alternative 1 follows the margin of this servitude. The SAHRA BGG Unit accepted the proposal to have the buffer zone reduced to 50 m and the pipeline route was therefore realigned to fall outside this 50m conservation buffer. Figure 6. The alignment of part 1 of the pipeline route however remains the same as that of Alternative 1. Refer to The realigned pipeline route is considered the preferred alternative as this will prevent any destruction of graves and subsequent conflict with local communities. Alternative 1 was therefore not further considered.</td>
</tr>
</tbody>
</table>

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

**4. PHYSICAL SIZE OF THE ACTIVITY**

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

<table>
<thead>
<tr>
<th>Proposed activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size of the activity:</strong></td>
</tr>
<tr>
<td>Alternative 1 (if any)</td>
</tr>
<tr>
<td>Alternative 2 (if any)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>or, for linear activities:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of the activity:</strong></td>
</tr>
<tr>
<td><strong>Pipeline route</strong></td>
</tr>
<tr>
<td>Alternative 1</td>
</tr>
</tbody>
</table>

5621 m²
Alternative 2 (Preferred)

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

Proposed activity
Alternatives:
Alternative 1
Alternative 2 (Preferred)

5. SITE ACCESS

Alternative 1 - Proposal
Does ready access to the site exist, or is access directly from an existing road?
If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

Part 1 of the proposed pipeline is located directly adjacent the R42 Springs Road and access is thus directly off this road. Part 2 of the proposed pipeline starting at the Dunnottar reservoir is off Prinsep Avenue. The pipeline runs along informal gravel roads from North to South parallel and to the left of the M63 Nigel Dunnottar Road and crosses Valkfontein Road and other unknown and gravel roads from which access to the pipeline route can be obtained. The pipeline crosses the M63 at approximately 1.6 km, after which it runs to the right of the M63. The pipeline route crosses more unknown gravel roads and the Afrisam access road and lastly Fred Wegner Road. Therefore, access to the pipeline route is readily available.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2 - Preferred
Does ready access to the site exist, or is access directly from an existing road?
If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

Access remains the same as proposed for Alternative 1.

Include the position of the access road on the site plan. (If the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated 2 times

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares;
  - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD’s;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
➢ the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
➢ servitudes indicating the purpose of the servitude;
➢ sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  o Rivers and wetlands;
  o the 1:100 and 1:50 year flood line;
  o ridges;
  o cultural and historical features;
  o areas with indigenous vegetation (even if it is degraded or infested with alien species);
➢ Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

➢ the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
➢ the locality map and all other maps must be in colour;
➢ locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
➢ for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
➢ areas with indigenous vegetation (even if it is degraded or infested with alien species);
➢ locality map must show exact position of development site or sites;
➢ locality map showing and identifying (if possible) public and access roads; and
➢ the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

7. SITE PHOTOGRAPHS

 colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix. It should be supplemented with additional photographs of relevant features on the site, where applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.
SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities
1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route 1 times

THE ROUTE ALIGNMENT FOR PART 1 OF THE PROPOSED PIPELINE ROUTE IS THE SAME FOR BOTH ALTERNATIVES CONSIDERED

Instructions for completion of Section B for location/route alternatives
1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alternative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives (complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way
☑ All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
☑ All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route (complete only when appropriate for above)

Section B – Location/route Alternative No. (complete only when appropriate for above)

ALTERNATIVE 2 (PREFERRED) – PART 1

1. PROPERTY DESCRIPTION

Property description: (Including Physical Address and Farm name, portion etc.)
- Portion 42 of the farm Grootfontein 165
- Portion 28 of the farm Draaikraal 166
- Portion 10, 18, 36, 61 and 75 of the farm Varkensfontein 169
- Erf 3, 4, 6, 83, 453, 1486 and 1531 of the township Glenvarloch
- Glenvarloch (Previously Portion 6 of the farm Varkensfontein 169) (Unknown)

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative: Centre point of the site.

In the case of linear activities: Starting point of the activity

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Latitude (S)</th>
<th>Longitude (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26° 24.915'S</td>
<td>28° 28.164'E</td>
</tr>
</tbody>
</table>
Middle point of the activity
26° 24.975'S
28° 27.807'E
End point of the activity
26° 24.883'S
28° 27.457'E

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix.

Addendum of route alternatives attached

The 21 digit Surveyor General code of each cadastral land parcel

3. GRADIENT OF THE SITE
Indicate the general gradient of the site.

<table>
<thead>
<tr>
<th>Flat</th>
<th>1:50 – 1:20</th>
<th>1:20 – 1:15</th>
<th>1:15 – 1:10</th>
<th>1:10 – 1:7.5</th>
<th>1:7.5 – 1:5</th>
<th>Steeper than 1:5</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

4. LOCATION IN LANDSCAPE
Indicate the landform(s) that best describes the site.

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE
a) Is the site located on any of the following?

| Shallow water table (less than 1.5m deep) | YES |
| Dolomite, sinkhole or doline areas | NO |
| Seasonally wet soils (often close to water bodies) | NO |
| Unstable rocky slopes or steep slopes with loose soil | NO |
| Dispersive soils (soils that dissolve in water) | NO |
| Soils with high clay content (clay fraction more than 40%) | NO |
| Any other unstable soil or geological feature | NO |
| An area sensitive to erosion | NO |

(information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) Are any caves located on the site(s)?

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S): 
Longitude (E): 10
c) Are any caves located within a 300m radius of the site(s) YES NO
If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)
Latitude (S): ° Longitude (E): °

If any of the answers to the above are “YES” or “unsure”, specialist input may be requested by the Department.

6. **AGRICULTURE**

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)? YES NO

Please note: The Department may request specialist input/studies in respect of the above.

7. **GROUNDCOVER**

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site

<table>
<thead>
<tr>
<th>Groundcover Type</th>
<th>Estimated Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural veld - good condition</td>
<td>% = 0</td>
</tr>
<tr>
<td>Natural veld with scattered aliens</td>
<td>% = 0</td>
</tr>
<tr>
<td>Natural veld with heavy alien infestation</td>
<td>% = 5</td>
</tr>
<tr>
<td>Veld dominated by alien species</td>
<td>% = 5</td>
</tr>
<tr>
<td>Landscaped (vegetation)</td>
<td>% = 10</td>
</tr>
<tr>
<td>Paved surface (hard landscaping)</td>
<td>% = 40</td>
</tr>
<tr>
<td>Building or other structure</td>
<td>% = 40</td>
</tr>
<tr>
<td>Bare soil</td>
<td>% = 0</td>
</tr>
</tbody>
</table>

Sport field | % = 0 |
Cultivated land | % = 0 |

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site YES NO
If YES, specify and explain:

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

If YES, specify and explain:

There is a Critical Biodiversity Area (CBA) category “Important” as well as an Ecological Support Area (ESA) according to CPlan v3.3, located to the north east of the pipeline route. The CBA and ESA are located between 25 and 35 meters north of the proposed pipeline alignment. A 200-meter buffer area along the pipeline route was surveyed. The CBA and ESA areas were found to be degraded and modified land with built-up areas that have a low sensitivity and consists of exotic bushclumps.

Are there any special or sensitive habitats or other natural features present on the site? YES NO
If YES, specify and explain:

Was a specialist consulted to assist with completing this section YES NO
If yes complete specialist details
Name of the specialist: Dr. Buks Henning
Qualification(s) of the specialist: PhD plant Ecology; MSc Botany - Soil Science related
Postal address: Postnet Suite 74, Private Bag X07, Arcadia
Postal code: 0007
Telephone: 012 751 2160 Cell: 
E-mail: buks@exigo3.com Fax: 086 607 2406

Are any further specialist studies recommended by the specialist? YES NO
If YES, specify:

<table>
<thead>
<tr>
<th>If YES, is such a report(s) attached?</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>If YES list the specialist reports attached below</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature of specialist:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>05/02/2019</td>
</tr>
</tbody>
</table>

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated.
8. **LAND USE CHARACTER OF SURROUNDING AREA**

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site.


**Other land uses (describe):**

**Note:** Each block represents an area of 250m × 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks.

**NOTE:** Each block represents an area of 250m × 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks.

**NORTH**

<table>
<thead>
<tr>
<th></th>
<th>32, 33</th>
<th>32, 33</th>
<th>32, 33</th>
<th>32, 33</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 32</td>
<td>15, 32, 33</td>
<td>32, 33</td>
<td>4, 12, 33</td>
<td>15</td>
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**WEST**

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>9</td>
<td>9</td>
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</table>

**EAST**

<table>
<thead>
<tr>
<th></th>
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<th>32, 33</th>
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<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 32</td>
<td>15, 32, 33</td>
<td>32, 33</td>
<td>4, 12, 33</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**SOUTH**

**Note:** More than one (1) Land-use may be indicated in a block.

**Please note:** The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an “A” and with an “N” respectively.

Refer to the land use map in the figure below:
Figure 7: Land use map for Part 1 of the proposed pipeline
<table>
<thead>
<tr>
<th>Have specialist reports been attached</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes indicate the type of reports below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecological and Wetland Impact Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage Impact Assessment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

**Note:** Complete Section B for the proposal and alternative(s) (if necessary)

**Instructions for completion of Section B for linear activities**
1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route 1 times

**THE RECEIVING ENVIRONMENT FOR PART 2 OF THE PROPOSED PIPELINE ROUTE IS THE SAME FOR BOTH ALTERNATIVES CONSIDERED**

**Instructions for completion of Section B for location/route alternatives**
1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alternative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives times (complete only when appropriate)

**Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application**

Section B is to be completed and attachments order in the following way
- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route (complete only when appropriate for above)

Section B – Location/route Alternative No. (complete only when appropriate for above)

**ALTERNATIVE 2 (PREFERRED) – PART 2**

1. **PROPERTY DESCRIPTION**

**Property description:** (Including Physical Address and Farm name, portion etc.)
Portion 0 (RE), 1, and 9 of the farm Grootfontein 165 Erf 2 of the township Prosperita

2. **ACTIVITY POSITION**

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

**Alternative:**

**Centre point of the site.**

<table>
<thead>
<tr>
<th>Latitude (S):</th>
<th>Longitude (E):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the case of linear activities:

**Alternative:**

- Starting point of the activity
- Middle point of the activity
- End point of the activity

<table>
<thead>
<tr>
<th>Latitude (S):</th>
<th>Longitude (E):</th>
</tr>
</thead>
<tbody>
<tr>
<td>26° 21.100'S</td>
<td>28° 25.921'E</td>
</tr>
<tr>
<td>26° 22.264'S</td>
<td>28° 26.095'E</td>
</tr>
<tr>
<td>26° 23.239'S</td>
<td>28° 26.613'E</td>
</tr>
</tbody>
</table>

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached
The 21 digit Surveyor General code of each cadastral land parcel

ALT 2 – PART 1

| T | O | I | T | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 5 | 0 | 0 | 0 | 0 | 0 |
| T | O | I | T | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 5 | 0 | 0 | 0 | 0 | 1 |
| T | O | I | T | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 5 | 0 | 0 | 0 | 0 | 9 |
| T | O | I | R | 0 | 5 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |

3. **GRADIENT OF THE SITE**

Indicate the general gradient of the site.

<table>
<thead>
<tr>
<th>Flat</th>
<th>1:50 – 1:20</th>
<th>1:20 – 1:15</th>
<th>1:15 – 1:10</th>
<th>1:10 – 1:7.5</th>
<th>1:7.5 – 1:5</th>
<th>Steeper than 1:5</th>
</tr>
</thead>
</table>

4. **LOCATION IN LANDSCAPE**

Indicate the landform(s) that best describes the site.

<table>
<thead>
<tr>
<th>Ridgeline</th>
<th>Plateau</th>
<th>Side slope of hill/ridge</th>
<th>Valley</th>
<th>Plain</th>
<th>Undulating/plant/low hills</th>
<th>River front</th>
</tr>
</thead>
</table>

5. **GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE**

a) Is the site located on any of the following?

| Shallow water table (less than 1.5m deep) | YES | NO |
| Dolomite, sinkhole or doline areas | YES | NO |
| Seasonally wet soils (often close to water bodies) | YES | NO |
| Unstable rocky slopes or steep slopes with loose soil | YES | NO |
| Dispersive soils (soils that dissolve in water) | YES | NO |
| Soils with high clay content (clay fraction more than 40%) | YES | NO |
| Any other unstable soil or geological feature | YES | NO |
| An area sensitive to erosion | YES | NO |

Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used.

b) are any caves located on the site(s)

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

<table>
<thead>
<tr>
<th>Latitude (S):</th>
<th>Longitude (E):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c) are any caves located within a 300m radius of the site(s)

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

<table>
<thead>
<tr>
<th>Latitude (S):</th>
<th>Longitude (E):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

d) are any sinkholes located within a 300m radius of the site(s)

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

<table>
<thead>
<tr>
<th>Latitude (S):</th>
<th>Longitude (E):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department.

6. **AGRICULTURE**

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

| YES | NO |

**Please note:** The Department may request specialist input/studies in respect of the above.
7. **GROUNDCOVER**

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site:

<table>
<thead>
<tr>
<th>Natural veld - good condition</th>
<th>Natural veld with scattered aliens</th>
<th>Natural veld with heavy alien infestation</th>
<th>Veld dominated by alien species</th>
<th>Landscaped (vegetation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% = 0</td>
<td>% = 90</td>
<td>% = 0</td>
<td>% = 0</td>
<td>% = 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sport field</th>
<th>Cultivated land</th>
<th>Paved surface (hard landscaping)</th>
<th>Building or other structure</th>
<th>Bare soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>% = 0</td>
<td>% = 10</td>
<td>% = 0</td>
<td>% = 0</td>
<td>% = 0</td>
</tr>
</tbody>
</table>

**Please note:** The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site? **YES**  **NO**

If YES, specify and explain:

No red data species was found in the area, although the potential habitats were surveyed to the extent representative of the area. The GDARD databases for the specific farm portions and quarter degree grid square obtained from the South African National Biodiversity Institute (SANBI) indicated the following red data species potentially occurring in the area:

- *Trachyandra erythrorrhiza* (Veldkool)

No other red data species potentially occur in the grid squares of the study area.

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site? **YES**  **NO**

If YES, specify and explain:

The pipeline route is situated in mostly CBA areas category “important” and partially in an ESA. A 200-meter buffer area along the pipeline route was surveyed. The CBA and ESA areas were found to consist of degraded grasslands, built-up and modified land, cultivated land, exotic bushclumps and an artificial wetland area, all of which had a low sensitivity. There are also some areas of secondary indigenous grassland with medium sensitivity in the project area. The pipeline route also crosses two valleybottom wetlands of high sensitivity and a hillslope seep wetland with medium to high sensitivity. Please refer to the sensitivity map in Appendix A:

Are there any special or sensitive habitats or other natural features present on the site? **YES**  **NO**

If YES, specify and explain:

The pipeline route crosses two valleybottom wetlands of high sensitivity and a hillslope seep wetland with medium to high sensitivity. Please refer to the sensitivity map in Appendix A: Site plan. The Blesbokspruit Wetlands Important Bird Area is located 4.9 kilometers east of the project area. An unknown water course (dam) is situated approximately 4.3 km south-west of the southern point of the proposed pipeline.

Was a specialist consulted to assist with completing this section? **YES**  **NO**

If yes complete specialist details:

Name of the specialist: Dr. Buks Henning

Qualification(s) of the specialist: PhD Plant Ecology; MSc Botany - Soil Science related

Postal address: Postnet Suite 74, Private Bag X07, Arcadia

Postal code: 0007

Telephone: 012 751 2160

Cell: 086 607 2406

E-mail: buks@exigo3.com

Fax: 086 607 2406

Are any further specialist studies recommended by the specialist? **YES**  **NO**

If YES, specify:

If YES, is such a report(s) attached? **YES**  **NO**

If YES list the specialist reports attached below:

Signature of specialist: [Signature]

Date: 05/02/2019

**Please note:** If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated.
8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site.

Refer to the land use map in the figure below:
Figure 8: Land use map for Part 2 of the proposed pipeline
Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an “A” and with an “N” respectively.

<table>
<thead>
<tr>
<th>Have specialist reports been attached</th>
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<td></td>
</tr>
<tr>
<td>Heritage Impact Assessment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. SOCIOC-ECONOMIC CONTEXT
Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The specific focus of the socio-economic profile is on the Ekurhuleni Metropolitan Municipality (EMM) and the communities located in close proximity to the proposed pipeline route, namely the Nigel CBD and the township of Glenverloch, as well as the communities of Dunnottar, and Duduzza.

Demographics
The total population of the Ekurhuleni Metropolitan Municipality (EMM) amounts to 3 663 474 people and this figure represents 6% of the total population of South Africa (Stats SA 2017). This municipality has a median age of 30 and 66% of the population in the EMM is between the ages of 18-64 while 18% of the population is below the age of 18 and only 6% are above the age of 65. The median age of the EMM is a little higher than that of Gauteng and approximately 20% higher than the entire South Africa. In addition, the EMM hosts 80% of the Black African population, 14% of the White population, 3% of the Coloured population and 2% of the Indian population. Furthermore, a greater proportion of the population is comprised of males who make up 51% of the population while females only account for 49%. Moreover, all 11 official languages are spoken within the EMM however IsiZulu appears to be the most spoken language within the metropolitan municipality (EMM IDP, 2018).

Households
The EMM has a total of 1 166 914 households (Stats SA, 2017). This is indicative of an average household size of 3.1 in the municipality. A quarter of the total households in the Gauteng Province are in the municipality. The population has steadily increased in the past ten years. The number of households in Gauteng and the EMM have had a growth rate of 13% each over the past five years. Moreover, there are 1 855 people per square kilometre in the municipality indicating high population densities.

Health
In terms of health, the overall prevalence of HIV is 12.7% in South Africa and of the total population aged 15-49 years, approximately 18.9% of the population has been diagnosed with HIV and the rate of infection has increased by a negligible figure annually. In addition, life expectancy within the municipality has increased in line with South Africa’s national numbers (EMM IDP 2018). Regarding education, the number of people who have passed matric and have acquired a certificate/diploma has increased with an annual average rate of 4.82% while the number of people who have passed matric and have acquired a Bachelor’s degree has increased with an average of 6.33% (EMM IDP 2018). These statistics thus show an overall improved education level in the municipality.

Economy
In 2016, the EMM economy was valued at R705 652 million in constant prices and contributed 24% to the economy of the Gauteng province (Quantec, 2017). The municipality also contributes 7.51% to the overall GDP of South Africa (EMM IDP 2018). Over a period of six years (2010-2016), the municipality’s economy grew at a positive compounded annual growth rate (CAGR) of 7%. In addition, the top three economic sectors in order of ranking are manufacturing, financial services and general government contributing 22.7%, 21.3% and 20.9%, respectively (EMM IDP 2018). It should however be noted that although the manufacturing industry is the top sector contributing to the EMM Gross Value Added (GVA), it has declined over the years. Furthermore, during the period 2000 to 2015, the mining and agricultural sectors’ GVA contribution to the EMM also appears to have steadily declined while the financial services sector has greatly improved over the years.

Access to services and state of local built environment
A substantial portion of over 99% of the population resides in urban areas, while the remaining percentage resides on farm land. Approximately 78% of these houses are brick structured dwellings; 20% are informal settlements and just over 2% are traditional dwellings (Quantec, 2017). Ekurhuleni has experienced urbanisation over the years as a result of the demand for better access to basic services such as education, health systems, housing and infrastructure as well as better living standards and seeking employment opportunities.

- The majority of the households in the EMM have access to electricity and comprise of almost 83% of the households, while approximately 13% of the households use candles and the remaining utilise alternative energy sources such as solar, gas, paraffin and other unspecified sources.
- Half of the households have piped water within their dwellings; 38% have piped water within yards; 7% has access to piped water on community stands while less than 5% uses other sources such as borehole, rain-water tanks, or wells.
• Approximately 90% of households have their waste removed by local authorities, of which just over 89% is removed at least once a week and 0.4% is removed less often (Quantec, 2017). Just over 4% of the households have their own refuse dumps and approximately 6% of the households either have no rubbish disposal or use communal refuse dumps and some have unspecified means of waste removal.

• With regards to sanitation approximately 85% of the households have access to flush toilets or chemical toilets, while 7% uses pit latrine; 2% uses bucket latrine; and 6% of the households use unspecified toilet systems (Quantec, 2017).

**Water Supply**

The above paragraphs demonstrate that the majority of Ekurhuleni households have access to basic services. As households increase and urbanisation take place, backlogs in “electricity provision, housing needs, roads, access to water and sanitation needs” also increase.

### 10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (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, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-
  - (i) exceeding 5 000 m² in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the rezoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If YES, explain:

**Alternative 2 (Preferred) – Part 1**

1. A Historical Period building of medium significance [Site Exigo-NBP-HP01] occurs in the Nigel CBD in close proximity to the project footprint alignment. It is primarily recommended that a conservation buffer of at least 20m around the site be implemented in order to avoid impact.
2. A vehicular bridge in the Nigel CBD [Site EXIGO-NBP-HP02] dating to the Historical Period occurs along the project footprint alignment. Since the bridge might contribute to an understanding of the industrial and architectural development of bridge and culvert structures in the historical landscape of Nigel, it is rated as of medium significance.

**Alternative 2 (Preferred) – Part 2**

3. The poorly preserved remains of Historical Period buildings and structures [Site EXIGO-NBP-HP03, Site EXIGO-NBP-HP03, Site EXIGO-NBP-HP03] occur at various locations along the project footprint alignment. The sites are rated as medium-low heritage significance.
4. An informal cemetery [Site Exigo-NBP-BP01] occurs south of Dunnottar along the pipeline route alignment. The SAHRA Burial Grounds and Graves (BGG) Unit primarily recommends that such sites be avoided by means of a 100m conservation buffer, however cognisant of the fact that the pipeline follows the already transformed ESKOM servitude, a relaxation of this buffer to 50m has been requested and approved by the SAHRA BGG Unit.

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:
Alternative 2 (Preferred) – Part 1

1. The pipeline route alignment falls outside the 20m buffer zone recommended for Site Exigo-NBP-HP01, and therefore it is highly unlikely that the historical period building will be impacted by the development.

2. The pipeline alignment traverses the vehicular bridge in the Nigel CBD (Site EXIGO-NBP-HP02). It is not foreseen that the structure will be altered due to the pipeline development; however, the pipeline does occur within the 20m conservation buffer surrounding the bridge. Should the bridge be altered in any way, an alteration permit will have to be obtained from the relevant Heritage Resources Authority (SAHRA, SAHRA Built Environment Unit) prior to the alteration of the structure.

Alternative 2 (Preferred) – Part 2

3. Site EXIGO-NBP-HP03, Site EXIGO-NBP-HP03, and Site EXIGO-NBP-HP03 are located approximately 26 to 45 meters from the pipeline route alignment, and it is therefore highly unlikely that these remains of Historical Period buildings and structure will be impacted by the pipeline development.

4. The informal cemetery (Site Exigo-NBP-BP01) is located approximately 40 meters to the east of the proposed pipeline alignment and impact could occur. The pipeline route will need to be re-aligned to fall outside this conservation buffer or any other buffer as required by the SAHRA Burial Grounds and Graves (BGG) Unit.

The impact rating for the above heritage resources are considered to be of high to negligible significance and can be mitigated to negligible significance. It is recommended that the above heritage resources be monitored during construction of the pipeline by a qualified Environmental Control Officer (ECO) in order to avoid any impacts on the structures and burial sites as well as the destruction of previously undetected heritage remains.

Will any building or structure older than 60 years be affected in any way? YES NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? YES NO

If yes, please attached the comments from SAHRA in the appropriate Appendix

The design engineer on the project has confirmed that the vehicular bridge in the Nigel CBD (Site EXIGO-NBP-HP02) will not be altered by the pipeline construction and therefore an alteration permit will not be required. The 710 mm diameter pipeline will span over the canal for a distance of 6000 mm but will not be attached to the bridge.

The Archaeological Impact Assessment (Appendix G.2: Archaeological Impact Assessment) will be submitted to SAHRA for comment. Comments from SAHRA will be submitted as part of the FBAR.
SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment? YES<><> NO

If yes, has any comments been received from the local authority? YES<><> NO

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

A screening request for the project was sent to the Ekurhuleni Metropolitan Municipality (EMM): Department of Environmental Resource and Waste Management on 15 June 2018. The following comments were received from the Department:

1. The bioregional plan indicate that the proposed development of the water pipeline for Part 1 is located in “Other Natural Areas”, “No Natural Remaining” and “Ecological Support Areas” Categories while Part 2 is located in “Other Natural Areas”, “Ecological Support Area” and “Critical Biodiversity Areas” Categories. “Ecological Support Area” and “Critical Biodiversity Areas” Categories are areas with intact natural/indigenous vegetation that are required to meet biodiversity thresholds, act as ecological corridors, and must be conserved.

2. The Grand Open Space Plan indicate that the proposed location is both a “Primary Open Space” and “Secondary Open Space” for Ecological Sensitive Areas and Ecological Support Areas. The proposed development site may have hydrological and ecological development constraints and the ecological sensitivity rating is rated as high for Part 2 and moderate to low for Part 1.

3. The site may contain endangered Tsakane Clay Grassland vegetation.

4. The conservation Plan indicate that the site is a Sensitive Important and Irreplaceable Site

5. The site also has important and irreplaceable vegetation

6. The water pipeline is located within the regulatory zone of a water course and wetland.

7. The proposed properties border the following GP-EMF Zones:
   - Zone 1 “Urban Development Zone”;
   - Zone 2 “High control area (within the urban development area)”;  
   - Zone 3 “High control area (outside the urban development zone)”; and
   - Zone 4 “Normal control zone”

8. Due to the amount of vegetation that may be removed, it should be noted that the proposed project trigger some of the listed activities in terms of Listing Notice 1, 2 and 3 of the Environmental Impact Assessment Regulations, 2017, published under the National Environmental Management Act (NEMA) (Act No.107 of 1998) (as amended) and the activity therefore legally require an environmental authorization.

   Listing Notice 3, Activity 12: “The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.
   - (ii) within Critical Biodiversity areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;
   - or
   - (iii) on land, where at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning”

9. Further to the above, the proposed water pipeline is located within the regulatory zone of watercourses and therefore require a Water Use License in terms of the National Water Act, 1998 (Act No 36 of 1998). The relevant competent authority must be contacted for guidance.

10. Please note a formal NEMA Land Use Queries may be submitted to the Competent Authority, GDARD, to assess the need of an Environmental Authorisation. This process takes up to 60 days for a response.

A notification letter informing the Ekurhuleni Metropolitan Municipality (EMM) of the project and asking them to register with the Environmental Assessment Practitioner and provide preliminary comment was sent to the EMM on the 8th of March 2019.

The Draft Basic Assessment Report (DBAR) is currently out for public review and comment. All comments received will be included to and submitted along with the Final Basic Assessment Report (FBAR).

If “NO” briefly explain why no comments have been received or why the report was not submitted if that is the case.

3. CONSULTATION WITH OTHER STAKEHOLDERS

25
Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least thirty (30) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Ms Hanneke Pretorius, a townplanner, informed Ms Uys of the Econ Oil & Energy pipeline just outside Nigel which has been approved and for which they are in the process of registering a servitude. She informed that the fuel pipeline route crossed a part of the proposed Phase 2 Bulk Water Supply Pipeline route on the Springs Road. She asked that Econ Oil pipeline’s project manager, Mr Ian Barnard, be registered as an I&AP and provided his contact details.

Mr Barnard has been registered as an I&AP on the project and will be kept informed of the progress of the project during the public participation process. Please refer to the Comments and Response Report in Appendix E.6 for more details.

Mr Neels Kruger, the Heritage Specialist for the project, contacted the SAHRA BGG Unit to inform them of a small informal cemetery along the M63 road in proximity of the proposed Nigel Phase 2 pipeline alignment (approximately 30m to the west). He requested a relaxation of the standard 100m conservation buffer, cognisant of the fact that the pipeline follows the already transformed ESKOM servitude and would not encroach on surrounding areas, to a 50m conservation buffer.

Ms Tshivhase from the SAHRA BGG Unit accepted the proposal to have the buffer-zone reduced to 50m. She stated that this does not count as an official comment regarding this project, as the full HIA still needs to be submitted in order for SAHRA to issue an official comment before the construction activity can commence.

Please note that the HIA will be provided to SAHRA BGG for formal comment along with the DBAR report during the public review period.

If "NO" briefly explain why no comments have been received

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice
Appendix 2 – Written notices issued as required in terms of the regulations
Appendix 3 – Proof of newspaper advertisements
Appendix 4 – Communications to and from interested and affected parties
Appendix 5 – Minutes of any public and/or stakeholder meetings
Appendix 6 - Comments and Responses Report
Appendix 7 – Comments from I&APs on Basic Assessment (BA) Report
Appendix 8 – Comments from I&APs on amendments to the BA Report
Appendix 9 – Copy of the register of I&APs
SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives
1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alternative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives 1 times
(complete only when appropriate)

<table>
<thead>
<tr>
<th>Section D Alternative No.</th>
<th>Proposal</th>
<th>(complete only when appropriate for above)</th>
</tr>
</thead>
</table>

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management
- Will the activity produce solid construction waste during the construction/initiation phase? YES NO
  - If yes, what estimated quantity will be produced per month? Approximately 100 m³
  - How will the construction solid waste be disposed of (describe)? The waste will be disposed of at a registered landfill facility or approved municipal waste disposal site.

<table>
<thead>
<tr>
<th>Where will the construction solid waste be disposed of (describe)?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The waste will be disposed of at a registered landfill facility or approved municipal waste disposal site.</td>
<td></td>
</tr>
</tbody>
</table>

- Will the activity produce solid waste during its operational phase? YES NO
  - If yes, what estimated quantity will be produced per month?
  - How will the solid waste be disposed of (describe)?

<table>
<thead>
<tr>
<th>Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?</th>
<th>YES NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?</td>
<td></td>
</tr>
<tr>
<td>The waste will be disposed of at a registered landfill facility or approved municipal waste disposal site.</td>
<td></td>
</tr>
</tbody>
</table>

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

- Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? YES NO
  - If yes, inform the competent authority and request a change to an application for scoping and EIA.

- Is the activity that is being applied for a solid waste handling or treatment facility? YES NO
  - If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

- Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials: N/A

Liquid effluent (other than domestic sewage)
- Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? YES NO

27
If yes, what estimated quantity will be produced per month?

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Will the activity produce any effluent that will be treated and/or disposed of on-site?

If yes, what estimated quantity will be produced per month?

<table>
<thead>
<tr>
<th>m³</th>
</tr>
</thead>
</table>

If yes describe the nature of the effluent and how it will be disposed.

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce any effluent that will be treated and/or disposed of at another facility?

If yes, provide the particulars of the facility:

<table>
<thead>
<tr>
<th>Facility name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact person:</td>
</tr>
<tr>
<td>Postal address:</td>
</tr>
<tr>
<td>Postal code:</td>
</tr>
<tr>
<td>Telephone:</td>
</tr>
<tr>
<td>E-mail:</td>
</tr>
</tbody>
</table>

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A

**Liquid effluent (domestic sewage)**

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

If yes, what estimated quantity will be produced per month?

| Approximately 1.8 m³ |

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Chemical sanitary facilities will be provided by a third-party contractor. The third-party contractor will be responsible for the provision and management of the facilities as well as the disposal of the liquid effluent on a regular basis.

Will the activity produce any effluent that will be treated and/or disposed of on-site?

If yes describe how it will be treated and disposed of.

**Emissions into the atmosphere**

Will the activity release emissions into the atmosphere?

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

No emissions will be released into the atmosphere during the operational phase of the proposed project. Dust will be generated during the construction phase by construction vehicles and excavation activities. Dust suppression is recommended during the construction phase.

### 2. WATER USE

Indicate the source(s) of water that will be used for the activity

<table>
<thead>
<tr>
<th>Municipal</th>
<th>Directly from water board</th>
<th>groundwater</th>
<th>river, stream, dam or lake</th>
<th>other</th>
<th>the activity will not use water</th>
</tr>
</thead>
</table>

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

0 liters

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix.

Does the activity require a water use permit from the Department of Water Affairs?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

If yes, list the permits required

A Water Use Licence is required for water uses in terms of section 21 (c) and (i) of the National Water Act (Act no. 36 of 1998) [NWA] for the crossing of wetlands and watercourses (impeding or diverting the flow of water in a watercourse and altering the beds, banks, course or characteristics of a watercourse).

If yes, have you applied for the water use permit(s)?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>
3. POWER SUPPLY

Please indicate the source of power supply e.g. Municipality / Eskom / Renewable energy source

N/A

If power supply is not available, where will power be sourced from?

Diesel powered generators will be utilized.

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The project does not entail any energy consumptions activities as diesel powered generators will be utilized. The generators will only be used as required in order to limit fuel usage and noise.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

N/A
SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i)).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

| The DBAR is currently out for public review and comment for a period of 30 days. All comments will be included to and submitted along with the FBAR. |

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)

(A full response must be provided in the Comments and Response Report that must be attached to this report):

| The DBAR is currently out for public review and comment for a period of 30 days. All comments will be included to and submitted along with the FBAR. |

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Description</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>Improbable</td>
<td>1</td>
</tr>
<tr>
<td>Probability</td>
<td>Probable</td>
<td>2</td>
</tr>
<tr>
<td>Probability</td>
<td>Highly Probable</td>
<td>4</td>
</tr>
<tr>
<td>Probability</td>
<td>Definite</td>
<td>5</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>1</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium term</td>
<td>3</td>
</tr>
</tbody>
</table>

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

The significance of the impacts was determined through a synthesis of the criteria below (Plomp, 2004):

- **Probability.** This describes the likelihood of the impact actually occurring:
  - Improbable: The probability of the impact occurring is very low, due to the circumstances, design or experience.
  - Probable: There is a probability that the impact will occur to the extent that provision must be made therefore.
  - Highly Probable: It is most likely that the impact will occur at some stage of the development.
  - Definite: The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.

**Duration.** The lifetime of the impact

- Short term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- Medium term: The impact will last up to the end of the phases, where after it will be negated.
- Long term: The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- Permanent: Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

**Scale.** The physical and spatial size of the impact

- Local: The impacted area extends only as far as the activity, e.g. footprint.
- Site: The impact could affect the whole, or a measurable portion of the above-mentioned properties.
- Regional: The impact could affect the area including the neighbouring residential areas.

**Magnitude/Severity.** Does the impact destroy the environment, or alter its function.

- Low: The impact alters the affected environment in such a way that natural processes are not affected.
- Medium: The affected environment is altered, but functions and processes continue in a modified way.
- High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

**Significance.** This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

- Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.
Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

The following potential impacts have been identified as part of this assessment (mitigation measures and significance rating explained in table to follow):
### 3.1 HERITAGE IMPACT

A number of Historical Period buildings and the remains of buildings relating to urban development and mining occur in the general landscape. No impact on these buildings or remains is anticipated provided that the proposed mitigation and management measures are implemented. The pipeline crosses a bridge structure in the Njel CBD, but will not alter the structure in any way.

An informal cemetery (Site Exigo-NBP-BP01) occurs south of Dunnottar along the pipeline route alignment. The SAHRA Burial Grounds and Graves (BGG) Unit primarily recommends that such sites be avoided by means of a 100m conservation buffer, however cognisant of the fact that the pipeline follows the already transformed ESkom servitude, a relaxation of this buffer to 50m has been requested and approved by the SAHRA BGG Unit.

The informal cemetery (Site Exigo-NBP-BP01) is located within a 100 m off the proposed pipeline and therefore the pipeline route will need to be re-aligned to fall outside this conservation buffer or any other buffer as required by the SAHRA Burial Grounds and Graves (BGG) Unit.

### 3.2 BIODIVERSITY AND WETLANDS IMPACT

- **Habitat modification**

  The proposed bulk water supply pipeline development will result in modification of a small section of natural habitat in the footprint area compared to the larger area. Rehabilitation of some of these areas would be possible but there is likely to be long-term damage in these areas. Most habitat destruction will be caused during the construction of the bulk water supply pipeline at the crossings. The impact of the habitat destruction will be on the flora and fauna of the study area.

- **Habitat fragmentation**

  The proposed bulk water supply pipeline development will inevitably result in natural faunal movement patterns being disrupted during construction and, to a varying degree depending on how different species react to these barriers, will result in the fragmentation of natural populations. The bulk water supply pipeline development will be a temporary impact in fragmenting the habitats of the area.

- **Increased Soil erosion and sedimentation**

  The construction activities associated with the development may result in widespread soil disturbance and is usually associated with accelerated soil erosion, particularly in areas receiving high rainfall. Soil, sediments and associated contaminants are transported into streams, rivers and other water bodies, resulting in the loss or alteration of habitats for aquatic organisms, as well as changes in water quality. Soil erosion also promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous fauna and flora.

- **Soil and Water pollution**

  Construction work will always carry a risk of soil and water pollution, with construction vehicles contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface- or groundwater, leading to potential medium or long-term impacts on fauna and flora.

- **Spread and establishment of alien invasive species**

  The constructional activities almost certainly carry by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites. Continued movement of personnel and vehicles on and off the site, as well as occasional delivery of materials required for maintenance, will result in a risk of importation of alien species throughout the life of the project.

- **Negative effect of human activities on ecosystem**

  An increase in human activity on the site and surrounding areas is anticipated. The risk of snaring, killing and hunting of certain faunal species will increase. Increased access for labour during construction could result in the increased collection of medicinal plants, firewood, building wood, and other plant material. This could impact negatively on biodiversity through the removal or damage of red data species, as well as result in the general degradation of habitat quality. Laydown areas and work areas create the risk of pollution because of litter and inadequate sanitation and the introduction of invasive fauna and flora are increased.

- **Impact on drainage regime of area**

  In the context of the physical transformation of a stretch of a drainage channel or wetland by a bulk water supply pipeline, it is important to note that the impact is likely to not only be limited to the crossing and the footprint of the crossing itself, but to a much wider area, especially downstream of the crossing. The major drainage channels, tributaries and wetlands in the area show signs of alien invasion and erosion in certain areas along its banks and these areas need to be rehabilitated as part of the development priorities, especially at the crossings. The drainage channels...
and small wetlands further provide breeding and foraging habitat for fauna such as amphibian and fish species.

- Road mortality
Large numbers of fauna are killed daily on roads. They are either being crushed under the tyres of vehicles in the case of crawling species, or by colliding with the vehicle itself in the case of avifauna or flying invertebrates. The impact is intensified at night, especially for flying insects, as result of their attraction to the lights of vehicles. The proposed bulk water supply pipeline development will most definitely cause fauna mortalities on the roads during the construction and operational phases.

3.3 AIR POLLUTION
The construction processes for the development will release dust and gasses, into the broader environment through vehicle emissions, dust from soil stockpiles and gravel roads. The environmental impacts of wind-borne dust, gasses and topsoil stockpiles are primarily related to human health and ecosystem damage. The proposed development will typically comprise the following sources and associated air quality pollutants:
- Vegetation clearance and excavations;
- Stockpiling (particulate matter);
- Materials handling operations (truck loading & unloading, tipping, stockpiling);
- Vehicle entrainment on paved and unpaved roads and vehicular emissions;
- Windblown dust-fugitive emissions (stockpiles).

3.4 VISUAL IMPACT
The biggest part of the proposed pipeline will be situated underneath the ground so the feeder pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles.

3.5 NOISE IMPACT
Construction activities will temporarily increase the noise levels on site due to construction vehicles moving to and from the site as well as noise from general construction activities.

3.6 TRAFFIC IMPACT
- Vehicles
The presence of construction vehicles on site will have an impact on the traffic flow in the immediate area although this will be kept at a minimum.

- Pedestrians
Construction areas and excavations in the roadside will be hazardous for pedestrians walking beside the roads during the construction phase.

3.7 SOCIO-ECONOMIC IMPACT
- Employment
The creation of temporary jobs during construction will have a positive impact. It will therefore provide employment to many people and further training and skills development in the area.

- Service Provision
The increased capacity of water provision will provide in the need of water provision and future growth.

- Safety, security and fire hazards
Construction activities will result in increased traffic by heavy vehicles in the area that can result in accidents. Construction activities such as excavating of trenches, movement of construction vehicles, the use of equipment and the congregation of workers and staff on site, further increase the risk of injury. Activities of construction personnel on site may further contribute to an increase in the risk for fires and crime in the area.
### Table 1: Impact Assessment Table (Alternative 2 – Preferred)

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Impact</th>
<th>Nature (Negative or Positive Impact)</th>
<th>Probability</th>
<th>Duration</th>
<th>Scale</th>
<th>Magnitude/Severity</th>
<th>Significance</th>
<th>Mitigation Measures</th>
<th>Mitigation Effect</th>
<th>Residual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Planning Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heritage Impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>EXIGO-NBP-HP01 EXIGO-NBP-HP02</td>
<td>Potential damage to Colonial Period structures due to planned alignment of pipeline route</td>
<td>WOM Negative</td>
<td>Probable</td>
<td>2</td>
<td>Short term</td>
<td>1</td>
<td>Site</td>
<td>2</td>
<td>Medium</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WM Negative</td>
<td>Improbable</td>
<td>1</td>
<td>Short term</td>
<td>1</td>
<td>Site</td>
<td>2</td>
<td>Low</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>EXIGO-NBP-HP03 EXIGO-NBP-HP04 EXIGO-NBP-HP05</td>
<td>Potential damage to Colonial Period structures due to planned alignment of pipeline route</td>
<td>WOM Negative</td>
<td>Probable</td>
<td>2</td>
<td>Short term</td>
<td>1</td>
<td>Site</td>
<td>2</td>
<td>Low</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WM Negative</td>
<td>Improbable</td>
<td>1</td>
<td>Short term</td>
<td>1</td>
<td>Site</td>
<td>2</td>
<td>Low</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Site Exigo-NBP-SP01</td>
<td>Potential damage to informal burial site due to planned alignment of pipeline route</td>
<td>WOM Negative</td>
<td>Probable</td>
<td>2</td>
<td>Short term</td>
<td>1</td>
<td>Site</td>
<td>2</td>
<td>High</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WM Negative</td>
<td>Improbable</td>
<td>1</td>
<td>Short term</td>
<td>1</td>
<td>Site</td>
<td>2</td>
<td>Low</td>
<td>2</td>
</tr>
</tbody>
</table>

**Notes:**
- **Magnitude Score:** Determined by the Magnitude/Severity rating.
- **Residual Impact:** Calculated by multiplying the Probability, Duration, and Scale scores.
- Remarks for mitigation measures are provided in italics.
Clearing of vegetation for pipelines and infrastructure, access roads etc.

<table>
<thead>
<tr>
<th>WOM</th>
<th>Negative</th>
<th>Definite</th>
<th>5</th>
<th>Medium term</th>
<th>3</th>
<th>Local</th>
<th>1</th>
<th>Medium</th>
<th>6</th>
<th>50</th>
<th>Moderate</th>
</tr>
</thead>
</table>

- The removal of indigenous flora should only occur on the footprint area of the pipeline development and not over the larger area. The clearing and damage of plant growth in these areas should be restricted to the footprint way leave area.
- Revegetation of disturbed areas must be undertaken with site indigenous species. This can provide a buffer to protect indigenous vegetation from invasion by weeds.
- Ongoing monitoring and maintenance of revegetation works following commissioning of proposal.
- Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.
- Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling of trenches during the bulk water supply pipeline construction.
- Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist.
- Should the development be approved by authorities, environmental monitoring of environmental aspects should be implemented during the construction phase of the development to ensure that minimal impact is caused to the fauna and flora of the area.
- Construction teams and machinery should not be allowed outside the boundaries of the footprint of the proposed pipeline or the right of way servitude. Access to the site should be clearly demarcated.
- As far as possible construction work should be restricted to one area at a time on the site. By doing so mammals, smaller birds and Can be avoided, managed or mitigated No
reptiles will have sufficient time to weather the disturbance and move into undisturbed zones.

- As much natural vegetation should be retained as possible. The necessary removal of vegetation outside the width of the working area should be prevented by clearly demarcating the working area.

| Clearing of vegetation for pipelines and construction of infrastructure, access roads etc. | WOM | Negative | Highly Probable | 4 | Long term | 4 | Local | 1 | Medium | 6 | 44 | Moderate |
| Exposure of soils to rainfall and wind during construction | WM | Negative | Probable | 2 | Long term | 4 | Local | 1 | Low | 2 | 14 | Negligible |
| Exposure of soils to rainfall and wind during construction | WOM | Negative | Highly Probable | 4 | Long term | 4 | Site | 2 | Medium | 6 | 48 | Moderate |
| Exposure of soils to rainfall and wind during construction | WM | Negative | Probable | 2 | Long term | 4 | Site | 2 | Low | 2 | 16 | Negligible |

- Use existing facilities (e.g., current bulk water supply pipeline route) to the extent possible to minimize the amount of new disturbance.
- Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the entire wetland zone and grassland areas during construction.
- During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place.
- Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas.

- During and after construction, ensure storm water management around permanent infrastructure, rehabilitate disturbed areas, protect topsoil and protect sensitive soils. This will reduce the possibility of soil erosion.
- Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. Control dust on construction sites and access roads using chemical dust suppressants.
- The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to drainage lines, streams and wetland communities. Both temporary and permanent soil erosion control measures must be
used during the construction and operation phases.

- Ensure the amount of bare soil exposed is minimized by staging earthworks in phases and leaving as much ground cover intact as possible during construction.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the Laydown Area and Work Areas.
- Repair all erosion damage as soon as possible and in any case not later than six months before the termination of the construction period.

Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant)

<table>
<thead>
<tr>
<th>WOM</th>
<th>Negative</th>
<th>Definite</th>
<th>5</th>
<th>Medium term</th>
<th>3</th>
<th>Local</th>
<th>1</th>
<th>Medium</th>
<th>6</th>
<th>50</th>
<th>Moderate</th>
</tr>
</thead>
</table>

Spillages of harmful substances, such as hydrocarbons and sewage, leading to soil and water pollution

- Water falling on areas polluted with oil/diesel or other hazardous substances must be contained. Any excess or waste material or chemicals should be removed from the site and discarded in an environmentally friendly way.
- All construction vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately at an off-site designated area.
- Vehicle maintenance yards (if any) must not be situated in any close proximity to water courses and all used oil and other waste products should be disposed of in an acceptable way – preferably it should be removed from the site and recycled.
- Ensure that refuelling stations on site are constructed so as to prevent spillage of fuel or oil onto the soil, and put in place measures to ensure that any accidental spillages can be contained and cleaned up promptly.
- The bulk water supply pipeline needs to be constantly monitored to prevent any leaks, especially into the wetland areas. It is recommended that pressure tests be conducted to prevent any leakages post-construction prior to underground pipelines being covered.
- Chemical sanitary facilities must be provided for construction workers. These facilities should be managed and emptied on a regular basis by a third party contractor.
- Institute environmental best practice guidelines as per the DWA Can be avoided, managed or mitigated No
### Integrated Environmental Management Series: Environmental Best Practice Specification for construction:

- Limit quantities of hazardous substances on site to the volumes used during 1 day's work.
- All soil contaminated due to leaks or spills should be remediated on site. If this is not possible, such contaminated soils must be disposed of in a suitable waste facility.
- Waste should be stored on site in clearly marked containers in a demarcated area. All waste material should be removed at the end of every working day to designated waste facilities at the main suitable waste disposal facility. All waste must be disposed off-site.
- Bins should be provided in the Laydown Area and work areas to prevent any littering.
- If butt welding techniques are utilised, HDPE shavings should be collected and removed for disposal daily.

### Spread of alien invasive species

<table>
<thead>
<tr>
<th>WOM</th>
<th>Negative</th>
<th>Highly Probable</th>
<th>4</th>
<th>Medium term</th>
<th>3</th>
<th>Site</th>
<th>2</th>
<th>Medium</th>
<th>6</th>
<th>44</th>
<th>Moderate</th>
</tr>
</thead>
</table>

- Institute strict control over materials brought onto site, which should be inspected for potential invasive invertebrate species and steps taken to eradicate these before transport to the site.
  - Routinely fumigate or spray all materials with appropriate low-residual insecticides prior to transport to site.
- The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species should be eradicated.
  - Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit regrowth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water.

### Continued movement of personnel and vehicles on and off the site during the construction phase

<table>
<thead>
<tr>
<th>WM</th>
<th>Negative</th>
<th>Probable</th>
<th>2</th>
<th>Medium term</th>
<th>3</th>
<th>Site</th>
<th>2</th>
<th>Low</th>
<th>2</th>
<th>14</th>
<th>Negligible</th>
</tr>
</thead>
</table>

- Can be avoided, managed or mitigated: No
• Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish.

• Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds.

• Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented.

• A plan should be developed for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive non-native plants should be avoided by keeping vehicles and equipment clean and reseeding disturbed areas with native plants.

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<thead>
<tr>
<th>Construction of infrastructure, access roads etc.</th>
<th>WOM</th>
<th>Negative</th>
<th>Highly Probable</th>
<th>4</th>
<th>Medium term</th>
<th>3</th>
<th>Site</th>
<th>2</th>
<th>Medium</th>
<th>6</th>
<th>44</th>
<th>Moderate</th>
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<tr>
<td>Negative effect of human activities on flora</td>
<td>WM</td>
<td>Negative</td>
<td>Probable</td>
<td>2</td>
<td>Medium term</td>
<td>3</td>
<td>Site</td>
<td>2</td>
<td>Low</td>
<td>2</td>
<td>14</td>
<td>Negligible</td>
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harassment and disturbance of wildlife, especially during reproductive (e.g. courtship, nesting) seasons. In addition, control pets to avoid harassment and disturbance of wildlife.

- Any fires at the construction laydown area or work areas must be strictly controlled to ensure that no veld fires are caused.

<table>
<thead>
<tr>
<th>WOM</th>
<th>Impact on drainage regime</th>
<th>Negative</th>
<th>Probable</th>
<th>2</th>
<th>Long term</th>
<th>4</th>
<th>Regional</th>
<th>3</th>
<th>Medium</th>
<th>6</th>
<th>26</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>WM</td>
<td>Construction of pipelines and roads at crossings and on floodplains</td>
<td>Can be avoided, managed or mitigated</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
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- Work in wetlands should preferably be done during the low flow season.

- The proposed bulk water supply pipeline development will cross wetlands. The bulk water supply pipeline should cross the wetlands in the least sensitive areas and preferably at a perpendicular angle to prevent any serious erosion. The site should be indicated by an ecologist after consultation with the engineers. The following mitigation measures and management actions should be taken to minimize potential impacts of the bulk water supply pipeline crossing drainage channels:
  - Minimize changes to natural drainage patterns and crossings to drainages. During construction through a crossing, the majority of the flow of the stream / river must be allowed to pass down the stream (i.e. no damming must be allowed to take place). In-stream diversions must allow for continuous water flow. The construction of new channels shall not be allowed.
  - Drainage crossings are potentially problematic, so they must be well designed. Changes to natural drainage patterns or channels often result in either environmental damage or failures. Where wetland, stream or drainage line crossings are unavoidable, drains and culverts must be designed in conjunction with relevant experts to Can be avoided, managed or mitigated | No |
the correct invert levels to prevent damming of
goals or draining of wet
areas. Culverts should be
designed to prevent
concentration of flows, and to maintain natural
flows as free flowing as
possible. Another
important consideration
in culvert design is
maintenance in the long-
term: consideration
should be given to
designs that minimize
blockages by silt that
could, in turn, result in
hydrological impacts on
adjacent wetlands,
streams or drainage
lines.

- Identify areas of historic
or potential vulnerability,
such as geologically
unstable materials or
areas subject to flooding.
- Avoid problematic areas
and avoid bulk water
supply pipeline
development route
locations in areas of high
natural hazard risk, such
as landslides, rock-fall
areas, steep slopes (over
60-70%), wet areas,
saturated soils, etc.
- Avoid or minimize
construction in narrow
canyon bottoms or on
flood plains of rivers that
will inevitably be
inundated during major
storm events.
- Typically keep cut and fill
slopes as flat as possible
and well covered
(stabilized) with
vegetation to minimize
slumping as well as
minimize surface
erosion. Well-cemented
but highly erosive soils
may best resist surface
erosion with near-
vertical slopes that
minimize the surface
area exposed to erosion.
- Locate the bulk water
supply pipeline
development route on
narrow sections of rivers
and in areas of bedrock
where possible. Avoid fine, deep alluvial deposits (of fine sand and silt) that are scour susceptible and problematic, or which otherwise require costly foundations.

- Ensure that structural designs for the bulk water supply pipeline crossing the drainage channels include appropriate design criteria and have good foundations to prevent failures during floods.
- Place retaining structures, foundations, and slope stabilization measures into bedrock or firm, in-place material with good bearing capacity to minimize undermining, rather than placing these structures on shallow colluvial soil or on loose fill material.
- Appropriate measures must be taken to manage storm water runoff and potential flooding.
- The excavated and stockpiled soil material must be stored and bermed on higher lying areas of the site and not in any wetlands, channels or at steep gradients.
- All surplus or unsuitable excavation materials arising from excavations must be spoiled and neatly spread and levelled so as not to interfere with future works or disrupt the natural flow of water.
- Ecological monitoring is recommended for the construction phase of the development considering the presence of wetlands that are linked to the Blesbokspruit, a Ramsar site at Marievale Bird Sanctuary.

| Continued movement of vehicles on and off the site during the construction phase | Fauna mortality on roads | WOM | Negative | Highly Probable | 4 | Medium term | 3 | Regional | 3 | Medium | 6 | 48 | Moderate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | WM | Negative | Probable | 2 | Medium term | 3 | Site | 2 | Low | 2 | 14 | Negligible |

- More fauna are normally killed the faster vehicles travel. A speed limit should be enforced (40km/h for dirt roads; 50km/h for access roads and 80km/h for national roads). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences). Can be avoided, managed or mitigated No
### Heritage Impact

| EXIGO-NBP-HP01 | EXIGO-NBP-HP02 | Potential damage to Colonial Period structures during construction | WOM | Negative | Probable | 2 | Long term | 4 | Site | 2 | Medium | 6 | 24 | Low | **Implement 20 m conservation buffer.** | **Phase 2 Study and destruction permitting if site is impacted upon.** | **Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible.** | **Contractors should be briefed what to look out for during bulk earthworks and excavations.** | Can be avoided, managed or mitigated | No |
| EXIGO-NBP-HP03 | EXIGO-NBP-HP04 | EXIGO-NBP-HP05 | WOM | Negative | Probable | 2 | Short term | 1 | Site | 2 | Low | 2 | 5 | Negligible | **Implement 20 m conservation buffer.** | **Site Monitoring: Frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.** | Can be avoided, managed or mitigated | No |
| Site Exigo-NBP-BP01 | Potential damage to informal burial site due to planned alignment of pipeline route | WOM | Negative | Highly Probable | 4 | Permanent | 5 | Regional | 3 | High | 8 | 64 | High | **Avoidance: Implement a heritage conservation buffer of at least 50m around the heritage resource.** | **The burial site should be fenced off in such a way as to restrict access and to clearly demarcate the margins of the cemetery prior to commencement of construction.** | **Site Management Plan: Implement the heritage Site Management Plan (SMP).** | **Site Monitoring: Strict bi-weekly monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site.** | **Grave Relocation: Legally compliant grave relocation if impact is foreseen.** | Can be avoided, managed or mitigated | No |
| Excavation and stockpiling and vehicular movement | Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic. | WOM | Negative | Definite | 5 | Medium term | 3 | Site | 2 | High | 8 | 65 | High | **Damping down of access roads that are used, stockpiles and cleared areas should take place to minimize dust pollution.** | **No refuse wastes will be allowed to be burned on the premises or surroundings.** | **Proper rehabilitation of disturbed areas is required in order to minimize bare patches.** | **Air filters on all mechanized equipment must be properly designed and maintained.** | Can be avoided, managed or mitigated | No |

### Air Quality Impacts

| Site | Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic. | WOM | Negative | Highly Probable | 4 | Medium term | 3 | Site | 2 | Low | 2 | 28 | Low | Can be avoided, managed or mitigated | No |
| Visual impact | The largest part of the proposed pipeline will be situated below ground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles during construction. | WOM | Negative | Highly Probable | 4 | Medium term | 3 | Local | 1 | Medium | 6 | 40 | Low |
| Construction activities relating to installation of the pipeline |  | WM | Negative | Probable | 2 | Medium term | 3 | Local | 1 | Low | 2 | 12 | Negligible |
| Noise Impacts | Noise pollution from excavation activities and construction vehicles | WOM | Negative | Definite | 5 | Medium term | 3 | Site | 2 | High | 8 | 65 | High |
| Construction activities and operation of machinery and vehicles | Equipment to be used must be well-maintained and fitted with the correct and appropriate noise abatement measures. Working hours should be limited during the construction phase to between 08h00 and 18h00 during weekdays. No construction work should occur during weekends. | WM | Negative | Highly Probable | 4 | Medium term | 3 | Site | 2 | Medium | 6 | 44 | Moderate |
| Traffic Impacts | |

- The location of the Laydown Area and material stockpiles should be placed outside the visual field of sensitive visual receptors/behind a dense vegetation screen in order to fully or partially hide the components.
- The Laydown Area and equipment storage area should be fenced and adequate lighting and signage should be supplied in these areas.
- Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds.
- Avoid high pole top security lighting.
- Use security lighting at the periphery of the site that is activated by movement and are not permanently switched on.
<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>WOM/WM</th>
<th>Impact</th>
<th>Timeframe</th>
<th>Scope</th>
<th>Probability</th>
<th>Actions</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Excavation and installation of pipeline and use of construction vehicles</td>
<td>WM</td>
<td>Negative</td>
<td>Probable</td>
<td>Medium term</td>
<td>Low</td>
<td>Moderate</td>
<td>The necessary traffic and information signs as per the Road Traffic Signs Manual, as well as road markings, and traffic personnel (flagmen) should be provided to ensure the safety of pedestrians and motorists where the proposed pipeline will cross any roads or where construction will take place next to any roads. Ensure that personnel acting as flagmen are suitably trained, supervised and adequately instructed in terms of Section 8 of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Construction Regulation 7. Pedestrian paths should be aligned around the construction areas of the proposed pipeline, to ensure that they are not forced to walk in main roads. Can be avoided, managed or mitigated No</td>
</tr>
<tr>
<td>19</td>
<td>Employment</td>
<td>WM</td>
<td>Positive</td>
<td>Probable</td>
<td>Medium term</td>
<td>Medium 6 24 Low</td>
<td>It is the Contractor’s responsibility to adhere to the Ekurhuleni Metropolitan Municipality’s guidelines, principles and policies. Jobs must be created for unemployed local people and skills must be transferred to them where possible. Where viable, the work must be executed in a labour intensive manner to create as many jobs as possible. It is recommended that employment be done from the local community. It is recommended that specialized public participation by professional social consultants is entered into as soon as the contractor detects any serious concerns raised continuously by various community members or as the need may arise otherwise. N/A No</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Service Provision</td>
<td>WM</td>
<td>Positive</td>
<td>Definite</td>
<td>Medium term</td>
<td>Medium 6 60 Moderate</td>
<td>No mitigation measures are recommended. N/A No</td>
<td></td>
</tr>
<tr>
<td>Safety, security and fire hazards</td>
<td>WM</td>
<td>Positive</td>
<td>Definite</td>
<td>5</td>
<td>Medium term</td>
<td>3</td>
<td>Regional</td>
<td>3</td>
</tr>
</tbody>
</table>

- A surveyed municipal services plan (indicating water reticulation, electrical services, communication services (such as fibre optic cables), etc.) should be obtained prior to construction in order to inform the route alignment and construction methodology for the proposed pipeline.
- No rubble or discarded building materials must remain on the construction site for more than two weeks.
- The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.
- The movement of public within the development footprint should be avoided by posting notices at key points.
- The contractor shall provide ample warning signs, guard rails, warning tape, etc., around open excavations, stacks of material, debris, etc. and shall be held liable for all claims as a result of neglect of such precautions and provisions.
- All trenches should be covered or demarcated with danger tape. It is recommended that trenches remain open for a maximum period of 24 hours.
- Construction vehicles should be under the control of competent and trained personnel.
- Ensure that personnel handling equipment and materials are suitably trained, supervised and adequately instructed.
- No open fires or cooking fires will be allowed on site. Fire-fighting equipment should be provided.
- Ensure that the contact details of the police, fire brigade and ambulance services are available on site.
- The relevant Personal Protective Equipment (PPE) such as safety shoes and vests should be provided to all personnel. Personnel should also wear identification.
- Daily safety talks (toolbox talks) Can be avoided, managed or mitigated No
<table>
<thead>
<tr>
<th>Movement of vehicles on site during operations for maintenance purposes</th>
<th>Spillages of harmful substances leading to soil and water pollution</th>
</tr>
</thead>
</table>

**WOM**
- Negative
- Probable
- 2 Long term
- 4 Regional
- 3 Medium
- 6 26

**WM**
- Negative
- Probable
- 2 Medium term
- 3 Site
- 2 Low
- 2 14

- Water falling on areas polluted with oil/diesel or other hazardous substances must be contained. Any excess or waste material or chemicals should be removed from the site and discarded in an environmentally friendly way.
- All maintenance/inspection vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately off-site at the relevant designated area.
- Vehicle maintenance yards (if any) must not be situated in any close proximity to water courses and all used oil and other waste products should be disposed of in an acceptable way – preferably it should be removed from the site and recycled.
- The bulk water supply pipeline needs to be constantly monitored to prevent any leaks, especially into the wetland areas.

Can be avoided, managed or mitigated
- No

should be help prior to work beginning.
Institute strict control over materials brought onto site, which should be inspected for potential invasive invertebrate species and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual insecticides prior to transport to site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species should be eradicated.

Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water guidelines.

Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish.

Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds.

Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented.

A plan should be developed for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive non-native plants should be avoided by keeping vehicles and equipment

### Table: Spread of Alien Invasive Species

<table>
<thead>
<tr>
<th>Spread of Alien Invasive Species</th>
<th>WOM</th>
<th>Negative</th>
<th>Probable</th>
<th>2</th>
<th>Long Term</th>
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Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water guidelines.

Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish.

Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds.

Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented.

A plan should be developed for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive non-native plants should be avoided by keeping vehicles and equipment

### Table: Spread of Alien Invasive Species

<table>
<thead>
<tr>
<th>Spread of Alien Invasive Species</th>
<th>WOM</th>
<th>Negative</th>
<th>Probable</th>
<th>2</th>
<th>Long Term</th>
<th>4</th>
<th>Regional</th>
<th>3</th>
<th>Medium</th>
<th>6</th>
<th>26</th>
<th>Low</th>
</tr>
</thead>
</table>
| Institute strict control over materials brought onto site, which should be inspected for potential invasive invertebrate species and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual insecticides prior to transport to site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species should be eradicated.

Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water guidelines.

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Can be avoided, managed or mitigated No
### Continued movement of vehicles on and off the site during the occasional delivery of materials required for maintenance during the operational phase

**Fauna mortality on roads**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Long term
- **Impact**: 4
- **Scale**: Local
- **Probability**: 1
- **Risk**: Medium
- **Score**: 6
- **Impact score**: 22
- **Category**: Low

**Notes**:
- More fauna are normally killed the faster vehicles travel. A speed limit should be enforced (40km/h for dirt roads; 50km/h for access roads and 80km/h for national roads). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences).
- Travelling at night by construction vehicles should be avoided or limited as much as possible.

**Mitigation**:
- Can be avoided, managed or mitigated

### Pipe failure or leaks

**Increased flows due to leaks or pipe failure**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Long term
- **Impact**: 4
- **Scale**: Site
- **Probability**: 2
- **Risk**: High
- **Score**: 8
- **Impact score**: 28
- **Category**: Low

**Notes**:
- Regular inspections and maintenance of the pipeline must be undertaken during the operational phase, with any leaks repaired immediately.
- Any damage/erosion caused by pipe failure must be repaired immediately following the event.

**Mitigation**:
- Can be avoided, managed or mitigated

### Subsidence

**Erosion due to subsidence along pipeline**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Long term
- **Impact**: 4
- **Scale**: Site
- **Probability**: 2
- **Risk**: High
- **Score**: 8
- **Impact score**: 28
- **Category**: Low

**Notes**:
- A walk-through survey should be undertaken long the entire pipeline route 6 months after completion of construction activities and then again at yearly intervals to survey for signs of subsidence along the pipeline route. Any subsidence should be immediately repaired.

**Mitigation**:
- Can be avoided, managed or mitigated

### Heritage Impact

#### EXIGO-NBP-HP01

**Potential damage to Colonial Period structures due to maintenance activities**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Short term
- **Impact**: 1
- **Scale**: Site
- **Probability**: 2
- **Risk**: Low
- **Score**: 2
- **Impact score**: 10
- **Category**: Negligible

**Notes**:
- Maintain 20 m conservation buffer.

**Mitigation**:
- Can be avoided, managed or mitigated

#### EXIGO-NBP-HP02

**Potential damage to Colonial Period structures due to maintenance activities**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Long term
- **Impact**: 4
- **Scale**: Site
- **Probability**: 2
- **Risk**: Low
- **Score**: 2
- **Impact score**: 12
- **Category**: Negligible

**Notes**:
- Maintain 20 m conservation buffer.

**Mitigation**:
- Can be avoided, managed or mitigated

#### EXIGO-NBP-HP03

**Potential damage to Colonial Period structures due to maintenance activities**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Short term
- **Impact**: 1
- **Scale**: Site
- **Probability**: 2
- **Risk**: Low
- **Score**: 2
- **Impact score**: 5
- **Category**: Negligible

**Notes**:
- Maintain 20 m conservation buffer.

**Mitigation**:
- Can be avoided, managed or mitigated

#### Site Exigo-NBP- BP01

**Potential damage to informal burial site due to planned alignment of pipeline**

- **WOM**: Negative
- **Probable**: 2
- **Time frame**: Short term
- **Impact**: 1
- **Scale**: Site
- **Probability**: 2
- **Risk**: Low
- **Score**: 2
- **Impact score**: 10
- **Category**: Negligible

**Notes**:
- Maintain 50 m conservation buffer.

**Mitigation**:
- Can be avoided, managed or mitigated
### No Go Alternative

<table>
<thead>
<tr>
<th>No</th>
<th>Potential Impacts</th>
<th>Significance rating of impacts (positive or negative)</th>
<th>Proposed Mitigation</th>
<th>Significance rating of impacts after mitigation</th>
<th>Risk of impact if mitigation is not implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Negative implications for the sustainability of the water network system within the area. Should any other future residential developments be constructed, there will not be a sufficient water network to meet this demand.</td>
<td>High (Negative)</td>
<td>New pipes and bulk infrastructure to replace old pipes with leakage potential.</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>Inability to meet the current capacity demands of residential developments in the area.</td>
<td>High (Negative)</td>
<td>Installation of new pipelines to meet current and future demand.</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Not undertaking the project means there will be no temporary opportunity for job creation within the local community.</td>
<td>Moderate (Negative)</td>
<td>Creation of temporary local employment with the installation of pipes and bulk infrastructure.</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>4</td>
<td>No water services provided to the area will not support the provincial and municipal plans</td>
<td>High (Negative)</td>
<td>New pipes and bulk infrastructure to meet provincial and municipal planning targets.</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Ecological and Wetland Impact Assessment - Appendix G.1

Heritage Impact Assessment - Appendix G.2

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

1. It is assumed that no construction camp will be required and that the labour force for the pipeline construction will be accommodated in Nigel and surrounds.
2. Even though it might be assumed that heritage survey findings are representative of the heritage landscape of the project area for the Nigel Bulk Water Pipeline Phase Project, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.
3. In order to obtain a comprehensive understanding of the dynamics of the flora and fauna of the study area, surveys should ideally be replicated over several seasons and over a number of years. However, due to project time constraints such long-term studies are not feasible and this biodiversity study was conducted over one season; i.e. the summer season of November 2018, as per the minimum requirements for biodiversity studies (GDARD Requirements for Biodiversity Assessments Version 3, 2014).

4. The large study area did not allow for the finer level of assessment that can be obtained in smaller study areas. Therefore, data collection in this study relied heavily on data from representative, homogenous sections of vegetation units, as well as general observations, aerial photograph analysis, generic data and a desktop analysis.

5. This report focuses only on the wetlands at the proposed bulk water supply pipeline crossings. Other wetland areas further away from the proposed bulk water supply pipeline was not assessed.

6. Even though it might be assumed that biodiversity and wetland survey findings are representative of the ecosystem of the project area, it should be stated that the possibility exists that individual plants or animal species might have been missed due to the nature of the terrain. Therefore, maintaining due cognisance of the integrity and accuracy of the ecological survey, it should be stated that the ecological resources identified during the study do not necessarily represent all the ecological resources present on the property.

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Alternative 2 (Preferred)

<table>
<thead>
<tr>
<th>Potential impacts:</th>
<th>Significance rating of impacts (positive or negative):</th>
<th>Proposed mitigation:</th>
<th>Significance rating of impacts after mitigation:</th>
<th>Risk of the impact and mitigation not being implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>The decommissioning of the proposed project is not envisaged at this stage. The development is for a proposed upgrade and expansion of a pipeline, which is not expected to be decommissioned.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

N/A

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

N/A

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative impacts result from actions, which may not be significant on their own, but which are significant when added to the impact of other similar actions i.e. combined impacts from other developments or construction activities in the area. Cumulative impacts relating to the proposed development include:

- Increased air pollution due to dust caused by vegetation clearance, earthworks and excavation activities as well as vehicle-entrained dust and motor vehicle emissions
- Increased noise from excavation activities and construction vehicles
- Presence of construction vehicles and installation of the pipeline alongside public roads will have an impact on traffic
- Spread of alien invasive species due to construction activities
- Socio-economic benefits such as local economic growth, temporary employment creation, skills transfer and development, etc.

All these cumulative impacts have been taken into consideration in the impact assessment above.

5. ENVIRONMENTAL IMPACT STATEMENT
Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**Alternative 2 (Preferred): Proposed Phase 2 Upgrade and Expansion of the Bulk Water Pipeline in Nigel, Gauteng**

An assessment of potential impacts identified for the proposed upgrade and expansion of the Nigel Phase 2 Bulk Water Supply Pipeline was undertaken. The impacts identified for further assessment were assessed within the respective specialist studies. The specialist studies undertaken to this effect are listed above. The specialist studies recommended mitigation measures in order to reduce or eliminate any impacts identified.

All impacts identified were analysed according the following key considerations, a description of which is included in Section E (2):

- **Probability**: This describes the likelihood of the impact actually occurring.
- **Duration**: The lifetime of the impact
- **Scale**: The physical and spatial size of the impact
- **Magnitude/Severity**: Does the impact destroy the environment, or alter its function.
- **Significance**: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Without mitigation the following impacts were rated as "high" significance during construction and include:

1. Increase in dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic
2. Noise pollution from excavation activities and movement of vehicles

With mitigation the following impacts were rated as "moderate" significance during operations (maintenance) and include:

3. Spillages of harmful substances leading to soil and water pollution
4. Spread of alien invasive species
5. Fauna mortality on roads

All of the above impacts can however be **mitigated to low or negligible significance**, apart from the noise impact due to excavation activities and movement of vehicles. However, this impact will be limited to the construction phase and of medium duration.

The following positive impacts were identified for the proposed development:

1. The creation of temporary jobs during construction which will further training and skills development in the area.
2. The increased capacity of water provision will provide in the need of water provision and future growth.

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Impact</th>
<th>Without or With Mitigation</th>
<th>Nature (Negative or Positive Impact)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Planning Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heritage Impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>EXIGO-NBP-HP01 EXIGO-NBP-HP02</td>
<td>Potential damage to Colonial Period structures due to planned alignment of pipeline route</td>
<td>WOM</td>
<td>Negative</td>
<td>18 Negligible</td>
</tr>
<tr>
<td>2</td>
<td>EXIGO-NBP-HP03 EXIGO-NBP-HP04</td>
<td>Potential damage to Colonial Period structures due to planned</td>
<td>WOM</td>
<td>Negative</td>
<td>10 Negligible</td>
</tr>
<tr>
<td></td>
<td>EXIGO-NBP-HP05</td>
<td>alignment of pipeline route</td>
<td></td>
<td>WM</td>
<td>Negative</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>3</td>
<td>Site Exigo-NBP-BP01</td>
<td>Potential damage to informal burial site due to planned alignment of pipeline route</td>
<td></td>
<td>WOM</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>5</td>
<td>Negligible</td>
<td></td>
</tr>
</tbody>
</table>

### Construction Phase

#### Biodiversity and Wetland Impact

<table>
<thead>
<tr>
<th></th>
<th>Clearing of vegetation for pipelines and infrastructure, access roads etc.</th>
<th>Habitat modification</th>
<th>WOM</th>
<th>Negative</th>
<th>50</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>24</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Clearing of vegetation for pipelines and construction of infrastructure, access roads etc.</th>
<th>Habitat fragmentation</th>
<th>WOM</th>
<th>Negative</th>
<th>44</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Exposure of soils to rainfall and wind during construction</th>
<th>Soil erosion and sedimentation</th>
<th>WOM</th>
<th>Negative</th>
<th>48</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>16</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant)</th>
<th>Spillages of harmful substances, such as hydrocarbons and sewage) leading to soil and water pollution</th>
<th>WOM</th>
<th>Negative</th>
<th>50</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>24</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Continued movement of personnel and vehicles on and off the site during the construction phase</th>
<th>Spread of alien invasive species</th>
<th>WOM</th>
<th>Negative</th>
<th>44</th>
<th>Moderate</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Construction of infrastructure, access roads etc.</th>
<th>Negative effect of human activities on flora</th>
<th>WOM</th>
<th>Negative</th>
<th>44</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Construction of pipelines and roads at crossings and on floodplains</th>
<th>Impact on drainage regime</th>
<th>WOM</th>
<th>Negative</th>
<th>26</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>18</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Continued movement of vehicles on and off the site during the construction phase</th>
<th>Fauna mortality on roads</th>
<th>WOM</th>
<th>Negative</th>
<th>48</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>14</td>
<td>Negligible</td>
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</tbody>
</table>

### Heritage Impact
<table>
<thead>
<tr>
<th>12</th>
<th>EXIGO-NBP-HP01</th>
<th>Potential damage to Colonial Period structures during construction</th>
<th>WOM</th>
<th>Negative</th>
<th>24</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXIGO-NBP-HP02</td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>5</td>
<td>Negligible</td>
</tr>
<tr>
<td>13</td>
<td>EXIGO-NBP-HP03</td>
<td>Potential damage to Colonial Period structures during construction</td>
<td>WOM</td>
<td>Negative</td>
<td>10</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>EXIGO-NBP-HP04</td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>5</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>EXIGO-NBP-HP05</td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>5</td>
<td>Negligible</td>
</tr>
<tr>
<td>14</td>
<td>Site Exigo-NBP-BP01</td>
<td>Potential damage to informal burial site due to planned alignment of pipeline route</td>
<td>WOM</td>
<td>Negative</td>
<td>64</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>16</td>
<td>Negligible</td>
</tr>
<tr>
<td>15</td>
<td>Air Quality Impacts</td>
<td>Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic</td>
<td>WOM</td>
<td>Negative</td>
<td>65</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WM</td>
<td>Negative</td>
<td>28</td>
<td>Low</td>
</tr>
<tr>
<td>16</td>
<td>Visual impact</td>
<td>Construction activities relating to installation of the pipeline</td>
<td>WOM</td>
<td>Negative</td>
<td>40</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The largest part of the proposed pipeline will be situated belowground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles during construction.</td>
<td>WM</td>
<td>Negative</td>
<td>12</td>
<td>Negligible</td>
</tr>
<tr>
<td>17</td>
<td>Noise Impacts</td>
<td>Construction activities and operation of machinery and vehicles</td>
<td>WOM</td>
<td>Negative</td>
<td>65</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Noise pollution from excavation activities and construction vehicles.</td>
<td>WM</td>
<td>Negative</td>
<td>44</td>
<td>Moderate</td>
</tr>
<tr>
<td>18</td>
<td>Traffic Impacts</td>
<td>Excavation and installation of pipeline and use of construction vehicles</td>
<td>WOM</td>
<td>Negative</td>
<td>52</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The presence of construction vehicles on site and installation of the pipeline alongside public roads will have an impact on the traffic situation of the neighbouring area although this will be kept to a minimum.</td>
<td>WM</td>
<td>Negative</td>
<td>22</td>
<td>Low</td>
</tr>
<tr>
<td>19</td>
<td>Socio-economic Impacts</td>
<td>Employment</td>
<td>WOM</td>
<td>Positive</td>
<td>24</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The creation of temporary jobs during construction will have a positive impact. It will provide temporary employment in the area and further training and skills development in the area.</td>
<td>WM</td>
<td>Positive</td>
<td>60</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Service Provision</td>
<td>The increased capacity of water provision will provide in the need of water provision and future growth.</td>
<td>WOM</td>
<td>Positive</td>
<td>60</td>
<td>Moderate</td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>-----</td>
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<td>----</td>
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</tr>
<tr>
<td></td>
<td>WM</td>
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<table>
<thead>
<tr>
<th></th>
<th>Safety, security and fire hazards</th>
<th>Construction activities will result in increased traffic by heavy vehicles in the area that can result in disruptions to traffic flow and accidents. Construction activities such as excavation of trenches, movement of construction vehicles, the use of equipment and the congregation of workers and staff on site, further increase the risk of injury. The activities of construction personnel on site may contribute to an increase in the risk for fires and crime in the area.</th>
<th>WOM</th>
<th>Negative</th>
<th>26</th>
<th>Low</th>
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<td></td>
<td>WM</td>
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</table>

### Operational Phase

#### Biodiversity and Wetland Impact

<table>
<thead>
<tr>
<th></th>
<th>Movement of vehicles on site during operations for maintenance purposes</th>
<th>Spillages of harmful substances leading to soil and water pollution</th>
<th>WOM</th>
<th>Negative</th>
<th>26</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
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<thead>
<tr>
<th></th>
<th>Continued movement of personnel and vehicles on and off the site during the occasional delivery of materials required for maintenance during the operational phase</th>
<th>Spread of alien invasive species</th>
<th>WOM</th>
<th>Negative</th>
<th>26</th>
<th>Low</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th></th>
<th>Continued movement of vehicles on and off the site during the occasional delivery of materials required for maintenance during the operational phase</th>
<th>Fauna mortality on roads</th>
<th>WOM</th>
<th>Negative</th>
<th>22</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
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<tr>
<th></th>
<th>Pipe failure or leaks</th>
<th>Increased flows due to leaks or pipe failure</th>
<th>WOM</th>
<th>Negative</th>
<th>28</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
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<table>
<thead>
<tr>
<th></th>
<th>Subsidence</th>
<th>Erosion due to subsidence along pipeline</th>
<th>WOM</th>
<th>Negative</th>
<th>28</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WM</td>
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</table>

### Heritage Impact

<table>
<thead>
<tr>
<th></th>
<th>EXIGO-NBP-HP01 EXIGO-NBP-HP02</th>
<th>Potential damage to Colonial Period structures due to</th>
<th>WOM</th>
<th>Negative</th>
<th>12</th>
<th>Negligible</th>
</tr>
</thead>
</table>
The proposed pipeline falls partially within CBA and ESA areas; however, no protected plant species, protected trees or red data fauna or flora species were observed during the specialist surveys.

Having assessed the potential impacts that may occur as a result of the proposed upgrade and expansion of the proposed Phase 2 Bulk Water Supply Pipeline, it was found that the impacts identified will all be reduced to a low and negligible significance provided that the mitigation measures and recommendations are strictly adhered to. There are no fatal flaws that should hinder the implementation of this project.

**No-go (compulsory)**

One of the options to be considered as part of the study is that of the no development option. This would entail leaving the site in its present state and not going ahead with the proposed development. If the development does not take place the following advantages and disadvantages are foreseen:

**Advantages of no-go:**
1. The site will remain as is without any of the anticipated ecological, air quality and noise impacts

**Disadvantages of no-go:**
2. Negative implications for the sustainability of the water network system within the area. Should any other future residential developments be constructed, there will not be a sufficient water network to meet this demand
3. Inability to meet the current capacity demands of residential developments in the area
4. Not undertaking the project means there will be no opportunity for job creation and skills development within the local community
5. No water services provided to the area will not support the provincial and municipal plans

The no-go alternative would mean that no development would occur and the status quo would remain. Should the mitigation measures proposed in the EMP be implemented the impact on the environment can be considered to be of negligible to low significance. The no-go option is therefore not the preferred option as the benefits accrued from going ahead with the development will not be obtained.
6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For Alternative 2 (Preferred):

An impact assessment was conducted for the proposed Phase 2 upgrade and expansion of the bulk water supply pipeline in Nigel, Gauteng. The following impacts relating to the proposed project were identified and assessed:

- Heritage impacts;
- Biodiversity and wetland impacts;
- Air Pollution due to dust;
- Noise impacts;
- Visual impacts;
- Traffic impacts; and
- Socio-economic impacts.

The impacts identified for further assessment were assessed within the respective specialist studies, namely:

1. Ecological and Wetland Impact Assessment – Appendix G.1
2. Heritage Impact Assessment - Appendix G.2

To prevent and minimise the identified impacts, specific mitigation measures were identified for the proposed project. All impacts can be mitigated effectively to low and negligible significance, apart from the noise impact due to excavation activities and movement of vehicles. However, this impact will be limited to the construction phase and of medium duration. Therefore, provided that the mitigation measures and recommendations are adhered to, the project can be supported.

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The findings of the specialist studies and impact assessment conducted under this environmental process provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. The findings inform that provided that the recommended management and mitigation procedures are implemented, there are no environmental fatal flaws that should prevent the proposed projects from commencing.

To achieve appropriate environmental management standards and to ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from the report have been included in an Environmental Management Programme Report (EMPr) which is included in Appendix H.

The EMPr should be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for key phases such as construction and operation of the proposed development is considered to be fundamental in achieving the appropriate environmental management standards as detailed for this project.

It is also recommended that the process of communication and consultation with the surrounding landowners is maintained after the closure of the Basic Assessment Process.

Therefore, based on the results of this report, Exigo recommends that this report is accepted by the competent authority.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.
8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).

YES NO

If “NO”, indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

If “YES”, please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

- All the recommended mitigations measures as contained in the EMPr must be implemented (Appendix H: EMPr). The EMPr will be binding on the developer and contractors operating/constructing the development as well as the project manager for the development.

- An ECO should be appointed by the Applicant, to ensure that the construction of the development is implemented in line with the recommendations and mitigation measures in the EMPr and complies with the conditions of approval as contained within the Environmental Authorisation for the project. The ECO should submit audit reports to GDARD monthly for the duration of the construction phase.

9. THE NEEDS AND DESIRABILITY OF THE PROPOSED DEVELOPMENT (as per notice 792 of 2012, or the updated version of this guideline)

In a water scarce country, water is a major vulnerability for human settlements. Apart from the need to deliver piped water to the approximately 4.5 million people who currently lack it, South Africa faces challenges of rapidly deteriorating infrastructure for those who already have water.

The main purpose of the bulk water pipeline upgrade and expansion is to improve the overall water supply to relief the strain due to new developments in the Greater Nigel area. The proposed pipeline will not only relief the strain of the current demand for water supply, but will also cater for future developments in the greater area. The proposed expansion of the pipeline will also improve the service infrastructure in the greater area.

During the expansion of the bulk water pipeline, temporal employment opportunities for both the skilled and unskilled labour will be created. The project may contribute to skills training for the local labour appointed.

How will this development (and its separate elements/aspects) impact on the ecological integrity of the area? Please explain

Refer to section B and E of this report.

How were the following ecological integrity considerations taken into account? Please explain

Threatened Ecosystems

Refer to Appendix G.1: Biodiversity and Wetland Impact Assessment and section B of this report.
<table>
<thead>
<tr>
<th>Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to Appendix G.1: Biodiversity and Wetland Impact Assessment and section B of this report.</td>
<td></td>
</tr>
<tr>
<td>Critical Biodiversity Areas (&quot;CBAs&quot;) and Ecological Support Areas (&quot;ESAs&quot;)</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to Appendix G.1: Biodiversity and Wetland Impact Assessment and section B of this report.</td>
<td></td>
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<tr>
<td>Conservation targets</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to Appendix G.1: Biodiversity and Wetland Impact Assessment and section B of this report.</td>
<td></td>
</tr>
<tr>
<td>Ecological drivers of the ecosystem</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to Appendix G.1: Biodiversity and Wetland Impact Assessment and section B of this report.</td>
<td></td>
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<tr>
<td>Environmental Management Framework</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to section A (2) of this report.</td>
<td></td>
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<tr>
<td>Spatial Development Framework</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to section E (7) of this report.</td>
<td></td>
</tr>
<tr>
<td>Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)</td>
<td>Please explain</td>
</tr>
<tr>
<td>Ecological monitoring is recommended for the construction phase of the development considering the presence of wetlands that are linked to the Blesbokspruit, a ramsar site at Marievale Bird Sanctuary 4.9 km east of the proposed site. Refer to Appendix G.1: Biodiversity and Wetland Impact Assessment.</td>
<td>Please explain</td>
</tr>
<tr>
<td>How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to section E.</td>
<td></td>
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<tr>
<td>How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</td>
<td>Please explain</td>
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<tr>
<td>Refer to section E.</td>
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<tr>
<td>What waste will be generated by this development? What measures were explored to firstly avoid waste and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to Section A (3), and E.</td>
<td></td>
</tr>
<tr>
<td>How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to section E.</td>
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<tr>
<td>How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</td>
<td>Please explain</td>
</tr>
<tr>
<td>Refer to Section A (3).</td>
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<tr>
<td>How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</td>
<td>Please explain</td>
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<tr>
<td>Refer to Section A (3).</td>
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<tr>
<td>Question</td>
<td>YES</td>
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<td>-------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?</td>
<td>YES</td>
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</tbody>
</table>

The natural resource dependency on water will increase, however the Constitution of South Africa Section 27 allows that everyone has the right to have access to sufficient water. Access to water implies that water should be both economically and physically accessible. Physical accessibility means that water should be available within a distance accessible to everyone including vulnerable individuals such as children, elderly persons and persons with disabilities. There should be adequate infrastructure and the effective maintenance of facilities and equipment, and equitable access even for under-serviced areas.

Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this proposed development alternative)?

The right of access to sufficient water in section 27(2) should be understood to mean that the State is under an obligation to create mechanisms that enable people to have access to sufficient water. In the event of resource constraints, which limit the ability of the State to fulfill its obligations, the State is still obliged to provide a plan of action that demonstrates that the full realisation of the right shall be achieved over time. Furthermore, available resources should be utilised effectively so as to give maximum results, with priority being given to assuring to everyone, the satisfaction of the most basic requirements as well as the provision of essential services, including access to sufficient water.

Do the proposed location, type and scale of development promote a reduced dependency on resources?

However, the upgrade and expansion of the bulk water supply pipeline is likely to reduce people having to travel in order to obtain access to water or the relevant authorities having to make water available by other means (i.e. transporting water with vehicles) will to a certain extent assist in decreasing the carbon footprint. The proposed pipelines may also negate the need for people to take water from the local watercourses and wetlands, thereby assisting with the ecological reserve of said water features.

How were a risk-averse and cautious approach applied in terms of ecological impacts

A risk analyses of the impacts identified was conducted to determine the significance of the impacts on the fauna and flora of the study area.

What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?

Refer to Section E.

What is the level of risk associated with the limits of current knowledge?

Refer to Section E.

Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?

A risk analyses of the impacts identified was conducted to determine the significance of the impacts of the proposed pipeline development.

How will the ecological impacts resulting from this development impact on people's environmental right in terms following:

Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?

Refer to Section E.

Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?

Refer to Section E.

Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development’s ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?

Refer to Section E.

Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?

Refer to Section E and E (5).

Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the “best practicable environmental option (BPEO)” in terms of ecological considerations?
Refer to Section A (3).

<table>
<thead>
<tr>
<th>Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please refer to Section 6 of the Biodiversity Impact Assessment (Appendix G.1: Biodiversity Impact Assessment).</td>
<td></td>
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</table>

### 10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

*CONSIDER WHEN THE ACTIVITY IS EXPECTED TO BE CONCLUDED*

Prior to construction the validity of the environmental authorization is required for 5 years; with regards to the operational phase it is requested that the Environmental Authorisation (EA) be valid for the life of the bulk water supply pipeline as per Regulation 26 (d) of the EIA regulations 2014 (as amended).

### 11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP)" (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers “Yes” to Point 7 above then an EMP is to be attached to this report as an Appendix

EMP attached
SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix.

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Other information

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.
3. APPENDIX A: ROUTE PLAN
4. APPENDIX B: SITE PHOTOS
5. APPENDIX C: FACILITY ILLUSTRATION (5)

NOT APPLICABLE
APPENDIX D: ROUTE POSITION INFORMATION
7. APPENDIX E: PUBLIC PARTICIPATION INFORMATION
8.1 APPENDIX E.1: PROOF OF SITE NOTICE
WILL BE INCLUDED WITH THE FINAL BA REPORT
8.2 APPENDIX E.2: WRITTEN NOTICES ISSUED AS REQUIRED IN TERMS OF THE REGULATIONS
8.3 APPENDIX E.3: PROOF OF NEWSPAPER ADVERTISEMENTS

WILL BE INCLUDED WITH THE FINAL BA REPORT
8.4 APPENDIX E.4: COMMUNICATIONS TO AND FROM INTERESTED AND AFFECTED PARTIES
8.5 APPENDIX E.5: MINUTES OF ANY PUBLIC AND/OR STAKEHOLDER MEETINGS

NOT APPLICABLE
8.6 APPENDIX E.6: COMMENTS AND RESPONSE REPORT
8.7 APPENDIX E.7: COMMENTS FROM I&APS ON THE DRAFT BA REPORT

WILL BE INCLUDED WITH THE FINAL BA REPORT
8.8 APPENDIX E.8: COMMENTS FROM I&APS ON AMENDMENTS TO THE BA REPORT

NOT APPLICABLE
8.9 APPENDIX E.9: COPY OF REGISTER OF I&APS
8. APPENDIX F: SAHRA CORRESPONDENCE
9. **APPENDIX G: SPECIALIST STUDIES**

7.1 **APPENDIX G.1: BIODIVERSITY AND WETLAND IMPACT ASSESSMENT**
7.2 APPENDIX G.2: ARCHAEOLOGICAL IMPACT ASSESSMENT