GAS TRANSMISSION PIPELINE AND ASSOCIATED INFRASTRUCTURE, NIGEL

Gauteng Province

Basic Assessment Report

June 2019

savannah environmental

t +27 (0)11 656 3237
f +27 (0)86 684 0547
e info@savannahsa.com
w www.savannahsa.com

Prepared for:

Iliza gas Pty Ltd,
A407 66-68 Albert Road 7925
Cape Town

GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

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, Umnotho House,
56 Eloff Street,
Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

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.

The final Basic Assessment report for the Gas Transmission Pipeline and associated infrastructure will be submitted within 90 days after the submission of the appliction form to the Gauteng Department of Agriculture and Rural Development in order to ensure compliance with the prescribed timeframes.

Is a closure plan applicable for this application and has it been included in this report? if not, state reasons for not including the closure plan. **NO**

A closure plan is not applicable for this application, or required to be included within this Basic Assessment (BA) Report.

Decommisioning activities include the folowing:

- Isolasion of the pipelines from the main supply network;
- Vent all gas from the system at each station;
- Purge the system with nitrogen to make it safe;
- Disconnect the pipe from network;
- Disconnect the cathodic protection system;
- Open trench, cut and grout the jacked/drilled road crossing;
- Demolish the stations and dispose of the material at appropriate waste facilities.

Activities relating to the decomissioning of the Nigel Gas Transmission Pipeline and associated infrastructure is assessed as part of this BA Report.

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? **NO**

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? **YES**

If no, state reasons for not attaching the list.

Have State Departments including the competent authority commented? **NO**

If no, why?

This BA Report is the report for review by the competent authority, stakeholders (including all relevant state departments) and the public. Following the 30-day review period, from 19 June 2019 to 19 July 2019, all comments received from the competent authority, stakeholders and I&APs will be included and

considered in the final BA Report. All comments will also be included and responded to in the Comments and Responses Report (**Appendix E6**).

PROJECT DETAILS

Title	:	Environmental Impact Assessment Process: Basic Assessment Report: Gas Transmission Pipeline and associated infrastructure, Nigel, Gauteng Province
Authors	:	Savannah Environmental Hermien Slabbert Gideon Raath Jo-Anne Thomas Nicolene Venter
Applicant	:	Iliza Gas (Pty) Ltd
Report Status	:	Basic Assessment Report for Public Review
Date	:	June 2019

When used as a reference this report should be cited as: Savannah Environmental (2019) Basic Assessment Report: Nigel Gas Transmission Pipeline and associated infrastructure, Gauteng.

TABLE OF CONTENTS

LIST OF APPENDICES

SUMMARY AND OVERVIEW OF THE PROJECT

Iliza Gas (Pty) Ltd. ('Iliza Gas or ENGP)' is proposing the development of a natural gas transmission pipeline to the Consol Glass factory in Nigel, from the Farm Grootfontein 165 Portion 44, Gauteng Province, where it connects with the distribution node on the larger Maputo – Gauteng natural gas pipeline network. This connection node is located near (20m) the Nigel-Springs Road in Nigel. The proposed project falls within the City of Ekurhuleni Metropolitan Municipality, in the Gauteng Province. The current pipeline route utilises the road reserve for its entire length.

The project will have a lifespan of 25 years after which the pipeline and associated infrastructure will be decommissioned. The proposed construction method for water crossings and road crossings is horizontal directional drilling (where absolutely necessary due to the inhibitive cost of this methodology). Horizontal drilling does not require trenches and does not disrupt the land surface. Trenching will be utilised for the portions in the road reserve., representing the largest length for the proposed pipeline. The construction period for the proposed pipeline is approximately 6-8 months.

Initial feasibility work assessed 5 alternative routes, with only route C ultimately proving to be viable following discovery of technical, financial and permissions obstacles (in particular, route wayleave approvals). Subsequently, only route C is proposed in this application as the preferred and only feasible alternative, having already gone through an initial screening routing and proving the only suitable option.

Route C is approximately 10 km length and planned with a 0.25m width. Safety concerns related to the transmission of compressed gas necessitated the methodology of underground pipe laying (i.e. no surface pipe laying) for the entirety of the proposed pipeline length. This is to avoid access to the pipeline and potential tampering with the pipe, possibly leading to loss of life and/or related emergency incidents.

The development is proposed to include the following infrastructure:

- 10km, 0.25 m diameter carbon steel pipeline;
- A High-Pressure Customer Metering Station, 14 x 18 m, 4m tall housed on Consol property enclosed by wall.

The proposed natural gas pipeline will connect to an existing high-pressure gas distribution pipeline and the gas will be used at the endpoint in the Consol Factory for glass smelting operations. Permitting has already been granted for this route by the following authorities, as the proposed route C will be located within servitudes of these organisations, should it be approved:

- Transnet;
- Gautrans; and
- Ekurhuleni Metropolitan Municipality (wayleave approval).

The proposed project will be located on the following properties:

- Varkensfontein 169 RE of portion 31;
- Grootfontein 165 portion 42;
- Grootfontein 165 portion 6;
- Grootfontein 165 portion 3;
- Grootfontein 165 portion 41/RE;
- Grootfontein 165 RE;

- Grootfontein 165 portion RE/46;
- Grootfontein 165 Portion 76;
- Grootfontein 165 Portion 74;
- Grootfontein 165 Portion 44;
- Grootfontein 165 Portion 75; and
- Grootfontein 165 Portion 46.

Table 1: Location of the gas transmission pipeline and associated infrastructure, Nigel, Gauteng Province

Province	Gauteng Province
Municipality	City of Ekurhuleni Metropolitan Municipality
Ward number(s)	Ward 88, 98 and 111
Nearest town(s)	The project site is located in Nigel and runs adjacent to Valkfontein Road (M45) for approximately 1,5km and Nigel Dunnottar Road for approximately 7,4km.
Farm name(s) and number(s)	- Varkensfontein 169 RE of portion 31 - Grootfontein 165 portion 42 - Grootfontein 165 portion 6 - Grootfontein 165 portion 3 - Grootfontein 165 portion 41/RE - Grootfontein 165 RE - Grootfontein 165 portion RE/46 - Grootfontein 165 Portion 76 - Grootfontein 165 Portion 74 - Grootfontein 165 Portion 44 - Grootfontein 165 Portion 75 - Grootfontein 165 Portion 46
SG 21 Digit Code	Surveyor-General Database property ID's: - T0IR00000000016900031 - T0IR00000000016500042 - T0IR00000000016500006 - T0IR00000000016500003 - T0IR00000000016500041 - T0IR00000000016500000 - T0IR00000000016500046 - T0IR00000000016500076 - T0IR00000000016500074 - T0IR00000000016500044 - T0IR00000000016500075 - T0IR00000000016500046
Current Zoning	Agricultural (and industrial?)
Site Coordinates	Start: 26°21'10.94"S, 28°27'23.92"E Middle: 26°22'0.10"S, 28°26'1.78"E End: 26°25'14.11"S, 28°26'56.72"E

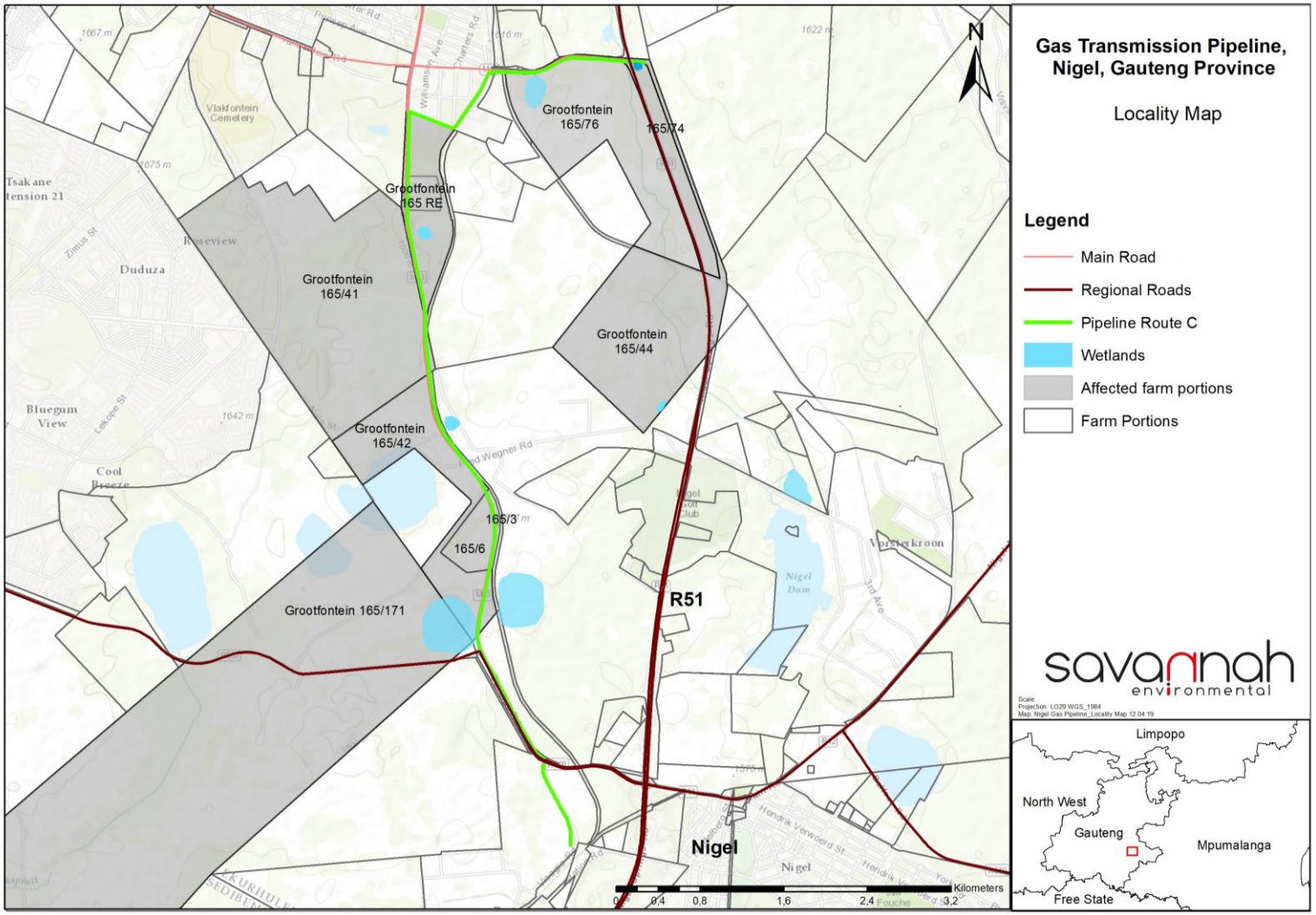

Figure 1: Locality map indicating the location of the proposed Gas Transmission Pipeline and associated infrastructure within the project site (refer to **Appendix A1**).

The nature and extent of the proposed project, and the potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the 2014 EIA Regulations, as amended on 07 April 2017, and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; as well as the recommendations proposed by the Environmental Assessment Practitioner.

1. Need and Desirability for the project

The proposed natural gas transmission pipeline is in line with local, provincial and national development frameworks. In terms of the National Development Plan (NDP), job creation has been listed as a priority by Government, and the proposed development in this instance has the potential to create employment and business opportunities for the residents of Nigel. Other priorities of the NDP are outlined as expanding infrastructure and the expansion of the current Sasol transmission pipeline into this region of Nigel to the Consol Factory is in line with this objective.

The Gauteng Provincial Environmental Management Framework (GPEMF) delineated various environmental management zones throughout the province, which take into account biodiversity sensitivity, land use planning objectives and the current status of these sites as far as possible, and provide clear development instruction regarding the various zones. The GPEMF indicated that the project falls within the "Normal Control Zone (Zone 4)" and the "High Control Zone (outside the urban development zone) (Zone 3)" which are conservation and agricultural focus zones under the GPEMF, respectively. In addition, the route traverses the "Urban Development Zone" (Zone 1) and the "Industrial and large commercial focus zone" (Zone 5), which are both development zones under the GEMPF. The latter two zones are detailed further below.

Zone 1 – Urban development zone
The intention with this zone is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective efficient city region that will minimise urban sprawl into rural areas. Approximately 2 915m of the proposed route currently occurs within this zone, located predominantly towards the northern portion of the site (near Dunnottar), representing 29% of the route.

Zone 5 – Industrial and large commercial focus zone
The intention with Zone 5 is to streamline non-polluting industrial and large-scale commercial (Warehouses etc.) activities in areas that are already used for such purposes and areas that are severely degraded but in proximity to required infrastructure. Approximately 603m of the proposed route currently occurs within this zone, located towards the extreme south of the route, representing 6% of the route.

It is clear that this pipeline will partially address components of both Zone 1 and Zone 5 as per the Gauteng Province EMF, and thus contribute to densification and urban development as per the states aims of both these zones.

The proposed pipeline will connect to the Sasol pipeline and provide gas to the Consol Factory in Nigel, as well as allow for the extension of the Sasol transmission network. This type of pipeline infrastructure is lacking in this particular part of Nigel. The pipeline will allow Consol to expand their operations in Nigel. The expansion of the Consol factory will create approximately 500 permanent jobs.

The expansion of the Gas transmission network will also allow other companies to take advantage of Natural Gas and the cost-effectiveness of Natural Gas as fuel source. Access to this cost-effective, abundant source of energy allows for companies to expand and create jobs and incur savings (savings which are passed onto the consumer).

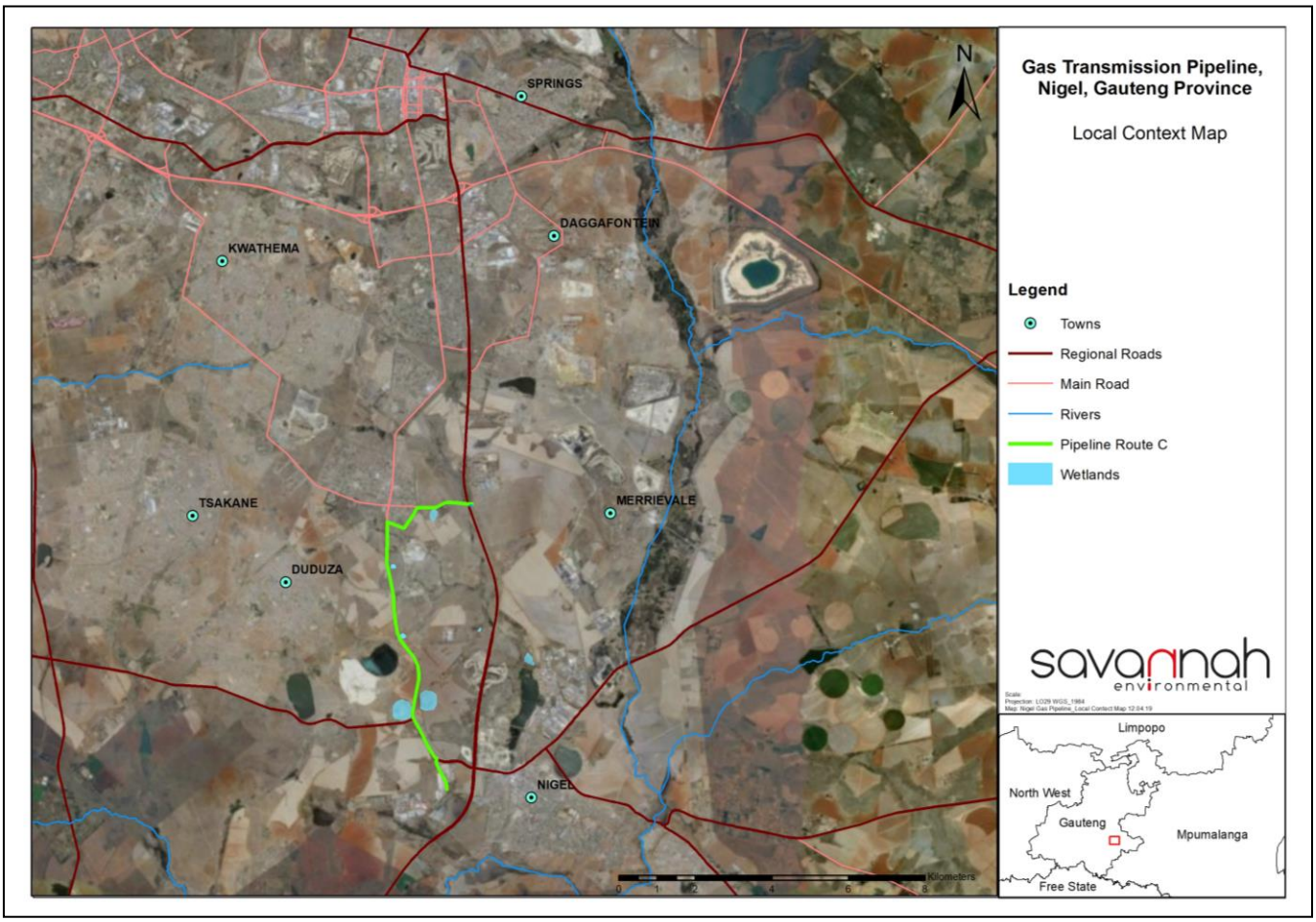

Figure 2: Map illustrating the surrounding towns or regional setting of the proposed gas transmission pipeline in Nigel.

2. Requirements for a Basic Assessment Process

In terms of the Environmental Impact Assessment (EIA) Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998), the City of Ekurhuleni requires Environmental Authorisation for the development gas transmission pipeline and associated infrastructure. In terms of Sections 24 and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations of GN R324 – R327, a Basic Assessment (BA) process is required to be undertaken in support of the application for authorisation for the proposed project. The proposed pipeline will trigger listed activities under GN R327 and GN R324, therefore requiring an application for Environmental Authorisation.

Listed activity as described in GN R 327, 325 and 324	Description of project activity that triggers listed activity
GN R 327 Item 12(c): The development of –	The proposed pipeline will have a diameter of 0.25m, and will necessitate the clearing of a 0.9m wide trench during

(ii) infrastructure or structures with a physical footprint of 100m² or more; where such development occurs – (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse – Excluding – (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves.	construction. While Nigel Route C crosses two unnamed tributaries, the dimension of the proposed pipeline will trigger the 100m² threshold (1 500 m2). This activity will be triggered depending on the fine scale layout and designs- whether 100m2 of the pipeline will fall outside an urban area.
GN R 327 Item 14: The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proposed gas pipeline is anticipated to include the handling of dangerous goods, however the quantity of these is not expected to exceed the 500m³ threshold.
GN R 327 Item 19: The infilling or depositing of any material of more than 10m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m³ from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving – (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan	The proposed pipeline will have a diameter of 0.25m and will be developed within a trench 0.9m in extent. While Nigel Route C crosses two unnamed tributaries, the dimension of the proposed pipeline and associated trench will trigger the 10m³ threshold (1500m³) and therefore Activity 19 of Listing Notice 1 (GNR 327) would be applicable.
GN R 324 Item 10: The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic meters. c. Gauteng Sites identified as Critical biodiversity areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;	The proposed pipeline will involve infrastructure for the handling of a dangerous good and will fall within Critical biodiversity areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.
GN R 324 Item 10: 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. c. Gauteng ii) Within Critical biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans	The pipeline will require the clearance of an area of 300 square metres or more of indigenous vegetation within Critical biodiversity Areas or Ecological Support Areas.

GN R 324 Item 14: The development of – (ii) Infrastructure or structures with a physical footprint of 10m² or more Where such development occurs – (a) Within a watercourse (b) In front of a development setback (c) If no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse c. Gauteng iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.	Nigel Route C traverses two unnamed tributaries, both of which occur entirely within CBA areas. Given the dimension of the pipeline (i.e. 0.25m) and will necessitate the clearing of a 0.9m wide trench during construction. the potential therefore exists that the construction of Nigel Route C could result in the development of infrastructure 10m² in extent within, and within 32m of a watercourse within an ESA and CBA. By way of calculation a pipeline diameter width of 0.25m x 32m on either side of a watercourse (i.e. 64m) = approximately 9.6m² which falls under the 10m² threshold. This figure excludes development within the watercourse itself. Should the combined length of pipeline works within the tributaries exceed 4m, at the given diameter this will add 0.4m2 to the total, thereby reaching the threshold. It is thus anticipated that this activity will be triggered.

In terms of Section 24(1) of NEMA, the potential impact on the environment associated with the activity must be considered, investigated, assessed and reported on to the competent authority that has been charged by NEMA with the responsibility of granting environmental authorisations. As the application is located within the Gauteng Province, the Gauteng Department of Agriculture and Rural Development (GDARD) is identified as the competent authority for the application for authorisation. This project will be registered with the GDARD through submission of an Application for Environmental Authorisation (EA).

The nature and extent of the project is explored in more detail in this Basic Assessment (BA) Report. This report has been compiled in accordance with the requirements of the EIA Regulations of December 2014, as amended on 07 April 2017 (as per **Table 2** below), and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner (EAP).

Table 2: Legal Requirements of GN. R. 326, Appendix 1 included in the 2014 EIA Regulations, as amended on 07 April 2017.

NEMA REGULATION GNR 326, SECTION 19 REQUIREMENTS FOR THE CONTENT OF BASIC ASSESSMENT REPORTS AS PER APPENDIX 1	**CROSS REFERENCE IN THIS REPORT (refer to the following parts in the report)**
(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	Section 1.3
(a) details of—	
(i) the EAP who prepared the report; and	
(ii) the expertise of the EAP, including a curriculum vitae;	Section 1.3 Appendix I
(b) the location of the activity, including:	Section A (1)
(i) the 21 digit Surveyor General code of each cadastral land parcel;	
(ii) where available, the physical address and farm name;	Section B(1)
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section B(2)
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;	Appendix A, Appendix A2 and Appendix C

NEMA REGULATION GNR 326, SECTION 19 REQUIREMENTS FOR THE CONTENT OF BASIC ASSESSMENT REPORTS AS PER APPENDIX 1	CROSS REFERENCE IN THIS REPORT (refer to the following parts in the report)
or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	N/A – no linear activity falls outside of the project site
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Section 1.2
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	Section A(2)
(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section A(2)
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 1.1 and Section E(9)
(g) a motivation for the preferred site, activity and technology alternative;	Section E(6)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including - (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section A (3) Section C Appendix E6
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section B
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section E Appendix G1 Appendix G2
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Appendix E(2)

NEMA REGULATION GNR 326, SECTION 19 REQUIREMENTS FOR THE CONTENT OF BASIC ASSESSMENT REPORTS AS PER APPENDIX 1	CROSS REFERENCE IN THIS REPORT (refer to the following parts in the report)
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section E
(viii) the possible mitigation measures that could be applied and level of residual risk;	Section E Appendix H
(ix) the outcome of the site selection matrix;	Section 1.1
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Section A (3)
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section E(6)
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Section E
(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section E
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Section E
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section E(6) and (8) Appendix G1 Appendix G2
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section E(5) Section A(6) Appendix A4 Appendix A5
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section E Appendix H

NEMA REGULATION GNR 326, SECTION 19 REQUIREMENTS FOR THE CONTENT OF BASIC ASSESSMENT REPORTS AS PER APPENDIX 1	CROSS REFERENCE IN THIS REPORT (refer to the following parts in the report)
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section E (8)
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.4
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section E(8)
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Appendix I
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t) any specific information that may be required by the competent authority; and	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

3. Details and Expertise of the Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326) Iliza Gas (Pty) Ltd has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent Environmental consultant to undertake the Basic Assessment and prepare the BA Report for the project. Neither Savannah Environmental nor any of its specialists are subsidiaries of, or are affiliated to Iliza Gas (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the project.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned), and is rated as a Level 2 Broad-based Black Economic Empowerment (B-BBEE) Contributor as the company is an Exempted Micro

Enterprise (EME). The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management, and has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa.

The Savannah Environmental team in this project includes:

» **Hermien Slabbert** – the principle author of this report. She holds a BSc degree with Honours in Environmental Management and has two years of experience in the renewable energy sector. She has worked on Solar Photovoltaic projects and has provided assistance basic assessments (BAs), amendment applications and General Authorisation (GA) applications. She has also done GIS mapping (ArcGIS) for small and large-scale projects.

» **Gideon Raath** - Gideon holds an MSc (Geography and Environmental Management; SU), a BSc Honours (Ecology and Environmental Studies - Cum laude; Wits) and a BSc (Geography and Environmental Management; UJ). His MSc thesis focused on the hydrological impact on the spatial distribution of invasive Eucalyptus trees along the Breede River, while his honours thesis evaluated ethnobotanical relationships around the Rio Tinto copper mine in Phalaborwa. Most recently he has worked as an Environmental Consultant at EOH Coastal and Environmental Services (EOH CES), conducting environmental authorisations applications (NWA, NEMA, MPRDA), Public Participation Processes, GIS specialisation as well as Ecological and Wetland specialist studies. Previously, Gideon worked as the Monitoring & Evaluation Project Manager for the City of Cape Town's invasive species unit (Environmental Resources Management Department).

» **Jo-Anne Thomas** is a Director at Savannah Environmental (Pty) Ltd. Jo-Anne has a Master of Science Degree in Botany (M.Sc. Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with the South African Council for Natural Scientific Professions (SACNASP). She has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through her involvement in related EIA processes over the past 20 years. She has successfully managed and undertaken EIA processes for infrastructure development projects throughout South Africa.

» **Nicolene Venter** – Board Member of IAPSA (International Association for Public Participation South Africa. She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula vitae for the Savannah Environmental project team are included in **Appendix I**.

4. Assumptions and Limitations

The following assumptions and limitations are applicable to this Basic Assessment Process:

- All information provided by the proponent to the environmental team was correct and valid at the time it was provided.
- It is assumed that the project site identified by the proponent represents a technically suitable site for the establishment of the proposed Nigel Gas Transmission Pipeline and associated infrastructure.
- This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other alternatives in terms of location and technology.

BASIC ASSESSMENT REPORT FOR PUBLIC REVIEW

This Basic Assessment Report has been prepared by Savannah Environmental in order to assess the potential environmental impacts associated with the gas transmission pipeline and associated infrastructure in Nigel, Gauteng. This process is being undertaken in support of an application for environmental authorisation to the Gauteng Department of Agriculture and Rural Development (GDARD).

The 30-day review period for the Basic Assessment Report is from **19 June 2019 to 19 July 2019**. The report is available for public review at the following locations:

» **Nigel Public Library located at 86 Hendrik Verwoed Street, Nigel;**
» **www.savannahsa.com**

To obtain further information, register on the project database, or submit written comment please contact:

Nicolene Venter of **Savannah Environmental** **Tel:** 011 656 3237 **Fax:** 086 684 0547 **Email:** publicprocess@savannahsa.com **Post:** PO Box 148 Sunninghill, 2157
The due date for comments on the Basic Assessment Report is **19 July 2019**

SECTION A: ACTIVITY INFORMATION

1. Proposal or Development Description

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

Project Title: "Gas Transmission Pipeline and associated infrastructure, Gauteng"

Iliza Gas (Pty) Ltd. ('Iliza Gas or ENGP)' is proposing the development of a natural gas transmission pipeline to the Consol Glass factory in Nigel, from the Farm Grootfontein 165 Portion 44, Gauteng Province, where it connects with the distribution node on the larger Maputo – Gauteng natural gas pipeline network. This connection node is located near (20m) the Nigel-Springs Road in Nigel. The proposed project falls within the Ekurhuleni District Municipality, in the Gauteng Province. The current pipeline route utilises the road reserve for its entire length.

The project will have a lifespan of 25 years after which the pipeline and associated infrastructure will be decommissioned. The proposed construction method for water crossings and road crossings is horizontal directional drilling (where absolutely necessary due to the inhibitive cost of this methodology). Horizontal drilling does not require trenching and does not disrupt the land surface. Trenching will be utilised for the portions in the road reserve, representing the largest length for the proposed pipeline. The construction period for the proposed pipeline is approximately 6-8 months.

The proposed natural gas pipeline will connect to an existing high-pressure gas distribution pipeline and the gas will be used at the endpoint in the Consol Factory for glass smelting operations. Permitting has already been granted for this route by the following authorities:

- Transnet;
- Gautrans; and
- Ekurhuleni Metropolitan Municipality (wayleave approval).

The proposed project will take place on the following properties:

- Varkensfontein 169 RE of portion 31;
- Grootfontein 165 portion 42;
- Grootfontein 165 portion 6;
- Grootfontein 165 portion 3;
- Grootfontein 165 portion 41/RE;
- Grootfontein 165 RE;
- Grootfontein 165 portion RE/46;
- Grootfontein 165 Portion 76;
- Grootfontein 165 Portion 74;
- Grootfontein 165 Portion 44;
- Grootfontein 165 Portion 75; and
- Grootfontein 165 Portion 46;

Table 3 provides the details of the technology proposed for the Gas Transmission Pipeline and the associated infrastructure and services.

Table 3: Details of the proposed project and associated infrastructure

Component	Description / Dimensions
10km pipeline	Dimension: 0.25m in diameter carbon steel pipeline, requiring a trench of 0.9m wide.
A High-Pressure Customer Metering Station (housed on Consol property enclosed by brick wall)	Dimension: 14 x 18 m, 4m tall

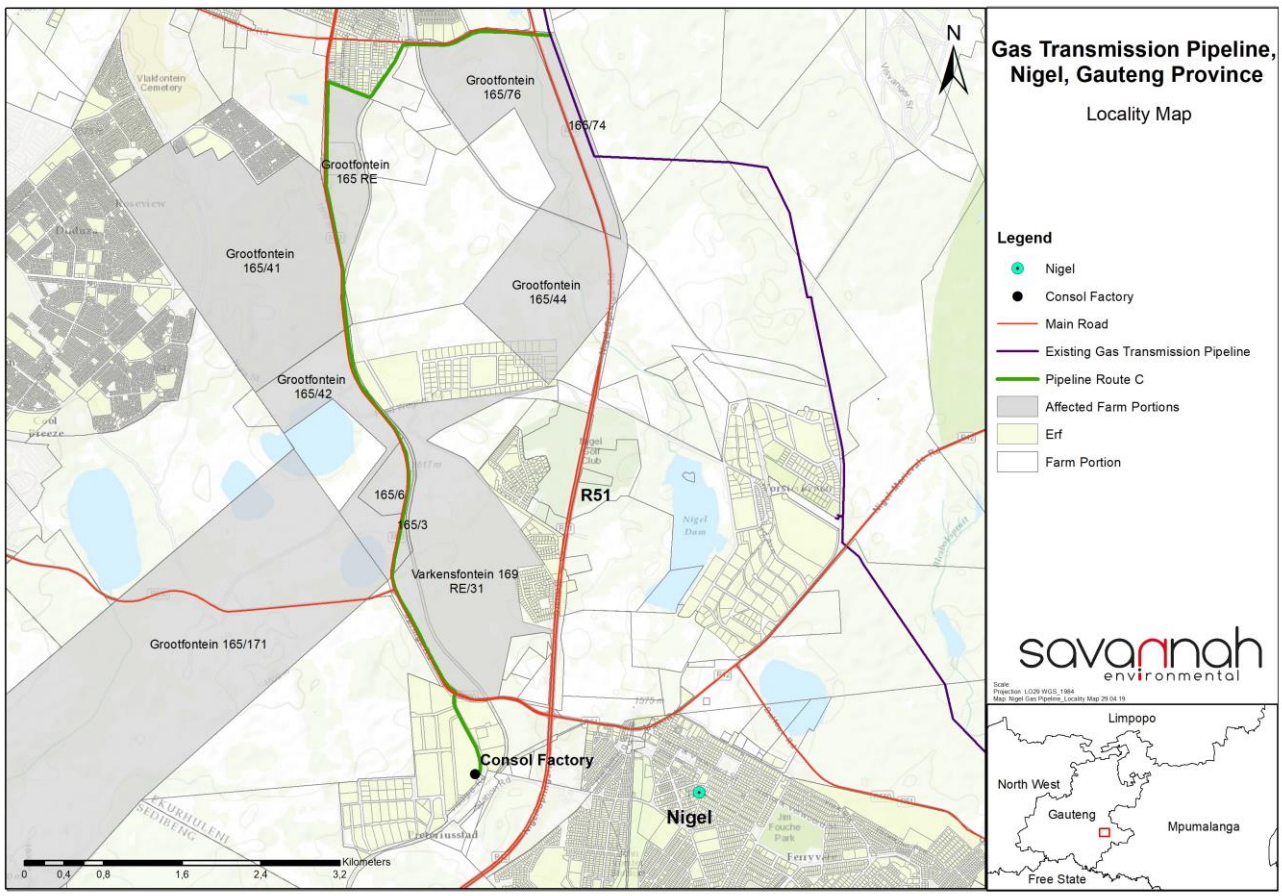

Figure 3: Location of the gas transmission pipeline in Nigel.

The following pre-construction, construction, operation and decommissioning activities will be associated with the project:

Pre-Construction Surveys:

Prior to initiating construction, a number of detailed surveys will be required including, but not limited to:

- Geotechnical survey – The geotechnical study will look at the availability of natural construction materials. This study will serve to inform the extent of earthworks and compaction required as well as the final micro-sitting of the infrastructure.
- Site survey - in order to finalise the design layout of the pipeline. The finalisation will need to be confirmed in line with the Environmental Authorisation issued for the project.

Construction Phase:

The construction phase will be 6-8 months. The following activities will be undertaken during the construction phase:

- The construction phase will include the transportation of the required equipment and building material to the project site. Typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.).
- Site preparation activities will be undertaken and will include the clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.
- Trenching will be required during the construction of the proposed pipeline. The proposed pipeline will be approximately 0.25m in diameter, and trenches required for the proposed pipelines would be approximately 0.9m in width and 1.5m deep.
- Laydown and storage areas will be required for the typical construction equipment.
- Construction of the gas transmission pipeline and associated infrastructure, inclusive of the following:
  - Fencing of the construction strip (nominally 10m in width or less, where necessitated by the road reserve);
  - Removal of vegetation within the strip;
  - The stripping of topsoil and storage to one side of the strip;
  - The excavation of the trench and the removal of surplus material;
  - The laying out (stringing) and welding of pipes;
  - The 'ditching' of the pipe into the trench;
  - The backfilling of the pipeline trench;
  - The reinstatement of the top soil;
  - The restoration of hedges or vegetation along the strip length; and
  - The restoration of the land including land drainage and ditches.
- Once construction is completed and all construction equipment is removed, the site must be rehabilitated where practical and reasonable.

Up to 60 employment opportunities will be created during the construction phase of the gas transmission pipeline and associated infrastructure. Of this approximately 35 of the opportunities will be available to unskilled workers and 25 will be available to skilled personnel.

Operation Phase

The gas transmission pipeline and associated infrastructure will be designed for a 25-year operation period. The pipeline and associated infrastructure will require maintenance as and when required.

Decommissioning

Depending on the continued economic viability of the project following the initial 25-year operation period, the project will either be decommissioned or the operation phase will be extended. However, if the decision is made to decommission the project, the following activities will form part of the project scope:

- Site preparation activities will include confirming the integrity of the access to the site to accommodate the required decommissioning infrastructure
- Isolate the lines from the main supply network
- Vent all gas from the system at each station
- Purge the system with nitrogen to make it safe
- Disconnect the pipe from network – cut the pipe and weld end cap on the Sasol Gas line
- Disconnect the cathodic protection system
- Open trench, cut and grout the jacked/drilled road crossing
- Demolish the stations and dispose of the material
- Rehabilitate the areas where stations have been removed

The development will include the following temporary and permanent infrastructure:

- Permanent infrastructure:
  - A 10km long, 0.25m diameter carbon-steel pipeline, buried to a depth of 1.4m
  - Cathodic Protection (CP) system, which protects the pipeline against corrosion by an impressed current CP system, requiring a ground bed, transformer/rectifier cabinet a power supply, along with buried sacrificial anodes at various locations along the pipeline;
  - Pipeline marking: Markers will be place at strategic locations along the length of the pipeline using industry standard marker posts;
  - A High-Pressure Customer Metering Station (HPCMS) approximately 14 x 18 m in surface area and 4m tall, with a block valve to control flow, housed on the Consol property enclosed by wall and access controlled as per all other Consol factory infrastructure.
- Temporary infrastructure:
  - 10km trenches, approximately 0.9m wide;
  - Pig dumps: Areas along the route for storage of pipe and associated materials;
  - Temporary construction compounds or laydown areas; and
  - Entry and exit camps where the HDD method is employed, to house the entrance and exit pits, along with control infrastructure and drilling rig.

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	**YES** **X**	Other, specify	

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

YES **X**	

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

- A Section 21 (c and i) water use as per the National Water Act (Act No 36 of 1998) will be applicable for the development. A General Authorisation (GA) registration application will be submitted to the Department of Water and Sanitation (DWS) in terms of the National Water Act and GN267.
- In addition, comments will be obtained from SAHRA under Section 38 of the National Heritage Resources (Act 25 of 1999) along with the completion of a Phase I Heritage Impact Assessment.

If yes, have you applied for the authorisation(s)?	**YES X (In Process)**
If yes, have you received approval(s)? (attach in appropriate appendix)	**NO X**

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 (refer to **Table 4** and **Table 5** below):

Table 4: All applicable legislation, policies and/or guidelines to the development of the proposed project and associated infrastructure

Legislation and date promulgated	Applicable Requirements	Relevant Authority
National Environmental Management Act (Act No. 107 of 1998) Date Promulgated - 27 November 1998	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GNR 327 of April 2017 a Basic Assessment Process is required to be undertaken for the proposed project.	» Gauteng Department of Agriculture and Rural Development (GDARD) – competent authority
National Environmental Management Act (Act No. 107 of 1998) Date Promulgated - 27 November 1998	In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.	» Gauteng Department of Agriculture and Rural Development (GDARD) – competent authority
National Environmental Management: Biodiversity Act (Act No. 10 of 2004) Date Promulgated - 07 June 1998	Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process. Three government notices have been published in terms of Section 56(1) of NEM:BA as follows: » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152).	» Gauteng Department of Agriculture and Rural Development (GDARD) – competent authority

Legislation and date promulgated	Applicable Requirements	Relevant Authority
	It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).	
National Environmental Management: Air Quality Act (Act No. 39 of 2004) Date Promulgated - 25 February 2005	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas.	» City of Ekurhuleni Metropolitan Municipality
National Water Act (Act No. 36 of 1998) Date Promulgated - 26 August 1998	Water uses under S21 of the Act must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.	» Department of Water and Sanitation (DWS).
Environment Conservation Act (Act No. 73 of 1989) Date Promulgated - 09 June 1989	In terms of section 25 of the ECA, the national noise-control regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The NCRs were revised under Government Notice Number R55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996, legislative responsibility for administering the noise control regulations was devolved to provincial and local authorities. Provincial Noise Control Regulations exist in the Free State, Western Cape and Gauteng provinces. Allows the Minister of Environmental Affairs to make regulations regarding noise, among other concerns.	» Gauteng Department of Agriculture and Rural Development (GDARD) » City of Ekurhuleni Metropolitan Municipality
National Forests Act (Act No. 84 of 1998)	According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 536.	» Department of Agriculture, Forestry and Fisheries (DAFF).

Legislation and date promulgated	Applicable Requirements	Relevant Authority
Date Promulgated - 30 October 1998	The prohibitions provide that "no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister".	» Gauteng Department of Agriculture and Rural Development (GDARD)
National Veld and Forest Fire Act (Act 101 of 1998) Date Promulgated - 27 November 1998	Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it. Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires; and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.	» Department of Agriculture, Forestry and Fisheries (DAFF).
Conservation of Agricultural Resources Act (CARA) (Act No 43 of 1983)	Regulation 15 of GN R1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GN R1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories: » Category 1 plants: are prohibited and must be controlled. » Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. » Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may re-main, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands. These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E.	» Department of Agriculture, Forestry and Fisheries (DAFF).
Hazardous Substances Act (Act No. 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising, or inflammable nature or the generation of pressure thereby in certain	» Department of Health

Legislation and date promulgated	Applicable Requirements	Relevant Authority
Date Promulgated - 04 April 1973	instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance; » Group IV: any electronic product; » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.	
National Heritage Resources Act, 1999 Date Promulgated: April 1999	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Our heritage is unique and precious and it cannot be renewed.	» Gauteng Department of Arts and Culture. » SAHRA
Gas Act (Act 48, 200) Date Promulgated- 21 February 2002	» Some of the objectives of the act are to: promote the efficient, effective, sustainable and orderly development and operation of gas transmission, storage, distribution, liquefaction and re-gasification facilities. Ensure the safe, efficient, economic and environmentally responsible transmission, distribution, storage, liquefaction and re-gasification of gas. » A gas regulator in accordance with this act, must issue a license for the construction of gas transmission, storage, liquefication, distribution and re gasification facilities.	» Department of Energy
Gauteng Provincial Environmental Management Framework Date Promulgated - November 2014	The Gauteng Provincial Environmental Management Framework is a legal instrument in terms of the Environmental Management Framework Regulations, 2010. The purpose of the regulations is to assist environmental impact management including EIA processes, spatial planning and sustainable development.	» Gauteng Department of Agriculture and Rural Development (GDARD)

Legislation and date promulgated	Applicable Requirements	Relevant Authority
	The objective of the framework is to promote efficient urban development (including associated service infrastructure) in defined selected areas with lower environmental concerns and high development demand.	
Gauteng Noise Control Regulations (1999) Date Promulgated - 20 August 1999	Acknowledges the role of the Gauteng Province to take effective measures to support local government. The document aims to: » Provide a uniform minimum standard for noise regulation in the Province; » Accommodate the specific circumstances of different neighbourhoods and areas; and » Create new mechanisms for effective enforcement in neighbourhoods. In the Gauteng Noise Control Regulations of 1999, a disturbing noise refer to a noise level that causes the ambient noise level to rise above the designated zone level, or if no zone level has been designated, the typical rating levels for ambient noise in districts, indicated in table 2 of SABS 0103.	» City of Ekurhuleni Metropolitan Municipality
Service Delivery Charter and Standards for the Gauteng Department of Agriculture, Conservation and Environment Date Promulgated - 2014	The following strategic objectives must be implemented: » The facilitation of sustainable development in Gauteng by ensuring sustainable land uses (including infrastructure development) and land use patterns. » To contribute to sustainable development and quality of life by promoting a safe and healthy living environment.	» Gauteng Department of Agriculture and Rural Development (GDARD)

Table 5: Description of compliance with the relevant legislation, policy or guideline

Legislation	Compliance requirements
National Environmental Management Act (Act No. 107 of 1998)	The listed activities triggered by the proposed project have been identified and assessed in the BA process being undertaken. This BA Report will be submitted to the competent and commenting authority in support of the application for authorisation.
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species. An ecological impact assessment has been undertaken as part of the BA Report (refer to **Appendix G1**). As such the potential occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered. A permit may be required should any listed plant species be disturbed or destroyed as a result of the proposed project. **No species of conservation concern under this Act have been identified on site.**
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr (refer to **Appendix H**).
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	No permitting or licensing requirements arise from this legislation. The EMPr however makes provision for managing and mitigating potential dust impacts (refer to **Appendix H**).
National Water Act (Act No. 36 of 1998)	A General Authorisation (GA) is required in terms of Section 21(c and i) of the National Water Act for impeding or diverting the flow of water in a watercourse; and Altering the bed, banks, course or characteristics of a water course.
Environment Conservation Act (Act No. 73 of 1989)	Noise impacts are expected to be associated with the construction phase of the project and are not likely to present an intrusion to the local community. There is no requirement for a noise permit in terms of the legislation.
National Forests Act (Act No. 84 of 1998)	A permit or license is required if protected tree species and/or indigenous tree species within a natural forest are destroyed.
National Veld and Forest Fire Act (Act 101 of 1998)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction and operation phase of the project. The relevant management and mitigation measures have been included in the EMPr (refer to **Appendix H**).
Conservation of Agricultural Resources Act (CARA) (Act No 43 of 1983)	While no permitting or licensing requirements arise from this legislation, this Act is applicable during the BA process and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. The EMPr provides measures for soil erosion and weed control and management (refer to **Appendix H**).
Hazardous Substances Act (Act No. 15 of 1973)	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license could be required to be obtained from the Department of Health.
Gas Act (Act 48 of 2001)	Prior to the construction of the transmission pipeline, a license should be applied for and issued by the Gas Regulator.

Legislation	Compliance requirements
Nation Heritage Resources Act (1999)	Heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities. The Phase I Heritage Assessment has been conducted for this project (refer to Appendix G3) and comment requested from SAHRA during the draft BAR disclosure period.
Gauteng Provincial Environmental Management Framework	The development of the project will aid in reducing the indirect demand on the national grid for electricity in the smelting operations. The development is therefore compliant with the relevant planning for the area. No further compliance requirements are applicable.
Gauteng Noise Control Regulations (1999)	Noise impacts are expected to be associated with the construction and operation phases of the project and are not likely to present a significant intrusion to the local community. There is therefore no requirement for a noise permit in terms of the legislation.
Service Delivery Charter and Standards for the Gauteng Department of Agriculture, Conservation and Environment	The project will enable adequate and reliable energy supply to the Consol factory and allow other companies to take advantage of Natural Gas and the cost-effectiveness of Natural Gas a fuel source.

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

Initial feasibility work considered 5 alternative routes, with only route C proving to be viable. This is due to various land use requirements which did not allow for the other routes to go ahead. Subsequently, only route C is proposed in this application as the preferred and only feasible alternative. Route C is approximately 10 km length (0.25m in width).

Provide a description of the alternatives[1] considered

[1] Only the preferred location (i.e. project site) and the preferred technology for the development of the project have been considered. No alternatives have been assessed other than the preferred alternatives identified.

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
	Location Alternative	
1	Location - Alternative 1 **(Preferred Alternative)**	Route C is the preferred and only alternative and is approxiametaly 10km in length (0.25m in width).Initial feasibility work assessed 5 alternative routes, with only route C proving to be viable. One of the other routes, Route D, was initially also investigated but was eliminated early in the process due to various land use requirements which did not allow for it or any of the other routes to go ahead. Subsequently, only route C is proposed in this application as the preferred and only feasible alternative.
	Design Alternative	
2	Design - Preferred alternative (Alternative 1)	The project will make use of an underground carbon steel piepline that will be used for the transmission of natural gas. This pipeline will require trenching for most of the route and will be located underground. Specific section of the pipeline route which involves some water crossing will be installed with horisontal drilling. Horizontal drilling does not require trenches and does not disrupt the land surface.
	Design - Alternative 2	The second alternative to the proposed design is an above ground carbon steel pipeline. Safety concerns related to the transmission of compressed gas necessitated the methodology of underground pipe laying (i.e. no surface pipe laying) for the entirety of the proposed pipeline length. This is to avoid access to the pipeline and potential tampering with the pipe, possibly leading to loss of life and emergency incidents.
	Technology Alternative	
No technology alternatives are propsed for the pipeline. The technology of the gas transmission pipeline is based on the specific requirements for this project and is considered to be the most sustainable solution. Due to the nature of the project, only a carbon steel pipeline will be feasable.		
2	Alternative 1	
3	Alternative 2	
	Etc.	

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

Route C is the only alternative in terms of location.
Initial feasibility work assessed five (5) alternative routes, with only route C proving to be viable. This is due to various land use requirements which did not allow for the other routes to go ahead. Subsequently, only

route C is proposed in this application as the preferred and only feasible alternative. Route C is approximately 10 km length (0.25m in width).

Route D is no longer feaible due to landowner concerns as this pipeline would run through a densely populated area. Route C is prefered from a safety perspective as this route is situated in a less densly populated area. Route D would also need to travers a large wetland and a risk assessment conducted identified such crossing as a high risk, where the smaller wetland crossing in Route C indicated low risks (i.e. Route D was least preferred from a wetland impact risk).

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:

	Size of the activity:
Proposed activity ***(Total environmental landscaping, parking, etc.) and the building footprint)***	- Carbon steel pipeline: 10km in length, 0.25 m diameter - A High-Pressure Customer Metering Station: 14m x 18m and 4m tall
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	

Ha/ m^2

or, for linear activities:

	Length of the activity:
Proposed activity	10km pipeline
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	

m/km

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

	Size of the site/servitude:
Proposed activity	0.9 m wide
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	

Ha/m^2

5. Site Access

Proposal

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

The pipeline route utilises the road reserve for its entire length. The pipeline route runs adjacent to Valkfontein Road (M45) for approximately 1,5km and Nigel Dunnottar Road for approximately 7,4km. The pipeline route also utilises Annan and Chaplan Avenues for small sections of the route.

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).

The position of the access road in relation to the project site has been illustrated in the Layout and Environmental Sensitivity Map included in **Appendix A3.**

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?	YES	NO
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

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

Does ready access to the site exist, or is access directly from an existing road?	YES	NO
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

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	**0**	Number of times	(only complete when applicable)

6. Layout or Route Plan

Layout and sensitivity mapping

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):
- Rivers and wetlands;
- the 1:100 and 1:50 year flood line;
- ridges;
- cultural and historical features;
- 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)

A layout map has been included as **Appendix A2** and is included as **Figure 4-5** below. A layout map overlain with the environmental sensitivities of the broader area and in close vicinity of the site has been included as **Appendix A3** and **Appendix A4**. Refer to **Figure 7** below for the sensitivity maps.

Locality Mapping (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.

A locality map has been as **Appendix A1** and **Figure 1**.

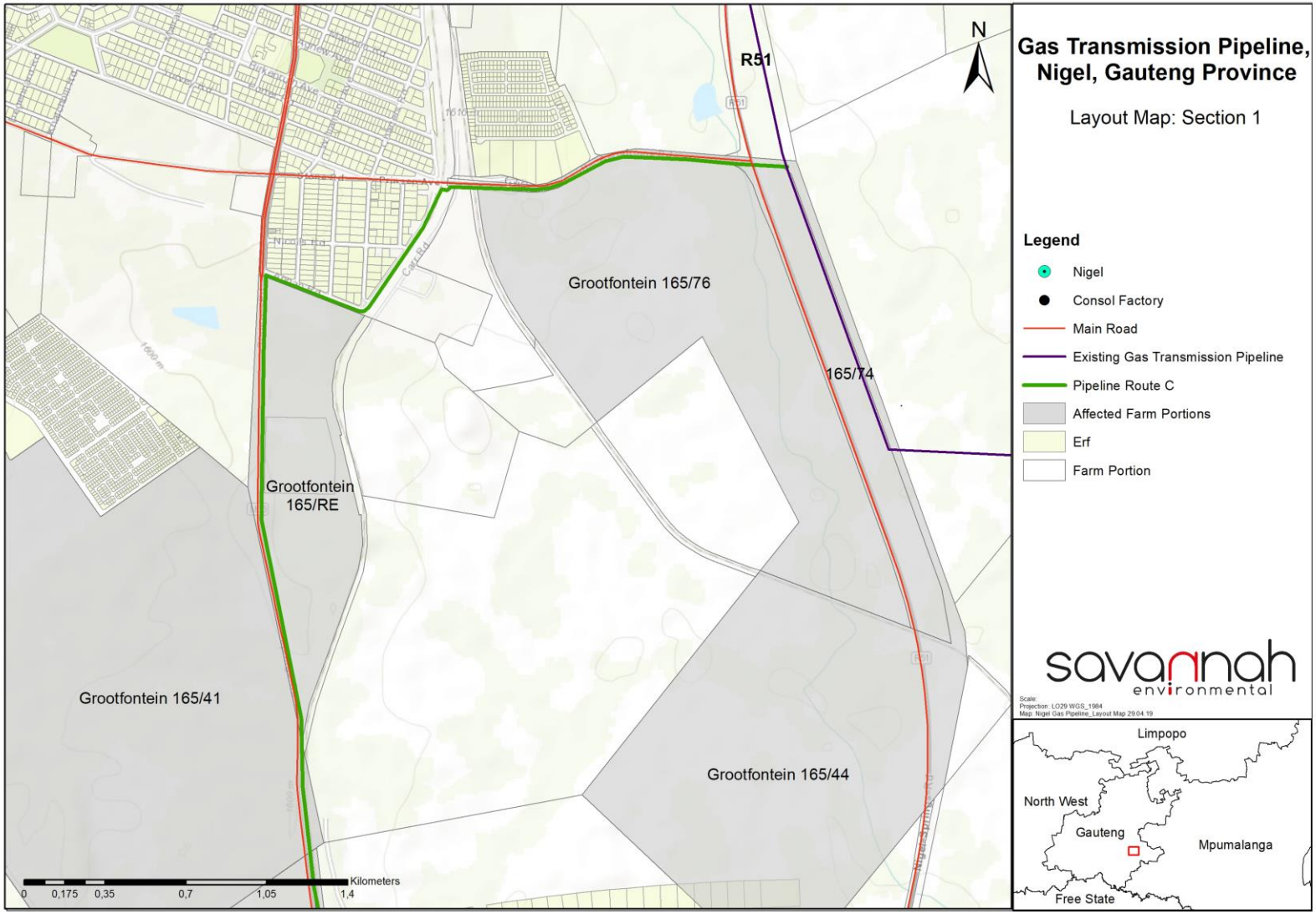

Figure 4: Map illustrating Section 1 of the proposed layout located within the project site (refer to **Appendix A2**).

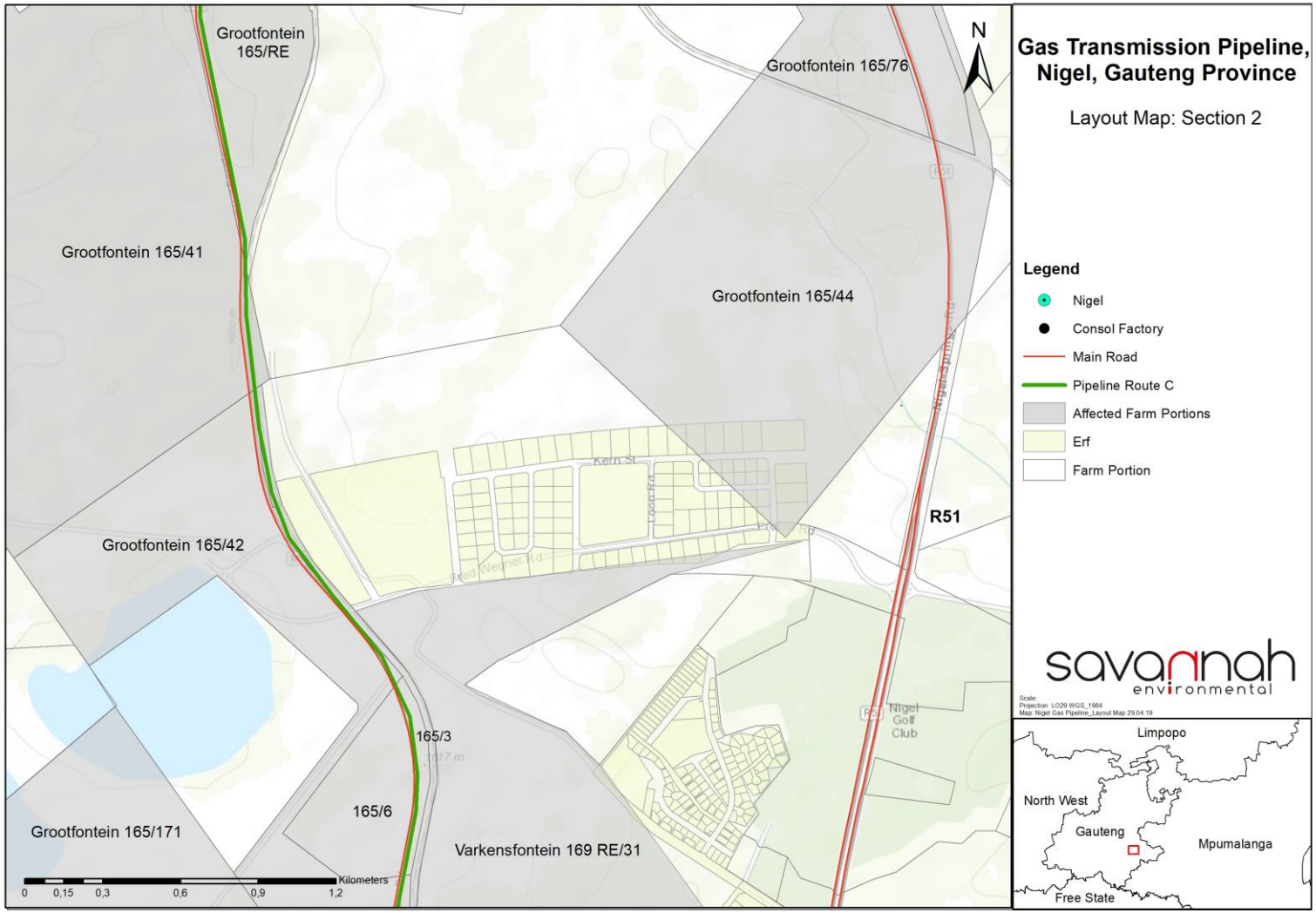

Figure 5: Map illustrating Section 2 of the proposed layout located within the project site (refer to **Appendix A2**).

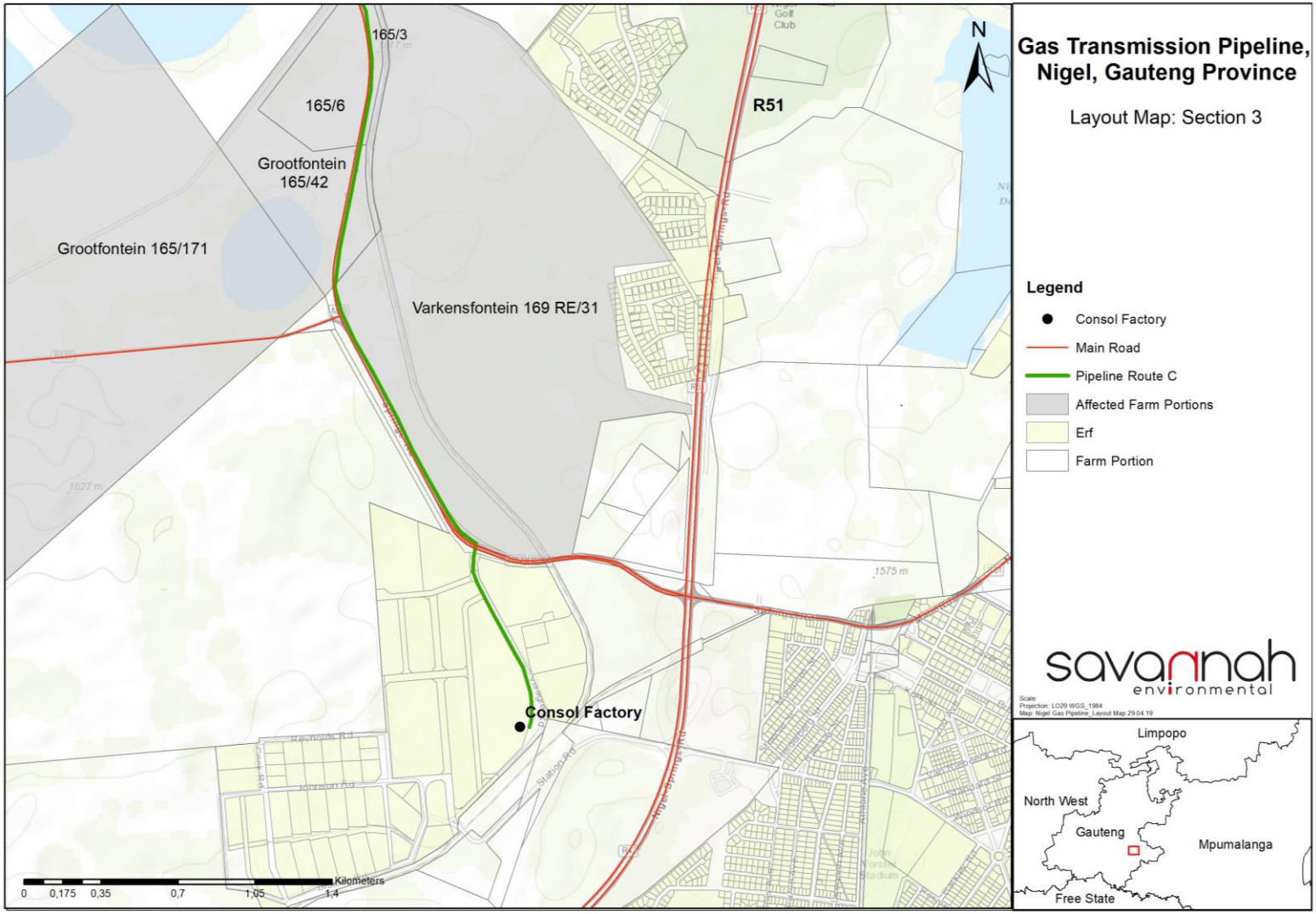

Figure 6: Map illustrating Section 3 of the proposed layout located within the project site (refer to **Appendix A2**).

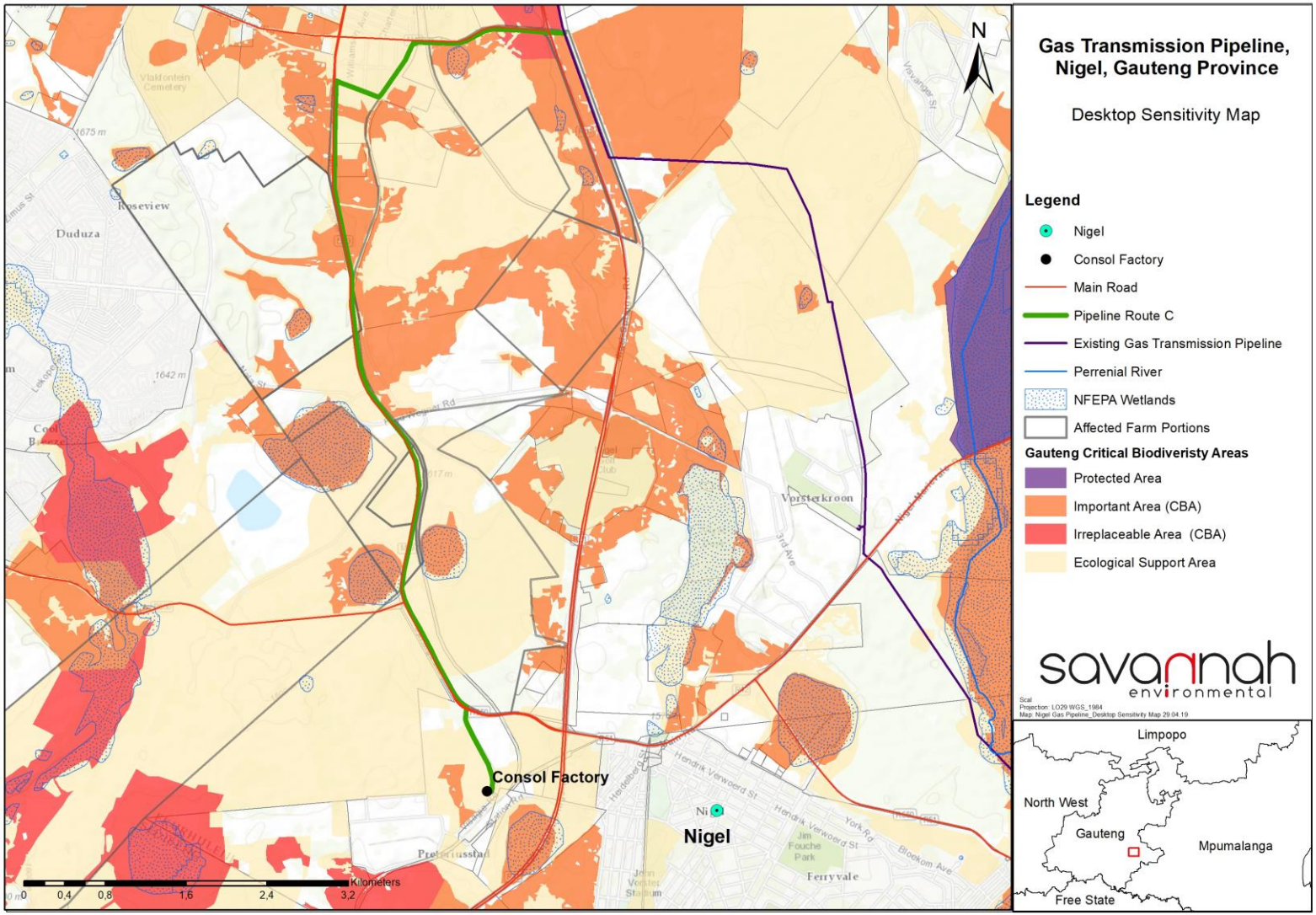

Figure 7: Map illustrating the sensitivity (in terms of CBAa and ESAs) of the the site (refer to **Appendix A4**).

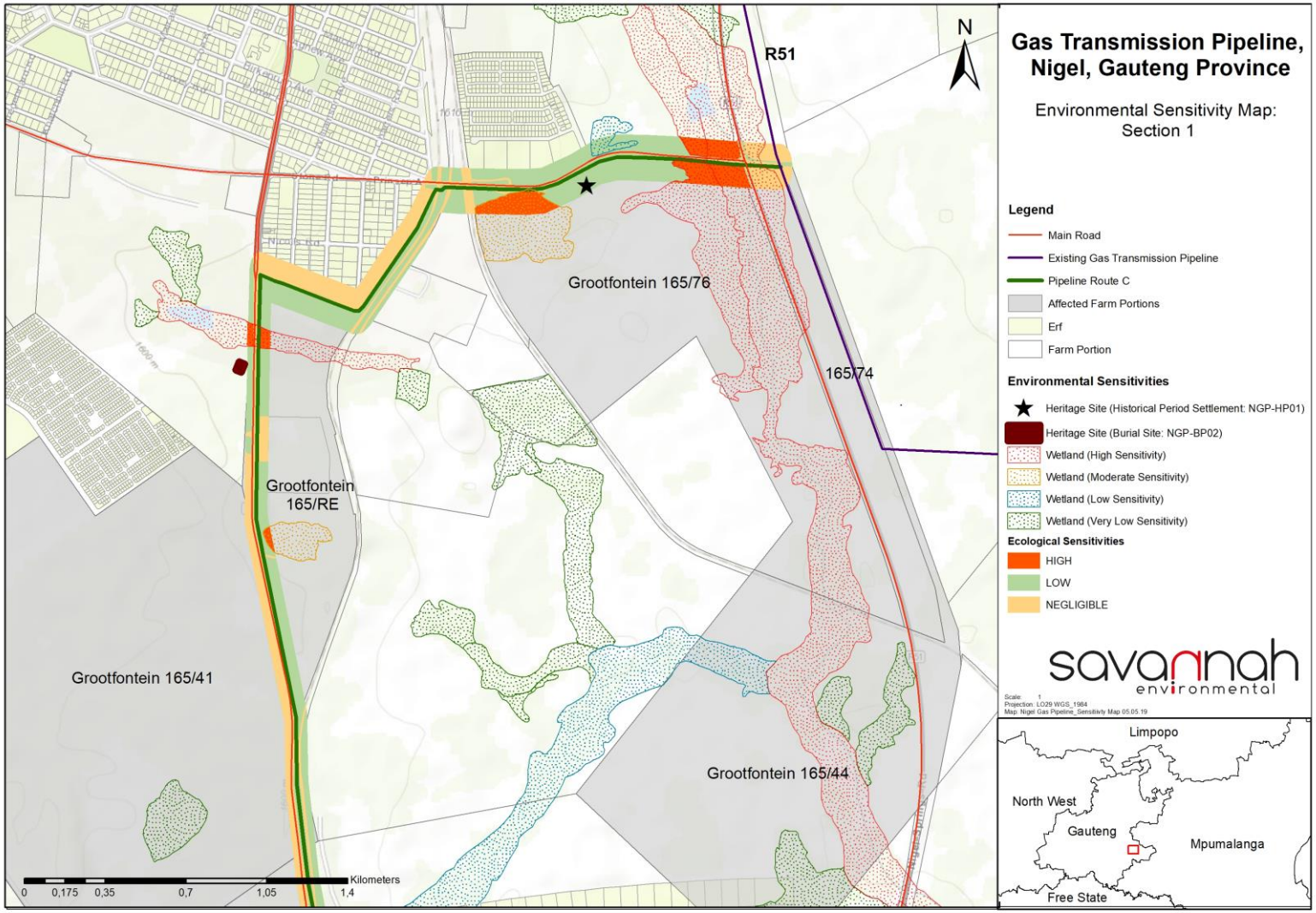

Figure 8: Map illustrating Section 1 of the pipeline and the environmental sensitivities of the site (refer to **Appendix A4**).

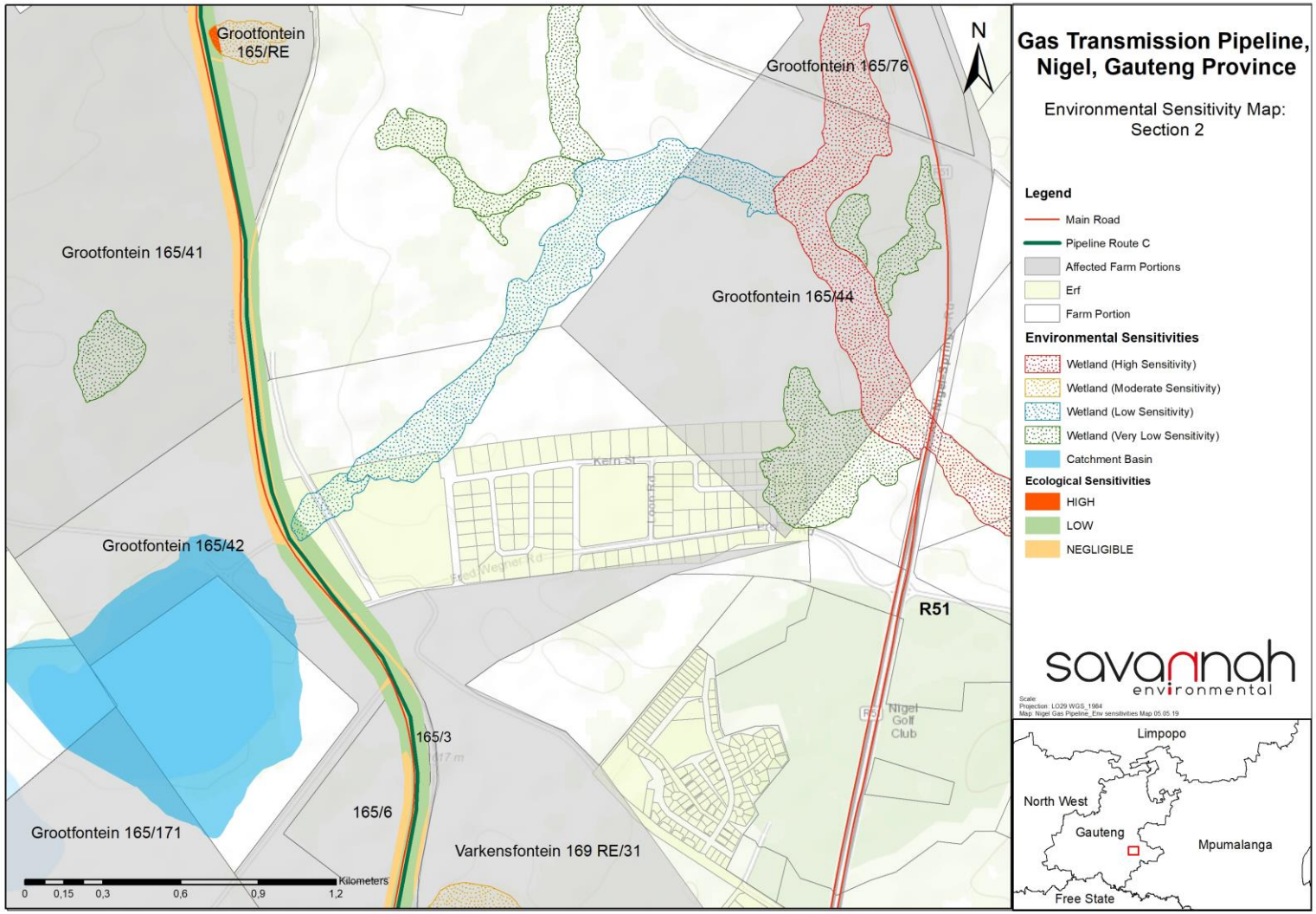

Figure 9: Map illustrating Section 2 of the pipeline and the environmental sensitivities of the site (refer to **Appendix A4**).

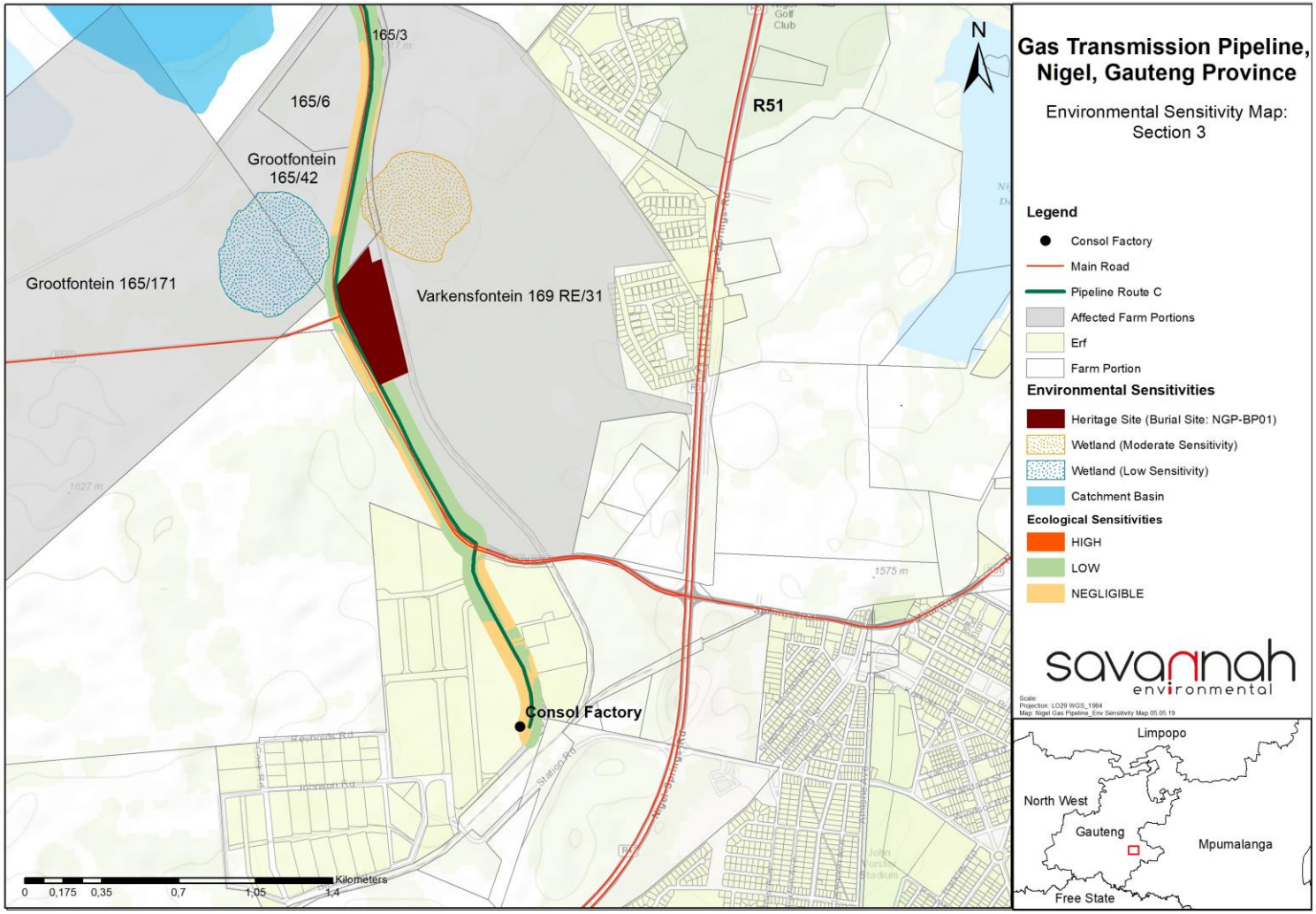

Figure 10: Map illustrating Section 3 of the pipeline and the environmental sensitivities of the site (refer to **Appendix A4**).

7. Site Photographs

Colour photographs from the centre 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.

Site photographs taken from the centre of the site have been included as **Appendix B**. Additional photographs have also been included to provide additional visual aid of the area.

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.

An illustration of the gas pipeline, and associated infrastructure to be developed for project has been included as **Appendix C**.

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 **0** times.

All linear activities are located within the same enivronment is therefore this section has not been completed more than once.

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 alterative 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) **0** times.

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

1) All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
2) All significantly different environments identified for Alternative 2 is to be completed and attached in chronological order, etc.

Section B - Section of Route **N/A** (complete only when appropriate for above)

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

No linear infrastructure alternatives or location alternatives are being considered for the project as motivated in Section A (3).

1. Property Description

Table 6 provides more detail of the affected property.

Table 6: Details of the affected property.

Province	Gauteng Province
Municipality	Ekurhuleni Metropolitan Municipality
Ward number(s)	Ward 88, 98, 111
Nearest town(s)	The project site is located in Nigel, and runs adjacent to Valkfontein Road (M45) for approximately 1,5km and Nigel Dunnottar Road for approximately 7,4km.
Farm name(s) and number(s)	- Varkensfontein 169 RE of portion 31 - Grootfontein 165 portion 42 - Grootfontein 165 portion 6 - Grootfontein 165 portion 3 - Grootfontein 165 portion 41/RE - Grootfontein 165 RE - Grootfontein 165 portion RE/46 - Grootfontein 165 Portion 76 - Grootfontein 165 Portion 74 - Grootfontein 165 Portion 44 - Grootfontein 165 Portion 75 - Grootfontein 165 Portion 46
SG 21 Digit Code	Surveyor-General Database » T0IR00000000016900031 » T0IR00000000016500042 » T0IR00000000016500006 » T0IR00000000016500003 » T0IR00000000016500041 » T0IR00000000016500000 » T0IR00000000016500046 » T0IR00000000016500076 » T0IR00000000016500074 » T0IR00000000016500044 » T0IR00000000016500075 » T0IR00000000016500046

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 development footprint):	**Latitude (S):**	**Longitude (E):**

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitude (E):**
☐ Starting point of the activity	26°21'10.94"S	28°27'23.92"E
☐ Middle point of the activity	26°22'0.10"S	28°26'1.78"E

End point of the activity	26°25'14.11"S,	28°26'56.72"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

Proposal	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	9	0	0	0	3	1
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	0	6
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	0	3
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	4	1
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	0	0
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	4	6
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	7	6
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	7	4
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	4	4
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	7	5
	T	0	I	R	0	0	0	0	0	0	0	0	0	1	6	5	0	0	0	4	6
ALT. 1																					
ALT. 2																					
etc.																					

3. Gradient of the Site

Indicate the general gradient of the site.

Flat	~~1:50 – 1:20~~	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

4. Location in Landscape

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

~~Ridgeline~~	~~Plateau~~	~~Side slope of hill/ridge~~	~~Valley~~	**Plain**	~~Undulating plain/low hills~~	~~River front~~

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 X**	
Dolomite, sinkhole or doline areas		**NO X**

Seasonally wet soils (often close to water bodies)	YES X	
Unstable rocky slopes or steep slopes with loose soil		NO X
Dispersive soils (soils that dissolve in water)		NO X
Soils with high clay content (clay fraction more than 40%)		NO X
Any other unstable soil or geological feature		NO X
An area sensitive to erosion		NO X

(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) NO X

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):**
°	°

c) Are any caves located within a 300m radius of the site(s) NO X

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):**
°	°

d) Are any sinkholes located within a 300m radius of the site(s) NO X

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 X** **PORTIONS OF THE SITE FALLS ACROSS GAPA V3 HIGH ZONES, HOWEVER THE PROJECT INFRASTRUCTURE**

REMAINS WITHING THE ROAD RESERVE AND WILL NOT REDUCE HIGH AGRICULTURAL POTENTIAL AREAS WITHIN THE REGION	

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).

7.1 Regional context

The project occurs entirely within the Grassland Biome (Mucina & Rutherford, 2012), which occurs from just north of Bisho in the Eastern Cape, to the Free-State border near Kimberley, to Pretoria in the north and Pietermaritzburg in the East. The bioregion within this biome – the Mesic Highveld Grassland Bioregion – furthermore occurs mainly in eastern, wetter areas of the Highveld, reaching towards the northern escarpment, straddling the border of the Grassland and Savanna Biome in the north. This Bioregion is comprised of 'sour' grasslands, with the various vegetation units generally distinguished by geology and substrate, elevation, topography and rainfall characteristics.

7.1.1 SANBI vegetation classification: Tsakane Clay Grassland (GM9)

Mucina and Rutherford (2012) developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project, to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than was available prior to their work. A national map was developed using large quantities of data from several contributors and has allowed for the best national vegetation map to date, the last being that of Acocks, developed over 50 years ago. The SANBI Vegetation map informs finer scale bioregional plans such as STEP and had two main aims:

- "To determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
- To compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason, the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible."

The result of the abovementioned work described each vegetation type in detail, showing the most important taxa, endemic species and any species that carry bioregional importance, and represents that most comprehensive dataset for vegetation types in South Africa to date. The Tsakane Clay Grassland

occupies the entirety of the site according to the vegetation classification (Figure 5.1), and is described in greater detail below.

7.1.2 Distribution

Tsakane Clay Grassland occurs mainly in the Gauteng and Mpumalanga provinces, with patches extending in a narrow band between Springs and Soweto, southwards towards Nigel and as far as Vereeniging. The grassland also occurs north of the Vaal Dam, and between Balfour and Standerton, and preferentially occurs at altitude ranging from 1 480 – 1 680 m (Mucina and Rutherford, 2012).

Please refer to Appendix G1 for a map depicting the Mucina and Rutherford (2012) vegetation classification overlaid onto the proposed pipeline route.

7.1.3 Vegetation & Landscape Features

This vegetation type occurs predominantly on flat to slightly undulating plains and low hills, and is short and dense in structure. Tsakane Clay Grassland is dominated by a mixture of common highveld grasses such as Themeda triandra, Heteropogon contortus, Elionurus muticus and a variety of Eragrostis species (Mucina and Rutherford, 2012). The forbs most common are of the families Asteraceae, Rubiaceae, Malvaceae, Lamiaceae and Fabaceae. Disturbance in this vegetation type allows for an increase in abundance of Hyparrhenia hirta and Eragrostis chloromelas (Mucina and Rutherford, 2012).

7.1.4. Geology & Soils

This vegetation unit is contained generally on regions where the most dominant rock is basaltic lava of the Klipriviersberg Group (Ventersdorp Supergroup), together with the sedimentary rocks of the Madzaringwe Formation of the Karoo Supergroup. Soils are typical of the Ba and Bb land types (Mucina and Rutherford, 2012).

7.1.5. Climate

Climate within the regions where this vegetation type occurs is strongly seasonal, with summer rainfall and very dry winters. Mean annual precipitation ranges between 630–720 mm, with a mean annual temperature of 15°C indicating the transitional nature between a cool-temperate and warm-temperate climate (Mucina and Rutherford, 2012).

7.1.6. Important Taxa

According to Mucina and Rutherford (2012), the following important taxa are characteristic of this vegetation type (Table 7.1):

Growth Form	Taxon name	Family
Graminoids	*Brachiaria serrata*	POACEAE
Graminoids	*Cynodon dactylon*	POACEAE
Graminoids	*Cynodon hirsutus*	POACEAE
Graminoids	*Digitaria ternata*	POACEAE

Graminoids	*Elionurus muticus*	POACEAE
Graminoids	*Eragrostis chloromelas*	POACEAE
Graminoids	*Eragrostis patentipilosa*	POACEAE
Graminoids	*Eragrostis plana*	POACEAE
Graminoids	*Eragrostis racemosa*	POACEAE
Graminoids	*Heteropogon contortus*	POACEAE
Graminoids	*Hyparrhenia hirta*	POACEAE
Graminoids	*Microchloa caffra*	POACEAE
Graminoids	*Setaria sphacelata*	POACEAE
Graminoids	*Themeda triandra*	POACEAE
Graminoids	*Trachypogon spicatus*	POACEAE
Graminoids	*Abildgaardia ovata*	CYPERACEAE
Graminoids	*Andropogon schirensis*	POACEAE
Graminoids	*Cymbopogon caesius*	POACEAE
Graminoids	*Diheteropogon amplectens*	POACEAE
Graminoids	*Melinis nerviglumis*	POACEAE
Graminoids	*Panicum gilvum*	POACEAE
Graminoids	*Setaria nigrirostris*	POACEAE
Herbs	*Acanthospermum australe*	ASTERACEAE
Herbs	*Ajuga ophrydis*	LAMIACEAE
Herbs	*Eriosema salignum*	FABACEAE
Herbs	*Euryops transvaalensis subsp. transvaalensis*	ASTERACEAE
Herbs	*Gerbera viridifolia*	ASTERACEAE
Herbs	*Helichrysum nudifolium var. nudifolium*	ASTERACEAE
Herbs	*Helichrysum rugulosum*	ASTERACEAE
Herbs	*Hermannia depressa*	MALVACEAE
Herbs	*Lotononis macrosepala*	FABACEAE
Herbs	*Nidorella hottentotica*	ASTERACEAE
Herbs	*Pentanisia prunelloides subsp. latifolia*	RUBIACEAE
Herbs	*Peucedanum caffrum*	APIACEAE
Herbs	*Rotheca hirsuta*	LAMIACEAE
Herbs	*Selago paniculata*	SCROPHULARIACEAE
Herbs	*Senecio coronatus*	ASTERACEAE
Herbs	*Senecio inornatus*	ASTERACEAE
Herbs	*Sonchus nanus*	ASTERACEAE
Herbs	*Vernonia oligocephala*	ASTERACEAE
Geophytic Herbs	*Aspidoglossum ovalifolium*	APOCYNACEAE
Geophytic Herbs	*Hypoxis rigidula var. pilosissima*	HYPOXIDACEAE
Semiparasitic Herb	*Striga asiatica*	OROBANCHACEAE
Low Shrubs	*Anthospermum rigidum subsp. pumilum*	RUBIACEAE
Low Shrubs	*Chaetacanthus setiger*	ACANTHACEAE
Low Shrubs	*Tephrosia capensis var. acutifolia*	FABACEAE
Semiparasitic Shrub	*Thesium impeditum*	SANTALACEAE

7.1.7. Conservation status

According to Mucina and Rutherford (2012), the conservation status of Tsakane Clay Grassland is Endangered (EN), with only 1.5% of the 24% conservation target conserved in 2012, mainly in the Suikerbosrand, Olifantsvlei, Klipriviersberg and Marievale Nature Reserves, with some minor patches in private reserves. The main threats to this vegetation type are transformation by cultivation, which had transformed approximately 60% of the distribution already, along with mining, dam-building and road development and operation. Large portions of Alberton, Springs, Tsakane and part of Soweto (all south and east of Johannesburg) were built in the area of this vegetation unit. Increasing urbanisation, especially in the south of Johannesburg and near the East Rand (Brakpan district) will increase pressure on the remaining vegetation. Erosion across this vegetation unit is generally very low or low.

7.1.8 Current disturbance on site

A wide variety of historical and ongoing disturbances are currently experienced by all three vegetation units found by the ecological specialist on site. These are detailed further below:

- Mowing: ongoing mowing of the road reserve is being conducted by the local municipality, in order to increase visibility and ease of maintenance of the road and the road verge. This continued mowing alters the species composition and abundance and is a regular disturbance in these areas.
- Invasive species: A wide variety of woody, shrub and herbaceous invasive species are present throughout site, possibly due to their historical introduction from earthworks associated with the road verge maintenance, the construction of bridge and railroad infrastructure, and the frequent foot traffic throughout the site.
- Burning: Evidence of fires were found on site, near bridge structures, and on aerial imagery where widescale burning had occurred. These fires may be started for heat or firebreaks, or accidentally via pedestrians traversing the project area, and inadvertently influences the species composition and abundance by promoting the greater occurrence and density of grass species.
- Foot traffic: Pedestrian footpaths are almost ubiquitous throughout site as people use the road, road verge and open areas to commute. While small amounts of vegetation are lost this way, secondary impacts (dumping, fires, litter) are strongly related to an increase in pedestrian presence. These in turn alter species composition and abundance.
- Washing in rivers: The site visit confirmed ongoing use of the rivers to wash clothes, and materials (in the case of informal traders). These activities degrade the water quality of these surface water features and contribute to the decline in aquatic wetland vegetation quality, quantity and species diversity.
- Old pipeline reserves: Historical pipelines were observed near the intersection of John Mackie drive and Visagie Weg, as well as within the northern wetland area near Dunnottar road and the Nigel-Springs Road. This historic infrastructure has had a small, but lasting influence on drainage and vegetation patterns within the areas, thus contributing to the historical degradation of the site.
- Cattle grazing: Large scale cattle grazing (in excess of 100 heads of cattle) was observed on site, directly within the road reserve and the proposed pipeline path. Such grazing alters the species composition found on site.
- Derelict roads and vehicles stopping adjacent the road: Numerous old, derelict roads are evident throughout site where access was required once and no longer used. These roads are mostly dirt roads, with two derelict tar roads found. The construction of these roads, their road verge

maintenance and the construction of their associated stormwater features would have impacted of the species composition along the proposed pipeline route.

- » Illegal dumping: Illegal dumping was evident throughout the project site where anything from domestic waste to building rubble was deposited in the road reserve and open areas. These contribute to ongoing degradation of the vegetation on site.
- » Clearing: Denuded, bare areas used historically for construction laydown areas were evident on site, specifically near the M45 and R51 where a new commercial park was created since 2016 (as observed on aerial imagery and confirmed on site). These areas show a very high degree of invasive species due to the earthworks and associated disturbance from that construction, but also remain largely denuded as rehabilitation efforts were not conducted adequately. Subsequently cleared areas are evident along some portions of the proposed pipeline route.
- » Road verge grading: Evidence of grading was observed on site where road verges were graded following strong rainfall events and subsequent erosion. These areas are subsequently entirely denuded and mostly highly occupied by invasive species.

7.1.9 Ecological Assessment Results

A total of 45 native vegetation species were identified within the proposed pipeline route, consisting mainly of mixed grass species commonly occurring in the highveld region. In addition, a total of 43 invasive vegetation species were observed, primarily in regions where the greatest historical and ongoing disturbance was evident. All of the native species observed were classified as Least Concern (LC) according to the SANBI red data list (2019) and were not considered to be sensitive species on that basis. No plant Species of Conservation Concern were identified on site. Forty-three (43) invasive species were observed on site found predominantly where historical construction activities had occurred.

At present, the site is deemed highly disturbed due to ongoing disturbance through fires, invasive species, grazing, illegal dumping, pedestrian movements, road verge maintenance, historical infrastructure and recent construction. The site remains unfenced and open to the public which promotes ongoing impacts identical to those just mentioned. No sensitive Species of Conservation Concern were observed on site, with the remainder of the species observed regarded as Least Concern (LC) in terms of their conservation status. Overall the ecological contribution of the site was deemed to be low, with no sensitive species observed and few ecological process areas and habitats due to the small size and highly disturbed character of the proposed site.

Please refer to Appendix G1 for a complete listing and description of the ecological condition on site.

7.2 Gauteng Conservation Plan (C-Plan)

The Gauteng C-Plan is based on the systematic conservation protocol developed by Margules and Pressey (2000) and is based on the principles of complementarity, efficiency, defensibility and flexibility, irreplaceability, retention, persistence and accountability. Ultimately, the tool resulted in systematic classification and mapping of the Gauteng region, taking a vast array of ecological and land use factors into account.

The main purposes of the C-Plan are:

- » To serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process;
- » To inform protected area expansion and biodiversity stewardship programmes in the province;
- » To serve as a basis for development of Bioregional Plans in municipalities within the province.

As such, the plan delineates Critical Biodiversity Areas (CBA's), and Ecological Support Area (ESA) for the entire province, to be used by private and public entities to guide land use decisions within Gauteng.

The Gauteng C-Plan shows that the project area occurs within approximately 2 186m (21%) of the Critical Biodiversity Area (CBA), whereas a further 6 578m (62%) occurs within an Ecological Support Area, with the remaining 17% unallocated according the C-Plan categorisation. In addition, approximately 600m of the proposed pipeline route occurs within "Irreplaceable Area", with the remainder of the route identified as "Important Areas" or Ecological Support Areas.

According to the Gauteng C-Plan, CBA and ESA areas occur within the proposed pipeline route, and occur on all three vegetation units identified. However, based on the fieldwork results and sensitivity assessment above, it was determined that where all three vegetation units occurred in regions classified as CBA by the Gauteng C-Plan, the CBA classification does not correspond to the real-world condition of the plant and animal species observed on site, and therefore contributes moderately-to-poorly to the ecological function of the broader area. This is most applicable to the mixed invasive woodland vegetation unit, and least applicable for the wetland vegetation unit, however, overall no functional CBA zone was determined present on any of the vegetation units - as confirmed by the site assessment results.

Furthermore, while the vegetation type deemed to be present on site has a high conservation value according to Mucina and Rutherford (2012), the highly degraded real-world condition of the vegetation units observed on site confirmed a modest overall conservation contribution. The degraded mixed grassland vegetation unit on site weakly resembled Tsakane Clay Grassland through the species composition, but remains highly degraded, with poor ecological functioning and a low conservation contribution, and as such does not represent a good conservation opportunity and does not currently contribute to the overall health and conservation status of the Tsakane Clay Grassland vegetation type or ESA status.

Furthermore, the mixed invasive woodland vegetation unit did not resemble Tsakane Clay Grassland at all due to the high composition of invasive species within this vegetation unit and due to the low species diversity - and presence - of diagnostic Tsakane Clay Grassland species. This vegetation unit thus also did not represent a good conservation opportunity and does not currently contribute to the overall health and conservation status of the Tsakane Clay Grassland vegetation type or the ESA status.

Indicate the types of groundcover present on the site and include the estimated percentage found on site[2].

~~Natural veld - good condition % = 0~~	**Natural veld with scattered aliens % = 10**	**Natural veld with heavy alien infestation % = 35**	~~Veld dominated by alien species % = 0~~	~~Landscaped (vegetation) % = 0~~
~~Sport field % = 0~~	**Cultivated land % = 15**	**Paved surface (hard landscaping) % = 15**	**Building or other structure % =20**	**Bare soil % = 5**

[2] This includes the entire project site.

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	**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.	**NO**

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on the site?	**YES**

If YES, specify and explain:

Ecological Sensitivity:
The entire project site is situated within the Tsakane Clay Grassland vegetation type which is listed to be endangered in terms of Section 52 of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA).

While the vegetation type deemed to be present on site has a high conservation value according to Mucina and Rutherford (2012), the highly degraded real-world condition of the vegetation units observed on site confirmed a modest overall conservation contribution. The degraded mixed grassland vegetation unit on site weakly resembled Tsakane Clay Grassland through the species composition, but remains highly degraded, with poor ecological functioning and a low conservation contribution, and as such does not represent a good conservation opportunity and does not currently contribute to the overall health and conservation status of the Tsakane Clay Grassland vegetation type or ESA status.

Furthermore, the mixed invasive woodland vegetation unit did not resemble Tsakane Clay Grassland at all due to the high composition of invasive species within this vegetation unit and due to the low species diversity - and presence - of diagnostic Tsakane Clay Grassland species. This vegetation unit thus also did not represent a good conservation opportunity and does not currently contribute to the overall health and conservation status of the Tsakane Clay Grassland vegetation type or the ESA status.

At present, the site is deemed highly disturbed due to ongoing disturbance through fires, invasive species, grazing, illegal dumping, pedestrian movements, road verge maintenance, historical infrastructure and recent construction. The site remains unfenced and open to the public which promotes ongoing impacts identical to those just mentioned. No sensitive Species of Conservation Concern were observed on site, with the remainder of the species observed regarded as Least Concern (LC) in terms of their conservation status. Overall the ecological contribution of the site was deemed to be low, with no sensitive species observed and few ecological process areas and habitats due to the small size and highly disturbed character of the proposed site.

Hydrological Sensitivity:
The wetland delineation and impact assessment found six wetlands impacted by the proposed development following fieldwork,.Of the six wetlands to be impacted by the development three wetlands (W1, 3 and 5) will be directly impacted by the development (crossed by proposed pipeline) and were subsequently awarded a High-Risk Rating.

The remaining three wetlands (W4, W6 and W9) are situated outside of the development footprint but are either situated directly downslope or directly adjacent to the proposed pipeline footprint. No direct impacts are expected to occur, although indirect secondary impact's linked with road run-off, water quality and sedimentation of freshwater habitats are likely to occur. Subsequently these three wetlands were assigned a Moderate Risk Rating.

Wetlands assigned either as High or Moderate Risk of being impacted were subjected to a detailed baseline assessment. The findings of the baseline wetland assessment suggests that owing to a range of existing impacts within the wetlands and catchment area (linked predominantly to alterations in water inputs and storm water runoff as well as surface water runoff through the wetland systems), the wetlands are generally in a modified condition with the level of modification varying according to the level of disturbance from 'Severely' modified (F PES Class) to 'Moderately' modified ('C' PES Class). Only one wetland (W6) was regarded as 'Natural / Unmodified' ('A' PES Class). Wetland Unit 1 (W1) was considered

to be 'Greatly' Modified ('E' PES Class). Both Wetland Units 2 and 4 (W2, W4) were considered to be 'Largely' Modified ('D' PES Class). Wetland Unit 5 (W5) have been 'Severely' Modified, whilst Wetland 9 (W9) have been 'Moderately' Modified.

» Key existing impacts affecting the condition of the various wetland units include:
  - Significant catchment alterations resulting in mostly a change (increase) in water inputs and flood peaks. Such catchment modifications are typically associated with:
    - Increase in hard surfaces such as roads (significant roads include; M45, M63, Carr Road), buildings, parking lots etc.;
    - Reduction in roughage (reduction in infiltration rate) due to poor land management, and agricultural activities (cultivation and livestock grazing);
    - Mining activities within the catchment; and
    - Discharge from storm water drainage systems.
  - Alteration and disturbances within the wetland boundaries mostly resulting in a reduction in roughage (vegetation responsible for increase infiltration and regulation of surface water flow) and an alteration in the hydrological character of the wetland itself. Such alterations are mostly associated with:
    - Overgrazing and trampling;
    - Limited erosion (mostly in the form of sheet erosion typically associated with soil capping);
    - Impeding structures such as roads (M54- and M63 Routes as well as other minor roads), fill embankments, railway lines and artificial instream dams resulting in an increase in flooding and saturation upstream and some desiccation and artificial channelling of surface water downstream of impeding structures.
    - Construction of artificial drainage channels within some wetland features;
    - Direct discharge of storm water into wetlands, creating 'artificially wetter' conditions;
    - Direct discharge for a sewage treatment plant;
    - Historic drainage of wetlands;
    - Limited sediment deposition within low lying areas

» Wetland unit W1 is considered to be of 'High' EI&S, linked with its relative high importance in providing biodiversity maintenance and water quality enhancement services primarily as well as its moderate-low sensitivity to external impacts. Wetland unit 1 provides a valuable corridor for movement (fauna and likely avifauna) as well as hydrological connectivity with important lower lying aquatic and wetland ecosystems as well as with surrounding terrestrial (primary and secondary) grasslands. Furthermore, water quality enhancement and maintenance are important for the maintenance of Nigel Dam, which is regarded as an important recreational area, and are vital for functionality and services provided by important downstream ecosystems. Wetland units W4, W6 an W9 are considered to be of 'Moderate' EI&S, linked with their moderately sensitivity to external impacts primarily as well as their low to moderate importance in providing biodiversity maintenance and water quality enhancement services. Wetland units W2 and W5 are considered to be of 'Low' EI&S, linked with their low functionality and sensitivity to external impacts. Furthermore, Wetland unit 5 have been rated as such due to the level of transformation and habitat loss this wetland has been subjected to.

A number of impacts and mitigation measures were provided through the wetland delineation and imapct assessment study. With this mitigation in place, impacts on aquatic ecosystem integrity and functioning can be potentially reduced to a sufficiently low level. This would be best achieved by incorporating the recommended management & mitigation measures into an Environmental Management Programme (EMPr) for the site, together with appropriate rehabilitation guidelines and ecological monitoring recommendations.

Based on the outcomes of the wetland study, specifically also considering the existing disturbances impacting on the affected wetland and resulting in the modified condition of the affected wetland, together with the fact that expected impacts can be mitigated to Low significance through the application of a number of easily implementable mitigation measures, it was condlued that in the wetland report that the proposed gas pipeline propejct detailed in this report could be authorised from a wetland perspective.

Please refer to Appendix G2 for the wetland delineation and impact assessment report for a detailed description of wetlands described above, impact ratings and mitigation measures proposed.

Heritage Sensitivity:

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 settlement as well as mining areas. The following general recommendations are made based on general observations in the proposed Nigel Gas Transmission Pipeline Project area pertaining to a number of identified occurrences of heritage potential. These sites identified are discussed in the section below.

The poorly preserved remains of a Historical Period settlement area occur along a northern section of the project footprint south of the M45 road (Site EXIGO-NGP-HP01). The site is rated as low heritage significance and impact seems unlikely but legislation requires that an alteration / destruction permit be obtained from the relevant heritage resources authority (SAHRA, SAHRA Built Environment Unit) should the site be altered at any stage. It is recommended that the site and its surrounds be closely monitored by an informed ECO during development in order to avoid the destruction of previously undetected heritage remains.

Two burial sites occur in the project area and these highly significant heritage resources are protected in terms of heritage and social by the National Heritage Resource Act (NHRA 1999). It is essential that the long-term conservation of the sites is ensured. The Nigel Municipal Cemetery (Site EXIGO-NGP-BP01) occurs east of the M63 road and approximately 10m east from the proposed pipeline alignment. The pipeline alignment runs within the road reserve which had previously been impacted on by the establishment and construction of municipal services (water and electricity lines) and impact on the adjacent cemetery is unlikely. It is primarily recommended that a heritage conservation buffer of at least 10m be implemented from the nearest graves in the cemetery, to the periphery of the impact buffer of construction activities. It is further recommended that a conservation buffer of 3m from the cemetery fence to the periphery of the impact buffer of construction activities be observed. A temporary construction barricade should be erected along areas where this measure proves unfeasible, i.e. in areas where construction activities might encroach on the 3m buffer.

An additional informal cemetery was documented in an open field directly west of the M63 road and south of Dunnotar, approximately 100m west of the proposed pipe alignment (Site Exigo-NGP-BP02). Even though impact on the site seems improbable it is recommended that a conservation buffer of at least 50m be implemented around the site. The developer should consider fencing off the burial site in order the clearly demarcate the presence and extent of this sensitive heritage resource in the larger development landscape.

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.

Heritage resources occur in close proximity of the Nigel Gas Transmission Pipeline Project pipeline alignment and potential peripheral to direct impacts on these heritage receptors are foreseen. However, these impacts can be mitigated and in the opinion of the author of the AIA study the proposed Nigel Gas Transmission Pipeline Project may proceed from a culture resources management perspective on the condition that mitigation measures are implemented where applicable, and provided that no subsurface heritage remains are encountered during construction.

No other features or sensitive areas apart from the abovementioned Ecological, Hydrological or Heritage features were determined for this project.

Was a specialist consulted to assist with completing this section	**YES**	
If yes complete specialist details		

Name of the specialist:	Gideon Raath			
Qualification(s) of the specialist:	MSc (Geography and Environmental Management);, a BSc Honours (Ecology and Environmental Studies) and a BSc (Geography and Environmental Management)			
Postal address:	PO Box 148 Sunninghill			
Postal code:	2157			
Telephone:	011-656-3237	Cell:	Not supplied	
E-mail:	gideon@savannahsa.com	Fax:	086-684-0547	

Are any further specialist studies recommended by the specialist?		**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: _____ Date: _____

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.

1. Vacant land	**2. River, stream, wetland**	~~3. Nature conservation area~~	**4. Public open space**	~~5. Koppie or ridge~~
~~6. Dam or reservoir~~	**7. Agriculture**	**8. Low density residential**	~~9. Medium to high density residential~~	~~10. Informal residential~~
~~11. Old age home~~	~~12. Retail~~	**13. Offices**	**14. Commercial & warehousing**	**15. Light industrial**
~~16. Heavy industrial[AN]~~	~~17. Hospitality facility~~	~~18. Church~~	~~19. Education facilities~~	~~20. Sport facilities~~
~~21. Golf course/polo fields~~	~~22. Airport[N]~~	~~23. Train station or shunting yard[N]~~	**24. Railway line[N]**	~~25. Major road (4 lanes or more)[N]~~
~~26. Sewage treatment plant[A]~~	~~27. Landfill or waste treatment site[A]~~	~~28. Historical building~~	**29. Graveyard**	~~30. Archeological site~~
31. Open cast mine	~~32. Underground mine~~	~~33.Spoil heap or slimes dam[A]~~	**34. Small Holdings**	
~~Other land uses (describe):~~				

NORTH

8	8	8	4,13	2
8	8	8	24,29,34	7
7	7		4	7
7	7	15	1	15
15	15	15	15	15

WEST EAST

SOUTH

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

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.

Have specialist reports been attached	YES X	

If yes indicate the type of reports below

Ecological Impact Assessment Report (refer to **Appendix G1**)
Wetland Impact Assessment Report (refer to **Appendix G2**)
Heritage Impact Assessment Report (refer to **Appendix G3**)

9. Socio 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.

According to the 2011 Census data, 455 608 people are unemployed within the Ekurhuleni Metropolitan Municipality and 1 126 844 people are employed. The unemployment rate was identified to be 28.8%. The Ekurhuleni Metropolitan Municipality economy is highly service-based with community services and government, financial services and manufacturing as the most significant sectors.

The Ekurhuleni Metropolitan Municipality is classified as a Category A municipality, which means that the municipality governs major city regions. Approximately 23% of the economy consists of manufacturing, 22% of finance and business services, 19% of community services and 11% of transport. The diverse economy in the region accounts for almost a quarter of the province's economy and is often referred to as "Africa's Workshop". Key projects in the municipality include:

- Ekurhuleni Aerotropolis Development;
- Revitalisation of the manufacturing sector;
- Integrated Rapid Public Transport System (IRPTN);
- Digital City; and
- Revitalisation of township economies.

Regarding the education levels present within the area approximately 3.6% of people aged 20 years or more have received no education. Approximately 35.4% of people aged 20 years of older have a matric certificate. Approximately 14.6% of people age 20 years or older have a higher education.

The project site falls within Region E of the Ekurhuleni Metropolitan Municipality which includes Brakpan, Tsakane and Duduza, mining land (active and closed), conservation areas, industrial development concentrated around Nigel and vacant/undeveloped and agricultural land.

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.

All comments received from SAHRA will be included as **Appendix E7**.

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 re-zoning 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?	**YES X**	

If YES, explain:

Heritage resources occur in close proximity of the Nigel Gas Transmission Pipeline Project pipeline alignment and potential peripheral to direct impacts on these heritage receptors are foreseen. However, these impacts can be mitigated and in the opinion of the author of the AIA study the proposed Nigel Gas Transmission Pipeline Project may proceed from a culture resources management perspective on the condition that mitigation measures are implemented where applicable, and provided that no subsurface heritage remains are encountered during construction.

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:

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 settlement as well as mining areas. The following general recommendations are made based on general observations in the proposed Nigel Gas Transmission Pipeline Project area pertaining to a number of identified occurrences of heritage potential. These sites identified are discussed in the section below.

The poorly preserved remains of a Historical Period settlement area occur along a northern section of the project footprint south of the M45 road (Site EXIGO-NGP-HP01). The site is rated as low heritage significance and impact seems unlikely but legislation requires that an alteration / destruction permit be obtained from the relevant heritage resources authority (SAHRA, SAHRA Built Environment Unit) should the site be altered at any stage. It is recommended that the site and its surrounds be closely monitored by an informed ECO during development in order to avoid the destruction of previously undetected heritage remains.

Two burial sites occur in the project area and these highly significant heritage resources are protected in terms of heritage and social by the National Heritage Resource Act (NHRA 1999). It is essential that the long-term conservation of the sites is ensured. The Nigel Municipal Cemetery (Site EXIGO-NGP-BP01) occurs east of the M63 road and approximately 10m east from the proposed pipeline alignment. The pipeline alignment runs within the road reserve which had previously been impacted on by the establishment and construction of municipal services (water and electricity lines) and impact on the adjacent cemetery is unlikely. It is primarily recommended that a heritage conservation buffer of at least 10m be implemented from the nearest graves in the cemetery, to the periphery of the impact buffer of construction activities. It is further recommended that a conservation buffer of 3m from the cemetery fence to the periphery of the impact buffer of construction activities be observed. A temporary construction barricade should be erected along areas where this measure proves unfeasible, i.e. in areas where construction activities might encroach on the 3m buffer.

An additional informal cemetery was documented in an open field directly west of the M63 road and south of Dunnotar, approximately 100m west of the proposed pipe alignment (Site Exigo-NGP-BP02). Even though impact on the site seems improbable it is recommended that a conservation buffer of at least 50m be implemented around the site. The developer should consider fencing off the burial site in order the clearly demarcate the presence and extent of this sensitive heritage resource in the larger development landscape.

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.

Nigel Gas Transmission Pipeline Project Heritage Sites Locations:

Site Code	Coordinate S, E	Short description	Mitigation Action
EXIGO-NGP-HP01	S26.35371° E28.44821°	Historical Period Site	**Site Monitoring:** Frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. Alteration / destruction permitting if site is impacted on.

EXIGO-NGP-BP01	S26.40559° E28.44252°	Burial Site	**Avoidance:** Implement a heritage conservation buffer of at least 10m from the nearest graves in the cemetery. Implement a conservation buffer of 3m from the cemetery fence to the periphery of the impact buffer of construction activities but where unfeasible, erect a temporary construction barricade along areas where construction might encroach on the 3m buffer. **Site Monitoring:** Strict weekly monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. Implement site management plan. **Grave Relocation:** Legally compliant grave relocation if impact on any human burial site is foreseen.
EXIGO-NGP-BP02	S26.36081° E28.43306°	Burial Site	**Avoidance:** Implement a heritage conservation buffer of at least 50m around the burial site. Possible fencing of the site and implementation of access control. **Site Monitoring:** Frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. Implement site management plan. **Grave Relocation:** Legally compliant grave relocation if impact on any human burial site is foreseen.

Will any building or structure older than 60 years be affected in any way?		**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		**NO**

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

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

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

The public participation process undertaken for the Nigel Gas Transmission Pipeline and associated infrastructure has been undertaken in accordance with Chapter 6 of the EIA Regulations, 2014, as amended on 07 April 2017.

1. 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.

The Ekurhuleni Metropolitan Municipality is the applicant of this application and is therefore aware of the submission of the application to the Gauteng Department of Agriculture and Rural Development (GDARD).

Was the draft report submitted to the local authority for comment? **YES** [redacted]

This Basic Assessment Report has been submitted to all interested and affected parties including Organs of State and Key Stakeholders to ensure that all the relevant local authorities are provided with the opportunity to submit any comments or raise any concerns. Proof of distribution of the report to all interested and affected parties, including Organs of State and Key Stakeholders is included as **Appendix E4**.

If yes, have any comments been received from the local authority? [redacted] **NO**

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

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

Notification letters informing identified interested and affected parties (I&APs) of the project and inviting I&APs to register on the project database were distributed via email on 19 June to 19 July 2019 (refer to **Appendix E2**). In addition, site notices were also placed on the project site boundary on 26 March 2019 (refer to **Appendix E1**).

No comments have been received to date, however it is expected that comments from local authorities will be submitted during the 30-day review period. All comments and responses will be submitted in the final BAR submission reflecting the queries, concerns and responses provided.

2. Consultation with Other Stakeholders

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.

Site notices were placed on along Visagie Avenue off Nigel Dunnottar Road and on the M45 along the nothern portion of the proposed pipeline on 26 March 2019 to notify stakeholders of the project (refer to **Appendix E1**).

Advert was not submitted in time for publication date of publisher for Heidelberg/Nigel Heraut. Registered I&APs, including Organs of State, on project database only notified of BAR review & comment period as per advert placed in **Pretoria News**. The Pretoria News is alos publisghed in the Nigel Area.

A notification letter has also been sent to all registered interested and affected parties to inform them of the application and the 30-day review period of the Basic Assessment Report. Details on the accessibality of the Basic Assessment Report were also included with instruction on how and where comments can be submitted. Refer to **Appendix E4** for proof.

Have any comments been received from stakeholders?	NO

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

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

No comments have been received on this proposed project to date. All comments received during the review period of the Basic Assessment report, as well as responses provided will be captured and recorded within the Comments and Response Report attached as **Appendix E6** in the submission of the Basic Assessment Report.

3. 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.

The public participation process has been undertaken in accordance with Chapter 6 of the EIA Regulations, 2014, as amended on 07 April 2017. The Comments and Responses Report (**Appendix E6**) will be updated

to include any comments received during the 30-day review period and be submitted as part of the final Basic Assessment Report to GDARD.

4. 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:

Appendices E1 to E9 include the specified public pariticipation appendices as listed below.

Appendix E1: Proof of site notice
Appendix E2: Written notices issued as required in terms of the regulations
Appendix E3: Proof of newspaper advertisements - *to be included in the final BAR*
Appendix E4: Communications to and from interested and affected parties
Appendix E5: Minutes of any public and/or stakeholder meetings
Appendix E6: Comments and Responses Report
Appendix E7: Comments from I&APs on Basic Assessment (BA) Report – *to be included in the Final Basic Assessment report*
Appendix E8: Comments from I&APs on amendments to the BA Report – *not applicable*
Appendix E9: 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
2) Each alterative needs to be clearly indicated in the box below
3) Attach the above documents in a chronological order

Section D has been duplicated for alternatives	**0** times	(complete only when appropriate)
Section D Alternative No.	**N/A**	(complete only when appropriate for above)

1. Waste, Effluent and Emission Management

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES X**

If yes, what estimated quantity will be produced per month?	Minimal – can be managed effectively through the management measures included in the EMPr (refer to **Appendix H**)

How will the construction solid waste be disposed of (describe)?

It is anticipated that construction waste will be comprised mainly of soil material from excavation activities, as well as packaging and minor wastes from materials used (metal, welding rods, old gloves and equipment). All solid waste generated during the construction phase will be collected and stored in weather and scavenger proof containers on site, and will be recycled where possible. The remainder will be disposed of at the nearest appropriate landfill site.

Where will the construction solid waste be disposed of (describe)?

In order to comply with legal requirements, the waste will be transported to the nearest registered waste disposal facility for appropriate disposal.

Will the activity produce solid waste during its operation phase?	**NO X**
If yes, what estimated quantity will be produced per month?	m^3

How will the solid waste be disposed of (describe)?

N/A

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?	**NO X**

This confirmation is not applicable as the Nigel gas transmission pipeline and associated infrastructure will not be generating any solid waste during the operation phase and therefore confirmation of capacity from the service provider is not required.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

N/A

Note: If the solid waste (construction or operation 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?	**NO X**

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?	**NO X**

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:

Solid waste produced during the construction phase of the proposed access road development will mostly comprise of minor building rubble. The waste management hierarchy will be implemented as far as possible through waste management conditions included into the EMPr. The waste management hierarchy will ensure the prevention of waste, but, if it cannot be prevented it should be minimised. If waste can't be minimised it must be reused or recycled. If this is not an option it should be used for energy recovery, this may involve selling waste to third part recovery organisations. Lastly if energy recovery is not possible waste should be disposal of. Any waste that is disposed of will be disposed of at a licenced dump/landfill. No waste will be generated during the operational phase of this pipeline.

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?		**NO X**
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)?	YES	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?	**NO X**
If yes, what estimated quantity will be produced per month?	m^3

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 effluent that will be treated and/or disposed of at another facility?	**NO X**

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

N/A No wastewater will be generated.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?		**NO X**
If yes, what estimated quantity will be produced per month?	m^3	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	YES	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?		**NO X**

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

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?		**NO X**
If yes, is it controlled by any legislation of any sphere of government?	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.

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

During the construction phase, limited gaseous or particulate emissions are anticipated from exhaust emissions from construction vehicles and equipment on-site, as well as vehicle entrained dust from the movement of vehicles on the main and internal access roads.

2. Water Use

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

~~Municipal~~	~~Directly from water board~~	~~Groundwater~~	~~River, stream, dam or lake~~	**Other**	~~The activity will not use water~~

During the construction phase, portable water will be utilised for any construction activities, transported to site through the use of tanker trucks. No water wil be required during the operation phase.

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: 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? **YES X**

If yes, list the permits required

A Section 21 (c and i) water use as per the National Water Act (Act No 36 of 1998) will be applicable for the development due to the proposed pipeline route crossing driange and wetland features, as described in the wetland delineation and impact assessment report. A General Authorisation (GA) registration application will be submitted to the Department of Water and Sanitation (DWS) in terms of the National Water Act and GN267.

If yes, have you applied for the water use permit(s)?	**YES X (in process)**	
If yes, have you received approval(s)? (attached in appropriate appendix)		**NO X**

A simultaneous General Authorisation process is being conducted for the authorisation of the water use envisaged. The issued GA (should it be granted) will only be available upon submission of the final BAR (indicative timing at present).

3. Power Supply

Please indicate the source of power supply, eg. Municipality / Eskom / Renewable energy source

The project will make use of Eskom electricity.

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

4. Energy Efficiency

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

Due to the specific nature of the development, only a small number of suitable technologies are available. While energy efficiency is considered in the design and feasibility phases, other factors such as safety, durability, cost and longevity of the materials utilised are also considered by the applicant, and weighted appropriately. Ultimately, this activity is not regarded as consumptive in terms of energy use, with the pipeline remaining passive during operation and requiring only small amounts of electricity to operate the pressure monitoring and safety mechanisms. As such, the most energy efficient technologies are already being employed and overall low amounts of energy is required to install and operate the proposed facility.

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

Due to the specific nature of the development, only a small number of suitable technologies are available. While alternative energy sources are considered in the design and feasibility phases, other factors such as safety, durability, cost and longevity of the materials utilised are also considered by the applicant, and weighted appropriately. Ultimately, this activity is not regarded as consumptive in terms of energy use, with the pipeline remaining passive during operation and requiring only small amounts of electricity to operate the pressure monitoring and safety mechanisms. As such, the most energy efficient technologies are already being employed and overall low amounts of energy is required to install and operate the proposed facility. No suitable alternative energy sources apart from those being employed were selected for this project.

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.

No issues have been raised by interested and affected parties to date. Focus group meetings will be held during the 30-day public review period. All comments raised during the 30-day review period of the Basic Assessment Report will be included and adressed in the final Basic Assessment Report and the comments and response report (**Appendix E6**) to be submitted to the competent authority.

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):

No issues have been raised by interested and affected parties to date. All comments raised during the 30-day review period of the Basic Assessment Report will be included and adressed in the final Basic Assessment Report and the Comments and response report to be submitted to the competent authority.

2. Impacts That May Result From the Construction and Operation Phase

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

The following methodology was used in assessing impacts related to the proposed project. All impacts are assessed according to the following criteria:

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.

- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).

- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.

- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;

- 6 is moderate and will result in processes continuing but in a modified way;
- 8 is high (processes are altered to the extent that they temporarily cease); and
- 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

» The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
- Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
- Assigned a score of 2 is improbable (some possibility, but low likelihood);
- Assigned a score of 3 is probable (distinct possibility);
- Assigned a score of 4 is highly probable (most likely); and
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

S= (E+D+M) P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance** weightings for each potential impact are as follows:

- < **30 points**: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30-60 points**: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > **60 points: High** (i.e. where the impact must have an influence on the decision process to develop in the area)

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.

Considering all the impacts identified and assessed, it is concluded that the construction activities of the Nigel Gas Pipeline:

DESIGN PHASE

Activities associated with the design and preconstruction phase pertains mostly to planning and design around the proposed development, and is done at a desktop level. In some cases site visits need to take place but the impact of these visits is negligible, if any, e.g. photographs, GPS point's etc. There are thus no Planning and Design Phase impact anticipated for this development.

CONSTRUCTION PHASE

- Stormwater management – erosion from runoff into wetlands and streams (sedimentation associated with earthworks) (-)
- Waste management – poor control of rubble and general construction waste will contaminate the environment through litter, attracting vermin and opportunistic alien species proliferation (-)
- Dust from earthworks and heavy vehicle movements on site (-)
- Noise from earthworks, construction crews and heavy vehicle movement on site
- Hazardous spillage – poor control over storage and handling of hazardous materials such as bonding and sealing chemicals, small electrical machinery, oil rags, diesel of other fuels will lead to soil and water pollution of nearby water sources and the general environment where containment of these items are breached (-)
- Light pollution – the presence of construction crews, traffic signalling and construction crews will increase the nighttime light levels (-)
- Traffic impacts – increase in traffic on regional roads, as well as temporary obstacles to traffic flow during work at congested corners or road segments (-)
- Employment creation – The constrcution of this pipeline will allow the expansion of the Consol plant which will create approxiamately 500 job oportunities. (+)
- Construction crew use of local services and businesses Social – during the constrcution phase local services and bussinesses will be used (+)
- Safety concerns with construction crews on site – the influx of construction crews and worker could pose safetly threats (-)
- Loss of highly degraded Tsakane Clay Grassland (-)
- Loss of Species of Conservation Concern (-)
- Loss of floral and faunal biodiversity leading to a disruption of ecosystem function and processes (-)
- Control of alien plant species (-)
- Increased erosion due to vegetation clearing for infrastructure (-)
- Loss of Critical Biodiversity Area (CBA) or Ecological Support Areas (ESA) (-)
- Displacement or destruction of heritage structures or features in the project area (-)
- Impacts could involve displacement or destruction of human remains an burials in the project area (-)
- Loss/Disturbance of wetland habitat and fauna (-)
- Impact on localized surface water quality (-)
- Increase in sedimentation and erosion within the development footprint (-)

OPERATIONAL PHASE

- Safety – poor maintenance and operational control of pipline and flammable fluids, and possible containment breaches or emergency incidents (-)
- Erosion from poor rehabilitation of backfilled trenches (-)
- Spread of invasive alien species due to recent earthworks and soil turning (-)
- Altered wetland hydrology due to interception/impoundment/diversion of flows (-)

- Impact on localized surface water quality(-)

DECOM PHASE

- Waste management – poor control of rubble and general construction waste will contaminate the environment through litter, attracting vermin and opportunistic alien species proliferation (-)
- Disturbance, poor rehabilitation and associated impacts (-)
- Loss/Disturbance of wetland habitat and fauna (-)
- Impact on localized surface water quality (-)
- Increase in sedimentation and erosion within the development footprint (-)
- Disturbance, poor rehabilitation and associated impacts (-)

NO-GO OPTION

- Increase in alien invasive species (-)
- Ongoing degradataion of the road reserve and vegetation communities through current land use and disturbances (see ecological report for a complete description of these disturbances) (-)
- Ongoing degradation of freshwater features (local rivers and wetlands) through current land use and disturbances (see ecological report for a complete description of these disturbances) (-)

CUMULATIVE

- Reduced ability to meet conservation obligations and targets (-)
- Impacts on Critical Biodiversity Areas and Broad-Scale Ecological Processes (-)
- Altered wetland hydrology due to interception/impoundment/diversion of flows (-)
- Increase in sedimentation and erosion within the development footprint (-)
- Impact on localized surface water quality (-)
- Impact on localized surface water quality (-)
- Waste management – poor control of rubble and general construction waste will contaminate the environment through litter, attracting vermin and opportunistic alien species proliferation (-)
- Traffic impacts – increase in traffic on regional roads, as well as temporary obstacles to traffic flow during work at congested corners or road segments (-)

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Construction phase				
General				
Stormwater management – erosion from runoff into wetlands and streams (sedimentation associated with earthworks)	Medium Negative (30)	» Storm water management plans must be compiled by an engineer approved by DEA, DWS and the ECO for the project. » All stormwater structures must comply with DWS and the regional road authority requirements. » The road engineer must ensure that suitable stormwater structures are included in the road design in order to minimise erosion and sedimentation of watercourses.	Low Negative (14)	Medium risk due to the extent and nature of the development
Waste management – poor control of rubble and general construction waste will contaminate the environment through litter, attracting vermin and opportunistic alien species proliferation	Medium Negative (30)	» A Waste Management Plan will be required for the site. » Construction waste must be disposed of at a licenced dump/landfill (on a regular basis) » Initiate recycling programmes at the construction site. » The waste management hierarchy must be adopted at the construction site where waste is prevented, if it cannot be prevented it should be minimised. If waste can't be minimised it must be reused or recycled. If this is not an option it should be used for energy recovery. This may involve selling waste to third part recovery organisations. Lastly if energy recovery is not possible waste should be disposed of. » Should waste be stored on site, it cannot be temporarily stored for longer than 80 days.	Low Negative (24)	Medium risk as waste will only be generated during the construction phase.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Noise from earthworks, construction crews and heavy vehicle movement on site	Low Negative (24)	» Machinery and equipment are to be switched off when not used. » Construction activities should take place during work hours, these are to be known and agreed upon with all contractors. » Retro-fit some equipment with dampening measures if possible » All labourers to wear PPE where required	Low Negative (15)	Low risk as this may only occur during construction activities.
Hazardous spillage – poor control over storage and handling of hazardous materials such as bonding and sealing chemicals, small electrical machinery, oil rags, diesel of other fuels will lead to soil and water pollution of nearby water sources and the general environment where containment of	Low Negative (20)	» If spillages occur during construction, they should be cleaned up using absorbent material. » Absorbent materials used to clean up spillages should be disposed of in a separate and labelled hazardous waste bin. » The storage area for hazardous material must be concreted, bunded, covered, labelled and well ventilated. » All hazardous waste must be disposed at an appropriately registered hazardous waste disposal facility. » Records of all waste being taken off site must be recorded and kept as evidence.	Low Negative (16)	Low risk as chemical pollution may only occur during construction and maintenance activities.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
these items are breached.				
Light pollution – the presence of construction crews, traffic signalling and construction crews will increase the nighttime light levels.	Low Negative (9)	» Machinery and equipment are to be switched off when not used.	Low Negative (12)	Low risk as this may only occur during construction activities.
Traffic impacts – increase in traffic on regional roads, as well as temporary obstacles to traffic flow during work at congested corners or road segments	Low Negative (27)	» Where possible, heavy vehicle traffic should be discouraged from using roads during peak traffic hours. » Road signs and speed limits should be adhered to at all times. » Transport of material and waste should comply with the necessary road regulations.	Low Negative (27)	Low risk as this may only occur during construction activities.
Employment creation – The constrcution of this pipeline leading to	Medium Positive (45)	» Where possible local labour should be utilised. » Where possible training schemes should be used.	Medium Positive (45)	No risk due to positive impact.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
the expansion of the Nigel plant which will create approxiamately 500 job oportunities. (+)				
Construction crew use of local services and businesses Social – during the constrcution phase local services and bussinesses will be used (+)	Medium Positive (45)	» Where possible local labour should be utilised. » Where possible training schemes should be used.	Medium Positive (45)	No risk due to positive impact.
Safety concerns with construction crews on site – the influx of construction crews and worker could pose safetly threats (-)	Low Negative (14)	» All new workers must be screened before employment.	Low Negative (12)	Low risk as this may only occur during construction activities.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Ecological				
Loss of highly degraded Tsakane Clay Grassland: The clearing of natural vegetation within the project footprint will lead to the temporary loss of highly degraded Tsakane Clay Grassland, which is considered an endangered vegetation type by SANBI.	Medium Negative (45)	» Since this vegetation type is listed as endangered, impacts must be kept to a minimum through the development and implementation of an EMPr, and the employment of an Environmental Control Officer (ECO) for the duration of construction. » Laydown areas and turning areas must be located in areas that have already been impacted or show evidence of degradation. The EO must identify such areas. » Vegetation clearing for the establishment of infrastructure must be kept to a minimum, by only clearing what is absolutely needed in order to further construction. » Vegetation impacted during the construction phase must be restored. » Topsoil must be stockpiled separately to subsoil. This is done to conserve the existing seedbank and aid in the restoration of natural grasslands during rehabilitation.	Low Negative (20)	Medium risk as a large portion of the project site consists of highly degraded Tsakane Clay Grassland.
Loss of Species of Conservation Concern: SCC that were not identified during the site assessment may still be present on site. As such, the	Medium Negative (33)	» Should any SCC be identified during excavation, these must be relocated or removed from the construction footprint by a qualified specialist prior to commencement of further activities. » In the event that SCC are identified during construction works, the relevant permits must be obtained from the relevant departments in order to remove such species prior to commencement of further activities.	Low Negative (20)	Low risk of loss of species of conservation concern within the project site.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
clearing of natural vegetation within the project footprint may lead to the loss of Species of Conservation Concern (SCC).				
Loss of floral and faunal biodiversity leading to a disruption of ecosystem function and processes: The removal of natural vegetation and faunal habitats within the project footprint and near surface water features will lead to a loss of biodiversity and ecosystem	Medium Negative (55)	» Prohibit all employees from harvesting wild plants or hunting any animals on site; » Prohibit open fires; » Rehabilitate laydown areas immediately after they are no longer required; » Develop an invasive management plan and implement during construction to ensure alien species do not invade disturbed or cleared areas and that ongoing invasions are controlled and limited as far as possible; » An ECO must be employed during construction; » Laydown areas and turning areas must be located in areas that have already been impacted or show evidence of degradation. The EO must identify such areas. » Vegetation clearing for the establishment of infrastructure must be kept to a minimum, by only clearing what is absolutely needed in order to further construction.	Low Negative (24)	Medium risk due to the historical disturbance within the project site resulting in a low species diversity.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
function and processes.		» Vegetation impacted must be restored and the area rehabilitated. It is likely that this will occur naturally but given the presence of alien species active rehabilitation and the removal of alien species will be required to ensure that only indigenous species remain. » Topsoil must be stockpiled separately to subsoil. » Where required by DWS for water features, implement the horizontal directional drilling methodology to reduce the impact on surface water features and wetland vegetation as far as possible; » Where unavoidable, and as far as possible, conduct trenching work through the wetland vegetation unit during the dry season.		
Poor control of alien plant species during construction leading to increasing invasive species presence: The lack of an effective alien vegetation management plan may lead to alien plant invasion following	Medium Negative (33)	» An Alien Plant Monitoring and Management Plan must be developed and implemented during the construction and operation phases to reduce the establishment and spread of undesirable alien plant species. » Alien plants must be removed from the site through appropriate methods for the specific species of concern such as hand pulling, application of chemicals, cutting etc., on a regular basis during construction. Removal must occur prior to plants developing seeds.	Low Negative (18)	Medium risk due to the existing presence of Alien Invasive species within the proejct site.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
construction earthworks.				
Increased erosion due to vegetation clearing for infrastructure: During construction, there will be a lot of disturbed and loose soil at the site which will render the area vulnerable to erosion.	Low Negative (27)	» Any erosion observed as a result of the construction works should be rectified immediately and monitored thereafter to ensure interventions are successful. » All bare areas, affected by the development, should be re-vegetated with locally occurring species, to bind the soil and limit erosion potential. » Reinstate as much of the eroded area to its pre-disturbed, "natural" levels. » The gravel access road and other disturbed areas (laydown areas) should be regularly monitored for erosion occurrences and must receive follow-up monitoring by the EO to assess the success of the erosion management. » Topsoil should be removed and stored separately from subsoil and should be reapplied where appropriate as soon as possible in order to encourage and facilitate rapid regeneration of the natural vegetation on cleared areas. » Where feasible, phased development and vegetation clearing should be practiced so that cleared areas are not left denuded and vulnerable to erosion for extended periods of time.	Low Negative (10)	Medium risk as the vegetation clearance will be required for the project.
Loss of areas classified as CBA or ESA due to	Medium Negative (33)	» Prohibit all employees from harvesting wild plants or hunting any animals on site or in the surrounding areas; » Prohibit open fires;	Low Negative (18)	Low risk due to the current status of the CBA within the project site.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
vegetation clearance: Although small, some region classified as CBA and ESA will be partially cleared during construction, resulting in a loss of CBA and ESA area.		» Rehabilitate laydown areas immediately after they are no longer required; » Develop a short invasive management plan and implement during construction to ensure alien species do not invade disturbed or cleared areas; » An ECO must be employed during construction; » Laydown areas and turning areas must be located in areas that have already been impacted or show evidence of degradation. The EO must identify such areas. » Vegetation clearing for the establishment of infrastructure must be kept to a minimum, by only clearing what is absolutely needed in order to further construction. » Vegetation impacted must be restored and the area rehabilitated. It is likely that this will occur naturally but given the presence of alien species active rehabilitation and the removal of alien species will be required to ensure that only indigenous species remain. » Topsoil must be stockpiled separately to subsoil.		
WETLANDS				
Loss/Disturbance of wetland habitat and fauna: This refers to the direct physical destruction or	Low Negative (27)	» Existing access roads to be used as far as possible. Limit the extent of the construction servitude to as small an area as possible. » Ideally the construction disturbance footprint should be kept to an area no wider than 5 m. » All material stockpiles and construction camps should be located outside wetland areas.	Low Negative (8)	Medium risk as the construction in these areas will be required for the project.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
disturbance of aquatic habitat caused by vegetation clearing, disturbance of wetland habitat, encroachment/colonisation of habitat by invasive alien plants and alteration of wetland geomorphological profiles (including stream beds and banks).		» Closure and rehabilitation of the disturbed areas should commence as soon as the laying of underground pipeline has been completed. » All material stockpiles (other than soils removed during trenching) and construction camps should be located outside wetland areas. » The areas where vegetation is destroyed and disturbed will however need to be monitored against invasion by alien vegetation and, if encountered, will need to be removed. » If natural re-vegetation is unsuccessful, seeding and planting of the area will need to be implemented. » There should be reduced activity at the site after large rainfall events when the soils are wet. » No driving off of hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased. **For Wetland 1, 2 and 5 (HDD):** » All construction activities occurring directly within wetland habitats (Wetland 1, 2 and 5) to take place within the dry season. » The remaining construction activities should be aimed to take place within the dry season as far as reasonably possible. » Regular monitoring should be conducted along the drilling route for potential frack-outs.		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		» Every effort must be made to avoid the release of drilling fluid into the wetlands. » Where drilling fluid is observed at the surface, the "spill" should immediately be contained / recovered. » Smothering of vegetation should also be avoided. » Once excess drilling mud have been removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation. » Revegetated areas will be monitored twice per year for two years subsequent to frack-out to confirm revegetation is successful. » Used drilling liquid should be contained in a settling pond or similar structure, from where the fluid can either be re-used or removed from site. **For Wetland 1 & 2 (HDD):** » All activities and disturbances should be confined to the raised road reserve (as close as possible to the M45 Road), » All vegetation clearance and activities associated with the rig setup should occur within the raised road reserve (as close as possible to the M45 Road). » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve).		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		» The natural surface of the inundated and permanent saturated zone the wetland, including a 10m buffer should be considered as a NO-GO Zone. **For Wetland 5 (HDD):** » All activities and disturbances should occur outside of the delineated wetland boundary (including a 10m buffer area). Limit the extent of the construction servitude to as small an area as possible. **For Wetland 4 and partially 1 and 2 (Trenching):** » Construction activities should be aimed to take place within the dry season as far as reasonably possible; » All activities must be restricted to the raised portion of the road reserve (as close as possible to the existing road). » Excavated soils should be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench; » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » Wetland areas other than the immediate areas of crossing are to be demarcated as no-go areas for vehicles and construction personnel. » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). » Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days). **For Wetland 6 and 9 (Trenching outside of wetland boundary):** » All activities restricted, as far as possible, within the elevated road reserve. » Wetlands located in close proximity to the proposed pipeline route should be regarded and demarcated as no-go areas for vehicles and construction personnel. » Excavated soils from the trench, made for the pipeline, should also be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench. » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). » Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days). »		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Impact on localized surface water quality: This refers to the alteration or deterioration in the physical, chemical and biological characteristics of water resources (i.e. water quality) such as wetlands & rivers as a result of water/soil pollution.	Medium Negative (32)	» Institute environmental best practice guidelines as per the DWA Integrated Environmental Management Series for Construction Activities. » Implement appropriate measures to ensure strict use and management of all hazardous materials used on site » Implement appropriate measures to ensure strict management of potential sources of pollutants (e.g. litter hydrocarbons from vehicles and machinery, cement during construction etc.) » Implement appropriate measures to ensure containment of all contaminated water by means of careful run-off management on the development site. » 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. » No vehicles to refuel within watercourses/ riparian vegetation. » Place spill kits on site which are operated by trained staff members for the adhoc remediation of minor chemical and hydrocarbon spillages. » 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 construction camp/suitable waste disposal facility. All waste must be disposed of offsite.	Low Negative (5)	Medium risk, chemical pollutants associated with site-clearing machinery and construction activities could be washed downslope via the ephemeral systems.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		» Working protocols incorporating pollution control measures (including approved method statements by the contractor) should be clearly set out in the Construction Environmental Management Plan (CEMP) for the project and strictly enforced. » » For Wetland 1, 2 and 5 (HDD): » The drilling rig should be placed on a plastic liner in order to avoid any potential soil contamination with hydrocarbon spillage or other associated pollutants. » Regular monitoring should be conducted along the drilling route. » All activities must be restricted to the raised portion of the road reserve (as close as possible to the existing road). » Used drilling liquid should be contained in a settling pond or similar structure, from where the fluid can either be re-used or removed from site. » Every effort must be made to avoid the release of drilling fluid into the wetlands. » Where drilling fluid is observed at the surface, the "spill" should immediately be contained/recovered. » A spill kit should always be on-site. » A regulatory approved contingency plan (frack-out) should be in place which should consider the possibility of frack-out (and other contingencies) and the response actions that should be considered.		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		» Large spills should be pumped out of the wetland into a contained area as soon as possible and the remaining fluid should be dispersed with hoses. » Smothering of vegetation should also be avoided. » Once excess drilling mud have been removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation. » Revegetated areas will be monitored twice per year for two years subsequent to frack-out to confirm revegetation is successful		
Increase in sedimentation and erosion within the development footprint: This refers to the alteration in the physical characteristics of wetlands and rivers as a result of increased turbidity and sediment deposition, caused	Low Negative (21)	» All construction activities occurring directly within wetland habitats (Wetland 1, 2 and 5 to take place within the dry season. The remaining construction activities should be aimed to take place within the dry season as far as reasonably possible. » Existing access roads to be used as far as possible. » Limit the extent of the construction servitude to as small an area as possible. » Ideally the construction disturbance footprint should be kept to an area no wider than 5 m. » Regular monitoring for erosion. - Any erosion problems observed, to be associated with the relating activity, should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. - Silt traps should be used where there is a danger of topsoil or material stockpiles eroding and entering streams and other sensitive areas.	Low Negative (4)	Medium risk as the development requires construction activities within wetland.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
by soil erosion and earthworks that are associated with construction activities.		- Construction of gabions and other stabilisation features to prevent erosion, if deemed necessary. » Closure and rehabilitation of the disturbed areas (control stations and rig set-up) should commence as soon as the laying of underground pipeline has been completed. - Soils should be landscaped to the natural landscape profile with care taken to ensure that no preferential flow paths or berms remain. » The areas where vegetation is destroyed and disturbed will however need to be monitored against invasion by alien vegetation and, if encountered, will need to be removed. » If natural re-vegetation is unsuccessful, seeding and planting of the area will need to be implemented. » There should be reduced activity at the site after large rainfall events when the soils are wet. » No driving off of hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased. **For Wetland 1, 2 and 5 (HDD):** » Any erosion problems observed, to be associated with the relating activity, should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur.		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		For Wetland 1 and 2 (HDD): » All activities and disturbances should be confined to the raised road reserve (as close as possible to the M45 Road), » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » The natural surface of the inundated and permanent saturated zone the wetland, including a 10m buffer should be considered as a NO-GO Zone **For Wetland 5 (HDD):** » All activities and disturbances should occur outside of the delineated wetland boundary (including a 10m buffer area). **For Wetland 4 and partially 1 and 2 (Trenching):** » Construction activities should be aimed to take place within the dry season as far as reasonably possible; » All activities must be restricted to the raised portion of the road reserve (as close as possible to the existing road). » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » Wetland areas other than the immediate areas of crossing are to be demarcated as no-go areas for vehicles and construction personnel. » Excavated soils should be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench;		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		» Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). » Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days). » Concentration and accumulation of flows along the servitude should be prevented by regularly providing for surface runoff to flow into the adjacent grassland rather than along the construction servitude and into the wetlands. **For Wetland 6 and 9 (Trenching outside of wetland boundary):** » All activities restricted, as far as possible, within the elevated road reserve. » Wetlands located in close proximity to the proposed pipeline route should be regarded and demarcated as no-go areas for vehicles and construction personnel. » Excavated soils from the trench, made for the pipeline, should also be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench. » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas).		

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		» Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days).		
HERITAGE				
Disturbance/ distruction of heritage receptors: The impact relates to the Historical period settlement (Exigo-NGP-HP01)	Medium Negative	» Site Monitoring: Regular examination of trenches and excavations. » Alteration Permitting: The site is older than 60 years and generally protected under the NHRA. Application for an alteration permit should be made with relevant heritage authorities (SAHRA, SAHRA Built Environment) should the site be alteration at any stage.	Low Negative	Low risk as this heritage site is not located directly next to the proposed pipeline
Disturbance/ distruction of heritage receptors: The impact relates to the burial site (Exigo-NGP-BP01)	High Negative	» Avoidance: Implement a heritage conservation buffer of at least 10m from the nearest graves in the cemetery. Implement a conservation buffer of 3m from the cemetery fence to the periphery of the impact buffer of construction activities but where unfeasible, erect a temporary construction barricade along areas where construction might encroach on the 3m buffer. Implement a site management plan detailing strict site management conservation measures. » Site Monitoring: The project site in the vicinity of this receptor should be monitored bi-weekly by the heritage consultant or an ECO familiar with the heritage occurrences of the site: regular examination of trenches and excavations and site clearing in order to detect and preserve previously undocumented heritage receptors.	Low Negative	Medium risk as this burial site is located directly next to the proposed pipeline

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Disturbance/ distruction of heritage receptors: The impact relates to the burial site (Exigo-NGP-BP02)	High Negative	» Avoidance: Implement a heritage conservation buffer of 50m around the graves / cemetery. If possible, fence burial place and apply access control. Implement a site management plan detailing strict site management conservation measures. » Site Monitoring: The project site in the vicinity of this receptor should be monitored on a frequent basis by the heritage consultant of an ECO familiar with the heritage occurrences of the site: regular examination of trenches and excavations and site clearing in order to detect and preserve previously undocumented heritage receptors.	Low Negative	Low risk as this heritage site is located 50m from the the proposed pipeline
Operation Phase				
General				
Safety – poor maintenance and operational control of pipeline and possible containment breaches or emergency incidents (-)	Medium Negative (30)	» Bi-annual inspections should be conducted as part of leak detection procedures. » Ensure that manholes used in the operational phase for mainatnce activities are adequately sealed off to ensure that no unauthorised access is gained to the pipeline.	Low Negative (14)	Low risk
Erosion from poor rehabilitation of backfilled trenches (-)	Medium Negative (30)	» Storm water must be managed according to the Storm Water Management Plan for the site to prevent erosion. This includes provisions for storm water run-off from the roof and overflow from	Low Negative (12)	Low risk due to the extent and nature of the development

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
		the reservoir weir and the scour wedge gate valve draining the reservoir.		
Ecological				
Poor control of alien plant species during construction leading to increasing invasive species presence: The lack of an effective alien vegetation management plan (and implementation thereof during operation) may lead to increasing alien plant communities on site.	Low Negative (18)	» As the project is contained with the road reserve, an Alien Plant Monitoring and Management Plan must be developed and implemented by the responsible roads agency to form part of their ongoing road maintenance programme. Ongoing control efforts must thus be implemented by the roads agency through the relevant maintenance plan for the road verges.	Low Negative (12)	Medium risk due to the the existing presence of alien plant species within the project site.
Wetlands				
Altered wetland hydrology due to interception/impou	Low Negative (21)	» Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur.	Low Negative (14)	Medium risk as the development requires

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
ndment/diversion of flows: This refers to the alteration in the physical characteristics of wetlands and rivers as a result of increased turbidity and sediment deposition, caused by soil erosion, as well as instability and collapse of unstable soils during project operation. Possible ecological consequences associated with this impact may include: » Deterioration in freshwater		» All bare areas, as a result of the development, should be revegetated with locally occurring species, to bind the soil and limit erosion potential. » Disturbed areas (areas at risk of erosion or already subjected to erosion) should be monitored for erosion problems (twice yearly within the first year of operation) and problem areas should receive follow-up monitoring (single inspection at the end of April the following year) to assess the success of the remediation. » Silt traps should be used where there is a danger of topsoil or material stockpiles eroding and entering streams and other sensitive areas. » Construction of gabions and other stabilisation features to prevent erosion, if deemed necessary. » There should be reduced activity at the site after large rainfall events when the soils are wet. No driving off of hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased.		construction activities within wetland.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
ecosystem integrity; and » Reduction/loss of habitat for aquatic dependent flora & fauna.				
Impact on localized surface water quality: This refers to the alteration or deterioration in the physical, chemical and biological characteristics of water resources (i.e. water quality) such as wetlands & rivers as a result of water/soil pollution. The term 'water	Low (22)	» Regular inspections and maintenance of the pipeline must be undertaken during the operational phase, with any leaks repaired immediately. » All bare areas, as a result of the development, should be revegetated with locally occurring species, to bind the soil and limit erosion potential.	Low (2)	Medium risk, chemical pollutants associated with site-clearing machinery and construction activities could be washed downslope via the ephemeral systems.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
quality' must be viewed in terms of the fitness or suitability of water for a specific use (DWAF, 2001). In the context of this impact assessment, water quality refers to its fitness for maintaining the health aquatic ecosystems. Possible ecological consequences associated with this impact may include: » Deterioration in freshwater ecosystem integrity; and				

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
» Reduction in and/or loss of species of conservation concern (i.e. rare, threatened/endangered species). A potential leakage of the gas into the soil and wetland may lead to a Reduction in oxygen levels resulting in local anoxic conditions leading to the displacement of resident fauna and the suffocation of benthic organisms and vegetation				

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Disturbance/ distruction of heritage receptors: The impact relates to the Historical period settlement (Exigo-NGP-HP01)	Medium Negative	» Site Monitoring: Regular examination of trenches and excavations. » Alteration Permitting: The site is older than 60 years and generally protected under the NHRA. Application for an alteration permit should be made with relevant heritage authorities (SAHRA, SAHRA Built Environment) should the site be alteration at any stage.	Low Negative	Low risk as this heritage site is not located directly next to the proposed pipeline
Disturbance/ distruction of heritage receptors: The impact relates to the burial site (Exigo-NGP-BP01)	High Negative	» Implement a heritage conservation buffer of at least 10m from the nearest graves in the cemetery. Implement a conservation buffer of 3m from the cemetery fence to the periphery of the impact buffer of operation activities. » The project site in the vicinity of this receptor should be monitored by an ECO familiar with the heritage occurrences of the site: regular examination of trenches and excavations and site clearing in order to detect and preserve previously undocumented heritage receptors.	Low Negative	Medium risk as this burial site is located directly next to the proposed pipeline
Disturbance/ distruction of heritage receptors: The impact relates to the burial site (Exigo-NGP-BP02)	High Negative	» Implement a heritage conservation buffer of 50m around the graves / cemetery. If possible, fence burial place and apply access control. » Site Monitoring: The project site in the vicinity of this receptor should be monitored by the operations and maintenance staff.	Low Negative	Low risk as this heritage site is located 50m from the the proposed pipeline

Alternative 1 *(REPEAT THIS TABLE FOR EACH ALTERNATIVE)*

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

No Go Alternative

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Poor control of alien plant species is currently being impleneted	Medium Negative	» An Alien Monitoring and Management Plan must be developed and implemented during the operational phase to reduce the establishment and spread of undesirable alien plant species. » Ongoing monitoring should be conducted by the site manager to ensure problem-areas are identified where alien species are proliferating, and to inform the control efforts throughout the operational phase. » Alien plants must be removed from the site through appropriate methods such as hand pulling, application of chemicals, cutting etc., on a regular basis during operation. Removal must occur prior to plants developing seeds.	Low Negative	Medium risk due to the the presence of alien invasive plant species present within the project site.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation / enhancement:	Significance rating of impacts after mitigation / enhnacement :	Risk of the impact and mitigation / enhancement not being implemented
Poor control of fires on site, will alter the species composition and richness of the existing vegetation and continue to degrade the ecological function and processes on site.	Medium Negative	» Prepare seasonal firebreaks around the facility to reduce incidences of fire spreading onto the property.	Low Negative	Medium risk

The No-Go Option is represented by the development not proceeding, and current land use to persist into the indefinite future. While many of the project-related impacts will thus be absent, the notable societal benefits will also be removed. Additionally, the option of continued agriculture and mixed industrial use exhibited in this area is not without its own impacts, stemming mainly from ongoing invasion of alien species and continued degradation of freshwater and terrestrial resources through disturbances currently experienced on site

While this option still has less impact than the overall project related impacts (regardless of which alternative is selected), the loss of societal benefit makes this the less attractive option, especially in the light of the fact that this project proceeding will not reduce the agricultural potential and capacity already present within the project area as all activities remain within the road reserve. It is the opinion of the EAP that this option not be elected, and rather the preferred option (as proposed in this report) be implemented. **The 'No-Go' alternative is, therefore, not a preferred alternative.**

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

» Ecological Impact Assessment Report (refer to **Appendix G1**);
» Wetland Impact Assessment Report (refer to **Appendix G2**); and
» Heritage Impact Assessment Report (refer to **Appendix G3**)

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

The following assumptions and limitations are applicable to this Basic Assessment Process:

» All information provided by the proponent to the environmental team was correct and valid at the time it was provided.
» It is assumed that the project site identified by the proponent represents a technically suitable site for the establishment of the proposed pipeline and associated infrastructure.
» This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other alternatives in terms of location and technology.

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.

Impacts associated with the decommissioning of the infrastructure on site are expected to be similar to impacts associated with the construction phase. During decommissioning the relevant legislation at the time would need to be complied with. All areas disturbed during decommissioning activities will be required to be rehabilitated as appropriate.

Potential impacts:	**Significance rating of impacts**	**Proposed mitigation:**	**Significance rating of**	**Risk of the impact and mitigation not being implemented**

	(positive or negative):		**impacts after mitigation:**	
General				
Waste management – poor control of rubble and general construction waste will contaminate the environment through litter, attracting vermin and opportunistic alien species proliferation (-)	Low Negative (14)	» All decommissioning waste is to be disposed of at a licensed facility and the disposal is to be supported with a waste manifest.	Low Negative (12)	Low risk, this actvity will not generate large amounts of waste
Ecological				
Loss of floral and faunal biodiversity from poor rehabilitation efforts during closure, leading to a disruption of ecosystem function and processes: During the decommissioning phase, project infrastructure will be removed. The removal process may result in the clearance of natural vegetation. In addition, there will be large areas of bare ground where the project infrastructure was located along the pipeline route. Without vegetation cover, these areas are sensitive to	Medium Negative (50)	» Design and implement a rehabilitation plan for the decommissioning phase; » Design and implement an erosion management plan for the decommissioning phase; » Implement an alien invasive monitoring and management plan for the decommissioning phase; » If laydown areas and turning areas are required, these must be sited in areas that have already been impacted or show evidence of degradation;	Low Negative (24)	Medium risk due to the existing presence of Alien Invasive species within the proejct site.

erosion and invasion by alien plant species.				
Increased erosion due to vegetation clearing for infrastructure: During decommissioning, removal of site infrastructure will expose soil and increase the potential for erosion	Medium Negative (35)	» Any erosion observed should be rectified immediately and monitored thereafter to ensure interventions are successful. » All bare areas, affected by the development, should be re-vegetated with locally occurring species, to bind the soil and limit erosion potential. » Reinstate as much of the eroded area to its pre-disturbed, "natural" levels » All disturbed areas should be regularly monitored for erosion occurrences and must receive follow-up monitoring by the EO to assess the success of the remediation. » Topsoil should be removed and stored separately and should be reapplied where appropriate as soon as possible in order to encourage and facilitate rapid regeneration of the natural vegetation on cleared areas. » Where feasible, phased development and vegetation clearing should be practiced so that cleared areas are not left denuded and vulnerable to erosion for extended periods of time.	Low Negative (16)	Medium risk as the vegetation clearance will be required for the project.
Wetlands				
Loss/Disturbance of wetland habitat and fauna: This refers to the direct physical destruction or	Low Negative (27)	» Existing access roads to be used as far as possible. Limit the extent of the construction servitude to as small an area as possible.	Low Negative (8)	Medium risk as the development requires construction activities within wetland.

disturbance of aquatic habitat caused by vegetation clearing, disturbance of wetland habitat, encroachment/colonisation of habitat by invasive alien plants and alteration of wetland geomorphological profiles (including stream beds and banks).		» Ideally the construction disturbance footprint should be kept to an area no wider than 5 m. » All material stockpiles and construction camps should be located outside wetland areas. » Closure and rehabilitation of the disturbed areas should commence as soon as the laying of underground pipeline has been completed. » All material stockpiles (other than soils removed during trenching) and construction camps should be located outside wetland areas. » The areas where vegetation is destroyed and disturbed will however need to be monitored against invasion by alien vegetation and, if encountered, will need to be removed. » If natural re-vegetation is unsuccessful, seeding and planting of the area will need to be implemented. » There should be reduced activity at the site after large rainfall events when the soils are wet. » No driving off of hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased. **<u>For Wetland 1, 2 and 5 (HDD):</u>**		

		» All construction activities occurring directly within wetland habitats (Wetland 1, 2 and 5) to take place within the dry season. » The remaining construction activities should be aimed to take place within the dry season as far as reasonably possible. » Regular monitoring should be conducted along the drilling route for potential frack-outs. » Every effort must be made to avoid the release of drilling fluid into the wetlands. » Where drilling fluid is observed at the surface, the "spill" should immediately be contained / recovered. » Smothering of vegetation should also be avoided. » Once excess drilling mud have been removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation. » Revegetated areas will be monitored twice per year for two years subsequent to frack-out to confirm revegetation is successful. » Used drilling liquid should be contained in a settling pond or similar structure, from where the fluid can either be re-used or removed from site. **<u>For Wetland 1 & 2 (HDD):</u>**		

		» All activities and disturbances should be confined to the raised road reserve (as close as possible to the M45 Road), » All vegetation clearance and activities associated with the rig setup should occur within the raised road reserve (as close as possible to the M45 Road). » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » The natural surface of the inundated and permanent saturated zone the wetland, including a 10m buffer should be considered as a NO-GO Zone. **For Wetland 5 (HDD):** » All activities and disturbances should occur outside of the delineated wetland boundary (including a 10m buffer area). Limit the extent of the construction servitude to as small an area as possible. **For Wetland 4 and partially 1 and 2 (Trenching):** » Construction activities should be aimed to take place within the dry season as far as reasonably possible;		

		» All activities must be restricted to the raised portion of the road reserve (as close as possible to the existing road). » Excavated soils should be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench; » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » Wetland areas other than the immediate areas of crossing are to be demarcated as no-go areas for vehicles and construction personnel. » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). » Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days). **For Wetland 6 and 9 (Trenching outside of wetland boundary):**		

		» All activities restricted, as far as possible, within the elevated road reserve. » Wetlands located in close proximity to the proposed pipeline route should be regarded and demarcated as no-go areas for vehicles and construction personnel. » Excavated soils from the trench, made for the pipeline, should also be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench. » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). » Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days).		
Impact on localized surface water quality: This refers to the alteration or deterioration in the physical, chemical and biological characteristics of water	Medium Negative (32)	» Institute environmental best practice guidelines as per the DWA Integrated Environmental Management Series for Construction Activities.	Low Negative (5)	Medium risk.

resources (i.e. water quality) such as wetlands & rivers as a result of water/soil pollution.		» Implement appropriate measures to ensure strict use and management of all hazardous materials used on site » Implement appropriate measures to ensure strict management of potential sources of pollutants (e.g. litter hydrocarbons from vehicles and machinery, cement during construction etc.) » Implement appropriate measures to ensure containment of all contaminated water by means of careful run-off management on the development site. » 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. » No vehicles to refuel within watercourses/ riparian vegetation. » Place spill kits on site which are operated by trained staff members for the adhoc remediation of minor chemical and hydrocarbon spillages. » 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 construction camp/suitable waste		

		disposal facility. All waste must be disposed of offsite. » Working protocols incorporating pollution control measures (including approved method statements by the contractor) should be clearly set out in the Construction Environmental Management Plan (CEMP) for the project and strictly enforced. » » For Wetland 1, 2 and 5 (HDD): » The drilling rig should be placed on a plastic liner in order to avoid any potential soil contamination with hydrocarbon spillage or other associated pollutants. » Regular monitoring should be conducted along the drilling route. » All activities must be restricted to the raised portion of the road reserve (as close as possible to the existing road). » Used drilling liquid should be contained in a settling pond or similar structure, from where the fluid can either be re-used or removed from site. » Every effort must be made to avoid the release of drilling fluid into the wetlands. » Where drilling fluid is observed at the surface, the "spill" should immediately be contained/recovered.		

		» A spill kit should always be on-site. » A regulatory approved contingency plan (frack-out) should be in place which should consider the possibility of frack-out (and other contingencies) and the response actions that should be considered. » Large spills should be pumped out of the wetland into a contained area as soon as possible and the remaining fluid should be dispersed with hoses. » Smothering of vegetation should also be avoided. » Once excess drilling mud have been removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation. » Revegetated areas will be monitored twice per year for two years subsequent to frack-out to confirm revegetation is successful		
Increase in sedimentation and erosion within the development footprint: This refers to the alteration in the physical characteristics of wetlands and rivers as a result	Low Negative (21)	» All construction activities occurring directly within wetland habitats (Wetland 1, 2 and 5 to take place within the dry season. The remaining construction activities should be aimed to take place within the dry season as far as reasonably possible.	Low Negative (4)	Medium risk as the development requires construction activities within wetland.

of increased turbidity and sediment deposition, caused by soil erosion and earthworks that are associated with construction activities.		» Existing access roads to be used as far as possible. » Limit the extent of the construction servitude to as small an area as possible. » Ideally the construction disturbance footprint should be kept to an area no wider than 5 m. » Regular monitoring for erosion. - Any erosion problems observed, to be associated with the relating activity, should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. - Silt traps should be used where there is a danger of topsoil or material stockpiles eroding and entering streams and other sensitive areas. - Construction of gabions and other stabilisation features to prevent erosion, if deemed necessary. » Closure and rehabilitation of the disturbed areas (control stations and rig set-up) should commence as soon as the laying of underground pipeline has been completed. - Soils should be landscaped to the natural landscape profile with care taken to ensure that no preferential flow paths or berms remain. » The areas where vegetation is destroyed and disturbed will however need to be monitored		

		against invasion by alien vegetation and, if encountered, will need to be removed. » If natural re-vegetation is unsuccessful, seeding and planting of the area will need to be implemented. » There should be reduced activity at the site after large rainfall events when the soils are wet. » No driving off of hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased. **For Wetland 1, 2 and 5 (HDD):** » Any erosion problems observed, to be associated with the relating activity, should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. **For Wetland 1 and 2 (HDD):** » All activities and disturbances should be confined to the raised road reserve (as close as possible to the M45 Road), » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » The natural surface of the inundated and permanent saturated zone the wetland,		

		including a 10m buffer should be considered as a NO-GO Zone **For Wetland 5 (HDD):** » All activities and disturbances should occur outside of the delineated wetland boundary (including a 10m buffer area). **For Wetland 4 and partially 1 and 2 (Trenching):** » Construction activities should be aimed to take place within the dry season as far as reasonably possible; » All activities must be restricted to the raised portion of the road reserve (as close as possible to the existing road). » No activities or movement of any construction vehicles within the natural wetland surface (below the raised road reserve). » Wetland areas other than the immediate areas of crossing are to be demarcated as no-go areas for vehicles and construction personnel. » Excavated soils should be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench; » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must		

		be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). » Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days). » Concentration and accumulation of flows along the servitude should be prevented by regularly providing for surface runoff to flow into the adjacent grassland rather than along the construction servitude and into the wetlands. **For Wetland 6 and 9 (Trenching outside of wetland boundary):** » All activities restricted, as far as possible, within the elevated road reserve. » Wetlands located in close proximity to the proposed pipeline route should be regarded and demarcated as no-go areas for vehicles and construction personnel. » Excavated soils form the trench, made for the pipeline, should also be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench. » Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must		

		be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). Excavation of the trench, for the laying of the pipeline, should only take place immediately before placement of the pipeline (ideally the trench should not remain open for longer than 7 days).		

Alternative 1

Potential impacts:	**Significance rating of impacts(positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**

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

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

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:

This Basic Assessment includes an assessment of the cumulative impacts associated with the gas pipeline and associated infrastructure, Gauteng.

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in-itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). Boundaries must be set so analysts are not attempted to measure effects on everything. Therefore, the cumulative impacts associated with the proposed project have been viewed from two perspectives within this report:

- Cumulative impacts associated with the location and nature of the project i.e. a gas pipeline within the broader Nigel area, Gauteng;
- Cumulative impacts associated with other similar existing developments and disturbances within the surrounding area.

The broader area to the north, north west and north east of the project site consists of largely residential and human settlements. In addition to this, the town of Nigel is located approximately 6.1km south east and has several businesses, industries and mining areas within the municipal boundaries and immediate project surroundings. Other infrastructure in close proximity to the project site includes the Consol Factory, the M63 and M45 regional road, main roads, power line infrastructure and railway line.

Ecology:

Cumulative ecological impacts will relate to the loss of biodiversity and conservation potential and the loss of CBAs and broad-scale ecological processes. The loss of sensitive vegetation types on a cumulative basis in the broader context impacts the ability to meet stated conservation targets for Tsakane Clay Grassland in particular. Some loss of vegetation is inevitable, and cannot be avoided, however the vegetation in the development corridor has a low sensitivity and conservation value, and contributes very little ecological function to the broader study area, especially in the road reserve where the proposed pipeline will be placed. Cumulative loss of conservation potential is thus regarded as low taking into account other possible developments within the broader study region. Although small in extent, some areas classified as CBA and ESA will be partially cleared during construction, resulting in a loss of CBA and ESA area. These areas are however not regarding as functioning CBA due to the highly degraded state of the development corridor in particular. The cumulative impact on ecology is considered to be of **low significance**. The cumulative impacts are deemed acceptable considering the existing poor ecological condition of the site, and the broader character of the area (i.e. already developed and highly degraded).

Wetlands:

In terms of loss and disturbance of wetland habitat and fauna, limited loss of ecosystem functions and services is expected. localized impacts on surface water quality in terms of the deterioration of water quality is highly unlikely. During flood events, any unstable banks (eroded areas) and sediment bars (sedimentation downstream) may be vulnerable to erosion, however, due to low mean annual runoff

within the region, increases sedimentation and erosion and altered wetland hydrology due to interception/impoundment/diversion of flows is not anticipated. The cumulative impact on ecology is considered to be of **low significance**.

Heritage:

Given the localized nature of the heritage features located within this project site, no cumulative impacts in terms of heritage features are anticipated.

Conclusion:
Overall, the development of the Nigel proposed gas pipeline and associated infrastructure will not lead to a whole-scale change of the area due to the current state of the surrounding area. Therefore, the development of the Nigel Gas Pipeline and associated infrastructure is considered appropriate within the proposed location without any significant cumulative impacts. The cumulative impacts are considered to be of **low significance**, depending on the impact being considered. Therefore, the development is considered appropriate and acceptable within the proposed location.

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.

This section provides a summary of the environmental assessment and conclusions drawn for the development of the project. In doing so, it draws on the information gathered as part of the Basic Assessment process and the knowledge gained by the environmental consultant during the course of the process, and presents an informed opinion of the environmental impacts associated with the proposed project. The following conclusions can be drawn from the Basic Assessment:

Ecology:

At present, the project area and development corridor in particular, are deemed highly disturbed due to ongoing disturbance through fires, invasive species, grazing, illegal dumping, pedestrian movements, road verge maintenance, historical infrastructure and recent construction. The development corridor remains unfenced and open to the public which promotes ongoing impacts identical to those just mentioned. No sensitive Species of Conservation Concern were observed within the development corridor, with the remainder of the species observed regarded as Least Concern (LC) in terms of their conservation status. Overall the ecological contribution of development corridor was deemed to be low, with no sensitive species observed and few ecological process areas and habitats due to the small size and highly disturbed character of the development corridor.

The CBA classification for the development corridor also does not correspond to the real-world condition of the plant and animal species observed during the field assessment, and therefore contributes poorly to the ecological function of the broader area. As such, no functional CBA zones were deemed present within the development corridor, as confirmed by the site assessment results, and thus the proposed development will not significantly impact the overall quantity and quality of the remaining CBA areas in the broader study area.

Furthermore, while the vegetation type present on site has a high conservation value according to Mucina and Rutherford (2012), the highly degraded real-world condition of the vegetation units observed within the development corridor confirmed a minimal overall conservation contribution, with the exception of wetland vegetation areas. Only the degraded mixed grassland vegetation unit within the development corridor resembles Tsakane Clay Grassland, but is highly degraded, with poor ecological functioning and a low conservation contribution, and as such does not represent a good conservation opportunity and does not currently contribute to the overall health and conservation status of the Tsakane Clay Grassland vegetation type. Should the development proceed, the loss of the highly degraded Tsakane Clay Grassland vegetation unit in the project area will not significantly reduce the conservation potential and current distribution of the vegetation type as a whole, due primarily to the severely degraded nature of this vegetation unit within the project area, and in particular the development corridor.

In addition, the mixed invasive woodland vegetation unit was not deemed to contribute significantly to the ecological functioning of the study area, due largely to the low species diversity, invasive nature of the vegetation within this unit, and the limited extent thereof. There are a vast number and variety of alien invasive plant species present onsite, particularly near the bridge structures, immediate road reserve and areas where previous construction activities have degraded the environment.

The ecological impacts of all aspects for the proposed project were assessed and considered to be ecologically acceptable (i.e. **no fatal flaws** were determined), provided that the mitigation measures provided in this report are implemented, and that relevant licencing is obtained from the Department of Water and Sanitation (DWS) for works conducted within or near the watercourses. Implementation of recommended mitigation measures is an important element of the mitigation strategy and will reduce all identified impacts to low negative

Wetlands:

The findings of the wetland assessment suggests that owing to a range of existing impacts within the wetlands and catchment area (linked predominantly to alterations in water inputs and storm water runoff as well as surface water runoff through the wetland systems), the wetlands are generally in a modified condition with the level of modification varying according to the level of disturbance from 'Severely' modified (F PES Class) to 'Moderately' modified ('C' PES Class). Only one wetland (W6) was regarded as 'Natural / Unmodified' ('A' PES Class). Wetland Unit 1 (W1) was considered to be 'Greatly' Modified ('E' PES Class). Both Wetland Units 2 and 4 (W2, W4) were considered to be 'Largely' Modified ('D' PES Class). Wetland Unit 5 (W5) have been 'Severely' Modified, whilst Wetland 9 (W9) have been 'Moderately' Modified.

With the mitigation measures recommended in the wetland assessment, impacts on aquatic ecosystem integrity and functioning can be potentially reduced to a sufficiently low level. Based on the outcomes of the wetland assessment, specifically also considering the existing disturbances impacting on the affected wetland and resulting in the modified condition of the affected wetland, together with the fact that expected impacts can be mitigated to **Low significance** through the application of a number of easily implementable mitigation measures.

Heritage:

Heritage resources found at the project site include a Historical Period settlement area and two burial sites. The poorly preserved remains of a Historical Period settlement area occur along a northern section of the project footprint south of the M45 road (Site EXIGO-NGP-HP01). The site is rated as low heritage significance and impact seems unlikely but legislation requires that an alteration / destruction permit be obtained from the relevant heritage resources authority (SAHRA, SAHRA Built Environment Unit) should the site be altered at any stage. It is recommended that the site and its surrounds be closely monitored by an informed ECO during development in order to avoid the destruction of previously undetected heritage remains.

Two burial sites occur in the project area and these highly significant heritage resources are protected in terms of heritage and social by the National Heritage Resource Act (NHRA 1999). It is essential that the long-term conservation of the sites is ensured. The Nigel Municipal Cemetery (Site EXIGO-NGP-BP01) occurs east of the M63 road and approximately 10m east from the proposed pipeline alignment. The pipeline alignment runs within the road reserve which had previously been impacted on by the establishment and construction of municipal services (water and electricity lines) and impact on the adjacent cemetery is unlikely. It is primarily recommended that a heritage conservation buffer of at least 10m be implemented from the nearest graves in the cemetery, to the periphery of the impact buffer of construction activities. It is further recommended that a conservation buffer of 3m from the cemetery fence to the periphery of the impact buffer of construction activities be observed. A temporary construction barricade should be erected along areas where this measure proves unfeasible, i.e. in areas where construction activities might encroach on the 3m buffer.

An additional informal cemetery was documented in an open field directly west of the M63 road and south of Dunnotar, approximately 100m west of the proposed pipe alignment (Site Exigo-NGP-BP02). Even though impact on the site seems improbable it is recommended that a conservation buffer of at least 50m be implemented around the site. The developer should consider fencing off the burial site in order the clearly demarcate the presence and extent of this sensitive heritage resource in the larger development landscape.

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.

Conclusion:

Based on the findings of the studies undertaken, in terms of environmental constraints and opportunities identified through the Basic Assessment process, no environmental fatal flaws were identified to be associated with the development of the proposed project. The development of the project will result in positive impacts and negative impacts. Impacts are expected to be **low** after the implementation of appropriate mitigation measures (as recommended in this report and the EMPr attached within **Appendix H**). Considering the information available at this planning stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable.

As South Africa faces challenges of rapidly deteriorating infrastructure and an increased need for energy, the need for the project in terms of reduced reliance on the national energy grid, and private investment into infrastructure, is considered to be high & desirable. The installation of the Nigel gas pipeline and associated infrastructure will allow Consol to expand their Nigel plant, this in turn will help boost the South

African economy, push saving on glass costs through to the consumer whilst also creating permanent employment opportunities.

The project is considered the best practicable environmental solution considering the needs of the proposed technology in the light of the feasibility assessments, and environmental impact assessment results.

Alternative 1

No-go (compulsory)

The No-Go Option is represented by the development not proceeding, and current land use to persist into the indefinite future. While many of the project-related impacts will thus be absent, the notable societal benefits will also be removed. Additionally, the option of continued agriculture and mixed industrial use exhibited in this area is not without its own impacts, stemming mainly from ongoing invasion of alien species and continued degradation of freshwater and terrestrial resources through disturbances currently experienced on site

While this option still has less impact than the overall project related impacts (regardless of which alternative is selected), the loss of societal benefit makes this the less attractive option, especially in the light of the fact that this project proceeding will not reduce the agricultural potential and capacity already present within the project area as all activities remain within the road reserve. It is the opinion of the EAP that this option not be elected, and rather the preferred option (as proposed in this report) be implemented. **The 'No-Go' alternative is, therefore, not a preferred alternative.**

6. Impact Summary of the Proposal or Preferred Alternative

The overall significance rating of the impacts of the proposed development during the construction and operation phases is of a **low significance** with the implementation of mitigation. The **positive impacts** associated with the operation will be of a **moderate to low significance**. The significance of the impact is primarily due to the control of existing alien plant species located within the project site, the implementation of effective fire control mechanisms as well as temporary employment opportunities.

Cumulative impacts associated with the development of the Gas pipeline, and associated infrastructure are considered to be of **low significance**. The site is located within an area already disturbed by existing infrastructure. The development of the Nigel Gas Pipeline and associated infrastructure will not lead to a whole-scale change of the area due to the current state of the surrounding area and the existing developments present in the area. Therefore, the development of the Nigel Gas Pipeline and associated infrastructure is considered appropriate within the proposed location without any significant cumulative impacts.

The impacts expected during the construction phase range from medium-term to short-term and of a local extent. The magnitude of the impacts will range from moderate to small. The impacts expected during the operation phase will range from long-term to short-term duration and of a local extent. The magnitude of the impacts will range from moderate to small.

For alternative:

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.

For the development of the project only the preferred alternative has been assessed. The location of the project mainly relates to the specific requirements of the Consol factory, and the nearby tie-in point with the existing Sasol transmission pipeline. The specific technologiesrequired have been identified as the only feasible alternative for the development based on cost, longevity, durability and technology requirements. No sensitive environmental features were identified within the project site that could not, with mitigation, be addressed in order to reduce impacts thereon to acceptable levels

7. Spatial Development Tools

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

- Energy efficiency is a stated aim for the province in the **Gauteng Spatial Development Framework (GSDF) (2030)**, to which this project contributes through reducing load on the national Eskom energy grid.
- In addition, improvements towards more sustainable forms electricity supply (as required under the **Gauteng Spatial Development Framework (GSDF) (2030)),** which includes further diversification of the province's energy sources, is contributed towards through the development of this project and the associated infrastructure it represents.

The **Gauteng Regional Spatial Development Framework (RSDF) (2015)** locates the project site in Region E of the EMM. The RSDF presents a clear strategic vision for the future spatial growth within Region E. The RSDF states a clear electricity constraint is being experienced by residents, and thus this project will marginally contribute to the alleviation through reducing the volume of energy drawn from the national grid.

Gauteng Conservation Plan:

The Gauteng C-Plan is based on the systematic conservation protocol developed by Margules and Pressey (2000) and is based on the principles of complementarity, efficiency, defensibility and flexibility, irreplaceability, retention, persistence and accountability. Ultimately, the tool resulted in systematic classification and mapping of the Gauteng region, taking a vast array of ecological and land use factors into account.

The main purposes of the C-Plan are:

- To serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process;
- To inform protected area expansion and biodiversity stewardship programmes in the province;
- To serve as a basis for development of Bioregional Plans in municipalities within the province.

As such, the plan delineates Critical Biodiversity Areas (CBAs), and Ecological Support Areas (ESAs) for the entire province, to be used by private and public entities to guide land use decisions within Gauteng.

Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, while Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic.

The Gauteng C-Plan shows that the study area contains numerous CBA and ESA regions, which is also true of the 100m project area. In addition, the Gauteng C-Plan further shows that the development corridor occurs within approximately 2 186m (21%) of the Critical Biodiversity Area (CBA), whereas a further 6 578m (62%) occurs within an Ecological Support Area, with the remaining 17% unallocated according the C-Plan categorisation. The CBA areas found within the development corridor comprise "Irreplaceable Area" of approximately 600m towards the north-east of the route, with the remainder being defined as either "Important Areas" or "Ecological Support Areas".

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** **X**

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:

It is the recommendation of the environmental assessment practitioner that the development of the Nigel gas pipeline and associated infrastructure be authorised, constructed and operated due to the positive impacts associated with the development, as well as the low negative impacts arising for the implementation of the project.

The construction and operation of the project should be implemented according to the specifications of the EMPr to ensure mitigation and management of potential impacts associated with construction and operation activities. The activities should be monitored against the approved EMPr, the Environmental Authorisation (once issued) and all other relevant environmental legislation. Relevant conditions to be adhered to include:

- All mitigation measures recommended within this report and associated appendices should be implemented and adhered to.
- An ECO must be employed during construction.
- An Alien Plant Monitoring and Management Plan must be developed and implemented during the construction phase to reduce the establishment and spread of undesirable alien plant species.
- An appropriate Storm Water Management and Erosion Plan should be compiled and implemented during the construction phase and operation phase of the development.

9. The Need and Desirability of the Proposed Development

The need and desirability of the proposed Nigel Gas Pipeline and associated infrastructure project must be undertaken as per notice 792 of 2012.

The **Gauteng Regional Spatial Development Framework (RSDF) (2015)** locates the project site in Region E of the EMM. The RSDF presents a clear strategic vision for the future spatial growth within Region E. The RSDF states a clear electricity constraint is being experienced by residents, and thus this project will marginally contribute to the alleviation through reducing the volume of energy drawn from the national grid. This will be through the reduced usage of the consol factory in particular, as well as the potential for future connections presented by the presence of such a gas pipieline within this area. Where possible, the pipeline may contribute to future development by increasing the gas reticulation within the area and allowing for further industrial connections to be made (in instances where gas may be used). This also represents a positive contribution to society through private industry investment into service infrastructure which may in future be utilised by parties other than simply Consol. Furthermore, the project represents and opportunity to control and reduce invasive species presence within the project site by the implementation of an operational phase invasive species management plan, where this is currently not being done.

As such, this project contributes the following, either temporarily or permanently:

i. Reduced electricity demand on the national grid;
ii. Support of the SA economy
iii. Private investment into infrastructure in the region;
iv. Increased gas reticulation within the Nigel area, with potential for further future connections to other industrial facilities;
v. An opportunity to implement an invasive species monitoring and control plan which may alleviate the ongoing and continued spread of invasive species within the project area;
vi. Temporary jobs during the construction phase;
vii. Temporary support for local businesses through materials purchases and workers making use of local facilities during the construction period;
viii. Facilitating the expansion of the Consol Nigel plant, leading to the creation of approximiately 500 permanent jobs, 70% of which will be filled by previously disadvantaged individuals.

Questions (Notice 792, NEMA, 2012)		Answer
PART 1: NEED		
1	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	Yes: The proposed project is aligned with the SDFs in a number of ways, including: » Creation of permanent and temporary job opportunities » Providing private investment into the area without putting additional pressure on the current municipal infrastructure; » Aiding in the alleviation of poverty and providing upliftment to the surrounding communities. The proposed project will provide job opportunities for people in the surrounding communities. » Ensuring sustainability of environment resources while creating socio-economic opportunities.

2	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	» There is presently a need for the proposed pipeline as demonstrated by the use of this gas by Consol; » In addition, there is currently a proponent and financier, whereas this may not be true in the future. » Furthermore, the location of this activity is constrained by the need to be close to both the source (the Sasol Mozambique supply line), and the off taker (Consol), and as such only minor route variations are sensible in the immediate area, for which feasibility studies, inclusive of cost, wayleave, environmental and engineering concerns, have been conducted and the preferred alternative proposed in this report, selected as the only suitable option. » In addition, the specialist studies and impact assessment have shown acceptable significance levels for anticipated impacts following mitigation, and as such the proposed development is an acceptable proposal from an environmental perspective.
3	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	» A clear need has been demonstrated through the offtake agreement of the piped gas, by Consol
4	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	Yes: A very small amount of general construction waste will be produced by the proposed development, for which adequate municipal landfill supply will be available due to the very small quantities envisaged. No further services or capacity is required as this is mainly a small-scale construction venture.
5	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The development is not provided for in the infrastructure planning of the municipality. However, the proposed project will not have any implications for municipal infrastructure planning, as no services and/or infrastructure will need to be created or upgraded to cater for this development, and indeed this development represents a privately-owned service infrastructure of its own. The current status of the infrastructure in the area will suffice for the proposed development.
6	Is the project part of a national programme to address an issue of national concern or importance?	The National Development Plan (NDP) aims to eliminate poverty and reduce inequality by 2030. The plan focuses extensively on the notion of capabilities, and the ongoing development and improvement of such capabilities to improve people's lives. The NDP proposes the following strategies to address these goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces;

		5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; and 8. Transforming society and uniting the nation. The proposed project is therefore aligned with the NDP, in particular goals 1-3, as it will partially address jobs, infrastructure and lower carbon options within the project region.
PART 2: DESIRABILITY		
1	Is the development the best practicable environmental option for this land/site?	Considering the fact that the proposed pipeline will only utilise portions of the road reserve, and the current precedent for linear features such as sewer mains, electricity cables and fibre optic cable being installed into such areas, as well as the highly degraded nature of the road reserve and the fact that this development will introduce invasive species control measures, it is argued that the proposed location does represent the best practicable environmental option for the site.
2	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No: the proposed project is aligned with the SDFs in a number of ways, including: » Creation of permanent and temporary job opportunities » Providing private investment into the area without putting additional pressure on the current municipal infrastructure; » Aiding in the alleviation of poverty and providing upliftment to the surrounding communities. The proposed project will provide job opportunities for people in the surrounding communities. » Ensuring sustainability of environment resources while creating socio-economic opportunities.
3	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	The Gauteng Provincial Environmental Management Framework (GPEMF) delineated various environmental management zones throughout the province, which take into account biodiversity sensitivity, land use planning objectives and the current status of these sites as far as possible, and provide clear development instruction regarding the various zones. The GPEMF indicated that the project falls within the "Normal Control Zone (Zone 4)" and the "High Control Zone (outside the urban development zone) (Zone 3)" which are conservation and agricultural focus zones under the GPEMF, respectively. In addition, the route traverses large portions of the "Urban Development Zone" (Zone 1) and the "Industrial and large commercial focus zone" (Zone 5), which are both development zones under the GEMPF. As such, the proposed development partially compliments the stated goals of both Zone 1 and Zone 5 through which it passes. In addition, with the effective implementation of the mitigation measures proposed in this report, all the identified negative

		impacts will be reduced to acceptable levels, and will thus not be compromise the existing planning frameworks for the province if authorised.
4	Do location factors favour this land use at this place? (This relates to the contextualization of the proposed land use on this site within its broader context).	The location of this activity is constrained by the need to be close to both the source (the Sasol Mozambique supply line), and the off taker (Consol), and as such only minor route variations are sensible in the immediate area, for which feasibility studies, inclusive of cost, wayleave, environmental and engineering concerns, have been conducted and the preferred alternative proposed in this report, selected as the only suitable option. In addition, considering the fact that the proposed pipeline will only utilise portions of the road reserve, and the current precedent for linear features such as sewer mains, electricity cables and fibre optic cable being installed into such areas, as well as the highly degraded nature of the road reserve and the fact that this development will introduce invasive species control measures, it is argued that the utilisation of the road reserve for this project is favourable in terms of the broader land use of the area.
5	How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The development of the proposed project will exert an impact on the environment; however, these impacts can be mitigated to acceptable levels should the mitigation measures contained in this report be rigorously implemented. Please refer to the impacts section of this report, as well as the specialist reports contained in this submission for a detailed description of the impact on sensitive natural or cultural areas.
6	How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	A small negative impact will be realised on people's well-being during the construction period (6-8 months) in terms of minor traffic inconvenience and a minor visual impact, both of which may be suitably mitigated through implementation of the measures contained in this report. However, once the construction phase has been completed no further impact to health or well-being is anticipated for the duration of the operational phase.
7	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. However the opportunity costs of <u>not</u> proceeding with the project would include: » The loss of the opportunity to provide temporary and permanent jobs The loss of opportunity of new investment in the area and infrastructure development; and » The loss of opportunity to support the SA glass economy and the opportunity to pass savings onto the consumer.

8	Will the proposed land use result in unacceptable cumulative impacts?	No. The proposed project and associated activities has identified cumulative negative impacts, with all of these having low significance upon mitigation, which are not regarded as unacceptable considering the need for investment and development to continually provide for a growing population. The measures outlined in the attached EMPr serve as mitigation methods to prevent the current and proposed project from having any unacceptable negative cumulative impacts on the receiving environment.

10. The Period for Which the Environmental Authorisation Is Required

Consider when the activity is expected to be concluded.

Construction is envisaged to commence shortly after receipt of the Environmental Authorisation. Construction will take ~6-8 months and then operation will commence directly after the completion of the construction phase. Construction activities are thus expected to be concluded in the second quarter of 2020.

11. Environmental Management Programme (EMPr)

Must include post construction monitoring requirements and when these will be concluded.
If the EAP answers "Yes" to Point 8 above then an EMP is to be attached to this report as an Appendix

EMPr attached **YES X**

SECTION F: APPENDICES

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)
Appendix A1: Locality Map
Appendix A2: Layout Map
Appendix A3: Sensitivity Map
Appendix A4: Sensitivity Map of the broader area Sensitivities
Appendix A5: Project Coordinates
Appendix A6: SG numbers for properties within 50m
Appendix B: Photographs
Appendix C: Facility Illustration
Appendix D: Route Position Information
Appendix E: Public Participation Information
Appendix E1: Proof of site notice
Appendix E2: Written notices issued as required in terms of the regulations
Appendix E3: Proof of newspaper advertisements - *to be included in the final BAR*
Appendix E4: Communications to and from interested and affected parties
Appendix E5: Minutes of any public and/or stakeholder meetings - *to be included in the final BAR*
Appendix E6: Comments and Responses Report
Appendix E7: Comments from I&APs on Basic Assessment (BA) Report - *not applicable*
Appendix E8: Comments from I&APs on amendments to the BA Report - *not applicable*
Appendix E9: Copy of the register of I&APs
Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information – *where applicable, to be supplied upon final BAR*
Appendix G: Specialist Reports
Appendix H: Environmental Management Programme (EMPr)
Appendix A: Curriculum Vitae of the Project Team
Appendix B: Grievance Mechanism for Public Complaints and Issues
Appendix C: A3 Layout and Sensitivity Maps
Appendix D: Alien Plant Management Plan
Appendix E: Stormwater Management Plan
Appendix I: Other information (EAP Declaration, Affirmation and CVs)

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.