



Draft Basic Assessment Report (DBAR) as part of the Environmental Authorisation Application for a proposed water supply pipeline for Goldi Abattoir, Standerton, Mpumalanga

A 3D rendering of a globe with water splashing over it, symbolizing sustainability and water management.

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Sustainability**

Technical Report: E44700261 _BAR_V1

Prepared for: Goldi - A Division of Astral Operations Limited

Prepared by: Exigo Sustainability (Pty) Ltd

Draft Basic Assessment Report (DBAR) as part of the Environmental Authorisation Application for a proposed water supply pipeline for Goldi Abattoir, Standerton, Mpumalanga

August 2021

Conducted on behalf of:

Goldi - A Division of Astral Operations Limited

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I&AP's	Interested and Affected Parties
Mr Wickus Kleynhans	Goldi - A Division of Astral Operations Limited

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LIST OF ABBREVIATIONS

Abbreviation	Description
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Areas
DBAR	Draft Basic Assessment Report
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Environmental Management Programme Report
GNR	Government Notice Regulation
GVA	Gross Value Added
IEM	Integrated Environmental Management
I&AP's	Interested and Affected Parties
IDP	Integrated Development Programme
LLM	Lekwa Local Municipality
NEMA	National Environmental Management Act
NEMBA	National Environmental Management Biodiversity Act
NHRA	The National Heritage Resources Act
SAHRA	South African Heritage Resources Association
SAWS	South African Weather Services
TCTA	Trans-Caledon Tunnel Authority
TLB's	Tractor-Loader-Backhoe
VRESAP	Vaal River Eastern Subsystem Augmentation Project
VRESS	Vaal River Eastern Subsystem
WM	With Mitigation
WOM	Without Mitigation
WMA	Water Management Area

EXECUTIVE SUMMARY

Background

Goldi, a division of Astral Operations Ltd, previously known as Earlybird Farms, has been operational in Standerton since 1972. The Goldi Abattoir is located on the R50 road in Standerton (corner of the R50 and Viking Avenue). The abattoir currently processes approximately 2.1 million birds a week.

The town of Standerton falls under the jurisdiction of the Lekwa Local Municipality (LLM). Water for Standerton is released from the Grootdraai Dam and abstracted at LLM's existing infrastructure on the bank of the Vaal River. Up to March 2019, the water supply to the abattoir by the Lekwa Municipality was adequate. Following a combination of factors, including load shedding and deterioration of the municipal infrastructure of the LLM, the community and water users in the high-lying areas in Standerton were challenged with water shortages as a result of inadequate pressure and water flow to the Concor Reservoir. The water supply interruptions resulted in Goldi not being able to keep up with production.

The water supply interruptions at the abattoir has cost the company in excess of R 85 million. The interruptions also had a knock-on effect on disposable income of the employees due to the fact that the abattoir only operated at 50%, resulting in huge financial losses to the workforce in terms of salaries and wages.

Goldi was therefore forced to actively seek alternative water supply solutions in an attempt to mitigate any further cost impacts as a result of the ongoing water supply interruptions. The investigation of alternative resources is described in Section 5.1.

Following meetings with the LLM and the Department of Human Settlements, Water and Sanitation (DHSWS) it was agreed that the most viable solution to the water supply problems would be for Goldi to prepare and submit an application for the abstraction of water from the Vaal River in order to become self-sufficient in terms of water supply.

Goldi therefore proposes to construct abstraction works and a pipeline to transfer 7 Mℓ/day (2 555 000 m³/a) of water from the Vaal River to the abattoir.

Project Description

The project will consist of the following phases:

Construction of abstraction works: Construction of the proposed abstraction works is planned to take place adjacent to the existing works of the Lekwa Municipality at the Vaal River. This phase will inter alia include the construction of a pump station and the installation of a prefabricated inlet channel, running from the river to a sump situated some 30 m from the river. Water abstracted from the sump will be pumped into a reservoir (1 000 m³) whereafter it will be pumped and conveyed to the Goldi Abattoir via a 450 mm diameter pipeline.

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Construction of a pipeline: The planned pipeline will stretch from the Vaal River abstraction point to the Goldi Abattoir located on the R50 road in Standerton. Three (3) alternative routes were investigated and the preferred route stretches over a distance of 5.42 km; from the abstraction point to the R39, after which it turns west and follows the road servitude of the R39 and R50 to the abattoir.

Alternative 1 will follow the wetland area that bisects Flora Park and Kosmos Park to the abattoir.

Alternative 2 extends north of Flora park towards the main reservoir. Just west of the reservoir it turns south through Kosmos Park towards the abattoir (refer to Figure 2-1 and Figure 2-2).

Construction of a water treatment plant at the Goldi abattoir: It is planned to install a fully automated clarifier water purification plant with a capacity of 90 000 l/hour.

The proposed pipeline development will start from coordinates 26°56'9.19"S; 29°15'55.25"E, join the R39 at coordinates 26°55'37.54"S; 29°15'15.09"E and end at 26°55'37.92"S; 29°13'22.92"E at the Goldi Abattoir.

Employment opportunities

The construction phase is likely to create about 18 Full-Time Equivalent jobs. The increase in demand for goods and services, due to the increase in income, as well as the investment for the project will create more job opportunities in other sectors of the local economy, and thus creating a positive employment effect.

Construction Works

The scope of work entails removal of 150mm of topsoil, excavation of pipeline trenches, pipe bridge foundations, footings and plinths, backfilling and compacting around structures, construction of concrete works, construction of a 1000m³ water reservoir, as well as construction of a pump station at the abstraction point.

Disposal of waste material

All material will be removed to a designated area, or a licenced waste disposal facility, if it cannot be re-used.

Rehabilitation

In areas where construction activities have been completed and no further disturbance is anticipated, rehabilitation and re-vegetation will commence as soon as possible. Refer to Appendix 10 for the Goldi Pipeline Landscape Management Plan.

Details of the Public Participation Process Followed

Public Participation is one of the most important aspects of the environmental authorisation process. This stems from the requirement that people have the right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the competent authority to make informed decisions and result in improved decision-making as the views of all parties are considered.

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Public Participation therefore allows I&AP's the opportunity to give their viewpoints and influence the process and the decisions of the competent authority.

The following process was undertaken to facilitate the public participation for the proposed project (refer to Appendix 13 for the Public Participation documentation). The registration period was completed, however public review of the Draft Basic Assessment will still take place (refer to Section 6.5)

Newspaper Advertisement

An advertisement, notifying the public of the Environmental Authorisation application and Basic Assessment process, and requesting I&APs to register their comments with Exigo, was placed in the Standerton Advertiser on 23 March 2021 (publishing date was 26 March 2021) as well as the Standerton Chronicle online newspaper on 26 March 2021. The advertisement was placed in accordance with regulation 41(2) (c) of the EIA Regulations of 2014 (as amended).

Site notices

In order to inform surrounding communities and adjacent landowners of the proposed development, six (6) site notice boards in accordance with regulation 41(2)(a) and 41(3) of the EIA Regulations were placed at the abstraction point, along the pipeline route (on the R39 / R50 road), and at the Goldi Abattoir (corner of Viking Avenue and the R50 road) on 23 March 2021.

Direct Notification of Identified I&AP's

Key stakeholders, who included the following sectors, were informed by means of hand deliveries, emails, faxes or registered post on 25 March 2021 of the proposed development:

- The owners and occupiers of land on and adjacent to the site where the activity is or is to be undertaken or to any alternative site
- Landowners in the surrounding area
- Mpumalanga Department: Agriculture, Rural Development, Land and Environmental Affairs (MDARLEA);
- Department of Mineral Resources and Energy;
- Department of Water and Sanitation (DWS);
- Department of Roads and Transport;
- South African Heritage Resources Agency (SAHRA);
- Mpumalanga Provincial Heritage Resource Authority (MPHRA);
- Department of Economic Development & Tourism;
- Mpumalanga Parks and Tourism Agency; and
- Mpumalanga Department of Human Settlements

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Hand deliveries

Notification letters were hand delivered to surrounding properties along the pipeline route.

Draft Basic Assessment Report (BAR)

The EIA Regulations specify that I&AP’s must have an opportunity to comment, in writing, on all reports or plans submitted to such party during the public participation process. A period of 30 days (30 August 2021 until 30 September 2021) will be made available to allow for public comment on the Draft BAR. The availability of the Draft BAR will be announced via personal notification letters distributed via hand delivery, post, fax, or emails to all the identified stakeholders on the distribution list. The following methods will be made available for I&AP’s to access the reports:

- Published on the Dropbox website; and
- Hard copies and electronic copies will be distributed upon request (reports will be sanitized).

Final Basic Assessment Report

The final BAR will be updated after the draft review to incorporate the comments received and issues raised by I&APs.

Summary of issues raised by I&APs

The following key issues were raised by I&AP’s during the registration period (refer to Table 6-1):

- Request for additional information on the water supply pipeline.
- The pipeline must not affect customers visiting the small shopping centre on the R50.

Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS
Ecological Impact Assessment (Exigo, 2020)	<p>The proposed water supply pipeline development will partially modify the vegetation and faunal habitats through the wetlands and secondary grassland areas. The importance of rehabilitation and implementation of mitigation processes to prevent negative impacts on the environment during and after the development phase should be considered a high priority.</p> <p>The proposed development should avoid negative impacts on wetlands and an IWUL should be obtained from the DWS. A number of mitigation measures have been recommended to minimise impacts. Negative impacts can be minimised by strict enforcement and compliance with an Environmental Management Plan which takes into account the recommendations for managing impacts detailed above.</p> <p>Provided that the proposed development is consistent with the sensitivity map and route option analysis; and take all the mitigation measures into consideration stipulated in this report, the planned development can be supported.</p>
Archaeological Impact Assessment (Exigo, 2019)	<p>The following recommendations are made based on general observations in the project area:</p> <ul style="list-style-type: none"> • Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any

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	<p>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.</p>
<p>Palaeontological Impact Assessment: Phase 1 Field Study (Dr H Fourie, 2020)</p>	<p>Shale and sandstone of the Vryheid Formation of the Ecca Group of the Karoo Supergroup underlie the study area. The geology of the study area is however obscured by soil and vegetation and no fossiliferous strata were found during the field assessment.</p> <p>The sedimentary rocks of the Vryheid Formation are highly fossiliferous in places and the chances are high that such layers will be exposed during development. The uppermost part of the underlying rocks is highly weathered however which diminishes the possibility of finding fossils in the study area.</p> <p>The fossils that occur in the Vryheid Formation are mostly that of leaf and stem imprints of plants such as <i>Glossopteris</i>, lycopods, ferns, horsetails, conifers, cordaitaleans and ginkgoaleans. Rare fossils of silicified and coalified wood, insects, bivalves, conchostrachans and fish scales also occur in this formation.</p> <p>If a particularly fossiliferous area is uncovered during development and a palaeontologist is not on site to advise the developer, the ECO should follow the guidelines as stipulated under the Chance Find Procedure (Appendix 9)</p>
<p>Socio-Economic Impact Assessment (Urban-Econ, 2020)</p>	<p>The investment for the proposed project is expected to be about R87.5 million, which is expected to create 18 full-time equivalent job opportunities during the construction phase of the project. The operational phase is not expected to have an increase in output or have an increase in employment for the short to medium term, but in the long-term, expansion of the abattoir is expected to take place that will likely create 800 full-time equivalent job opportunities.</p> <p>Goldi Chicken Abattoir will continue its operation in Standerton and the communities affected by water shortages in the past are expected to experience improvement due to the proposed development. Goldi Chicken Abattoir employs 3 400 individuals permanently and will need a constant supply of water for the company to continue its operations in the Standerton region. The construction and operation of the proposed pipeline are essential for retaining jobs, creating new jobs in the future as well as improving the living standards of the Standerton community.</p>

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An assessment of the significance of each issue and risk and an indication of the extent to which the issues and risks could be avoided or addressed by the adoption of mitigation measures

Summary Table of impacts and significance (with mitigation (WM) and without mitigation (WOM))

No	Activity	Impact	Without or With Mitigation	Nature (Negative or Positive Impact)	Significance	
					Score	Magnitude
Construction Phase						
Ecological and Wetland Impacts						
1	Clearing of vegetation for pipelines and infrastructure, access roads etc.	Loss of floral diversity or vegetation communities with resultant impact on fauna	WOM	Negative	50	Moderate
			WM	Negative	24	Low
2	Clearing of vegetation for pipelines and construction of infrastructure, access roads etc.	Habitat fragmentation	WOM	Negative	44	Moderate
			WM	Negative	14	Negligible
3	Exposure of soils to rainfall and wind during construction	Increased soil erosion and sedimentation	WOM	Negative	48	Moderate
			WM	Negative	16	Negligible
4	Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant)	Spillages of harmful substances, such as hydrocarbons and sewage) leading to soil and water pollution	WOM	Negative	50	Moderate
			WM	Negative	24	Low
5	Continued movement of personnel and vehicles on and off the site during the construction phase	Spread and establishment of alien invasive species	WOM	Negative	44	Moderate
			WM	Negative	14	Negligible
6	Construction of infrastructure, access roads etc.	Negative effect of human activities on the ecosystem resulting in degradation of habitat quality and increased pollution	WOM	Negative	44	Moderate
			WM	Negative	14	Negligible
7	Construction of pipelines and roads at crossings and on floodplains	Impact on drainage regime	WOM	Negative	26	Low
			WM	Negative	18	Negligible
8	Continued movement of vehicles on and off the site during the construction phase	Fauna mortality on roads	WOM	Negative	48	Moderate
			WM	Negative	14	Negligible
9		Air/ dust pollution	WOM	Negative	55	Moderate

	Continued movement of vehicles on and off the site during the construction phase		WM	Negative	28	Low
10	Construction through wetland crossings / abstraction of water from Vaal River	Impact on the characteristics of the watercourse habitat, biota, water quality and geomorphology due to construction within floodline zone	WOM	Negative	50	Moderate
			WM	Negative	24	Low
	Air Quality Impacts					
11	Excavation and stockpiling and vehicular movement	Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic.	WOM	Negative	35	Low
			WM	Negative	14	Negligible
	Visual impact					
12	Construction activities relating to installation of the pipeline	The largest part of the proposed pipeline will be situated belowground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles during construction.	WOM	Negative	40	Low
			WM	Negative	12	Negligible
	Noise Impacts					
13	Construction activities and operation of machinery and vehicles	Noise pollution from excavation activities and movement of vehicles	WOM	Negative	65	High
			WM	Negative	28	Low
	Traffic Impacts					
14	Excavation and installation of pipeline and use of construction vehicles	The presence of construction vehicles on site and installation of the pipeline alongside public roads will have an impact on the traffic situation of the neighbouring area although this will be kept to a minimum.	WOM	Negative	52	Moderate
			WM	Negative	22	Low
	Socio-economic Impacts					
15	Construction phase of 12 months	Temporary stimulation of economy and growth of the GDP	WOM	Positive	8	Negligible
			WM	Positive	8	Negligible
16	18 Full-Time Equivalent job opportunities	Creation of temporary employment opportunities nationally and locally	WOM	Positive	32	Low
			WM	Positive	32	Low
17	Increase in demand for employment in the region	Temporary increase in household income during construction	WOM	Positive	12	Negligible
			WM	Positive	12	Negligible
18	Workers requiring training to ensure skills development and knowledge transfer	Contribution to skills development during construction	WOM	Positive	20	Negligible
			WM	Positive	20	Negligible
20	Construction activities	Negative Impact on the sense of place	WOM	Negative	4	Negligible
			WM	Negative	4	Negligible
21		Increased pressure on local services and infrastructure	WOM	Negative	32	Low

	Use of roads, electricity and water during construction		WM	Negative	32	Low
22	Influx of people into the area	Temporary increase in crime and social conflicts associated with an influx of people	WOM	Negative	4	Negligible
			WM	Negative	4	Negligible
Ecological and Wetland Impacts						
23	Movement of vehicles on site during operations for maintenance purposes	Spillages of harmful substances leading to soil and water pollution	WOM	Negative	26	Low
			WM	Negative	14	Negligible
24	Pipe failure or leaks	Increased flows due to leaks or pipe failure	WOM	Negative	28	Low
			WM	Negative	16	Negligible
25	Subsidence	Erosion due to subsidence along pipeline	WOM	Negative	28	Low
			WM	Negative	16	Negligible
Socio-economic Impacts						
26	Sustainable production at Goldi Abattoir	Sustainable increase in production and GDP-R in national and local economies	WOM	Positive	45	Moderate
			WM	Positive	45	Moderate
27	Sustainable production at Goldi Abattoir	Creation of sustainable employment opportunities nationally and locally	WOM	Positive	36	Low
			WM	Positive	36	Low
28	Sustainable production at Goldi Abattoir	Improved living standards of positively affected households	WOM	Positive	18	Negligible
			WM	Positive	18	Negligible
29	Sustainable production at Goldi Abattoir	Sustainable increase in government revenue	WOM	Positive	14	Negligible
			WM	Positive	14	Negligible
30	Sustainable production at Goldi Abattoir	Skills development of permanently employed workers	WOM	Positive	22	Low
			WM	Positive	22	Low
31	Sustainable production at Goldi Abattoir	Local economic development benefits derived through the business social responsibility programme.	WOM	Positive	9	Negligible
			WM	Positive	9	Negligible
32	Sustainable production at Goldi Abattoir	Less Pressure on local Infrastructure (water supply infrastructure)	WOM	Positive	22	Low
			WM	Positive	22	Low

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Reasoned opinion as to whether the proposed activity should or should not be authorised

The findings of the specialist studies undertaken within this BAR provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. The findings conclude that, provided that the recommended mitigation and management measures are implemented, there are no environmental fatal flaws that post the provided mitigation, should prevent the proposed project from proceeding.

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SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 Contact Person and correspondence address

1.1 The EAP who prepared the report

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1.2 Expertise of the EAP

1.2.1 The qualifications of the EAP

Table 1-1: EAP expertise

EAP	Qualifications	Years' experience
Catherine Da Camara	BSc. Hons (Animal, Plants and Environmental Sciences); Pr.Sci.Nat, EAPASA Registered	18 years

Qualifications and CV's are attached as Appendix 1.

2 Location of the overall activity

Farm Name:	Portions 10, 36, 37 and 38 of the Farm Verblyden 387 IS; and Portions 2, 7, 26, 44, 48, 101, 114 and 121 of the Farm Grootverlangen 409 IS
Physical Address	Pipeline route from the Vaal River abstraction point to the Goldi Abattoir located on the R50 road in Standerton (corner of Viking Avenue and the R50 road in Standerton)
Metropolitan Municipality:	Gert Sibande District Municipality
Distance and direction from nearest town	The pipeline abstraction point is located at the Vaal River which is East of Standerton. The pipeline route passes through Standerton to the Goldi Abattoir located on the R39 / R50 road in Standerton.
21 digit Surveyor General Code for each farm portion	The following portions of the farm Verblyden 387 IS TOIS000000000387000010 TOIS000000000387000036 TOIS000000000387000037 TOIS000000000387000038 The following portions of the farm Grootverlangen 409 IS TOIS0000000004090002 TOIS0000000004090007 TOIS0000000004090026 TOIS0000000004090044 TOIS0000000004090048 TOIS00000000040900101 TOIS00000000040900114 TOIS00000000040900121

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Corridor of proposed activity	<ul style="list-style-type: none">• 26°56'9.19"S; 29°15'55.25"E• 26°56'12.40"S; 29°15'49.77"E• 26°56'19.70"S; 29°15'40.34"E• 26°55'37.54"S; 29°15'15.09"E• 26°55'44.31"S; 29°15'1.16"E• 26°55'50.62"S; 29°14'34.07"E• 26°55'51.18"S; 29°13'55.08"E• 26°55'37.92"S; 29°13'22.92"E
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2.1 Locality map

Please refer to Appendix 3: Locality Map, Figure 2-1 and Figure 2-2.

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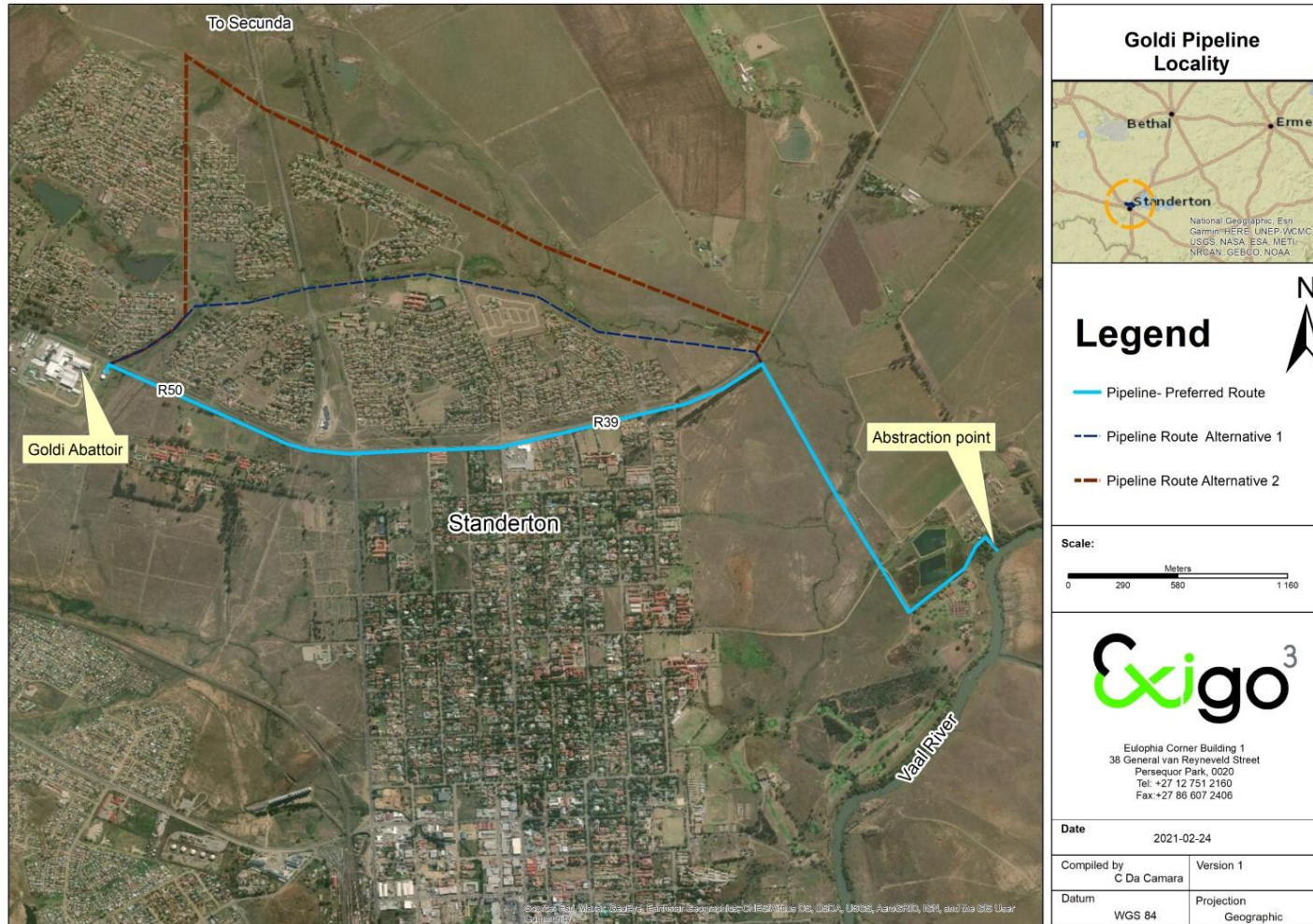


Figure 2-1: Locality Map (Aerial map)

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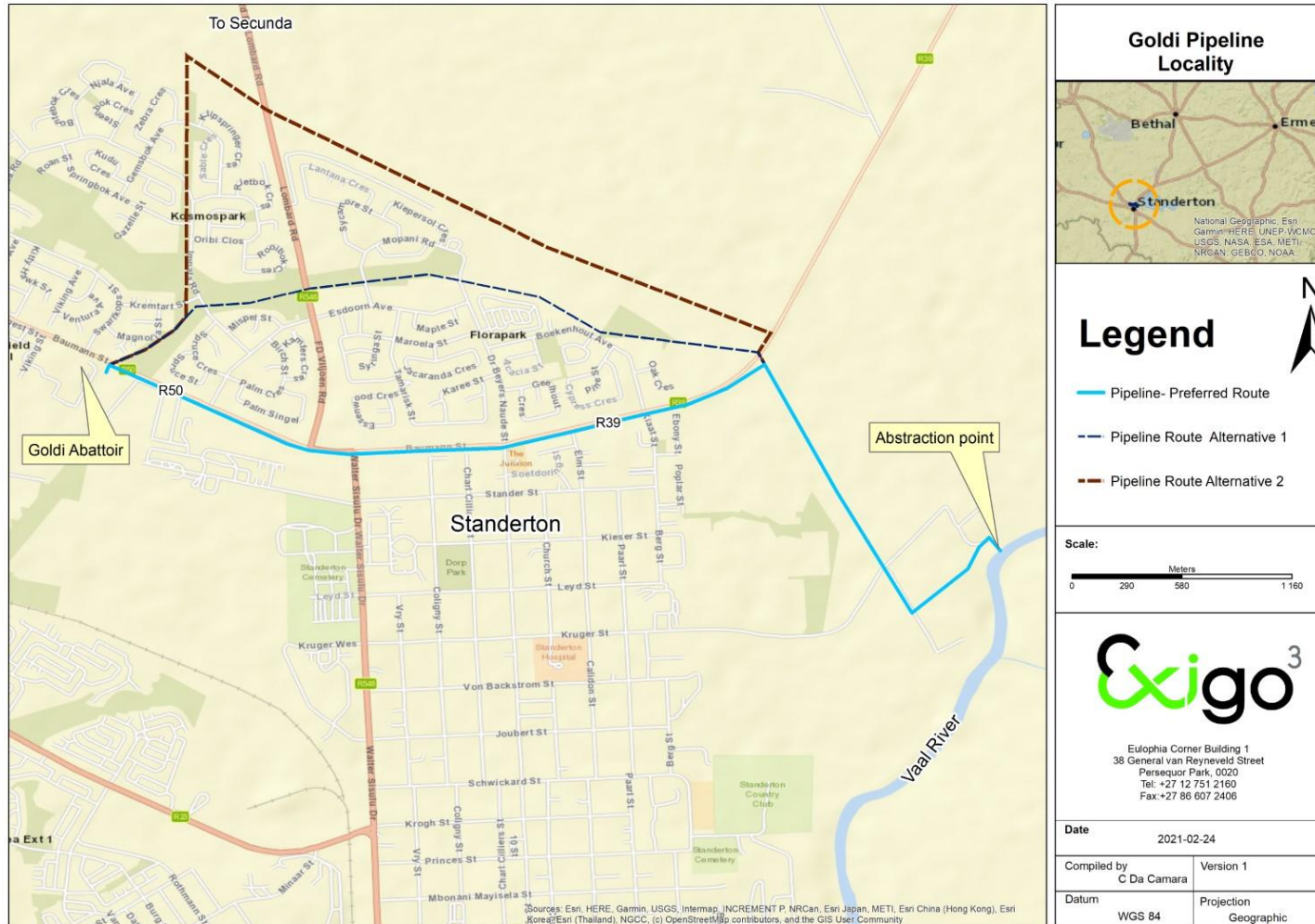


Figure 2-2: Locality (Street map)

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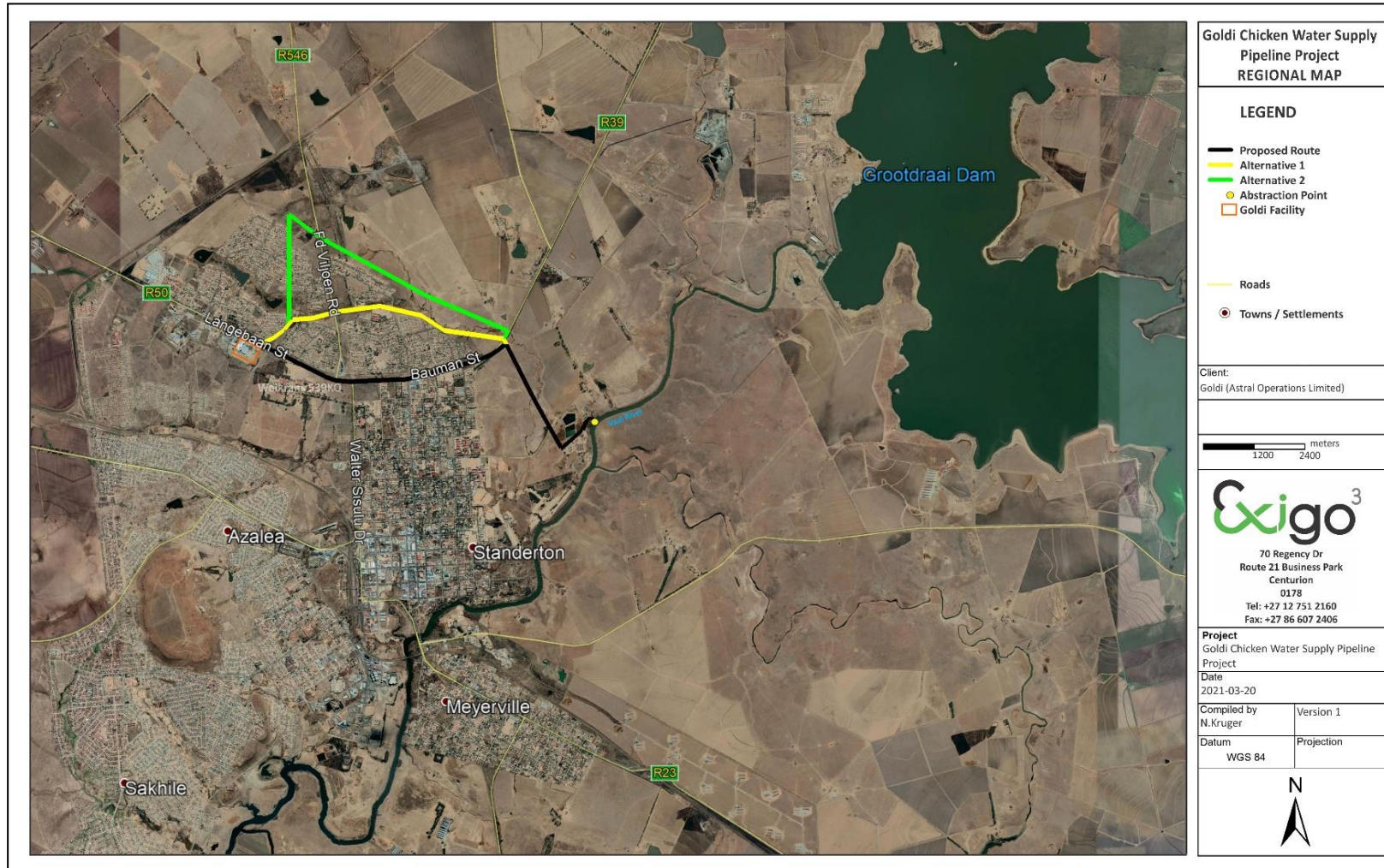


Figure 2-3: Aerial map providing a regional context for the proposed Water Supply Pipeline Project area

3 Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

Refer to the layout plan included in Figure 3-1 below and also included in Appendix 4.

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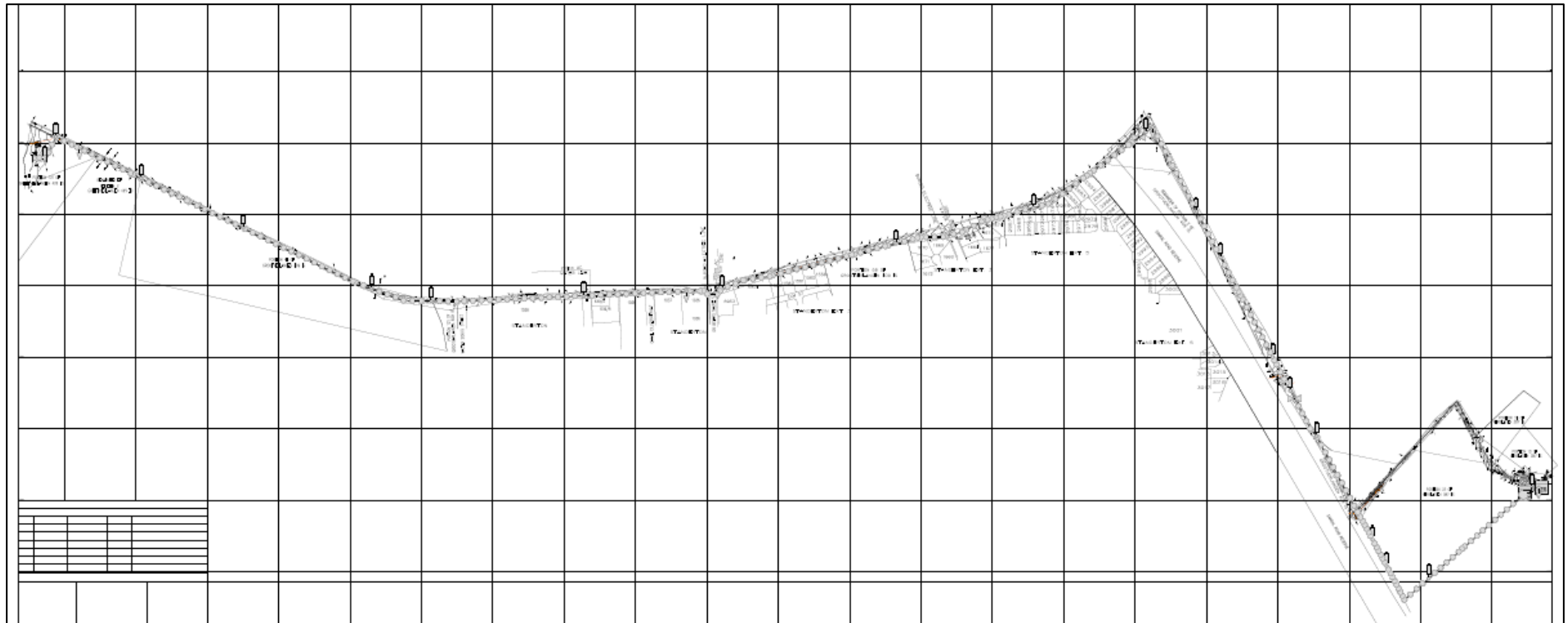


Figure 3-1: Proposed Site layout (refer to Appendix 4)

3.1 Listed and specified activities

Table 3-1: Listed Activities Applied for in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) and the Environmental Impact Assessment Regulations, 2014 (as amended)

Indicate the number and date of the relevant notice:	Activity No.(s) (in terms of the relevant or notice):	Wording of the relevant Government Notice	Applicability to the project
Government Notice R983 (as amended) (07 April 2017)	LN 1 Activity 9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more ; or (ii) with a peak throughput of 120 litres per second or more; excluding where— (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	The project involves the development of a 450 mm diameter pipeline for the transfer of water from the Vaal River to the Goldi Abattoir, Standerton. The application is for the abstraction of 7 Mℓ/day (2 555 000 m ³ /a) from the Vaal River for industrial purposes. The preferred pipeline route stretches over a distance of 5.42 km; from the abstraction point to the R39, after which it turns west and follows the road servitude of the R39 and R50 up to the Goldi Abattoir.
Government Notice R983 (as amended) (07 April 2017)	LN 1 Activity 12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres 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 32 metres of a watercourse, measured from the edge of a watercourse; —	Construction of the proposed abstraction works is planned to take place adjacent to the existing works of the Municipality, on the banks of the Vaal River. This phase will inter alia include the construction of a pump station and the installation of a prefabricated inlet channel, running from the river to a sump situated some 30 from the river.

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		<p>excluding—</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area; [or]</p> <p>(ee) where such development occurs within existing roads, [or] road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>	<p>Water abstracted from the sump will be pumped into a reservoir (1 000 m³) from where it will be pumped and conveyed to the Goldi Abattoir for purification via a 450 mm pipeline.</p>
<p>Government Notice R983 (as amended) (07 April 2017)</p>	<p>LN 1 Activity 19</p>	<p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>This activity is applicable to the construction of the concrete sump within the river.</p>
<p>Government Notice R985 (as</p>	<p>LN 3 Activity 2</p>	<p>The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.</p> <p>f. Mpumalanga</p>	<p>A reservoir (tank) will also be located at the Goldi Abattoir.</p>

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<p>amended) (07 April 2017)</p>		<p>i. In a protected area identified in terms of NEMPAA, excluding conservancies; ii. Outside urban areas: (aa) National Protected Area Expansion Strategy Focus areas; (bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (cc) Sites or areas identified in terms of an international convention; (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ee) Core areas in biosphere reserves; or (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation; or iii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose.</p>	
<p>Government Notice R985 (as amended) (07 April 2017)</p>	<p>LN 3 Activity 12</p>	<p>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.</p> <p>f. Mpumalanga</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; or iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.</p>	<p>This activity is applicable to clearance of indigenous vegetation for construction of the pipeline.</p>

3.2 Description of the activities to be undertaken

Goldi, a division of Astral Operations Ltd, previously known as Earlybird Farms, has been operational in Standerton since 1972. The Goldi Abattoir is located on the R50 road in Standerton (corner of the R50 and Viking Avenue). The abattoir currently processes approximately 2.1 million birds a week.

The town of Standerton falls under the jurisdiction of the Lekwa Local Municipality (LLM). Water for Standerton is released from the Grootdraai Dam and abstracted at LLM's existing infrastructure on the bank of the Vaal River. Up to March 2019, the water supply to the abattoir by the Lekwa Municipality was adequate. Following a combination of factors, including load shedding and deterioration of the municipal infrastructure of the LLM, the community and water users in the high-lying areas in Standerton were challenged with water shortages as a result of inadequate pressure and water flow to the Concor Reservoir. The water supply interruptions resulted in Goldi not being able to keep up with production.

The water supply interruptions at the abattoir has cost the company in excess of R 85 million. The interruptions also had a knock-on effect on disposable income of the employees due to the fact that the abattoir only operated at 50%, resulting in huge financial losses to the workforce in terms of salaries and wages.

Goldi was therefore forced to actively seek alternative water supply solutions in an attempt to mitigate any further cost impacts as a result of the ongoing water supply interruptions. The investigation of alternative resources is described in Section 5.1.

Following meetings with the LLM and the Department of Human Settlements, Water and Sanitation (DHSWS) it was agreed that the most viable solution to the water supply problems would be for Goldi to prepare and submit an application for the abstraction of water from the Vaal River in order to become self-sufficient in terms of water supply.

Goldi therefore proposes to construct abstraction works and a pipeline to transfer 7 Mℓ/day (2 555 000 m³/a) of water from the Vaal River to the abattoir.

The project will consist of the following phases:

Construction of abstraction works: Construction of the proposed abstraction works is planned to take place adjacent to the existing works of the Lekwa Municipality at the Vaal River. This phase will inter alia include the construction of a pump station and the installation of a prefabricated inlet channel, running from the river to a sump situated some 30 m from the river. Water abstracted from the sump will be pumped into a reservoir (1 000 m³) whereafter it will be pumped and conveyed to the Goldi Abattoir via a 450 mm diameter pipeline.

Construction of a pipeline: The planned pipeline will stretch from the Vaal River abstraction point to the Goldi Abattoir located on the R50 road in Standerton. Three (3) alternative routes were investigated and

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the preferred route stretches over a distance of 5.42 km; from the abstraction point to the R39, after which it turns west and follows the road servitude of the R39 and R50 to the abattoir.

Alternative 1 will follow the wetland area that bisects Flora Park and Kosmos Park to the abattoir.

Alternative 2 extends north of Flora park towards the main reservoir. Just west of the reservoir it turns south through Kosmos Park towards the abattoir (refer to Figure 2-1 and Figure 2-2).

Construction of a water treatment plant at the Goldi abattoir: It is planned to install a fully automated clarifier water purification plant with a capacity of 90 000 l/hour.

The proposed pipeline development will start from coordinates 26°56'9.19"S; 29°15'55.25"E, join the R39 at coordinates 26°55'37.54"S; 29°15'15.09"E and end at 26°55'37.92"S; 29°13'22.92"E at the Goldi Abattoir.



Figure 3-2: View of the location of the proposed abstraction point in the Vaal River.



Figure 3-3: View of the Standerton WWTW along the proposed alignment for the preferred pipeline route.

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Figure 3-4: View of open fields along the proposed alignment for the preferred pipeline route.



Figure 3-5: View of vegetation along the proposed alignment for the preferred pipeline route.



Figure 3-6: View of the proposed alignment for the preferred pipeline route along the R39 road.



Figure 3-7: View of the proposed alignment for the preferred pipeline route along the R39 road in Standerton.



Figure 3-8: View of the Goldi facility at the offset of the proposed pipeline.



Figure 3-9: View of a small wetland along the alternative 1 alignment for the pipeline route.



Figure 3-10: View of a drainage line along the alternative 1 alignment for the pipeline route.

3.2.1 Employment opportunities

The construction phase is likely to create about 18 Full-Time Equivalent jobs where workers will be paid in the form of salaries. The increase in demand for goods and services, due to the increase in income, as well as the investment for the project will create more job opportunities in other sectors of the local economy, and thus creating a positive employment effect.

3.2.2 Construction Works

The scope of work entails removal of 150mm of topsoil, excavation of pipeline trenches, pipe bridge foundations, footings and plinths, backfilling and compacting around structures, construction of concrete works, construction of a 1000m³ water reservoir, as well as construction of a pump station at the abstraction point.

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3.2.3 Materials and Equipment to be used

The following equipment will be used during construction:

- Excavators (20 to 30 ton);
- Rollers suitable for the compaction of trenches;
- Tractor-Loader-Backhoe (TLB's);
- Tipper trucks (10 m³) or equivalent ADT's;
- Watercarts; and
- Cement truck.

3.2.4 Disposal of waste material

All material will be removed to a designated area, or a licenced waste disposal facility, if it cannot be re-used.

3.2.5 Rehabilitation

In areas where construction activities have been completed and no further disturbance is anticipated, rehabilitation and re-vegetation will commence as soon as possible. Refer to Appendix 10 for the Goldi Pipeline Landscape Management Plan.

3.2.6 Floodline

CWT Consulting was appointed to undertake the 1:100 flood line determination.

Statistical, Empirical and Deterministic methods were considered to estimate the 1:100 year flood peak. The Statistical methods were deemed to be the only applicable method because of reliable good data, a long record and the large size of the catchment. The location of the 1:100 year flood line is shown in Figure 3-11.



Figure 3-11: 1:100 year flood line

3.2.7 Water availability

Standerton is located within quaternary catchment C11M, a catchment of the Upper Vaal River in the Vaal Water Management Area (WMA). The Grootdraai Dam forms part of the Vaal River Eastern Subsystem (VRESS) and is the main storage dam in the Usutu-Vaal Phase 1 System, which was constructed in 1982 to primarily supply water to Tutuka Power Station as well as Kendal and Kriel Power Stations (supplementing the Usutu System when required). The dam with a catchment area of 8 195 km² and a natural inflow of 580 million m³ has a full supply capacity of 364 million m³ making it a 0,7 MAR dam.

The water resources in the VRESS were insufficient to supply all its users and an augmentation project was launched to transfer water from the Vaal Dam. This is known as the Vaal River Eastern Subsystem Augmentation Project (VRESAP) which entails a 1.9 m diameter pipe designed to transfer 160 million m³/a from the Vaal Dam to Knoppiesfontein where water is diverted into the VRESS.

The VRESAP pipeline was funded by the TCTA and commissioned in 2008 to supply Sasol Synfuels in Secunda and the Eskom power stations in the Mpumalanga Highveld area with water from the Vaal Dam.

The small users are allowed to take water from the VRESAP up to a combined maximum rate of 300l/s. The VRESAP is not fully utilised and its capacity allows for the addition of other third parties or small users. The

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only town, apart from the companies Sasol and ESKOM, currently receiving its water from the VRESAP, is Greylingstad. The total allowance for third party users is 300 l/s. The required rate for the Goldi WULA is 7 Ml/day, which translates to an abstraction rate of 81 l/s.

Ground water resources were found to be insufficient and cannot be used as an alternative source.

3.2.8 Water conservation and demand management

Goldi is acutely aware of the necessity to use water as efficiently as possible. Water conservation and demand management are now key sustainability drivers which primarily focuses on (a) water efficiency through equipment modifications and (b) water savings through process modifications.

Goldi has invested heavily in the acquisition of new equipment using the latest technology in order to use water as efficiently as possible.

Various process and operating procedures were revisited and measures implemented to save water.

These water saving initiatives have resulted in the reduction of water use from 16 to 12 litres per bird (a 25% saving).

4 Policy and Legislative Context

The legislation in the following table is relevant to the project.

Table 4-1: Summary of legislation applicable to the application

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
The Constitution of the Republic of South Africa (Act 108 of 1996)	Minister for Justice and Constitutional Development	18 December 1996
The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Ministry of Public Administration and Justice	9 March 2001
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	Department of Environment, Forestry and Fisheries (DEFF) and Gauteng Department of Agriculture and Rural Development (GDARD)	27 November 1998
Environmental Impact Assessment Regulations, 2014 (as amended)	Department of Environment, Forestry and Fisheries (DEFF)	4 December 2014 as amended on 7 April 2017
The National Heritage Resources Act (NHRA) (Act No 25 of 1999)	South African Heritage Resources Association (SAHRA)	28 April 1999
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Department of Agriculture	1 June 1983
National Environmental Management Biodiversity Act (NEMBA: Act 10 Of 2004)	Department of Environment, Forestry and Fisheries (DEFF) and Gauteng Department of Agriculture and Rural Development (GDARD)	2004
The National Forest Act (Act 84 of 1998)	Department of Forestry and Fisheries (DAFF)	1998
Mpumalanga Biodiversity Sector Plan – MBSP	Mpumalanga Tourism and Parks Agency	2015
Lekwa Local Municipality Integrated Development Plan	Lekwa Local Municipality	2020/21
Lekwa Local Economic Development Strategy	Lekwa Local Municipality	2016

Table 4-2: Description of compliance with the relevant legislation, policy or guideline

Legislation, policy of guideline	Description of compliance
The Constitution of the Republic of South Africa (Act 108 of 1996)	This report has been prepared, submitted and considered within the constitutional framework set by inter alia section 24 and 33 of the Constitution.
The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	The provisions of this legislation will be heeded throughout the public participation process.

<p>National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).</p>	<p>The Basic Assessment process followed is in compliance with the National Environmental Management Act: NEMA, 1998 (Act No. 107 of 1998), as amended.</p> <p>An integrated application for environmental authorisation was submitted to the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs (MDARDLEA) on 25 August 2021</p>
<p>Environmental Impact Assessment Regulations, 2014 (as amended)</p>	<p>The Basic Assessment process followed is in compliance with the Environmental Impact Assessment Regulations of 2014 (Government Notice No R983 of December 2014), as amended.</p> <p>This report has been prepared, submitted and considered in line with Appendix 1 of the EIA Regulations (GNR 326)</p>
<p>The National Heritage Resources Act (Act No 25 of 1999) (NHRA)</p>	<p>The legislation was taken into account during the compilation of the Draft Basic Assessment Report.</p>
<p>Mpumalanga Biodiversity Sector Plan – MBSP</p>	<p>Critical Biodiversity Areas (CBA’s) are those areas (outside of Protected Areas) that are required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. They should remain in a natural state that is maintained in good ecological condition. CBAs are areas of high biodiversity value, but are often also at risk of being lost through biodiversity-incompatible land-use practices. CBAs include, inter alia, Critically Endangered Ecosystems and critical linkages (corridor pinch-points) to maintain connectivity. Terrestrial CBAs can be classified into two sub-categories:</p> <ul style="list-style-type: none"> • CBA Irreplaceable; and, • CBA Optimal. <p>The legislation was taken into account during the compilation of the Draft Basic Assessment Report.</p> <p>The pipeline crosses a CBA Optimal area. Refer to Figure 7-3</p>
<p>Lekwa Local Municipality Integrated Development Plan (IDP) 2020/21</p>	<p>The construction of a new water supply line would enable Goldi to obtain a constant supply of water which will allow them to become self-sufficient. This proposed water line will reduce pressure on the Lekwa Municipality's water infrastructure and free up capacity in the Concor Reservoir to supply the regions affected, with an uninterrupted supply of water. This new development will support some of the critical issues that need to be addressed as well as aligning with some of the strategic objectives mentioned in the IDP of Lekwa Municipality (Municipality L. L., 2019).</p>
<p>Lekwa Local Economic Development Strategy (LED)</p>	<p>The municipality has a new LED plan, recently revised, and approved by the council in 2016. The old LED strategy expired at the close of the last council term in the 2015/2016 financial year. The Council adopted the LED & Tourism Strategy in November 2010. The LED strategy forms the link between sustainable livelihoods and economic activities.</p> <p>Development objectives in the LED strategy seek to address poverty and unemployment, and economic development through e.g., an enabling environment for the advancement of LED activities; addressing youth-related social-economic issues; accelerate the rollout and effective implementation of High Impact Projects and Investment; and Identification and upgrading of new tourism projects and facilities.</p>

	With the necessary construction of a new water supply line for Goldi’s abattoir, the business will be able to operate at an optimal capacity. This will promote and support the agricultural and sector development pillars within the Lekwa Local Municipal area (Urban-Econ, 2021)
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4.1 Guideline on Need and Desirability

In 2014 the DEA published the Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9. The project has therefore also been evaluated against the criteria presented in the guideline.

Table 4-3: Need and Desirability (Urban-Econ, 2021)

Aspect	Comment
The socio-economic context of the area based on the IDP and other strategic documents	From a local policy perspective, the IDP indicates that the Lekwa Municipality had planned on raising capital for a new pipeline to the Goldi Abattoir from the Concor Reservoir to address their water supply challenges. The proposed pipeline will alleviate pressure from the local water infrastructure as Goldi will become self-sufficient and the decrease in demand for water will increase the amount of water available to the rest of the community. The Lekwa Local Municipality experience challenges in providing a constant supply of water to the high lying areas of ward 8. The proposed pipeline will support the Lekwa Local Municipality’s IDP.
Spatial priorities and desired spatial patterns	The Mpumalanga province identified nine objectives for spatial development. One of these objectives is infrastructure development and economic growth. The proposed pipeline is expected to create future economic benefits for the region as well as improve access to basic services for the communities.
Spatial characteristics	The land where the proposed activity is planned to be developed is currently mostly as a road reserve. The pipeline will not influence the use of the land.
Complementing the local socio- economic initiatives or skills development programs	Goldi employs about 3 400 individuals permanently. For Goldi to continue their production in Standerton, the water pipeline is a necessity as it will contribute to the possibility of future expansion. The job opportunities offered may also involve skills training.
Equitable impacts in the short and long term, as well as social and economically sustainable considerations	The Goldi Abattoir is envisaged to be operational for the foreseeable future, suggesting that it will benefit not only the current generation but will also assist in improving the livelihoods of the future generation by creating sustainable employment opportunities for some of the households in the region.
Creation of residential and employment opportunities in close proximity to or	The pipeline itself is not expected to create job opportunities, however, it is essential to ensure production continues in the foreseeable future. The abattoir is expected to expand within the next 5 to 10 years, which will create an additional 800 job opportunities. Many of these jobs will

<p>integrated with each other</p>	<p>require unskilled and semi-skilled workers, therefore, offering opportunities for the local labour to find employment closer to their place of residence.</p>
<p>Reduction of the need for transport of people and goods</p>	<p>Goldi Chicken Abattoir’s existing operation requires a portable pipeline in the form of water tankers to supply the Goldi Chicken Abattoir with 2ML per day to continue its operations when the municipality cannot supply water to the plant. The water pipeline will replace the portable waterline, which will reduce the need for the transport of water.</p>
<p>Complimenting other uses in the area</p>	<p>The proposed Goldi pipeline project will allow Goldi to be self-sustainable in terms of water supply. Goldi is the biggest water consumer in the region and is currently reliant on the Lekwa Municipality for water. By constructing the proposed pipeline, Goldi will relieve pressure on the municipality and free up capacity in the Concor Reservoir, which will enable the Lekwa Municipality to provide the community with a more constant supply of water. By relieving pressure on the water network, it is expected to extend the lifetime of the current network by a few years.</p>
<p>Alignment with planning for the area</p>	<p>I&APs are fully aware of the proposed pipeline project. Furthermore, the supply of water from the development will assist the municipality as it will avail water resources for the communities in the region.</p>
<p>Use of underutilised land available (only for urban-related development)</p>	<p>The land where the proposed pipeline is to be installed is currently not used as it runs over 5,4km of land that is not used for specific economic activities. Most of the land is owned by the state. The pipeline will start at the Standerton waterworks where the Goldi abstraction point will be constructed. It will run on the road servitude to the Goldi Plant. It is believed that this land can be better utilised by installing the pipeline infrastructure as its use is limited. The proposed project will, however, not restrict future development on the proposed land as the pipeline will be out of sight and underground.</p>
<p>Optimisation of the use of existing resources and infrastructure</p>	<p>The water infrastructure of the Lekwa Municipality is not able to supply Goldi, Extension 4, Extension 8 and the Prison with a constant supply of water. The proposed water pipeline will allow Goldi to be self-sufficient in terms of water supply, which will reduce the amount of water used by Goldi from the Concor Reservoir. The communities affected will be provided with a constant supply of water from the municipality.</p>
<p>Discouragement of "urban sprawl" and contribute to compaction/densification</p>	<p>The project will potentially create jobs for the local people through the expansion at Goldi, therefore, likely to discourage out-migration from the local municipality to urban areas that may be perceived to provide greater employment opportunities.</p>
<p>Encouragement of environmentally sustainable land development practices and processes</p>	<p>Goldi researched the potential routes available and contracted out these projects to independent parties to identify the best route, which will have the smallest negative effect on the environment.</p>

<p>Generation of the highest socio- economic returns</p>	<p>Although the proposed development may result in closure or reduction of some of the commercial activities during the construction phase, the potential value add to be derived from the pipeline in the future could far exceed the value-added derived from the existing activities.</p>
<p>Promotion or contribution to creating a more integrated settlement</p>	<p>The contribution of the pipeline to job creation is expected to be during the construction phase when 18 new jobs will be created. A local contractor will be used, keeping investment within the community. The operational phase, in the short run, is not expected to contribute any socio-economic benefits. In the long run, however, Goldi is planning to expand production that will subsequently lead to the creation of new opportunities. Also, demand for goods and services by workers will lead to the creation of local businesses and, therefore, a more integrated settlement.</p>
<p>Limitations of current knowledge (the gaps, uncertainties, and assumptions)</p>	<p>Future market conditions and circumstances are difficult to predict and a level of uncertainty in the markets must be acknowledged.</p>
<p>Linkages and dependencies between human wellbeing, livelihoods, and ecosystem services</p>	<p>The proposed water pipeline’s construction and operational phases stimulate economic activities of directly and indirectly affected businesses in the short run as well as in the long run, which translates into the creation of new employment opportunities and the creation of potential new businesses. This results in increased household income and subsequently increased household expenditure. Through the development, an additional round of value-adding is created. Goldi, as well as the construction company, should seek to procure materials, goods, services, and other products required for the operation from local suppliers as far as feasible to increase the positive impact on the local economy.</p> <p>The proposed water pipeline is expected to reduce pressure on the local water infrastructure and the regions affected by an inconstant supply of water can now experience improvement and a sustainable water supply.</p>
<p>Availability of labour relevant to take up the job opportunities from the development of the mine</p>	<p>Some of the employment opportunities created from the construction phase of the project will be for unskilled and semi-skilled workers, which are in abundance in the LM. Goldi may also create opportunities in the future for unemployed individuals as the pipeline will give them the needed capacity to expand their operation.</p>
<p>The location of job opportunities versus the location of impacts</p>	<p>Numerous positive socio-economic impacts will be created. Negative impacts will be primarily localized within the site and local communities.</p>
<p>Socio-economic impacts of the development based on Socio-economic context</p>	<p>Positive impacts will include the stimulation of the economy as a result of investment into the establishment of the water pipeline, creation of temporary employment (during construction) and sustainable employment (Goldi plant continues its operations and is expected to expand within the next 10 years). Investment and future job opportunities will increase household income and government</p>

	<p>revenue. The pipeline will contribute to the well-fare of the community as the reduced demand for water by Goldi from the Municipality is expected to increase the water supply to regions previously affected by having no water. The pipeline will not create additional job opportunities when operational, yet Goldi must continue current production as well as for Goldi to expand in the future. The development of the water pipeline is still expected to have a positive net effect on the local economy.</p>
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5 Motivation for the overall preferred site, activities and technology alternative

5.1 Details of all alternatives considered

5.1.1 The property on which or location where it is proposed to undertake the activity

The planned pipeline will stretch from the Vaal River abstraction point to the Goldi Abattoir located on the R50 road in Standerton. Three (3) alternative routes were investigated and the preferred route stretches over a distance of 5.42 km; from the abstraction point to the R39, after which it turns west and follows the road servitude of the R39 and R50 to the abattoir.

Alternative 1 follows the wetland area that bisects Flora Park and Kosmos Park to the abattoir.

Alternative 2 extends north of Flora park towards the main reservoir. Just west of the reservoir it turns south through Kosmos Park towards the abattoir (refer to Figure 2-1 and Figure 2-2).

Following the ecological surveys, the classification of the study area into different sensitivity classes and development zones was based on information collected at various levels on different environmental characteristics. Factors which determined sensitivity classes were as follows:

- Presence, density and potential impact of development on rare, endemic and protected plant species
- Conservation status of vegetation units
- Soil types, soil depth and soil clay content
- Previous land-use
- State of the vegetation in general as indicated by indicator species

The ecological sensitivity map is included in Figure 7-5. Only criteria applicable to the specific vegetation units were used to determine the sensitivity of the specific unit.

The sensitivity comparison of the different route alternatives indicating the preferred route from an ecological point of view is indicated in Table 5-1.

Table 5-1: Pipeline alternatives ecological sensitivity analysis

Options	Positives	Negatives	Recommendation
Proposed Route (originally the “Alternative 1” as indicated in the Ecological Assessment)	<ul style="list-style-type: none"> • Lower impact on ecological sensitivity compared to other options due to shorter route and low sensitivity areas traversed • Only 2 wetland crossings along route 	<ul style="list-style-type: none"> • Potential gas pipelines that is already established in the area that will make the option non-viable 	MOST suitable option from ecological impact point of view
Alternative 1 (originally the “proposed route” as indicated in the Ecological Assessment)	<ul style="list-style-type: none"> • Partially following already established water pipeline servitude; • Shorter route compared to Alternative 2; • Only 2 wetland crossings along route 	<ul style="list-style-type: none"> • Impacting on wetland crossings as well as close proximity to the wetland area that bisect Flora Park • Slightly longer route compared to Alternative 1. 	2nd option from an ecological impact point of view
Alternative 2	<ul style="list-style-type: none"> • Following already established water pipeline servitude 	<ul style="list-style-type: none"> • Impacting on several wetland crossings • Impact on larger footprint area compared to other options; • Higher ecological impact 	3rd option from a ecological impact point of view

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5.1.2 The acquisition of agricultural water use entitlements within the immediate vicinity and conversion to industrial use (through a water use licence application)

Investigations into this alternative was suspended after being informed that the DHSWS will not allow such transfer since Section 25(2) of the NWA does not make provision for the transfer of water use entitlements from one person to another and does not make provision for the trading of water between private parties.

5.1.3 Abstraction of groundwater

The use of groundwater resources were also investigated but historical studies into subterranean resources showed that the sustainable yield from boreholes within the vicinity of the abattoir are low.

5.1.4 Transportation of water to the abattoir by water tankers

Goldi currently abstracts water on one of their properties located on the other side of the Vaal River (Portion 11 of the farm Erdzak 9 HS) and transports the water via tankers to the temporary water treatment works for purification, located at Goldi. Goldi currently abstracts 3,5 MI/day from the Vaal River. This alternative is costly and is an unsustainable method of water supply.

5.1.5 The option of not implementing the activity (No-Go Alternative)

The assessment of the “no-go” alternative is a legal requirement according to NEMA and the EIA Regulations 2014 (as amended). In this scenario no development would take place. The environment would be left as is, and the impact on the area and potential benefits would remain unchanged.

In the event that the pipeline is not constructed, the status quo will be maintained. The no-go alternative will imply that virtually none of the identified impacts of proceeding with the project will be incurred.

Should the water supply pipeline not be developed the existing water shortages will continue. During water shortages, Goldi Chicken Abattoir uses trucks and water tankers to maintain a constant supply of water. This option is very costly and unsustainable. In turn, the water shortages will not allow the abattoir to operate at full capacity thereby affecting production levels which will in turn have a negative effect on the country's food security, as well as an impact on the national and local economies. Goldi will not be able to maintain sustainable employment for the existing 3400 employees as well as the 48 contracted chicken grower farms that supply the abattoir with chickens. In addition, the water shortages experienced throughout the town will continue to affect the local community.

Should the water supply pipeline not be developed, Goldi Chicken Abattoir will not be in the position to establish a third production line to its operations at the Standerton plant which is expected to take place within the next ten years. This additional production line will not create the 800 semi-skilled job opportunities in the region nor boost the value add and demand for resources through the existing value chains. Therefore, the sustainable employment opportunities and improvement of living standards within the region through improved household incomes will not be realised.

The construction phase would create about 18 Full-Time Equivalent jobs where workers will be paid in the form of salaries. The increase in demand for goods and services, due to the increase in income, as well as

the investment for the project will create more job opportunities in other sectors of the local economy, and thus creating a positive employment effect. Should the development of the pipeline not take place, these positive impacts will not occur.

Therefore, the development of the water supply pipeline is recommended and the “no-go” alternative is not deemed a viable option.

6 Details of the Public Participation Process Followed

Public Participation is one of the most important aspects of the environmental authorisation process. This stems from the requirement that people have the right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the competent authority to make informed decisions and result in improved decision-making as the views of all parties are considered.

The Public Participation Process:

- Provides an opportunity for interested and affected parties (I&AP's) to obtain clear, accurate and comprehensive information about the proposed activity, its alternatives or the decisions and the environmental impacts thereof;
- Provides I&AP's with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and/or the decisions;
- Provides I&AP's with the opportunity of suggesting ways of avoiding, reducing or mitigating negative impacts of an activity and for enhancing positive impacts;
- Enables an applicant to incorporate the needs, preferences and values of the affected parties into the activity;
- Provides opportunities to avoid and resolve disputes and reconcile conflicting interests; and
- Enhance transparency and accountability in decision – making.

Public Participation therefore allows I&AP's the opportunity to give their viewpoints and influence the process and the decisions of the competent authority.

The following process was undertaken to facilitate the public participation for the proposed project (refer to Appendix 13 for the Public Participation documentation). The registration period was completed, however public review of the Draft Basic Assessment will still take place (refer to Section 6.5)

6.1 Newspaper Advertisement

An advertisement, notifying the public of the Environmental Authorisation application and Basic Assessment process, and requesting I&APs to register their comments with Exigo, was placed in the Standerton Advertiser on 23 March 2021 (publishing date was 26 March 2021) as well as the Standerton Chronicle online newspaper on 26 March 2021. The advertisement was placed in accordance with regulation 41(2) (c) of the EIA Regulations of 2014 (as amended).

6.2 Site notices

In order to inform surrounding communities and adjacent landowners of the proposed development, six (6) site notice boards in accordance with regulation 41(2)(a) and 41(3) of the EIA Regulations were placed at the abstraction point, along the pipeline route (on the R39 / R50 road), and at the Goldi Abattoir (corner of Viking Avenue and the R50 road) on 23 March 2021.

6.3 Direct Notification of Identified I&AP's

Key stakeholders, who included the following sectors, were informed by means of hand deliveries, emails, faxes or registered post on 25 March 2021 of the proposed development:

- The owners and occupiers of land on and adjacent to the site where the activity is or is to be undertaken or to any alternative site
- Landowners in the surrounding area
- Mpumalanga Department: Agriculture, Rural Development, Land and Environmental Affairs (MDARLEA);
- Department of Mineral Resources and Energy;
- Department of Water and Sanitation (DWS);
- Department of Roads and Transport;
- South African Heritage Resources Agency (SAHRA);
- Mpumalanga Provincial Heritage Resource Authority (MPHRA);
- Department of Economic Development & Tourism;
- Mpumalanga Parks and Tourism Agency; and
- Mpumalanga Department of Human Settlements

6.4 Hand deliveries

Notification letters were hand delivered to surrounding properties along the pipeline route.

6.5 Draft Basic Assessment Report (BAR)

The EIA Regulations specify that I&AP's must have an opportunity to comment, in writing, on all reports or plans submitted to such party during the public participation process. A period of 30 days (30 August 2021 until 30 September 2021) will be made available to allow for public comment on the Draft BAR. The availability of the Draft BAR will be announced via personal notification letters distributed via hand delivery, post, fax, or emails to all the identified stakeholders on the distribution list. The following methods will be made available for I&AP's to access the reports:

- Published on the Dropbox website; and
- Hard copies and electronic copies will be distributed upon request (reports will be sanitized).

6.6 Final Basic Assessment Report

The final BAR will be updated after the draft review to incorporate the comments received and issues raised by I&APs.

6.7 Summary of issues raised by I&APs

The following key issues were raised by I&AP's during the registration period (refer to Table 6-1):

- Request for additional information on the water supply pipeline.
- The pipeline must not affect customers visiting the small shopping centre on the R50.

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Table 6-1: Summary of issues raised upon initial registration

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
Local Authorities					
Lekwa Local Municipality	Sakhile Morgenzon	25 March 2021	Via email & registered post: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the municipality.	No comment received to date.	
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the municipality.	No comment received to date.	
	Dakalo Sigidi	4 May 2021		Via email and telephone: Ms Sigidi Dakalo stated the following: I would like to thank you on behalf of Lekwa Local Municipality for the notification of the Environmental Impact Assessment for the proposed construction of a water supply pipeline for Goldi. Lekwa Local Municipality hereby acknowledge receipt of the	Via email: Ms Catherine Da Camara from Exigo replied and stated the following: Thank you for your email. I have attached an electronic copy of the notification letter that was sent in March 2021. You will be informed once the Draft Basic Assessment Report is available for public review.

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
				<p>Notification of Interested and Affected Parties (I &APs) for the afore- mentioned project.</p> <p>The municipality would like to form part of the Interested and affected parties as per the Environmental impact assessment regulations and the National Environmental Management Act (Act 107 of 1998).</p> <p>Kindly forward me the site specific information (i.e. Locality maps, Background Information Documents (BID) and any other relevant documentation available at this stage.</p> <p>Further comments will be official issued once the Municipality received draft Basic Assessment and EMPr.</p> <p>The address was confirmed as: Cnr Hlongwane and Palmer street , Sakhile Standerton 2431</p>	<p>Please let me know if you would like to have a meeting in order to discuss the project in more detail. We would be able to give a presentation of the proposed project. The meeting can be in Standerton, or online.</p> <p>The email was followed up telephonically and it was agreed that an online meeting will take place during the public review of the DBAR.</p>
Gert Sibande District Municipality	Cllr. Muzi Chirwa	25 March 2021	Via email & registered post: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
			municipality.		
Ward Councillor Ward 8	Mr Tornado Kambule	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the Ward Councillor.	No comment received to date.	
Ward Councillor Ward 10	Mr Johannes van der Wath	25 March 2021	Via SMS: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the Ward Councillor.	No comment received to date.	
Government Departments					
Mpumalanga Department: Agriculture, Rural Development, Land and Environmental Affairs (MDARLEA)	Mr L.S Monareng (Acting Head of Department)	25 March 2021	Via registered post: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
	Thami Dlamini (Head of Office)	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
	Ms. A. Akoojee (Private Secretary)	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
	Robyn Luyt (Ehlanzeni District)	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
	Surgeon Marebane (Gert Sibande District)	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Department of Water and Sanitation (DWS)	Khathutshelo Mudau	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
	Bishop W Malatsi Gauteng Provincial Operation Institutional Management	25 March 2021	Via SMS: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Department of Mineral Resources and Energy	Mr A Tshivhandekano	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Department of Roads and Transport	P.J. Phala (Head of Office)	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
South African Heritage Resources Agency (SAHRA)	Nokukhanya Khumalo	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Mpumalanga Provincial Heritage Resource Authority (MPHRA)	Mr Benjamin Moduka	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Department of Economic Development & Tourism	Ms. A. Mare (Office Manager) Ms. T. Nxumalo (Personal Assistant)	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Mpumalanga Department of Human Settlements	Ms. L. Ramphisa	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
Mpumalanga Parks and Tourism Agency	Reception	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the department.	No comment received to date.	
Directly Affected Landowners					
2 Grootverlangen 409 IS	Lekwa Local Municipality	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.I	No comment received to date.	
	Sakhile Morgenzon				
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
7 Grootverlangen 409 IS	Lekwa Local Municipality	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
	Sakhile Morgenzon				
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
			registration of I&APs on the project was sent to the I&AP.		
26 Grootverlangen 409 IS	Property no longer exists			n/a	
44 Grootverlangen 409 IS 69 Grootverlangen 409 IS	Provincial Government Of The Mpumalanga Province Mr. N. Molelekoa Chief of Staff	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
48 Grootverlangen 409 IS	Gert Sibande Further Education & Training College			No comment received to date.	
101 Grootverlangen 409 IS	Lekwa Local Municipality Sakhile Morgenzon	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
			sent to the I&AP.		
114 Grootverlangen 409 IS	Property no longer exists	25 March 2021		n/a	
Farm 10 of Verblyden 387 IS	Property no longer exists	25 March 2021		n/a	
Farm 36 of Verblyden 387 IS	Lekwa Local Municipality	25 March 2021	Via email: Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
	Sakhile Morgenzon				
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Farm 37 of Verblyden 387 IS	Lekwa Local Municipality	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
	Sakhile Morgenzon				

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Farm 38 of Verblyden 387 IS	Michael Starke	25 March 2021	Via SMS & registered mail: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Adjacent landowners and land occupiers					
Standerton Primary School	Reception	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Vaal River High School	Mr M.J van Rensburg	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Transnet	Thembinkosi Msikeleli Memela Property Technician Transnet Property: Corporate Real Estate	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
	Juliet Modipa	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
	Nsumbulana Mtsenga	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
The Guest House Standerton Mpumalanga	Reception	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Planet Pawn Standerton	J. Nerasmus / Sandra Harrison	25 March 2021	Via hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Waterfront Lodge Standerton	Stander	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Sasol Flora Park	Sharmilia (Manager)	23 & 25 March 2021	Via hand delivery & email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent and hand-delivered to the I&AP.	No comment received to date.	
115 Grootverlangen	Property no longer exists	25 March 2021		No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
409 IS					
Farm 9 of Verblyden 387 IS				No comment received to date.	
Farm 11 of Verblyden 387 IS	Mohseen Bhabha	25 March 2021	Via registered post: Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Farm 18 of Verblyden 387 IS	Blue Horison Properties 7: Gert Frederick Du Preez	25 March 2021	Via registered mail: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Farm 33 of Verblyden 387 IS	Christina Johanna Marthina Du Plessis	25 March 2021	Via registered mail / email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
Farm 34 of Verblyden 387 IS	Lekwa Local Municipality	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was sent to the I&AP.	No comment received to date.	
	Sakhile Morgenzon				
	Howard Vilakazi	25 March 2021	Via email: On 25/03/2021, a notification which requested the registration of I&APs on the project was	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
			sent to the I&AP.		
Other					
Perfect Water	VP Zimu	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	Verbal comment during the hand delivery of the notification letter: The I&AP requested that the proposed pipeline must be constructed on the opposite side of the road as the current proposed location of the pipeline will disrupt the movement of their customers. This is because the pipeline is proposed on the side of the road where the entrance to the shop also lies.	
Standerton Welding Alloys	Bingo	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	Verbal comment during the hand delivery of the notification letter: The I&AP requested that the proposed project must not disrupt the movement of their customers as the pipeline is proposed on the side of the road where the entrance to the shop also lies. The I&AP also requested for Goldi to repair the roads like another factory in the area has done so.	
EP Glass	Gugu Hlatshwayo	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Sasol Junxion	T. Russell	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
			registration of I&APs on the project was hand-delivered to the I&AP.		
Spur El Condor	Carol Malinga	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Liquor City	D.Nikiwe	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Courier Guy	C. Pretorius	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Intertainment Lounge	D. van der Westhuizen	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Pizza Perfect	K.M Pile	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
AS Friendly Hair Salon	Hussain	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
I&AP	T. Nolvaardt	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
I&AP	S.E Dlamini	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
I&AP	N.J Eksteen	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
I&AP	Ntombi Maukasi	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
I&AP	Muhammad Usman	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Hairtique Unisex Salon	Lauret	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
I&AP	Chris	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
I&AP	D.N Spandiez	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Hompie Kedompie	Melissa Olivier	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the	No comment received to date.	

Organisation / Company / Individual	Contact Person	Date	Notification	Comments	Response
			registration of I&APs on the project was hand-delivered to the I&AP.		
I&AP	A. Steynberg	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Crazy Store	Sphiwe Matshiya	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Pick 'n Pay	Lucky/ Sheilla/ Amini Sprus	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Pep Store	Priscilla	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Ackermans	Goodness	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
JJ Cell	Ali	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	
Fat Cake City	Amine	23 March 2021	Via Hand delivery: On 25/03/2021, a notification which requested the registration of I&APs on the project was hand-delivered to the I&AP.	No comment received to date.	

7 The Environmental attributes associated with the site

7.1 Climate

Standerton normally receives about 576mm of rain per year, with most rainfall occurring during summer. It receives the lowest rainfall (0mm) in June and the highest (102mm) in January. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Standerton range from 16.8°C in June to 26°C in January. The region is the coldest during June when the mercury drops to 0°C on average during the night.

7.2 Geology and soil types

Geology is directly related to soil types and plant communities that may occur in a specific area (Van Rooyen & Theron, 1996). A Land type unit is a unique combination of soil pattern, terrain and macroclimate, the classification of which is used to determine the potential agricultural value of soils in an area. The land type unit represented within the study area include the Ea18 land type (Land Type Survey Staff, 1987) (ENPAT, 2001). The land type, geology and associated soil type is presented in Table 7-1 below as classified by the Environmental Potential Atlas, South Africa (ENPAT, 2000).

Table 7-1: Land types, geology and dominant soil types of the proposed development site

Landtype	Soils	Geology
Ea18	One or more of: vertic, melanic, red structured diagnostic horizons, undifferentiated	Dolerite; sandstone, grit and shale of the Ecca Group, Karoo Sequence

The soil types are mostly determined by position on the landscape, and the most dominant soils on the development site are vertic clayey soils on the low-lying plains and plateaus, while the undulating areas are typified by shallow Glenrosa and Mispah soils. Alluvial soils occur in and around the drainage channels and floodplains.

7.3 Topography

When assessing the ecology of an area, it is important to know in which eco-region it is located. The study area forms part of the Highveld Eco-region. According to the Environmental Potential Atlas of South Africa (ENPAT, 2000) the project area is classified as being “Dissected Plains”. The slopes of the study area are classified as being between 1 and 9 degrees. The project area is characterised by slightly undulating plains. Wetlands bisect the area in the form of valley bottom wetlands. The topography across the site varies from slightly undulating to flat with the elevation varying from 1540 mamsl to 1560 mamsl.

7.4 Drainage

The project area is situated within the quaternary catchments, C11M in the Upper Vaal Water management Area (WMA) (Figure 7-2). The study area is drained mainly by surface run-off (i.e. sheetwash) with surface water flowing into perennial streams and wetlands of the study area. This water eventually drains into the

Vaal River that occurs to the southeast of the proposed pipeline route, and which will also be the point of water abstraction for the pipeline. The state of the Vaal River is summarized in Table 7-2.

Table 7-2: State of major streams / rivers in the project area (DWA)

Quaternary drainage region	Name	Class	Ecoregion II	State of river / streams	Category
C11M	Vaal	Perennial	Highveld	CLASS D: LARGELY MODIFIED	Critically endangered

7.5 Biodiversity

7.5.1 Vegetation types

The development site occurs within the Grassland biome. The Grassland Biome is found chiefly on the high central plateau of South Africa, and the inland areas of Kwazulu-Natal and the Eastern Cape. The terrain morphology is gently to moderately undulating plains on the Highveld plateau supporting short to medium high, dense, tufted grassland dominated by *Themeda triandra*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover. The vegetation of the area has been degraded to a large extent through agricultural activities and livestock farming.

7.5.2 Vegetation units

The analysis of the data resulted in the identification of 4 major vegetation / ecological units in the larger area. The location of these vegetation units is indicated in the vegetation map for the pipeline (Figure 7-4), while each of these vegetation units was further classified according to sensitivity into a sensitivity map (Figure 7-5).

The following vegetation units were identified during the survey (refer to Table 7-3):

1. Degraded grassland / roadsides;
2. Secondary grassland;
3. Exotic bushclumps;
4. Hydrogeomorphic units:
 - Perennial River (Vaal River);
 - Valley bottom wetlands;
 - With Channel;
 - Artificial wetlands;
 - Man-made dams (depressions).

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Table 7-3: Characteristics of the major vegetation units in the study area

Characteristics	Degraded grassland / old fields, cleared areas, degraded roadsides	Secondary grassland	Exotic bushclumps	Valley bottom wetlands	Perennial River	Man-made dams / artificial wetlands
State of vegetation	Degraded	Semi-natural	Degraded land	Slightly degraded to degraded	Slightly degraded	Slightly to moderately degraded
Vegetation structure:	Short, degraded grassland with exotic weeds / degraded roadsides	Semi-natural grasslands in state of succession	Homogenous stands of Eucalyptus trees	Closed hygrophilic grassland / channel vegetation	Open Water habitat with exotic riparian woodland and modified lawns on riverbanks	Man-made wetlands / depressions with hydrophilic vegetation along shallow edges
Woody structure	Trees: <1 (3-8m) Shrubs <1% (1-2m)	Trees: <1 (3-8m) Shrubs <1% (1-2m)	Trees: 10-20% (3-8m) Shrubs <1% (1-2m)	Trees: <1 (3-8m) Shrubs <1% (1-2m)	Trees: <1 (3-8m) Shrubs <1% (1-2m)	Trees: <1 (3-8m) Shrubs <1% (1-2m)
Herbaceous layer	Grass: 60-70% (0.8-1.2m) Forbs: 1-2% (0.5m)	Grass: 60-70% (0.8-1.2m) Forbs: 1-2% (0.5m)	Grass: 30-40% (0.8-1.2m) Forbs: 1-2% (0.5m)	Grass: 70-80% (0.8-1.2m) Waterplants: 5-10% (0.5m)	Grass: 50-60% (0.8-1.2m) Forbs: 10-15% (0.5m)	Grass (temporary wet zone): 50-60% (0.8-1.2m) Waterplants: 5-10% (0.5m)
Conservation priority	Low	Medium-low	Low	High	High (Permanent wet zone) Medium-low (modified banks)	Low

Characteristics	Degraded grassland / old fields, cleared areas, degraded roadsides	Secondary grassland	Exotic bushclumps	Valley bottom wetlands	Perennial River	Man-made dams / artificial wetlands
Sensitivity	Low	Medium-low	Low	High	High	Low
Dominant plant species	<i>Cynodon dactylon</i> , <i>Eragrostis plana</i> , <i>Eragrostis curvula</i> , <i>Aristida</i> spp.,	<i>Themeda triandra</i> , <i>Heteropogon contortus</i> , <i>Melinis repens</i> , <i>Eragrostis</i> spp.	<i>Eucalyptus camaldulensis</i> , <i>Aristida</i> spp.	<i>Paspalum dilatatum</i> , <i>Sporobolus africanus</i> , <i>Andropogon eucomis</i> , <i>Imperata cylindrica</i> , <i>Typha capensis</i> , <i>Juncus effuses</i> , <i>Schoenoplectus corymbosus</i>	<i>Salix babylonica</i> (riparian), <i>Populus alba</i> (riparian), <i>Phragmites australis</i> , <i>Typha capensis</i> , <i>Ludwigia stolonifera</i> ,	<i>Juncus effuses</i> , <i>Typha capensis</i> , <i>Imperata cylindrica</i> , <i>Schoenoplectus corymbosus</i>
Red data flora species	None observed during surveys	None observed during surveys	None observed during surveys	None observed during surveys	None observed during surveys	None observed during surveys
Protected tree species	None observed during surveys	None observed during surveys	None observed during surveys	None observed during surveys	None observed during surveys	None observed during surveys
General (Geology, soil)	Mostly fertile red Hutton soils to shallow gravelly soils of the Glenrosa soil form	Mostly fertile red Hutton soils to shallow gravelly soils of the Glenrosa soil form	Mostly fertile red Hutton soils to shallow gravelly soils of the Glenrosa soil form	Black clayey soils of the Rensburg / Oakleaf / Cartref soil forms derived from Shale	Black clayey soils of the Rensburg / Oakleaf / Cartref soil forms derived from Shale	Black clayey soils of the Rensburg / Oakleaf / Cartref soil forms derived from Shale

Characteristics	Degraded grassland / old fields, cleared areas, degraded roadsides	Secondary grassland	Exotic bushclumps	Valley bottom wetlands	Perennial River	Man-made dams / artificial wetlands
General:	Vegetation associated with roadsides, cultivated land and primary old fields. Invasion of exotic weeds apparent.	Secondary grassland associated with old fields and roadside still in semi-natural state	Exotic bushclumps with many exotic weeds in herbaceous layer	Bottomlands forming valleybottom wetlands (channelled and unchannelled)	Perennial river system with high importance and connectivity to the larger catchment and South Africa	Man-made wetlands that should be rehabilitated when leaking pipelines and other stormwater infrastructure are repaired. Does not form part of natural hydrological regime of the area.
Fauna:	No specific red data fauna or other fauna of significance occur in the degraded areas. Mostly utilized by common birds and small mammals (rodents) for foraging and shelter.	No specific red data fauna or other fauna of significance occur in the degraded areas. Mostly utilized by common birds and small mammals (rodents) for foraging and shelter.	No specific red data fauna or other fauna of significance occur in the degraded areas. Mostly utilized by common birds and small mammals (rodents) for foraging and shelter.	Potential habitats for red data bird species and mammals. Important corridor for other fauna such as small mammal species, birds and reptiles. Pipeline will only minimally impact on this area.	Potential habitats for red data bird species. Important habitat for other fauna such as birds. Pipeline will only minimally impact on banks of this area at abstraction point.	Potential habitats for red data bird species. Important habitat for other fauna such as birds. Pipeline will only minimally impact on this area.

7.5.3 Species of conservation concern

A list of red data plant species previously recorded in the study area in which the proposed development is planned was obtained from the Plants of Southern Africa (POSA) database of SANBI. There are various categories for Red Data Book species, such as ‘Endangered’, ‘Vulnerable’, ‘Rare’ and ‘Near threatened’ as listed in the Red Data List of Southern African Plants (Hilton-Taylor 1996).

Table 7-1 indicate the red listed species potentially occurring within the project area:

Figure 7-1: Red listed species potentially occurring within the project area (POSA, Sanbi database)

Genus	Species	Conservation Status
<i>Drimia</i>	<i>elata</i>	Data Deficient
<i>Cineraria</i>	<i>austrotransvaalensis</i>	Near Threatened
<i>Gladiolus</i>	<i>robertsoniae</i>	Near Threatened
<i>Kniphofia</i>	<i>typhoides</i>	Near Threatened

No red data species was found in the area.

7.5.3.1 Protected tree species (DAFF)

No tree species listed as protected under the national list of declared protected tree species as promulgated by the National Forest Act (NFA), 1998 (No. 84 of 1998) was observed in the project area.

7.5.3.2 Protected plants (GNCB)

Plant species are also protected according to the Mpumalanga Conservation Act. According to this Act, no person may pick, import, export, transport, possess, cultivate or trade in a specimen of a specially protected or protected plant species. Schedule 5 of the Act provides an extensive list of species that are protected, although none of these species was observed during the vegetation surveys.

7.5.4 Wetlands of The Project Area

DWAF (2003) states that in order to classify an area as a wetland it must have one or more of the following attributes:

- Hydromorphic soils that exhibit features characteristic of prolonged saturation;
- The presence of hydrophytes (even if only infrequently);
- A shallow water table that results in saturation at or near the surface, leading to the development of anaerobic conditions in the top 50 cm of the soil.

For the abstraction point and the preferred pipeline route the following major wetland types were identified on site namely:

1. Valley bottom wetlands associated with the low-lying valleys of the project area;

- Channelled
- 2. Man-made dams (depressions);
- 3. Artificial wetlands.

The wetland areas are presented in the vegetation map (Figure 7-4). Wetland zone identification was done according to geology, soil types, soil wetness indicators (mottling in top 50 cm of soil, topography of the landscape and vegetation (plant species indicators).

The perennial Vaal River is not classified as a wetland but as a perennial river channel with clearly defined banks and riparian woodland in some areas. Refer to the Aquatic Ecological Impact Statement (SAS, 2020) in Appendix 12 for further information.

7.5.4.1 Valleybottom wetlands

Valley bottom wetlands are classified as low-lying, gently-sloped areas that receive water from an upstream channel and/or from adjacent hillslopes, not subject to periodic over-bank flooding by a river channel. Surface water in the valley bottom wetlands of the study area flows only seasonally, although the channels are in most cases perennial. The valley bottom wetland type is the most common wetland in the project area with the highest risk of being impacted on.

The vegetation structure of the valley bottom wetlands vary from the actual channels being closed grassland in certain areas, to a sandy riverbed with alluvial sand and conglomerates along the banks. The drainage channels that form part of the channelled valley bottom wetlands is mostly perennial although this is due to the leaking water supply and sewage pipelines in the Standerton and surrounding areas.

The most abundant and most conspicuous plant species is hygrophilous grasses such as *Sporobolus africanus*, *Paspalum dilatatum*, *Andropogon eucomis*, *Hyparrhenia tamba*, *Eragrostis gummiflua* and *Setaria sphacelata*. Other plants associated with valley bottom channels are *Juncus effusus*, *Schoenoplectus corymbosus*, *Verbena bonariensis*, *Persicaria serrulata* and *Typha capensis*.

Unfortunately, the valley bottom wetlands provide a distribution route for weeds and invading trees. Many of the usual weeds were recorded together with *Xanthium strumarium* (Large cocklebur) *Datura stramonium* and *Flaveria bidentis*. Weeds and invaders should be removed, as well as destruction of such plants in a safe place and manner.

7.5.4.2 Man-made dams (depressions)

The depressions in the project area represent man-made dams or artificial depressions created where stormwater collects (discussed under artificial depressions).

The vegetation associated with depressions is mostly sedges and bulrushes depending on the depth of the water and the substrate. Species such as *Persicaria serrulata*, *Schoenoplectus corymbosus*, *Ludwigia stolonifer* and *Leersia hexandra* mostly grow along the shallow edges of depressions in the project area on a muddy substrate.

7.5.4.3 Artificial wetlands

The artificial wetlands identified within the project area primarily exist due to the leaking of pipelines as well as runoff from the roads or railway line at stormwater culverts creating an artificial hydraulic regime that leads to the wetness regime in soils needed for wetland formation. This artificial hydraulic regime caused by the leaking pipes will remain until the infrastructure is repaired to allow the areas to rehabilitate. Due to the rich abundance of natural water sources in the primary catchment (in the form of natural wetlands, rivers and streams) contributing largely to ecosystem functioning, the ecological significance of these artificial systems is minimal.

The most abundant and most conspicuous plant species is hygrophilous grasses such as *Juncus effusus*, *Paspalum dilatatum* and *Sporobolus africanus*. Other wetland plants identified include *Phragmites australis*, *Typha capensis* and *Cyperus esculentis*.

7.5.4.4 Perennial River (Vaal River) Channel

The perennial Vaal River is the most important drainage feature in the area and the point from where water will be abstracted. The greatest demand for water in this catchment is for irrigation, followed by mining and industrial use, with a similar proportion going to urban and domestic use.

The Vaal River is classified as a channel. A channel is an open conduit with clearly defined margins that (i) continuously or periodically contains flowing water, or (ii) forms a connecting link between two water bodies. Dominant water sources include concentrated surface flow from upstream channels and tributaries, diffuse surface flow or interflow, and/or groundwater flow. Water moves through the system as concentrated flow and usually exits as such but can exit as diffuse surface flow because of a sudden change in gradient. Unidirectional channel-contained horizontal flow characterises the hydrodynamic nature of these units. As a result of the erosive forces associated with concentrated flow, channels characteristically have relatively obvious active channel banks. At Level 4A of the classification system, the entire active channel is treated as a unit.

Typical indicator species of the channel include species like *Phragmites australis*, *Typha capensis*, *Schoenoplectus corymbosis* and *Persicaria serrulata*. The peripheral vegetation is characterized by tall grassland dominated by species such as *Paspalum urvillei*, *Setaria sphacelata*, *Imperata cylindrical* and *Chloris virgata*. The herbaceous component is well developed. Exotic tree species typical of the banks of the Vaal River include *Salix babylonica*, *Populus alba*, *Morus alba* and *Eucalyptus camaldulensis*.

7.5.5 Wetland Integrity Assessments

In determining the integrity of the wetlands, the condition of the site and the indirect and direct disturbances is taken into account. The roads, alien invasive vegetation species, pollution, sedimentation and density roughness elements were taken into account in determining the PES and EIS of the wetland units on site (Table 7-4 below).

Table 7-4: Present Ecological State and Ecological Importance & Sensitivity of the wetland and riparian systems on the proposed development site

Wetland	PES	EIS
Valley bottom wetland with channel (Crossing C7 at Goldi factory)	Class E: Seriously Modified	Low
Valley bottom wetland with channel (Crossing C1) and Vaal River at abstraction point	Class C: Moderately Modified	Moderate

The PES of the valley bottom wetland at the Goldi Factory (Crossing C7) has been severely modified and has a ‘Seriously Modified’ PES with main impacts being from complete habitat modification, alien species invasion, erosion and sedimentation. The EIS of this wetland type is ‘LOW’ and represent wetlands that are not ecologically important and sensitive at any scale. The biodiversity of these wetlands is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.

The Valley bottom wetland at crossing C1 as well as the perennial Vaal River has a ‘Moderately Modified’ PES. This wetland and perennial river channel play a significant role in toxicant-, nitrate- and phosphate removal as well as streamflow regulation and sediment trapping.

The EIS of these aquatic ecosystems is ‘Moderate’ and considered to be ecologically important and sensitive at least on a local scale. The biodiversity of the wetland and Vaal River is not usually sensitive to flow and habitat modifications and may play a small role in moderating the quantity and quality of water entering downstream areas.

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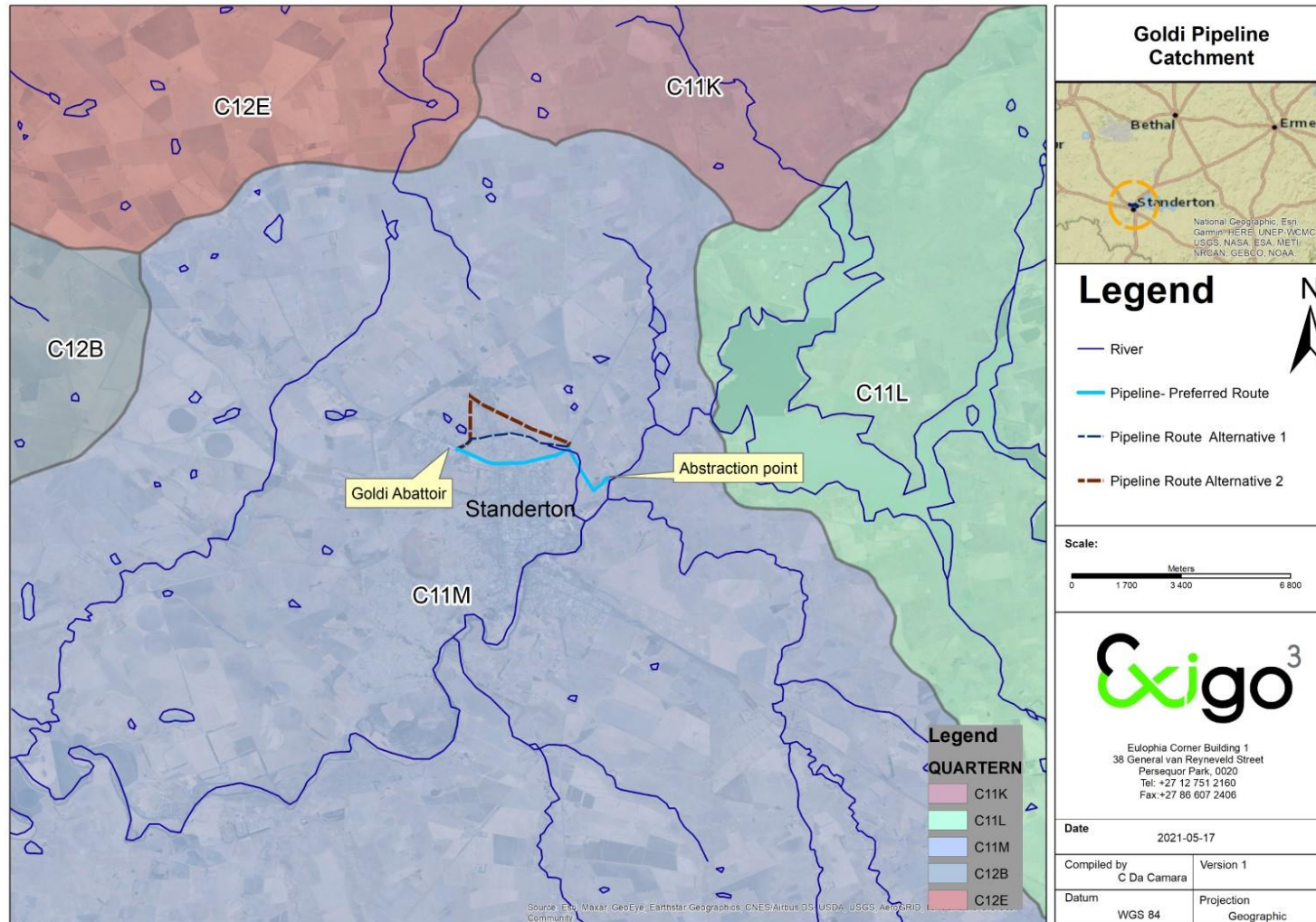


Figure 7-2: Catchment Map

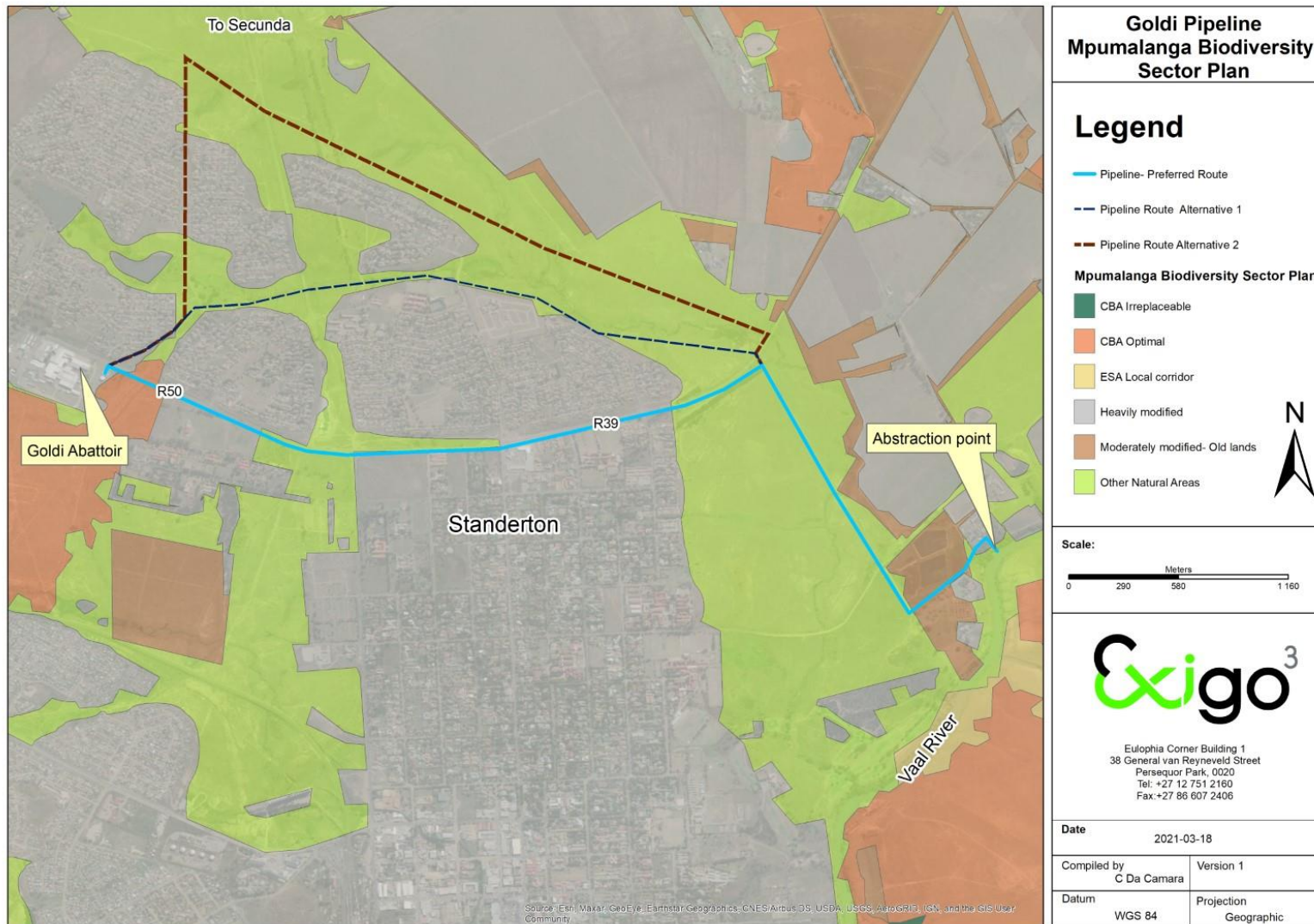


Figure 7-3: Mpumalanga Biodiversity Sector Plan – MBSP

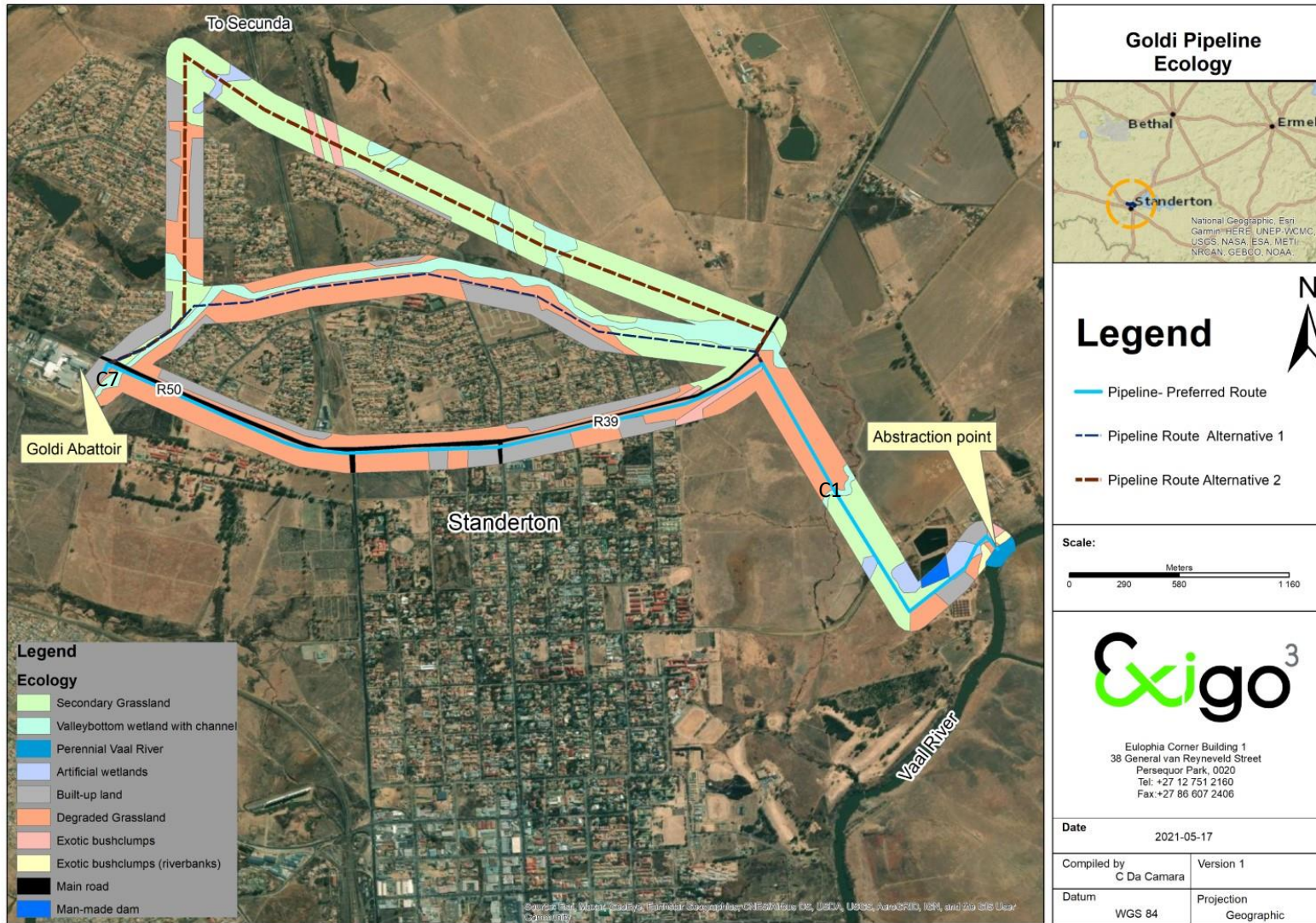


Figure 7-4: Vegetation Map of the study area

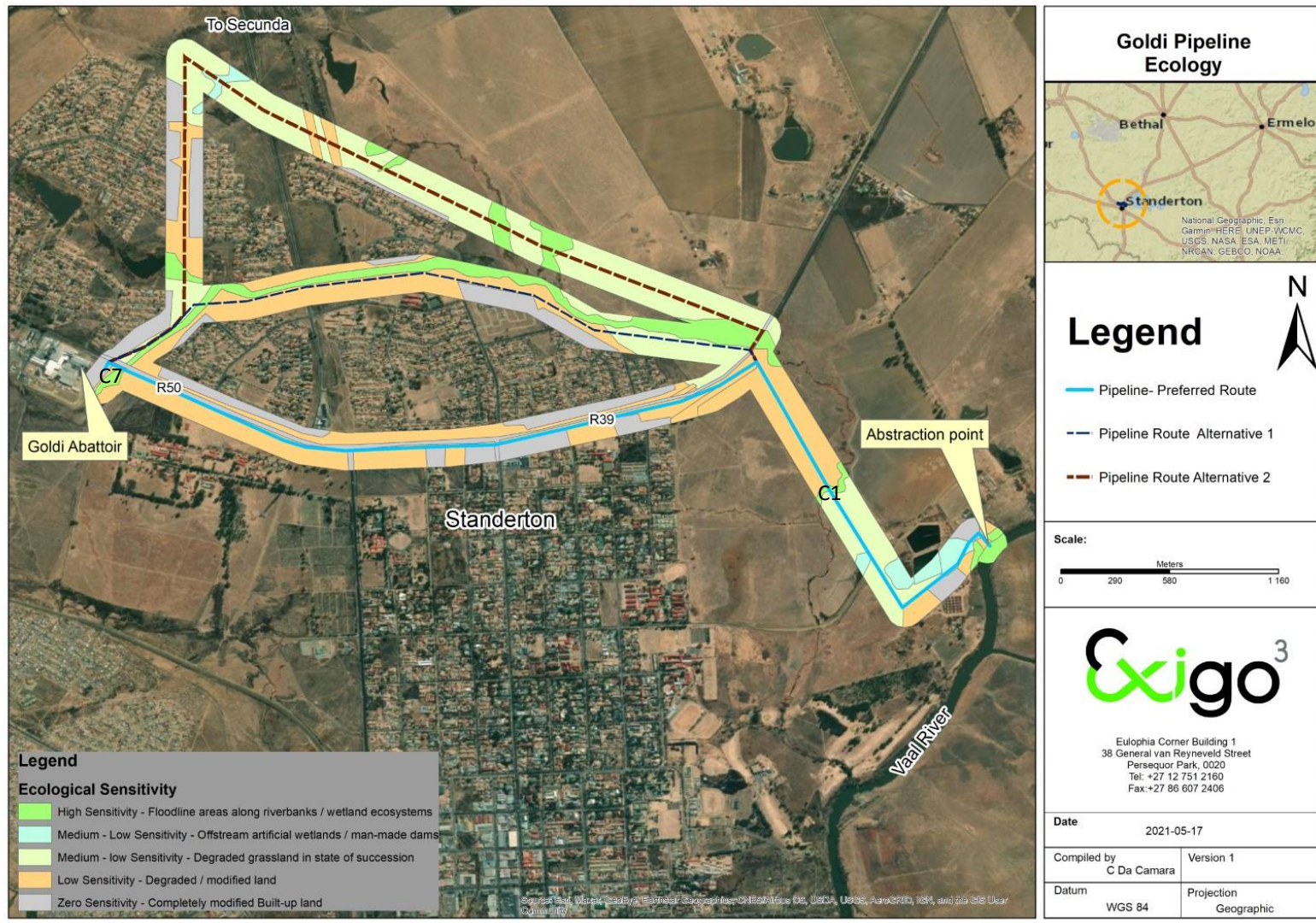


Figure 7-5: Ecological Sensitivity Map of the study area

7.6 Sites of archaeological and cultural interest

The town of Standerton was founded in 1878 on a farm called Grootverlangen and the town has seen substantial development over the past decades. An analysis of historical aerial imagery and archive maps indicate that much of the project area occurs along portions of the town which were established in the past 30 years and it might be inferred that these areas have been altered and transformed extensively.

A careful analysis of historical aerial imagery and archive maps indicate that the larger Weikrans property had been utilized for agriculture during the 19th century and much of the project area has been transformed into a rural residential settlement in recent years.

It is evident that the proposed footprint area subject to this assessment have been altered and transformed extensively and this inference was confirmed during an archaeological site assessment during which the following observations were made:

- No heritage sites, palaeontological features or remains were encountered in the project area.

7.7 Socio-economic Environment

The population of any geographical area is the cornerstone of the development process, as it affects economic growth through the provision of labour and entrepreneurial skills and determines the demand for the production output. Examining population dynamics is essential to gaining an accurate perspective of those who are likely to be affected by any prospective development or project. This section describes the status quo of the study area's population using the 2011 Census, Quantec, and the 2016 Community Survey data.

In 2010, South Africa had about 13.8 million households, which means that the average household size in the country will be about 3.7. Mpumalanga had just over 1 million households and indicating a higher average household size than the country. The primary study area had about 30 837 households and had a higher average household size (3.84) than the rest of the province and country. Table 7-5 provides the number of households and historical growth rates, between the 2010 to 2019 period for South Africa, provincial, district, and local municipalities.

Table 7-5: Number of Households

Study Area	2010	2019	Historical growth rates		
			2010-2014	2015-2019	2010-2019
South Africa	13 881 145	16 366 369	1,54%	1,40%	1,66%
Mpumalanga	1 018 523	1 216 531	1,67%	1,53%	1,79%
Gert Sibande	261 132	316 109	1,80%	1,64%	1,93%
Lekwa LM	30 837	37 462	1,70%	1,62%	1,97%

SOURCE: CENSUS 2011, CS 2016 AND URBAN-ECON'S CALCULATIONS BASED ON QUANTEC DATA

There is a strong correlation between household expenditure and economic growth. Increased household expenditure implies increased demands for goods and services, which indicates a higher output and a positive shift in the size of the economy. Knowledge of the volume of the disposable income and the expenditure patterns of households, therefore, can provide vital intelligence concerning the sectors that are most dependent on the household income and therefore would be most affected in the case of a change in household income. Table 7-6 shows income distribution in the study areas as captured in the 2011 Census (SA, 2011).

Table 7-6: Income Distribution (2011)

Income category (per annum)	South Africa	Mpumalanga	Gert Sibande District	Lekwa LM
No income	14,84%	14,40%	14,45%	10,68%
R1 - R4 800	4,46%	5,19%	4,76%	3,88%
R4 801 - R9 600	7,42%	8,75%	8,05%	5,91%
R9 601 - R19 200	16,96%	18,49%	17,98%	17,89%
R19 201 - R38 400	19%	19,79%	19,74%	22,24%
R38 401 - R76 800	13,09%	13,29%	13,46%	15,74%
R76 801 - R153 600	9,33%	8,92%	9,39%	10,32%
R153 601 - R307 200	7,28%	6,18%	6,67%	8,08%
R307 201 - R614 400	4,79%	3,46%	3,78%	3,79%
R614 401 - R1 228 800	1,88%	1,04%	1,16%	1,08%
R1 228 801 - R2 457 600	0,57%	0,30%	0,35%	0,21%
More than R2 457 600	0,33%	0,20%	0,21%	0,20%
No response	0,01%	0,0%	0,0%	0,0%
TOTAL	100%	100%	100%	100%

SOURCE: CENSUS 2011 AND URBAN-ECON'S CALCULATIONS BASED ON QUANTEC DATA

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It could be concluded that the household income mirrored some of the patterns observed in Mpumalanga and the rest of the country. The percentage of households earning less than R3 200 per month (R38 400 per annum) in the primary study area was 60,6%, which is significantly less compared to that of the District (64,98%), Province (66,61%), and rest of the country (62,72%) in 2011. Overall, more than 60% of households earned less than R3 200 per month in the entire country in 2011.

At the same time, the percentage of households without any income was considerably lower in the Lekwa LM than in any other study area analysed. From an average household income perspective, an average household in the primary study area earned the same as an average household in the rest of the country. This, in turn, was smaller than in Mpumalanga and Gert Sibande District. Regarding the settlements located in the Lekwa local municipal area, more than 60 % of employed residents made less than R38 400 per year (less than R3 200 per month) and only 39.4 % of people residing in the Lekwa region made more than R38 400 per annum.

Household expenditure refers to how much the average household spend on goods and services. The goods and services refer to durable goods (items that generally last more than 3 years, for example, cars), semi-durable goods (items that can be used a few times before they need to be replaced, such as clothing), non-durable goods (everyday household items) as well as services.

Figure 7-6 shows that there are slight differences between the expenditure patterns of households in the Lekwa LM and other study areas. In three of the study areas, households tend to spend more of their disposable income on non-durable goods than on services, whilst compared to the rest of the country, households tend to spend more on services than on non-durable goods. The share of disposable income spent by households in the Lekwa Local Municipality on non-durable goods is also greater than the share of expenditure on these goods by households residing in the Gert Sibande District and the rest of the country. The expenditure on durable goods is usually a good indicator for the measuring of economic activity in a region. The expenditure on durable goods for the Lekwa LM is relatively lower than the district as well as the province, indicating that economic activity is low in the region.

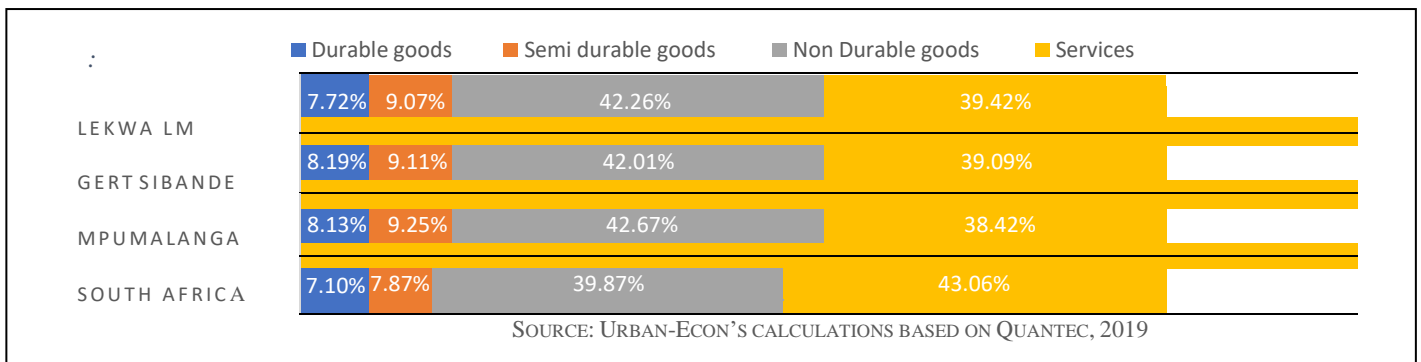


Figure 7-6: Household Expenditure (2019)

The various demographic factors show a growth in the population as well as number of households, which may be indicative that may be perceived economic prospects within the municipality. The analysis also showed that the residents within the municipality are relatively poor, with more than 60% of households earning less than R38 400 per year. The findings show a need for job opportunities that will improve the living standards in the region.

Lekwa Local Municipality had a relatively slow growth in its economy of 1.2% per annum, which was the second lowest among the local municipalities in the Gert Sibande District. Lekwa, however, had the third largest GDP-R contribution, which indicates that there was significant economic activity within the municipality. The main economic drivers for the municipality were the agricultural, utilities and financial industries. It is important to note that the municipality had a relatively high unemployment rate of 25,3% that increases since 2010. The findings illustrate that the economy in Lekwa is relatively stable, however, there is a need for job opportunities to address the unemployment, poverty and inequality within the region.

8 Impacts and risks identified for each alternative including the nature, significance, consequence, extent, duration and probability of the impacts

Refer to Section 9.1 for impacts and risks identified including the alternatives.

8.1 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. Assessment of impacts will be based on the Department of Environmental Affairs Guideline Document: EIA Regulations 2010. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

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

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

Duration. The lifetime of the impact

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

Scale. The physical and spatial size of the impact

- Local: The impacted area extends only as far as the activity, e.g. footprint
- Site: The impact could affect the whole, or a measurable portion of the above mentioned properties.
- Regional: The impact could affect the area including the neighbouring residential areas.
- Magnitude/ Severity. Does the impact destroy the environment, or alter its function.
 - Low: The impact alters the affected environment in such a way that natural processes are not affected.
 - Medium: The affected environment is altered, but functions and processes continue in a modified way.
 - High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

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

- Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights will be assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1

	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

The significance of each activity will be rated without mitigation measures and with mitigation measures for both construction, operational and closure phases of the Platinum Mine development.

The findings of the impact assessment have been consolidated in the sections below. The impacts have been classified as impacts on the biophysical environment and impacts on the socio-economic environment. The impacts are further classified in terms of the phase of the development in which they are likely to occur, namely the construction phase and the operational phase.

8.2 The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

Refer to Section 9.1 for impacts and risks identified including the alternatives.

8.3 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

Refer to Section 9.1 for impacts and risks identified including the alternatives.

8.4 The possible mitigation measures that could be applied and level of residual risk

Refer to Section 9.1 for impacts and risks identified including the alternatives.

8.5 The outcome of the site selection matrix

Refer to Section 5.1.1.

The preferred route stretches over a distance of 5.42 km; from the abstraction point to the R39, after which it turns west and follows the road servitude of the R39 and R50 to the abattoir. This route was chosen due to having the lowest Ecological Impact. Refer to Figure 2-1 and Figure 2-2.

8.6 If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such

Not applicable. Three different pipeline routes were investigated.

8.7 A concluding statement indicating the preferred alternatives, including preferred location of the activity

Refer to Section 5.1.1.

9 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

In order to identify the potential impacts associated with the proposed prospecting activities the following steps were undertaken:

- The stakeholder consultation process is undertaken in a manner that is interactive and which provides landowners and identified stakeholders with the opportunity to provide input into the project. The local landowners and community have capabilities of providing site specific information which may otherwise not be available to the project team. Identified stakeholders have the opportunity to provide their comments on the project and any concerns that they may have. All comments and concerns are documented in the Table 6-1 and captured in the Impact assessment.
- A detailed desktop investigation was undertaken to determine the environmental setting of the proposed project. Resources included the use of Geographic Information Systems and databases for the area, Municipal Integrated Development Plan etc.
- Specialist studies were undertaken to determine the impacts and associated management and mitigation measures.

The methodology of the ratings of impacts is described under Section 8.1.

9.1 A description of all environmental issues and risks that were identified during the environmental impact assessment process

9.1.1 Construction Phase

9.1.1.1 Ecological Impacts

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

Destruction or loss of floral diversity or vegetation communities

The following impacts of the development will potentially impact on the flora of the site:

- The clearing of vegetation during construction and operation will result in an increase in edge habitat immediately adjacent to disturbed areas. Edge habitat is characterized by a predominance of generalist and alien species because these areas experience higher levels of stress and more frequent disturbance (in both time and space), for example higher light conditions, lower soil moisture conditions and higher exposure to wind. Edge habitat is characterized by highly competitive species which can invade areas of established vegetation, resulting in a loss of sedentary species of mature habitats which are normally considered sensitive;
- The construction will lead to the loss of individual plants that will be cleared within the pipeline corridor;
- The construction activities can impact on surrounding vegetation by dust and altered surface run-off patterns; and
- The disturbance of the area could lead to an increase in the growth of alien vegetation.

The following impacts of the development will potentially impact on the fauna of the site:

- Habitat modification / destruction by construction activities could either directly cause fauna mortalities or will force animals out of the area and animal numbers will decrease. This impact could also take place because of hunting and snaring of animals in natural areas;
- Changes in the community structure: It is expected that the faunal species composition will shift, due to an anticipated loss in habitat surface area. In addition, it is predicted that more generalist species (and a loss of functional guilds) will dominate the study area. Attempts to rehabilitate will attract taxa with unspecialised and generalist life-histories. It is predicted that such taxa will persist for many years before conditions become suitable for succession to progress.

Habitat fragmentation

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

Increased soil erosion and sedimentation

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

the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous fauna and flora.

Soil and water pollution

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

Spread and establishment of alien invasive species

The constructional activities almost certainly carry by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites.

Continued movement of personnel and vehicles on and off the site, as well as occasional delivery of materials required for maintenance, will result in a risk of importation of alien species throughout the life of the project.

Negative effect of human activities on ecosystem

Increased access for labour during construction could result in the increased collection of medicinal plants, firewood, building wood, and other plant material. This could impact negatively on biodiversity through the removal or damage of red data species, as well as result in the general degradation of habitat quality.

If staff compounds are erected for construction workers, the risk of pollution because of litter and inadequate sanitation and the introduction of invasive fauna and flora are increased.

Impact on drainage regime of area

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

Road mortality

Large numbers of fauna are killed daily on roads. They are either being crushed under the tyres of vehicles in the case of crawling species, or by colliding with the vehicle itself in the case of avifauna or flying

invertebrates. The impact is intensified at night, especially for flying insects, as result of their attraction to the lights of vehicles. The proposed water supply pipeline development will most definitely cause fauna mortalities on the roads during the construction and operational phases.

Air pollution

The construction processes for the development will release dust and gasses, into the broader environment through vehicle emissions, dust from soil stockpiles and gravel roads. The environmental impacts of wind-borne dust, gases and topsoil stockpiles are primarily related to human health and ecosystem damage. The proposed development will typically comprise the following sources and associated air quality pollutants:

- Land clearing operations and scraping;
- Stockpiling (particulate matter);
- Materials handling operations (truck loading & unloading, tipping, stockpiling);
- Vehicle entrainment on paved and unpaved roads;
- Windblown dust-fugitive emissions (stockpiles).

impact on the characteristics of the watercourse i.e. flow regime, habitat, biota, water quality and geomorphology due to construction within floodline zone

The construction activities associated with the proposed water supply pipeline in the floodline zone will potentially have an impact on the wetland areas, whether it is through direct or indirect impacts. Loss of the wetland and instream habitat will also result in permanent loss or displacement of the invertebrates, birds and small mammals dependant on the wetland vegetation for feeding, shelter and breeding purposes. All functions associated with the wetlands and the surrounding landscape will be compromised if mitigation measures are not applied correctly. Other indirect impacts of the construction of the water supply line on the characteristics of the water course include impacts on water quality and changes to the geomorphology should the development cause impacts on downstream areas.

9.1.1.2 Impact on heritage resources

No sensitive heritage receptors were found in the project area and no potential impact to heritage resources is foreseen (Appendix 8).

Cognisant of known site distribution patterns in this section of the Mpumalanga Province, and based on general on-site observations and off-site assessments and, notably the fact that the project site and its immediate surrounds have previously been transformed by urbanization and human settlement, the construction of the proposed project will have no impact on archaeological artefacts, features or structures surviving in primary context, subject to the fact that no previously undetected heritage remains (for example, those in sub-surface deposits) are exposed at any stage of the development.

- No human burials were documented in the project area and no impact on human remains is foreseen.
- Fossils were not found during the walk through of the site (refer to Appendix 9).

9.1.1.3 Air Quality Impacts (dust)

- Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic.

9.1.1.4 Visual Impacts

- The largest part of the proposed pipeline will be situated below ground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles during construction.

9.1.1.5 Noise Impacts

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

9.1.1.6 Traffic Impacts

- Vehicles
 - The presence of construction vehicles on site will have an impact on the traffic flow in the immediate area although this will be kept at a minimum.
- Pedestrians
 - Construction areas and excavations in the roadside will be hazardous for pedestrians walking beside the roads during the construction phase.

9.1.1.7 Socio-economic impacts

This section highlights the socio-economic impacts during the construction phase of the project (Urban-Econ, 2021):

Temporary Stimulation of the Local and National Economy

The construction phase is a short-term development phase for the proposed water pipeline development, which is envisioned for 12 months.

The construction of the proposed water pipeline is estimated to cost R87,5 million, and the construction of the water pipeline will be outsourced to a local firm in Standerton as part of Goldi's initiative to empower the local community. The investment into the construction of the pipeline is likely to create a short-term positive impact in terms of job creation as well as a positive direct impact on the construction industry and its value chain, leading to an increase in the demand for goods and services in various sectors of the local economy. The sectors likely to be affected during the construction phase include local transport services,

trade and personal services as well as the manufacturing industries that will benefit from construction activities. The increased demand across the sectors is likely to create a short-term increase in indirect employment opportunities, which are likely to positively impact the household income within the region. Various spillover effects are expected to spread throughout the local economy, which will further contribute to heightened production levels. Some of these positive effects will be realised in the local economy, stimulating growth within the regional economy.

Creation of Temporary Employment Opportunities at a Local and National Level

Employment impacts are determined in terms of the Full-Time Equivalent (FTE) employment positions, which is the same as an FTE job or one man-year of work.

The Standerton community has experienced an increase in unemployment over the last 10 years and the construction of the pipeline is likely to stimulate employment opportunities in the regional sectors. The construction phase is likely to create about 18 Full-Time Equivalent jobs where workers will be paid in the form of salaries. The increase in demand for goods and services, due to the increase in income, as well as the investment for the project will create more job opportunities in other sectors of the local economy, and thus creating a positive employment effect.

For the construction of the proposed pipeline, the labour force required can be further defined as follow:

- Highly skilled employment - 15%
- Skilled employment - 20%
- Semi-skilled/unskilled employment - 65%

It is expected that 15 of the 18 workers required for the construction of the pipeline will be from the Standerton region. Additionally, the proposed project will stimulate opportunities for semi-skilled and unskilled workers that are seeking employment within the region. Three of the 18 workers will be highly skilled workers and will be required to oversee the construction of the pipeline and its various components.

Temporary Increase in Household Income During Construction

The construction of the pipeline is likely to create an increase in household income levels due to the increase in demand for employment in the region. The information gathered in the previous chapters indicates that more than 60% of the population are receiving R3 200 per month or less per household. The proposed project is likely to improve the standard of living and reduce poverty levels through the creation of short-term employment. Furthermore, a boost in the local economy will prevail as the consumption level are likely to rise mainly due to the investment for the pipeline creating a positive spillover effect and contributing to an increase in household income for the Standerton community.

Contribution to Skills Development During Construction

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The construction phase for the proposed project comprises the laying of the water pipeline as well as establishing the necessary infrastructure to support and operate the water pipeline. The skillsets required are not solely construction skills, but also include skills in the establishment of an abstraction point, as well as installing the various components of the abstraction point.

Most of the workers required will be sourced within the local economy. However, the employment opportunities created are subject to the availability of local workers with the appropriate skills.

The construction phase will potentially require unskilled and low-skilled labourers for the construction of the water pipeline. The workers will require training to ensure skills development and knowledge transfer. Furthermore, skilled workers will gain further experience and improve their skills level. The sustainable impact of skills development will thus improve the skills profile for the local economy.

Change in Sense of Place

Three development routes were investigated to minimise the negative effect on the communities as well as on the environmental landscape. In the short run, the community may experience a change of sense of place as the trenches that will be excavated might influence the appearance and potential noise from machinery. The route chosen by the developer will not cause any damage to the land during the installation of the pipeline. Once the pipeline is installed, the trenches will be closed off and restored to the previous state to minimise the effect on the community. During construction, road networks may experience increased traffic in the area as the construction may disturb the current level of traffic and affect commuters who frequently use the roads where the installation will take place.

Pressure on Social and Economic Infrastructure

The proposed development is likely to place increased pressure on existing social infrastructure in the area during the construction phase. The social infrastructure includes, but is not limited to, public roads, electricity, water and/or sewage infrastructure and disruption to local businesses along the pipeline route due to restriction of access to shops. The most affected infrastructure component will be the roads as the pipeline will be installed at certain points. The road will, however, be repaired and restored to its previous state promptly once the pipeline is installed. For the installation of the pipe and construction of the pumphouse, no further pressure is expected to be placed on local infrastructure.

Temporary Increase in Crime and Social Conflicts Associated with an Influx of People

The migration of people to the area could result in social conflicts between the residents and the migrants regarding the potential job opportunities that will be created during the construction phase. The influx of people into the area may lead to a temporary increase in the level of crime due to potential job seekers being unable to find work, especially the semi-skilled and unskilled construction workers. The impact, thereof, will negatively affect the local area. This will also affect the sense of place for other local residents. During the construction period, there is a cumulative effect since temporary job opportunities on offer will

increase. Workers may, therefore, experience periods of unemployment, which could temporarily increase crime and social conflicts.

9.1.2 Operation Phase

9.1.2.1 Ecological and Wetland Impacts

Possible impacts during the operation phase include:

- Movement of vehicles on site during operations for maintenance purposes resulting in spillages of harmful substances leading to soil and water pollution;
- Pipe failure or leaks resulting in Increased flows due to leaks or pipe failure;
- Subsidence resulting in erosion due to subsidence along pipeline.

9.1.2.2 Socio-Economic Impacts

The project will have the following positive Socio-economic Impacts (Urban-Econ, 2020):

The impacts during the operational phase of the project refer to the functioning of the proposed water pipeline, and the Goldi Chicken Abattoir in Standerton being self-sufficient in water supply. This phase will begin after completion of the construction phase of 12 months.

Sustainable Increase in Production and GDP-R in the National and Local Economies

The installation of the water pipeline will enable the Goldi Chicken Abattoir to have a sustainable water supply that will improve current production levels at the abattoir and assist with returning the production levels to the abattoir's full capacity. The expected improvement indicates a positive impact on production levels during the operational phase of the proposed pipeline. The abattoir currently has two production lines that employ over 3 400 workers and intends to expand production within the next ten years by establishing another production line based on the long-term expected increases in demand for chickens. The addition of the production line through the expansion will require additional workers, with the abattoir expecting about 1 500 full-time equivalent job opportunities. The possible job opportunities created through the expansion of the abattoir is likely to positively impact household income levels, which in turn, may improve the living standards of the people employed.

Goldi Chicken Abattoir currently has a throughput of 7 500 000 chickens per month distributed across the country for consumption. The implication, thereof, indicates that the Goldi Chicken Abattoir plays a significant role in food security for the country. With an expected increase in population, the demand for chicken is likely to increase as well. This implies that there will likely be a need for higher production levels at the abattoir, which will require sustainable production levels to enable expansion in the future.

Creation of Sustainable Employment Opportunities Nationally and Locally

The Goldi Chicken Abattoir is the largest employer in the region as it currently employs over 3 400 employees. The abattoir employs workers with varying skills levels that can be subdivided as follows:

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- Highly skilled: 30 workers employed
- Skilled: 106 workers employed
- Semi-skilled/unskilled: 3 322 workers employed

As previously mentioned, the installation of the water pipeline provides the Goldi Chicken Abattoir with the ability to produce at full capacity due to a sustainable supply of water for its operations. The abattoir is likely to expand its operations, which will provide a positive impact on production as well as potential job opportunities for the local community. The Goldi Chicken Abattoir currently makes use of 48 contracted chicken grower farms that supply the abattoir with chickens, which illustrates the relations between the Goldi Chicken Abattoir and the local businesses that are affected by the abattoir. The proposed water pipeline is a necessity for the Goldi Chicken Abattoir to continue production in the Standerton region and to continue with adding value to the existing value chains and its suppliers.

Food security remains a key priority in the country as the population continues to increase. The Goldi Chicken Abattoir is expected to establish a third production line to its operations at the Standerton plant within the next ten years. This additional production line will likely create approximately 800 semi-skilled job opportunities in the region and boost the value add and demand for resources through the existing value chains. This will be beneficial to the region, and further contribute to the development of skills and knowledge in the area. The sustainable employment opportunities will enable economic growth and reduce unemployment in the local economy, also improving the living standards within the region through improved household incomes.

Improved Living Standards of Positively Affected Households

The Standerton community is a relatively small farming community with a high level of unemployment and inequality. The proposed project will enable the abattoir to become self-sufficient in water resources and relieve pressure on the Standerton water infrastructure. As a result, the Concor Reservoir will have reduced pressure and will be able to sustainably supply more water effectively to the regions affected. The Goldi Chicken Abattoir pipeline will be built with a capacity of 7ML per day, enabling expansion of operations in the future without additional pressure being applied on the local infrastructure.

Sustainable Increase in Government Revenue

The operational phase will take place over the long term. During this phase, the Goldi Chicken Abattoir is likely to have improved production levels due to the installation of the water pipeline, potentially leading to an increase in revenue, thereby likely increasing government revenue through the taxes collected. The potential expansion within the next ten years will also contribute positively to government revenue as expansion will increase production and income in the local economy. The taxes generated will increase not only the national fiscus but the local government's revenue. With the expansion at the Goldi Chicken Abattoir, employment and economic activity are likely to improve, leading to increased spending power

that would increase the tax base for the government. The various tax received by the government improves the government's ability to deliver basic services to the local communities.

Skills Development of Permanently Employed Workers

As exhibited in the previous sections, there is a shortage of semi-skilled to highly skilled workers within the local region. Skills development is therefore imperative for local residents and the initiatives planned by the project owners may improve the status of the skills profile in the area. Astral Foods has various educational programmes for employees. The NQF level 2 to 5 programmes were established to improve the skills of the low skilled workers and provide opportunities that were not previously accessible. Astral Foods, in collaboration with the Goldi Chicken Abattoir, receives several individuals yearly who are interested in undertaking their apprenticeship programmes where they learn several new skills and gain knowledge of various processes and tasks.

Local Economic Development Benefits Derived through the Business Social Responsibility Programme

Goldi Chicken Abattoir is actively involved in the community through different social responsibility programmes. The company currently has an active feeding programme that aims to donate food parcels to schools, old age homes as well as community feeding schemes. It is estimated that the abattoir feeds approximately 160 homeless individuals each week to uplift and contribute to the community. The company is involved in various sporting activities such as cricket as well as an annual marathon. Goldi Chicken Abattoir sponsors a cricket development tournament annually at a local school as well as sponsors prizes and funding of the Annual Goldi Marathon.

Goldi Chicken Abattoir is also involved with the activities of the Earlybird Primary School in Standerton where the company hosted a Christmas party and donated food, stationery, backpacks and gifts for 216 learners and teachers at the school. Goldi Chicken Abattoir has made efforts to be as involved as possible within the local communities by providing regular maintenance at the school, as well as contribute to the welfare and safety of the learners as well as the teachers.

With the municipality facing challenges in sustainable water supply at times, the company has intermittently supplied clean water through water tankers to the communities, including the Standerton Hospital.

Less Pressure on Infrastructure

The Goldi Chicken Abattoir currently requires about 2,4 ML of water per day from the Lekwa Local Municipality. The abattoir uses a significant amount of water for its production activities, making it the biggest water user in the region. The proposed water pipeline will free up capacity in the Lekwa Municipality's water network and enable an extended lifespan for the municipality's network as there will be less pressure on the public water infrastructure. The pipeline will assist with restoring the Concor

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Reservoir water levels, which will assist with the constant supply of water to the areas currently receiving water through the Concor Reservoir.

For the pipeline to be effective, a new sub-station will need to be installed and operated at the abstraction point to ensure a sustainable supply of water to the abattoir. The sub-station will likely increase electricity demand once operational, which may place some pressure on the local infrastructure in the long term.

9.2 An assessment of the significance of each issue and risk and an indication of the extent to which the issues and risks could be avoided or addressed by the adoption of mitigation measures

Table 9-1: Table of impacts and significance (with mitigation (WM) and without mitigation (WOM))

No	Activity	Impact	Without or With Mitigation	Nature (Negative or Positive Impact)	Probability		Duration		Scale		Magnitude/Severity		Significance	
					Magnitude	Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	Score	Magnitude
Construction Phase														
Ecological and Wetland Impacts														
1	Clearing of vegetation for pipelines and infrastructure, access roads etc.	Loss of floral diversity or vegetation communities with resultant impact on fauna	WOM	Negative	Definite	5	Medium term	3	Local	1	Medium	6	50	Moderate
			WM	Negative	Highly Probable	4	Medium term	3	Local	1	Low	2	24	Low
2	Clearing of vegetation for pipelines and construction of infrastructure, access roads etc.	Habitat fragmentation	WOM	Negative	Highly Probable	4	Long term	4	Local	1	Medium	6	44	Moderate
			WM	Negative	Probable	2	Long term	4	Local	1	Low	2	14	Negligible
3	Exposure of soils to rainfall and wind during construction	Increased soil erosion and sedimentation	WOM	Negative	Highly Probable	4	Long term	4	Site	2	Medium	6	48	Moderate
			WM	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible

4	Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant)	Spillages of harmful substances, such as hydrocarbons and sewage) leading to soil and water pollution	WOM	Negative	Definite	5	Medium term	3	Local	1	Medium	6	50	Moderate
			WM	Negative	Highly Probable	4	Medium term	3	Local	1	Low	2	24	Low
5	Continued movement of personnel and vehicles on and off the site during the construction phase	Spread and establishment of alien invasive species	WOM	Negative	Highly Probable	4	Medium term	3	Site	2	Medium	6	44	Moderate
			WM	Negative	Probable	2	Medium term	3	Site	2	Low	2	14	Negligible
6	Construction of infrastructure, access roads etc.	Negative effect of human activities on the ecosystem resulting in degradation of habitat quality and increased pollution	WOM	Negative	Highly Probable	4	Medium term	3	Site	2	Medium	6	44	Moderate
			WM	Negative	Probable	2	Medium term	3	Site	2	Low	2	14	Negligible
7	Construction of pipelines and roads at crossings and on floodplains	Impact on drainage regime	WOM	Negative	Probable	2	Long term	4	Regional	3	Medium	6	26	Low
			WM	Negative	Probable	2	Long term	4	Regional	3	Low	2	18	Negligible
8	Continued movement of vehicles on and off the site during the construction phase	Fauna mortality on roads	WOM	Negative	Highly Probable	4	Medium term	3	Regional	3	Medium	6	48	Moderate
			WM	Negative	Probable	2	Medium term	3	Site	2	Low	2	14	Negligible

9	Continued movement of vehicles on and off the site during the construction phase	Air/ dust pollution	WOM	Negative	Definite	5	Medium term	3	Site	2	Medium	6	55	Moderate
			WM	Negative	Highly Probable	4	Medium term	3	Site	2	Low	2	28	Low
10	Construction through wetland crossings / abstraction of water from Vaal River	Impact on the characteristics of the watercourse habitat, biota, water quality and geomorphology due to construction within floodline zone	WOM	Negative	Definite	5	Medium term	3	Local	1	Medium	6	50	Moderate
			WM	Negative	Highly Probable	4	Medium term	3	Local	1	Low	2	24	Low
Air Quality Impacts														
11	Excavation and stockpiling and vehicular movement	Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic.	WOM	Negative	Definite	5	Medium term	3	Site	2	Low	2	35	Low
			WM	Negative	Probable	2	Medium term	3	Site	2	Low	2	14	Negligible
Visual impact														
12	Construction activities relating to installation of the pipeline	The largest part of the proposed pipeline will be situated belowground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is	WOM	Negative	Highly Probable	4	Medium term	3	Local	1	Medium	6	40	Low
			WM	Negative	Probable	2	Medium term	3	Local	1	Low	2	12	Negligible

		completed. The only visual impact will arise from the construction activities and vehicles during construction.													
	Noise Impacts														
13	Construction activities and operation of machinery and vehicles	Noise pollution from excavation activities and movement of vehicles	WOM	Negative	Definite	5	Medium term	3	Site	2	High	8	65	High	
			WM	Negative	Highly Probable	4	Medium term	3	Site	2	Low	2	28	Low	
	Traffic Impacts														
14	Excavation and installation of pipeline and use of construction vehicles	The presence of construction vehicles on site and installation of the pipeline alongside public roads will have an impact on the traffic situation of the neighbouring area although this will be kept to a minimum.	WOM	Negative	Highly Probable	4	Medium term	3	Site	2	High	8	52	Moderate	
			WM	Negative	Probable	2	Medium term	3	Site	2	Medium	6	22	Low	
	Socio-economic Impacts														
15	Construction phase of 12 months	Temporary stimulation of economy and growth of the GDP	WOM	Positive	Probable	2	Short term	1	Local	1	Low	2	8	Negligible	
			WM	Positive	Probable	2	Short term	1	Local	1	Low	2	8	Negligible	
16	18 Full-Time Equivalent job opportunities	Creation of temporary employment opportunities nationally and locally	WOM	Positive	Highly Probable	4	Short term	1	Local	1	Medium	6	32	Low	
			WM	Positive	Highly Probable	4	Short term	1	Local	1	Medium	6	32	Low	

17	Increase in demand for employment in the region	Temporary increase in household income during construction	WOM	Positive	Probable	2	Short term	1	Regional	3	Low	2	12	Negligible
			WM	Positive	Probable	2	Short term	1	Regional	3	Low	2	12	Negligible
18	Workers requiring training to ensure skills development and knowledge transfer	Contribution to skills development during construction	WOM	Positive	Probable	2	Short term	1	Regional	3	Medium	6	20	Negligible
			WM	Positive	Probable	2	Short term	1	Regional	3	Medium	6	20	Negligible
20	Construction activities	Negative Impact on the sense of place	WOM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible
			WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible
21	Use of roads, electricity and water during construction	Increased pressure on local services and infrastructure	WOM	Negative	Highly Probable	4	Short term	1	Local	1	Medium	6	32	Low
			WM	Negative	Highly Probable	4	Short term	1	Local	1	Medium	6	32	Low
22	Influx of people into the area	Temporary increase in crime and social conflicts associated with an influx of people	WOM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible
			WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible
Operational Phase														
	Ecological and Wetland Impacts													
23	Movement of vehicles on site during operations for maintenance purposes	Spillages of harmful substances leading to soil and water pollution	WOM	Negative	Probable	2	Long term	4	Regional	3	Medium	6	26	Low
			WM	Negative	Probable	2	Medium term	3	Site	2	Low	2	14	Negligible
24	Pipe failure or leaks		WOM	Negative	Probable	2	Long term	4	Site	2	High	8	28	Low

		Increased flows due to leaks or pipe failure	WM	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible
25	Subsidence	Erosion due to subsidence along pipeline	WOM	Negative	Probable	2	Long term	4	Site	2	High	8	28	Low
			WM	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible
Socio-economic Impacts														
26	Sustainable production at Goldi Abattoir	Sustainable increase in production and GDP-R in national and local economies	WOM	Positive	Definite	5	Long term	4	Regional	3	Low	2	45	Moderate
			WM	Positive	Definite	5	Long term	4	Regional	3	Low	2	45	Moderate
27	Sustainable production at Goldi Abattoir	Creation of sustainable employment opportunities nationally and locally	WOM	Positive	Highly Probable	4	Long term	4	Regional	3	Low	2	36	Low
			WM	Positive	Highly Probable	4	Long term	4	Regional	3	Low	2	36	Low
28	Sustainable production at Goldi Abattoir	Improved living standards of positively affected households	WOM	Positive	Probable	2	Long term	4	Regional	3	Low	2	18	Negligible
			WM	Positive	Probable	2	Long term	4	Regional	3	Low	2	18	Negligible
29	Sustainable production at Goldi Abattoir	Sustainable increase in government revenue	WOM	Positive	Probable	2	Long term	4	Local	1	Low	2	14	Negligible
			WM	Positive	Probable	2	Long term	4	Local	1	Low	2	14	Negligible
30	Sustainable production at Goldi Abattoir	Skills development of permanently employed workers	WOM	Positive	Probable	2	Long term	4	Local	1	Medium	6	22	Low
			WM	Positive	Probable	2	Long term	4	Local	1	Medium	6	22	Low
31		Local economic development benefits	WOM	Positive	Improbable	1	Long term	4	Regional	3	Low	2	9	Negligible

	Sustainable production at Goldi Abattoir	derived through the business social responsibility programme.	WM	Positive	Improbable	1	Long term	4	Regional	3	Low	2	9	Negligible
32	Sustainable production at Goldi Abattoir	Less Pressure on local Infrastructure (water supply infrastructure)	WOM	Positive	Probable	2	Long term	4	Local	1	Medium	6	22	Low
			WM	Positive	Probable	2	Long term	4	Local	1	Medium	6	22	Low

Table 9-2: Table of impacts with mitigation measures

No	Activity	Impact	Without or With Mitigation	Nature (Negative or Positive Impact)	Significance		Mitigation Measures	Mitigation Effect	Residual Impact to be managed or monitored
					Score	Magnitude			
Construction Phase									
Ecological and Wetland Impacts									
1	Clearing of vegetation for pipelines and infrastructure, access roads etc.	Loss of floral diversity or vegetation communities with resultant impact on fauna	WOM	Negative	50	Moderate	<ul style="list-style-type: none"> The removal of indigenous flora should only occur on the footprint area of the pipeline development and not over the larger area. The clearing and damage of plant growth in these areas should be restricted to the footprint way leave area; Revegetation of disturbed areas must be undertaken with site indigenous species. This can provide a buffer to protect indigenous vegetation from invasion by weeds; Ongoing monitoring and maintenance of revegetation works following commissioning of proposal; Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications; Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling of trenches during the bulk water supply pipeline construction; Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist; Should the development be approved by authorities, environmental monitoring of environmental aspects should be implemented during the construction phase of the development to ensure that minimal impact is caused to the fauna and flora of the area. 	Can be avoided, managed or mitigated	No
			WM	Negative	24	Low			
2	Clearing of vegetation for pipelines and construction of infrastructure, access roads etc.	Habitat fragmentation	WOM	Negative	44	Moderate	<ul style="list-style-type: none"> Use existing facilities (e.g., current bulk water supply pipeline route) to the extent possible to minimize the amount of new disturbance; Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the entire wetland zone and grassland areas during construction; During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place; Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas. 	May cause irreplaceable loss of resources	No
			WM	Negative	14	Negligible			
3	Exposure of soils to rainfall and wind during construction	Increased soil erosion and sedimentation	WOM	Negative	48	Moderate	<ul style="list-style-type: none"> During and after construction, ensure storm water management around permanent infrastructure, rehabilitate disturbed areas, protect topsoil and protect sensitive soils. This will reduce the possibility of soil erosion; Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. Control dust on construction sites and access roads using chemical dust suppressants; The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to drainage lines, streams and wetland communities. Both temporary and permanent soil erosion control measures must be used during the construction 	May cause irreplaceable loss of resources	No
			WM	Negative	16	Negligible			

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							and operation phases; <ul style="list-style-type: none"> • Ensure the amount of bare soil exposed is minimized by staging earthworks in phases and leaving as much ground cover intact as possible during construction; • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas; • Repair all erosion damage as soon as possible and in any case not later than six months before the termination of the construction period. 		
4	Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant)	Spillages of harmful substances, such as hydrocarbons and sewage) leading to soil and water pollution	WOM	Negative	50	Moderate	<ul style="list-style-type: none"> • Water falling on areas polluted with oil/diesel or other hazardous substances must be contained. Any excess or waste material or chemicals should be removed from the site and discarded in an environmentally friendly way; • All construction vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately; • Vehicle maintenance yards (if any) must not be situated in any close proximity to water courses and all used oil and other waste products should be disposed of in an acceptable way – preferably it should be removed from the site and recycled; • Ensure that refuelling stations on site are constructed so as to prevent spillage of fuel or oil onto the soil, and put in place measures to ensure that any accidental spillages can be contained and cleaned up promptly; • The water supply pipeline needs to be constantly monitored to prevent any leaks, especially into the wetland areas. • Chemical sanitary facilities must be provided for construction workers if required. Institute environmental best practice guidelines as per the DWA Integrated Environmental Management Series: Environmental Best Practice Specification for construction <ul style="list-style-type: none"> ❖ Limit quantities of hazardous substances on site to the volumes used during 1 days' work. ❖ All soil contaminated due to leaks or spills should be remediated on site. If this is not possible, such contaminated soils must be disposed of in a suitable waste facility. ❖ Waste should be stored on site in clearly marked containers in a demarcated area. All waste material should be removed at the end of every working day to designated waste facilities at the main suitable waste disposal facility. All waste must be disposed off-site 	May cause irreplaceable loss of resources	No
			WM	Negative	24	Low			
5	Continued movement of personnel and vehicles on and off the site during the construction phase	Spread and establishment of alien invasive species	WOM	Negative	44	Moderate	<ul style="list-style-type: none"> • Institute strict control over materials brought onto site, which should be inspected for potential invasive invertebrate species and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual insecticides prior to transport to site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species should be eradicated; • Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water guidelines; • Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish; • Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds; • Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented; 	May cause irreplaceable loss of resources	No
			WM	Negative	14	Negligible			

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							<ul style="list-style-type: none"> • A plan should be developed for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive non-native plants should be avoided by keeping vehicles and equipment clean and reseeding disturbed areas with native plants. 		
6	Construction of infrastructure, access roads etc.	Negative effect of human activities on the ecosystem resulting in degradation of habitat quality and increased pollution	WOM	Negative	44	Moderate	<ul style="list-style-type: none"> • Staff must not be allowed to stay on site; • Maintain proper firebreaks around entire development footprint; • Construction activities must remain within defined construction areas. No construction / disturbance will occur outside these areas; • Construction activities must be restricted to working hours Monday to Saturday, unless otherwise approved by the appropriate competent person in consultation with the affected residents; • Educate workers regarding the occurrence of important resources in the area and the importance of protection; • Instruct employees, contractors, and site visitors to avoid harassment and disturbance of wildlife, especially during reproductive (e.g. courtship, nesting) seasons. In addition, control pets to avoid harassment and disturbance of wildlife; • No camp fires at construction sites. 	May cause irreplaceable loss of resources	No
			WM	Negative	14	Negligible		Can be reversed	
7	Construction of pipelines and roads at crossings and on floodplains	Impact on drainage regime	WOM	Negative	26	Low	<ul style="list-style-type: none"> • Work in wetlands should preferably be done during the low flow season; • The proposed water supply pipeline development will cross wetlands. The bulk water supply pipeline should cross the wetlands in the least sensitive areas and preferably at a perpendicular angle to prevent any serious erosion. The site should be indicated by an ecologist after consultation with the engineers. The following mitigation measures and management actions should be taken to minimize potential impacts of the bulk water supply pipeline crossing drainage channels: <ul style="list-style-type: none"> o Minimize changes to natural drainage patterns and crossings to drainages. During construction through a crossing, the majority of the flow of the stream / river must be allowed to pass down the stream (i.e. no damming must be allowed to take place). In-stream diversions must allow for continuous water flow. The construction of new channels shall not be allowed; o Drainage crossings are potentially problematic, so they must be well designed. Changes to natural drainage patterns or channels often result in either environmental damage or failures. Where wetland, stream or drainage line crossings are unavoidable, drains and culverts must be designed in conjunction with relevant experts to the correct invert levels to prevent damming of flows or draining of wet areas. Culverts should be designed to prevent concentration of flows, and to maintain natural flows as free flowing as possible. Another important consideration in culvert design is maintenance in the long-term: consideration should be given to designs that minimize blockages by silt that could, in turn, result in hydrological impacts on adjacent wetlands, streams or drainage lines; o Identify areas of historic or potential vulnerability, such as geologically unstable materials or areas subject to flooding; o Avoid problematic areas and avoid bulk water supply pipeline development route locations in areas of high natural hazard risk, such as landslides, rock-fall areas, steep slopes (over 60-70%), wet areas, saturated soils, etc.; o Avoid or minimize construction in narrow canyon bottoms or on flood plains of rivers that will inevitably be inundated during major storm events; o Typically keep cut and fill slopes as flat as possible and well covered (stabilized) with vegetation to minimize slumping as well as minimize surface erosion. Well-cemented but highly erosive soils may best resist surface erosion with near-vertical slopes that minimize the surface area exposed to erosion; o Locate the water supply pipeline development route on narrow sections of 	May cause irreplaceable loss of resources	No
			WM	Negative	18	Negligible		Can be avoided, managed or mitigated	

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							<p>rivers and in areas of bedrock where possible. Avoid fine, deep alluvial deposits (of fine sand and silt) that are scour susceptible and problematic, or which otherwise require costly foundations;</p> <ul style="list-style-type: none"> o Ensure that structural designs for the water supply pipeline crossing the drainage channels include appropriate design criteria and have good foundations to prevent failures during floods; o Place retaining structures, foundations, and slope stabilization measures into bedrock or firm, in-place material with good bearing capacity to minimize undermining, rather than placing these structures on shallow colluvial soil or on loose fill material; • Appropriate measures must be taken to manage storm water run-off and potential flooding; • The excavated and stockpiled soil material must be stored and bermed on higher lying areas of the site and not in any wetlands, channels or at steep gradients. • All surplus or unsuitable excavation materials arising from excavations must be spoiled and neatly spread and levelled so as not to interfere with future works or disrupt the natural flow of water. 		
8	Continued movement of vehicles on and off the site during the construction phase	Fauna mortality on roads	WOM	Negative	48	Moderate	<ul style="list-style-type: none"> • More fauna are normally killed the faster vehicles travel. A speed limit should be enforced (40km/h for dirt roads; 50km/h for access roads and 80km/h for national roads). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences); • Travelling at night by construction vehicles should be avoided or limited as much as possible. 	May cause irreplaceable loss of resources	No
			WM	Negative	14	Negligible		Can be avoided, managed or mitigated	
9	Continued movement of vehicles on and off the site during the construction phase	Air/ dust pollution	WOM	Negative	55	Moderate	<ul style="list-style-type: none"> • Dust suppression must be undertaken. Implement standard dust control measures, including chemical dust suppression and / or strategic surfacing of some roads in the project area (frequency will depend on many factors including weather conditions, soil composition and traffic intensity and must thus be adapted on an ongoing basis) of construction areas and access roads, and ensure that these are continuously monitored to ensure effective implementation; • Soil dumps may be covered if necessary; • A speed limit (preferably 40 km/hour) should be enforced on dirt roads 	May cause irreplaceable loss of resources	No
			WM	Negative	28	Low		Can be reversed	
10	Construction through wetland crossings / abstraction of water from Vaal River	Impact on the characteristics of the watercourse habitat, biota, water quality and geomorphology due to construction within floodline zone	WOM	Negative	50	Moderate	<ul style="list-style-type: none"> • Clearing of vegetation should be scheduled for the drier winter months and limited to areas immediately needed for construction. Vegetation stripping should occur in parallel with the progress of construction to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment. Only selected plant species must be used in the re-vegetation process. • All development activities should be restricted to the footprint areas of the proposed development. The Environment Site Officer (ESO) should demarcate and control these areas. Storage of building equipment, fuel and other materials should be limited to demarcated areas. Layouts should be adapted to fit natural patterns rather than imposing rigid geometries. • The Environment Control Officer (ECO) should advise the construction team in all relevant matters to ensure minimum destruction and damage to the environment and specifically wetlands. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation. • Rehabilitation of the water supply line footprint area after construction have been completed should be considered a high priority and all areas rehabilitated should be audited after construction has ceased by a suitably qualified environmentalist; • Should the development be approved by authorities, environmental monitoring of environmental aspects should be implemented during and after the 	May cause irreplaceable loss of resources	No
			WM	Negative	24	Low		Can be reversed	

							<p>construction phase of the development to ensure that minimal impact is caused to the floodline or wetlands of the area.</p> <ul style="list-style-type: none"> • Demarcate all wetland boundaries with pegs and danger tape; • Edge effects of pre-construction and construction activities, including erosion, sedimentation and alien/weed control, need to be strictly managed in wetland areas as well as their associated buffer zones; • The following general rehabilitation measures should be implemented in the disturbed wetland zone: <ul style="list-style-type: none"> o All disturbed surface areas will be re-shaped to resemble the surrounding natural topography. Surfaces will be ripped / scarified, and re-vegetated with indigenous grass species. o As far, as is practical, implement concurrent rehabilitation processes in order to limit degradation of soil biota. o Terrestrial invasive removal programs must be maintained throughout the proposed development as well as in the aftercare and maintenance phases; o Roads and hardened areas should be ripped and scarified to prevent water from these hardened surfaces directly flowing onto the wetland zone. o The re-establishment of a mixed community of indigenous hydrophytic species in the within the cleared / impacted areas within the wetland boundary is important for a number of reasons. The most obvious is the increase in habitat and biodiversity value of the wetland zone. Secondly, a well established vegetation covering across the wetland zone greatly increase the roughness of the system, helping slow water moving through the river, trapping sediment and improving water quality. Re-establishment of the wetness regime will promote the return of hydrophytic species and wetland communities. o The creation of wetland vegetation could act as an effective pollution filter through absorptive and assimilative capacities of wetland plants and their soils. It could further aid in capturing sediment through filtration by plants and spreading out of flows. Any building rubble should be removed from the site 		
Air Quality Impacts									
11	Excavation and stockpiling and vehicular movement	Construction activities will increase the dust pollution on site and surrounding areas due to vegetation clearance, earthworks and increased traffic.	WOM	Negative	35	Low	<ul style="list-style-type: none"> • Damping down of access roads that are used, stockpiles and cleared areas should take place to minimize dust pollution. • No refuse wastes will be allowed to be burned on the premises or surroundings. • Proper rehabilitation of disturbed areas is required in order to minimize bare patches. • Air filters on all mechanized equipment must be properly designed and maintained 	Can be avoided, managed or mitigated	No
			WM	Negative	14	Negligible			
Visual impact									
12	Construction activities relating to installation of the pipeline	The largest part of the proposed pipeline will be situated belowground so the water supply pipeline will have no visual impact on the surrounding environment when the proposed pipeline is completed. The only visual impact will arise from the construction activities and vehicles during construction.	WOM	Negative	40	Low	<ul style="list-style-type: none"> •The location of a construction camp (if any) and material stockpiles should be placed outside the visual field of sensitive visual receptors/ behind a dense vegetation screen in order to fully or partially hide the components. 	Can be reversed	No
			WM	Negative	12	Negligible			
Noise Impacts									
13	Construction activities and operation of machinery and vehicles	Noise pollution from excavation activities and movement of vehicles	WOM	Negative	65	High	<ul style="list-style-type: none"> • Equipment to be used must be well-maintained and fitted with the correct and appropriate noise abatement measures. • Working hours should be limited during the construction phase to between 	Can be avoided, managed or mitigated	No
			WM	Negative	28	Low			

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							08h00 and 18h00 during weekdays. No construction work should occur during weekends.		
	Traffic Impacts								
14	Excavation and installation of pipeline and use of construction vehicles	The presence of construction vehicles on site and installation of the pipeline alongside public roads will have an impact on the traffic situation of the neighbouring area although this will be kept to a minimum.	WOM	Negative	52	Moderate	The necessary traffic and information signs, as well as road markings, should be provided to ensure the safety of pedestrians and motorists where the proposed pipeline will cross any roads or where construction will take place next to any roads • Pedestrian paths should be aligned around the construction areas of the proposed pipeline, to ensure that they are not forced to walk in main roads.	Can be avoided, managed or mitigated	No
			WM	Negative	22	Low			
	Socio-economic Impacts								
15	Construction phase of 12 months	Temporary stimulation of economy and growth of the GDP	WOM	Positive	8	Negligible	n/a	N/A	No
			WM	Positive	8	Negligible			
16	18 Full-Time Equivalent job opportunities	Creation of temporary employment opportunities nationally and locally	WOM	Positive	32	Low	As far as possible, preference should be given to local labour. Procurement should also be done locally as far as possible. If necessary, skills development programmes should be put in place to develop local skills.	N/A	No
			WM	Positive	32	Low			
17	Increase in demand for employment in the region	Temporary increase in household income during construction	WOM	Positive	12	Negligible	n/a	N/A	No
			WM	Positive	12	Negligible			
18	Workers requiring training to ensure skills development and knowledge transfer	Contribution to skills development during construction	WOM	Positive	20	Negligible	Continuation of skills development at Goldi	N/A	No
			WM	Positive	20	Negligible			
20	Construction activities	Negative Impact on the sense of place	WOM	Negative	4	Negligible	<ul style="list-style-type: none"> • With the preparation of the portions of land onto which activities will take place the minimum amount of existing vegetation and topsoil should be removed. • Specifications with regards to the placement of construction camps (if required), as well as a site plan of the construction camp, indicating waste areas, storage areas and placement of ablution facilities should be finalised prior to construction. These areas should either be screened or positioned in areas where they would be less visible from human settlements and main roads. • Building or waste material discarded should be undertaken at an authorised location, which should not be within any sensitive areas. Earthworks <ul style="list-style-type: none"> • Earthworks should be executed in such a way that only the footprint and a small 'construction buffer zone' around the proposed activities is exposed. In all other areas, the natural occurring vegetation, should be retained, especially along the periphery of the site. • Proper rehabilitation of disturbed areas is required in order to minimize bare patches. 	Can be avoided, managed or mitigated	No
			WM	Negative	4	Negligible			
21	Use of roads, electricity and water during construction	Increased pressure on local services and infrastructure	WOM	Negative	32	Low	Rehabilitation of disturbed areas timeously	Can be avoided, managed or mitigated	No
			WM	Negative	32	Low			
22	Influx of people into the area	Temporary increase in crime and social conflicts associated with an influx of people	WOM	Negative	4	Negligible	As far as possible, preference should be given to local labour. Procurement should also be done locally as far as possible. If necessary, skills development programmes should be put in place to develop local skills.	Can be avoided, managed or mitigated	No
			WM	Negative	4	Negligible			

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Operational Phase									
	Ecological and Wetland Impacts								
23	Movement of vehicles on site during operations for maintenance purposes	Spillages of harmful substances leading to soil and water pollution	WOM	Negative	26	Low	<ul style="list-style-type: none"> Water falling on areas polluted with oil/diesel or other hazardous substances must be contained. Any excess or waste material or chemicals should be removed from the site and discarded in an environmentally friendly way; All vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately 	Can be avoided, managed or mitigated	No
			WM	Negative	14	Negligible			
24	Pipe failure or leaks	Increased flows due to leaks or pipe failure	WOM	Negative	28	Low	Regular inspections and maintenance of the pipeline must be undertaken during the operational phase, with any leaks repaired immediately. ❖ Any damage/erosion caused by pipe failure must be repaired immediately following the event.	Can be avoided, managed or mitigated	No
			WM	Negative	16	Negligible			
25	Subsidence	Erosion due to subsidence along pipeline	WOM	Negative	28	Low	❖ A walk-through survey should be undertaken long the entire pipeline route 6 months after completion of construction activities and then again at yearly intervals to survey for signs of subsidence along the pipeline route. Any subsidence should be immediately repaired.	Can be avoided, managed or mitigated	No
			WM	Negative	16	Negligible			
	Socio-economic Impacts								
26	Sustainable production at Goldi Abattoir	Sustainable increase in production and GDP-R in national and local economies	WOM	Positive	45	Moderate	n/a	N/A	No
			WM	Positive	45	Moderate			
27	Sustainable production at Goldi Abattoir	Creation of sustainable employment opportunities nationally and locally	WOM	Positive	36	Low	As far as possible, preference should be given to local labour. Procurement should also be done locally as far as possible. If necessary, skills development programmes should be put in place to develop local skills.	N/A	No
			WM	Positive	36	Low			
28	Sustainable production at Goldi Abattoir	Improved living standards of positively affected households	WOM	Positive	18	Negligible	n/a	N/A	No
			WM	Positive	18	Negligible			
29	Sustainable production at Goldi Abattoir	Sustainable increase in government revenue	WOM	Positive	14	Negligible	n/a	N/A	No
			WM	Positive	14	Negligible			
30	Sustainable production at Goldi Abattoir	Skills development of permanently employed workers	WOM	Positive	22	Low	Continuation of skills development at Goldi	N/A	No
			WM	Positive	22	Low			
31	Sustainable production at Goldi Abattoir	Local economic development benefits derived through the business social responsibility programme.	WOM	Positive	9	Negligible	n/a	N/A	No
			WM	Positive	9	Negligible			
32	Sustainable production at Goldi Abattoir	Less Pressure on local Infrastructure (water supply infrastructure)	WOM	Positive	22	Low	n/a	N/A	No
			WM	Positive	22	Low			

9.3 Cumulative Impacts

Cumulative impacts result from actions, which may not be significant on their own, but which are significant when added to the impact of other similar actions i.e. combined impacts from other developments or construction activities in the area. As far as Exigo is aware there are no other infrastructure development projects planned for construction in the same preferred corridor nor over the same time period.

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9.4 Summary of specialist reports

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

Table 9-3: Specialist summary

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE BASIC ASSESSMENT REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Ecological Impact Assessment (Exigo, 2020)	<p>The proposed water supply pipeline development will partially modify the vegetation and faunal habitats through the wetlands and secondary grassland areas. The importance of rehabilitation and implementation of mitigation processes to prevent negative impacts on the environment during and after the development phase should be considered a high priority.</p> <p>The proposed development should avoid negative impacts on wetlands and an IWUL should be obtained from the DWS. A number of mitigation measures have been recommended to minimise impacts. Negative impacts can be minimised by strict enforcement and compliance with an Environmental Management Plan which takes into account the recommendations for managing impacts detailed above.</p> <p>Provided that the proposed development is consistent with the sensitivity map and route option analysis; and take all the mitigation measures into consideration stipulated in this report, the planned development can be supported.</p>	X	Section 9.1.1, 9.1.2, 9.5 and Appendix 5
Archaeological Impact Assessment (Exigo, 2019)	<p>The following recommendations are made based on general observations in the project area:</p> <ul style="list-style-type: none"> According to the South African Heritage Resources Agency Information System (SAHRIS) Palaeo Map, portions of the project area fall within a sensitive fossiliferous zone and a Palaeontological Assessment has been commissioned for the project. Should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should carefully safeguarded and the relevant heritage resources 	X	Section 9.1.1, 9.1.2, 9.5 and Appendix 8.

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	<p>authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.</p> <ul style="list-style-type: none"> • Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages 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. • It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development. 		
<p>Palaeontological Impact Assessment: Phase 1 Field Study (Dr H Fourie, 2020)</p>	<p>Shale and sandstone of the Vryheid Formation of the Ecca Group of the Karoo Supergroup underlie the study area. The geology of the study area is however obscured by soil and vegetation and no fossiliferous strata were found during the field assessment.</p> <p>The sedimentary rocks of the Vryheid Formation are highly fossiliferous in places and the chances are high that such layers will be exposed during development. The uppermost part of the underlying rocks is highly weathered however which diminishes the possibility of finding fossils in the study area.</p> <p>The fossils that occur in the Vryheid Formation are mostly that of leaf and stem imprints of plants such as <i>Glossopteris</i>, lycopods, ferns, horsetails, conifers, cordaitaleans and ginkgoaleans. Rare fossils of silicified and coalified wood, insects, bivalves, conchostrachans and fish scales also occur in this formation.</p>	<p>X</p>	<p>Section 9.1.1, 9.1.2, 9.5 and Appendix 9</p>

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	<p>If a particularly fossiliferous area is uncovered during development and a palaeontologist is not on site to advise the developer, the ECO should follow the guidelines as stipulated under the Chance Find Procedure (Appendix 9)</p>		
<p>Socio-Economic Impact Assessment (Urban-Econ, 2020)</p>	<p>The investment for the proposed project is expected to be about R87.5 million, which is expected to create 18 full-time equivalent job opportunities during the construction phase of the project. The operational phase is not expected to have an increase in output or have an increase in employment for the short to medium term, but in the long-term, expansion of the abattoir is expected to take place that will likely create 800 full-time equivalent job opportunities.</p> <p>Goldi Chicken Abattoir will continue its operation in Standerton and the communities affected by water shortages in the past are expected to experience improvement due to the proposed development. Goldi Chicken Abattoir employs 3 400 individuals permanently and will need a constant supply of water for the company to continue its operations in the Standerton region. The construction and operation of the proposed pipeline are essential for retaining jobs, creating new jobs in the future as well as improving the living standards of the Standerton community.</p>	<p>X</p>	<p>Section 9.1.1, 9.1.2, 9.5 and Appendix 7</p>

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9.5 Environmental impact statement

9.5.1 Summary of the key findings of the environmental impact assessment.

Construction Phase

Impacts of Moderate or High significance prior to mitigation can be mitigated to Low or Negligible which include the following:

- Ecological and Wetland:
 - Clearing of vegetation for pipelines and infrastructure, access roads etc. resulting in habitat modification
 - Clearing of vegetation for pipelines and construction of infrastructure, access roads etc. resulting in habitat fragmentation
 - Exposure of soils to rainfall and wind during construction resulting in soil erosion and sedimentation
 - Movement of vehicles on site during construction and use of temporary ablution facilities (if relevant) resulting in spillages of harmful substances, such as hydrocarbons and sewage) leading to soil and water pollution
 - Continued movement of personnel and vehicles on and off the site during the construction phase resulting in spread of alien invasive species
 - Construction of infrastructure, access roads etc. resulting in negative effect of human activities on flora
 - Continued movement of vehicles on and off the site during the construction phase resulting in fauna mortality on roads
 - Continued movement of vehicles on and off the site during the construction phase resulting in air/ dust pollution
 - Construction through wetland crossings / abstraction of water from Vaal River resulting in an impact on the characteristics of the watercourse habitat, biota, water quality and geomorphology due to construction within floodline zone
- Noise
 - Construction activities and operation of machinery and vehicles resulting in noise pollution from excavation activities and movement of vehicles
- Traffic

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- Excavation and installation of pipeline and use of construction vehicles resulting in an impact on the traffic situation of the neighbouring area although this will be kept to a minimum.
- Socio-economic
 - Disruption to local businesses
 - Change in Sense of Place
 - Pressure on Social and Economic Infrastructure
 - Temporary Increase in Crime and Social Conflicts Associated with an Influx of People.

The Positive Socio-economic impacts include:

- Temporary Stimulation of the Local and National Economy
- Creation of Temporary Employment Opportunities at a Local and National Level
- Temporary Increase in Household Income During Construction
- Contribution to Skills Development During Construction
- Temporary Increase in Government Revenue

Operation Phase

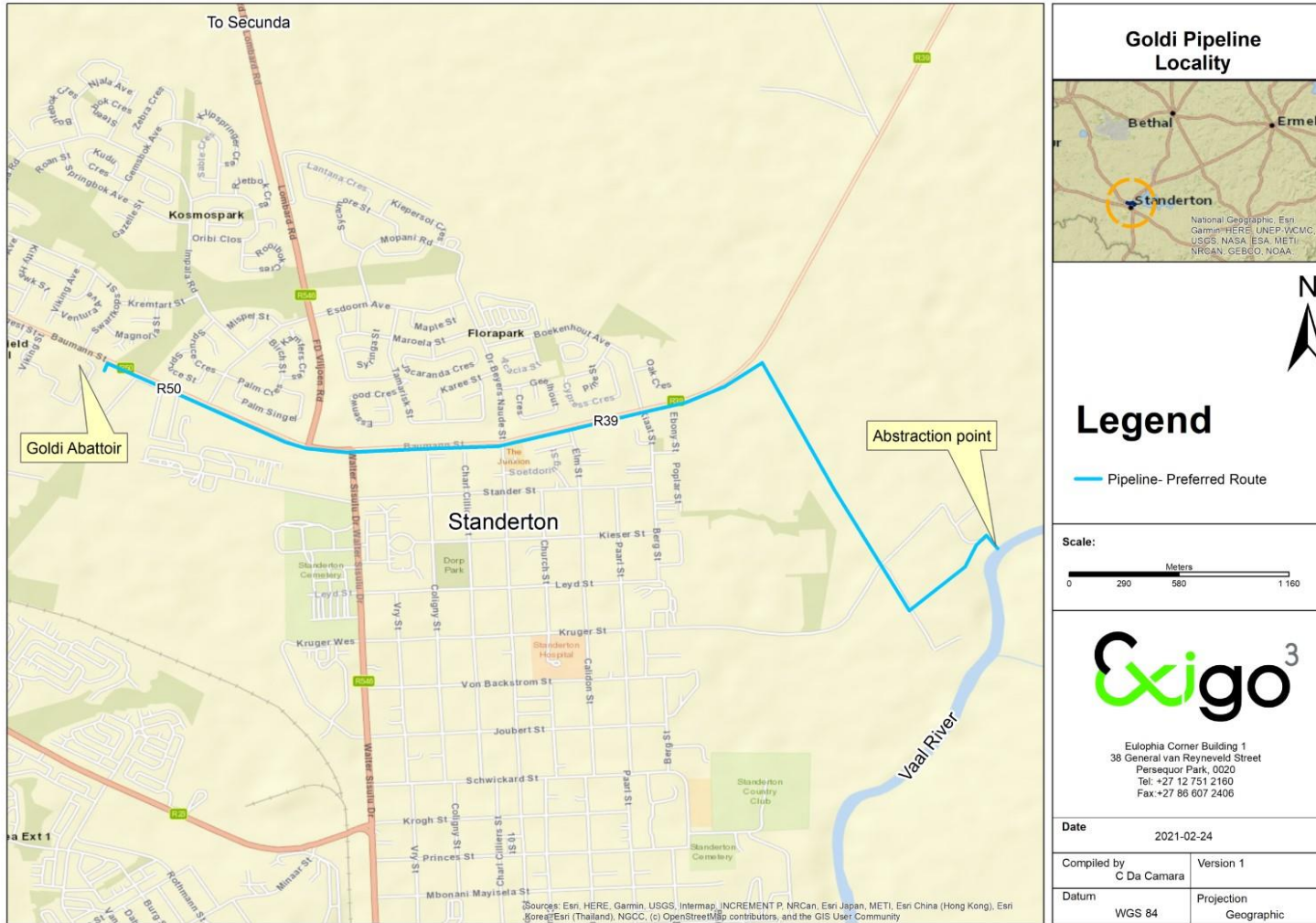
Positive impacts include:

- Sustainable Increase in Production and GDP-R in the National and Local Economies
- Creation of Sustainable Employment Opportunities Nationally and Locally
- Improved Living Standards of Positively Affected Households
- Sustainable Increase in Government Revenue
- Skills Development of Permanently Employed Workers
- Local Economic Development Benefits Derived through the Business Social Responsibility Programme
- Less Pressure on Infrastructure.

9.6 Final Site Map

Please refer to Figure 9-1 and Appendix 4.

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9.7 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Please refer to Section 9.5.1.

9.8 Proposed Impact Management Objectives and the Impact Management Outcomes for Inclusion in the EMPR

Please refer to Section 9.5.1. Also note the following objectives for the project:

Ecological Objectives

The primary aim of this project is to investigate options for enhancing and / or maintaining biodiversity to mitigate the impact of the proposed development and related infrastructure with the overall objective of preventing further loss of biodiversity. The end product would be a tool for promoting and lobbying for the recognition of the importance of species habitat and habitat conservation. Options available to maintain the current level of floral diversity include:

1. Protection of native vegetation;
2. Minimisation of habitat fragmentation;
3. Minimisation of any threats to the native flora and fauna and their habitats during the construction and operational phases of the development;
4. Protection and enhancement of vegetation / habitats of high conservation value;
5. The protection of water quality in the locality so as not to threaten native aquatic flora that rely on the watercourse for survival;
6. Rehabilitation to establish plant communities / landscaping that will provide future habitat values.

Socio-Economic Objectives

1. Creation of employment opportunities
2. Improvement in water supply infrastructure and improving living standards of the Standerton community
3. Sustainable Increase in Production and GDP-R in the National and Local Economies
4. Creation of Sustainable Employment Opportunities Nationally and Locally.

9.9 Monitoring Programmes

Several methods exist to monitor rehabilitated areas to scientifically prove that a self-sustainable ecosystem has developed or show a positive trend towards successful rehabilitation. This will prove that environmental degradation and biological diversity have been mitigated and restored where it has been negatively impacted upon. The important aspect to keep in mind is that it is not only a visual inspection,

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but measurable information gathering e.g. soil samples, vegetation diversity, biomass, basal cover, species composition etc. The monitoring data must be of such a standard that meaningful conclusions can be made and a trend indicated. Good record keeping is essential. All illegal invader plants and weeds shall be eradicated as required in terms of Sections 119 to 126 of The Environmental Management Act.

Monitoring should also take place on regular time intervals to establish if the re-vegetation strategy was successful. The site must be monitored for at least one year in order to observe any possible invasion by alien species and, if they appear, they must be controlled as is appropriate. Also to monitor and correct possible erosion, storm water and siltation problems.

Monitoring should take place on a 6 monthly interval, especially at crossings or rehabilitated areas along the wetlands to establish if the wetland is in a sound ecological state. Refer to Appendix 10.

9.10 Aspects for inclusion as conditions of Authorisation

Any aspects which must be made conditions of the Environmental Authorisation

All mitigation as listed in Section 9.5 must be adhered to.

9.11 Description of any assumptions, uncertainties and gaps in knowledge

(Which relate to the assessment and mitigation measures proposed)

There is an inherent level of uncertainty in impact assessment, as impact assessment essentially aims to determine what would happen in the future, and is thus associated with unforeseen and unforeseeable events. This uncertainty cannot be reduced by doing more research and has to be addressed by acknowledging the assumptions, uncertainties and gaps in knowledge associated with an impact assessment study (Thissen & Agustinata, 2008).

The conclusions and recommendations made in this impact assessment have to be routinely verified through monitoring exercises during the construction and operational phases of the proposed project, as measuring the actual impacts of a development as they occur is the only undisputable way of showing which impacts are of an acceptable significance and which impacts may require additional or adapted management measures in order to reduce their physical, measured impact.

Thus while this report was compiled with due regard to public consultation, authority consultation, specialist input and in accordance with the relevant legislation, it cannot be seen as a “promise” of what is going to happen, but rather should be seen as a scientific prediction of the most likely significant effects that could be brought about by the proposed project based on current knowledge.

The detailed specialist studies referred to the adequacy of their predictions. Where an uncertainty existed the precautionary principle was applied and the impact rated with a higher significance.

9.12 Reasoned opinion as to whether the proposed activity should or should not be authorised

The findings of the specialist studies undertaken within this BAR provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. The findings conclude that,

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provided that the recommended mitigation and management measures are implemented, there are no environmental fatal flaws that post the provided mitigation, should prevent the proposed project from proceeding.

9.13 Period for which the Environmental Authorisation is required

It is requested that the EA is authorised for the maximum possible time period.

9.14 Undertaking

(Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report).

The undertaking is applicable to both the Basic assessment report and the Environmental Management Programme report.

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The EAP herewith confirms:

- 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) that the 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 are correctly reflected herein.

CdaCamara.

Signature of the environmental assessment practitioner:

Exigo Sustainability (Pty) Ltd

Name of company:

26 August 2021

Date:

-END-

10 APPENDICES

Appendix 1: EAP's Qualifications and CV

Appendix 3: Locality Map

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Appendix 4: Site Plan

Appendix 6: Socio-economic Impact Assessment

Appendix 7: Archaeological Impact Assessment

Appendix 8: Palaeontological Assessment

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Appendix 9: Goldi Pipeline Landscape Management Plan

Appendix 10: Agricultural Assessment – Compliance Statement

Appendix 11: Aquatic Assessment – Compliance Statement

Appendix 12: Public Participation Documentation

Appendix 13: Environmental Management Programme Report (EMPR)

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Appendix 14: Incident and Environmental Incident log

INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	Env. Condition	Comments <i>(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)</i>	Corrective Action Taken <i>(Give details and attach documentation as far as possible)</i>	Signature

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