

BASIC ASSESSMENT REPORT

In terms of Section 24 and 24(D) of NEMA (Act No. 107 of 1998)

for:

The proposed replacement pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa –Temane Local Municipality, North West Province

NWP/EIA/76/2020

Report Date: March 2021



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Compiled for:

Dr. Ruth Segomotsi Mompati District Municipality



DRAFT REPORT

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EXECUTIVE SUMMARY

Dr. Ruth Segomotsi Mompati District Municipality has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed replacement of pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa – Temane Local Municipality, North West Province.

The project will comprise the replacement of existing pipe lines from the Pump Station to the Christiana and Utlwanang water towers.

The activity is listed in terms of the Regulations (in force since 4 December 2014) in terms of Section 24(M) and 44 made under section 24(5) of the National Environmental Management Act (NEMA) 1998 (Act 107 of 1998) as amended and published in Government Notice No. R 326 of 2017. The proposed development triggers the following regulations and listed activities:

Indicate the number and date of the relevant notice:	Activity No (s) and Activity Description (in terms of the relevant notice)	Describe each listed activity as per project description	Time for construction to be completed applied for
GN.R. 327, 7 April 2017	19	<i>“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— (i) a watercourse”</i>	10 years
GN.R. 327, 7 April 2017	12 (ii)(a)	<i>“The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse”</i>	10 years

The purpose of the study is therefore to determine the impacts that the environment may have on the proposed activity, as well as the possible impacts that the activity may have on the environment.

The study is being conducted according to normal scientific practices. A theoretical background review was compiled for the different variables by using available information from the literature. Field verification was undertaken and visits paid to the site to gather further information and/or to verify information. It also includes the identification of *key interest groups*, both governmental and non-governmental, and to establish good lines of communication. Specialist studies were undertaken to determine the impacts on sensitive areas and

to determine whether the proposed project can be sustainably implemented. The specialists will also advise on mitigation measures where applicable.

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1. INTRODUCTION

Dr. Ruth Segomotsi Mompati District Municipality has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed replacement pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa –Temane Local Municipality, North West Province.

1.1 THE BASIC ASSESSMENT PROCESS

The purpose of this document is to adhere to the requirements for compilation of Basic Assessment Reports as amended and published in Government Notice R. 326 of 7 April 2017, Appendix 1, and the National Environmental Management Act (Act 107 of 1998) (NEMA).

1.2 DESCRIPTION OF THE PROCESS FOLLOWED

In order to assess a proposed development it is important to take into consideration the principles of NEMA. These principles are outlined in Chapter 1 and read as follows:

- 1) *“The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and—*
 - a. *shall apply alongside all other appropriate and relevant considerations, including the State’s responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;*
 - b. *serve as the general framework within which environmental management and implementation plans must be formulated;*
 - c. *serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;*
 - d. *serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and*
 - e. *guide the interpretation administration and implementation of this Act, and any other law concerned with the protection or management of the environment.*
- 2) *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
- 3) *Development must be socially, environmentally and economically sustainable.*
- 4) (a) *Sustainable development requires the consideration of all relevant factors including the following:*

- (i) *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied:*
 - (ii) *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (iii) *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
 - (iv) *that waste is avoided. or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
 - (v) *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
 - (vi) *that the development use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
 - (vii) *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*
 - (viii) *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*
- (b) *Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.*
 - (c) *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*
 - (d) *Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.*
 - (e) *Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
 - (f) *The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.*

- (g) *Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.*
- (h) *Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.*
- (i) *The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment.*
- (j) *The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.*
- (k) *Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.*
- (l) *There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.*
- (m) *Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.*
- (n) *Global and international responsibilities relating to the environment must be discharged in the national interest.*
- (o) *The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.*
- (p) *The costs of remedying pollution, environmental degradation consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*
- (q) *The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.*
- (r) *Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.”*

The above mentioned principals and the applicable legislation, Policies and Guidelines as described in Paragraph 5 of this Report were taken into account in the assessment of the Environmental Impacts for the proposed development. The process followed can be described as follows:

- 1) The EAP was contracted by Dr. Ruth Segomotsi Mompoti District Municipality as their Independent Environmental Assessment Practitioner.
- 2) The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and available bulk services.
- 3) A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- 4) A Botanical specialist has been appointed to determine the impact of the proposed development on the Fauna and Flora of the area.
- 5) A Wetland Specialist has been appointed to determine the impact of the proposed development on wetlands in the area
- 6) An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- 7) Desk top studies were conducted and alternatives assessed.
- 8) Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined.
- 9) A full Public Participation Process is being followed to obtain inputs from interested and affected parties.
- 10) All the information obtained from the above mentioned processes is being used to assess the Environmental Impact that the proposed development may have on the Environment and vice versa.
- 11) The inputs from Specialists, interested and affected parties, together with the knowledge of the EAP is being used to determine measures to avoid, mitigate and manage potential impacts. These measures are described in the Environmental Management Programme.

1.3 ASSESSMENT PHASE

The assessment phase included the necessary investigations to assess the suitability of the identified site and its surrounding environment, for the development proposal. The assessment phase described the “status quo” of the bio-physical, social, economic and cultural environment, and identifies the anticipated environmental aspects associated with the proposed development. The assessment phase included the identification of *key interest groups*, (both government and non-government), and strived to establish efficient and effective communication. Identifying and informing Interested and affected parties of the proposed development may have an impact on the focus of the EIA. (*S. Cliff, 2015*).

This phase also determines the *significance of the impact* of the proposed activity on the surrounding Environment. During this phase, a Basic assessment Report (BAR) is compiled, and, following public review, is submitted to the approving authority – the DEDECT.

The purpose of the Basic Assessment Report is to document the outcome of the Assessment Phase of the project. The report fulfilled the requirements of the EIA Regulations (2014) for the documentation of the Basic

Assessment Process. The Report was compiled in accordance with Section 21(3) of NEMA's 2014 EIA Regulation (GN R. 982) as amended and published in Government Notice R. 326 of 7 April 2017.

The Draft Basic Assessment Report will be submitted to DEDECT on the 10th March 2021.

1.3.1 Objective of the basic assessment process

The objective of the basic assessment process is to, through a consultative process-

(a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives;

(d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine-

(i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

(ii) the degree to which these impacts-

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;

(cc) can be avoided, managed or mitigated; and

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to-

(i) identify and motivate a preferred site, activity and technology alternative;

(ii) identify suitable measures to avoid, manage or mitigate identified impacts; and

(iii) identify residual risks that need to be managed and monitored.

1.3.2 Scope of assessment and content of basic assessment reports

The BAR assesses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with the project design, construction, and operation phases, and recommends appropriate mitigation measures for potentially significant environmental impacts. The Environmental impacts are assessed both before and after mitigation to determine:

- The significance of the impact despite mitigation; and
- The effectiveness of the proposed mitigation measures.

The BAR addresses potential environmental impacts and benefits associated with all phases of the project, including design, construction and operation, and aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

Table 1 below provides a summary of the legislative requirements in terms of a Basic Assessment Report as stipulated in Section 23 of the 2014 EIA Regulation (GN R. 982) as amended and published in Government Notice R. 326 of 7 April 2017. Cross-references are provided in terms of the relevant section within this BA Report where the NEMA and BA Report requirements have been addressed.

Table 1: Basic Assessment Report content as per Section 23 of NEMA's 2014 EIA Regulation (GN R. 982) as amended and published in Government Notice R. 326 of 7 April 2017 Appendix 1.

3. (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include:

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Location in this report
Appendix 1, section 3 (a)	Details of the EAP who prepared the report; and the expertise of the EAP;	Paragraph 2
Appendix 1, section 3 (b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including – (i) The 21 digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties	Paragraph 4 Paragraph 4 Paragraph 4
Appendix 1, section 3 (c)	A plan which locates the proposed activity or activities applied for, at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A1 and Appendix A2 Paragraph 4
Appendix 1, section 3 (d)	A description of the scope of the proposed activity, including – (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Paragraph 3 Paragraph 3
Appendix 1, section 3 (e)	A description of the policy and legislative context within which the development is proposed including (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments explanation of how the proposed development complies with and responds to the legislation and policy context	Paragraph 5.1 Paragraph 5.2 Paragraph 5.2
Appendix 1, section 3 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Paragraph 6
Appendix 1, section 3 (g)	a motivation for the preferred site, activity and technology alternative	Paragraph 4
Appendix 1, section 3 (h)	A full description of the process followed to reach the proposed preferred alternative within the site, including- (i) Details of all alternatives considered;	Paragraph 8

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Location in this report
	(v) the degree to which the impact and risk can be reversed;	Paragraph 9
	(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and	Paragraph 9
	(vii) the degree to which the impact and risk can be mitigated;	Paragraph 9
Appendix 1, section 3 (k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Paragraph 11
Appendix 1, section 3 (l)	An environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Paragraph 12.2 and 12.2 Figure 2 Paragraph 12
Appendix 1, section 3 (m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr	Paragraph 11 and 12
Appendix 1, section 3 (n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Paragraph 3.1.2.1
Appendix 1, section 3 (o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Paragraph 1.4.3
Appendix 1, section 3 (p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Paragraph 12.4
Appendix 1, section 3 (q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised	Not Applicable
Appendix 1, section 3 (r)	An undertaking under oath or affirmation by the EAP in relation to- (i) The correctness of the information provided in the report; (ii) The inclusion of the comments and inputs from stakeholders and interested and affected parties; and (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Paragraph 13 Paragraph 13 Paragraph 13 Paragraph 13
Appendix 1, section 3 (s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	Not Applicable
Appendix 1, section 3 (t)	Any specific information that may be required by the competent authority.	Not Applicable
Appendix 1, section 3 (u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act	Not Applicable

1.3.3 Assumptions, uncertainties, limitations and gaps in knowledge:

This report is based on current available information and, as a result, the following limitations and assumptions are implicit –

The report is based on the *project description* provided by the Applicant as a result of reports that was compiled by the following Specialists:

- A Civil engineer has been appointed to determine the availability of services and the layout of the development
- A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- An Ecologist specialist has been appointed to determine the impact of the proposed development on the Fauna and Flora of the area.
- A Wetland specialist has been appointed to determine the impact of the proposed development on the non-perennial stream on site.
- An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- Desktop studies were conducted and alternatives assessed.

Descriptions of the biophysical and social environments are based on specialist fieldwork, investigations, and the Public Participation Process.

2. DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

AB Enviro Consult (CC) is a registered consultancy, owned and operated as an independent unit by the registered owner and consultant: **Prof. A.B. de Villiers**

- **Mr J.P. De Villiers** joined the consultancy during 2004
- **Mrs J.E. du Plooy** is a consultant since 2001

PERSONAL PARTICULARS AND CAREER HISTORY OF PROF DE VILLIERS

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ACADEMIC AND PROFESSIONAL QUALIFICATIONS

Post–Matric Qualifications

YEAR	Qualification	Institution	Field of Study
1968	B.Sc.	PU FOR CHE	Geography, Geology
1970	HONNS. B.Sc.	PU FOR CHE	Soil Science
1974	M.Sc.	PU FOR CHE	Geography
1981	Ph.D.	UOFS	Geography

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

YEAR	Qualification/ Registration	Institution	Field of Study
1986	Professional Natural Scientist	S.A. Council for Natural Scientists	Environmental Science
1994	Quality Auditor	ESKOM	Auditing
1998	Personnel & Verifying Auditor	SAATCA	Environmental Auditing
2006	Environmental Assessment Practitioner	Interim Certification Board EAPSA	Environmental Science

MEMBERSHIP AND PARTICIPATION IN SOCIETIES, COUNCILS, ETC.

Name of professional societies	YEAR	Capacity
S.A. Geographical Society.	1967-1996	Board Member
Society for Geography	1968-2004	Member
SAGS Western Transvaal	1985-1989 1987-1989 1996	Chairman
Africa Geographical Association	1993-1995	Vice-President.
Society for the Vaal River Catchment	1980-1999	Member
S.A. Society for Photogrammetry, Remote Sensing and Cartography	1984-1996	Member
Dendrological Society	1986-2005	Member
Birdlife South Africa	2003-present	Member
British Geomorphological Research Group	1985-1997	Member
Int Com on Water Resource Systems	1985-1997	Member
Int Com on Continental Erosion	1986-1990	Member
Int Com on Remote Sensing and Data Transmission	1986-1991	Member
Society for S.A. Geographers	1995-2005	Member
SA Photogrammetrical and Geo. Info.	1995-2003	Member
S.A. Association of Geomorphologists	1994-1999	Board Member and member
SADC Mine Dump Study Group	1996-2005	Member

ACADEMIC AND PROFESSIONAL QUALIFICATIONS MR J.P. DE VILLIERS

YEAR	Qualification	Institution	Field of Study
1993	BA	PU FOR CHE	Geography, Economics
1994	HED	PU FOR CHE	Geography Economics
2006	B.Sc.(Honns) Cum Laude	North-West University	Environmental Management
2007	M.Sc.	North-West University	Geography

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

YEAR	Qualification/ Registration	Institution	Field of Study
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2008	Basic Principles of Ecological Rehabilitation and Mine Closure	Centre for Environmental Management (North West University)	Ecological Rehabilitation
2019	Registered as Environmental assessment Practitioner	EAPASA Registration number: 2019/808	

ACADEMIC AND PROFESSIONAL QUALIFICATIONS MRS J.E. DU PLOOY

<u>YEAR</u>	<u>Qualification</u>	<u>Institution</u>	<u>Field of Study</u>
1999	BA	PU FOR CHE	Geography, Tourism
2000	BA (Honns) Cum Laude	PU FOR CHE	Geography
2003	Master's degree in Environmental Management	PU FOR CHE	Environmental Management
2001	Aquabase Intro	AQUABASE	Hydrology
2001	Geomedia Professional	INTERTECH	GIS
2001	Map Info	SPATIAL TECHNOLOGY	GIS
2020	Registered as Environmental Assessment Practitioner	EAPASA - REGISTRATION NUMBER: 2019/1573	

EXPERIENCE OF THE CONSULTANCY

Over a period of 25 years (1996-2021) this consultancy has successfully applied for, and obtained positive ROD's and EA's for more than 380 projects. Environmental Control Officer's duties are also performed on various projects.

3. DESCRIPTION OF THE ACTIVITY

Environmental Impact Assessment for the proposed the proposed replacement pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa –Temane Local Municipality, North West Province.

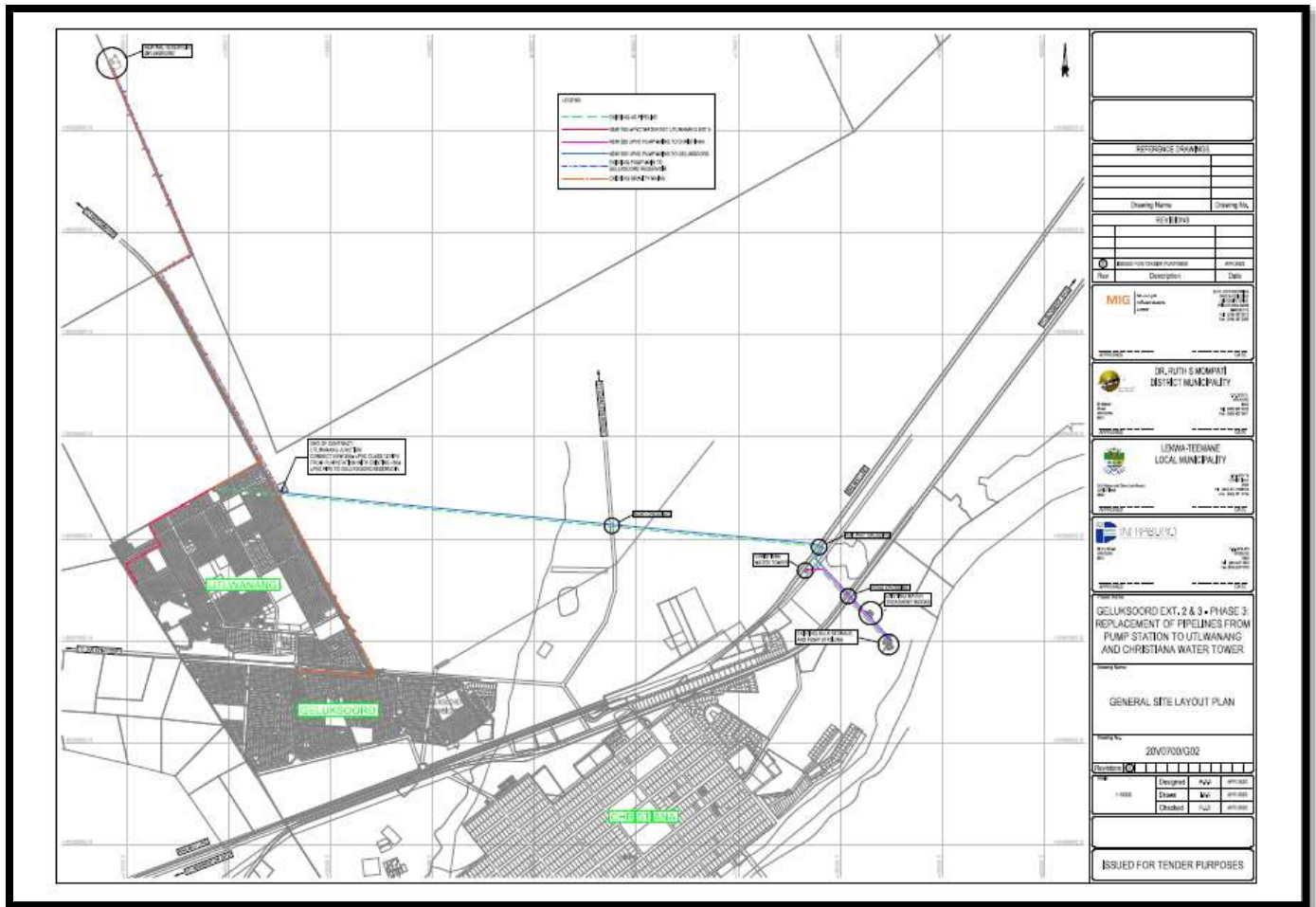


Figure1: Proposed Layout Plan

The proposed project will be for the construction of a proposed stream crossing by a pipe line from the water pump station on Geluksoord Extension 2 & 3 – Phase 3 by the replacement pipe lines to the Utlwanang and Christiana water towers, Lekwa –Temane Local Municipality ; Dr. Ruth S. Mompoti District Municipality, North West Province.

Figure1: Is a copy of the Layout Plan. A new 355mm uPVC class 12 pipe is proposed to replace the existing 450mm pipe from the Existing Bulk Storage and pump stations, via the existing water treatment works to the Geluksoord Reservoir. The pipe will cross the non-perennial stream

The project will comprise the replacement of existing pipe lines from the Pump Station to the Christiana and Utlwanang water towers.



FIGURE 2: PROPOSED STREAM-CROSSING

In the planning for the design phase of the pipelines, cognisance is taken of the following reference documents;

- Red Book – Guidelines for Human Settlement Planning and Design
- SABS 1200 – Standardized Specification for Civil Engineering Construction
- Local Municipal standards

When planning or designing the pipelines, a holistic approach that adheres to all the tenets of the reference or policy documents listed above will be adopted.

The approach to design and construction will encompass the following;

- Appropriate and adequate protection of the river/stream/wetland banks in the vicinity of the pipeline will be incorporated into the design.
- The existing river/stream bank structure will be maintained to reduce disturbance to the river/stream flow.
- Where crossing or running alongside river or stream courses, the existing river/stream bank structure will be maintained to reduce disturbance to the river flow.
- Where the pipeline crosses storm water channels these will be designed to have no impact on normal storm water flow in that all pipes and concrete casing will be buried at least 1.0m

below natural channel level in the case of soft material, and level with the natural channel in the case of hard rock material.

- In the case of sewer pipelines, man holes will be provided at all changes in grade and direction and at intervals not exceeding 80m to facilitate maintenance during the lifetime of the pipelines.
- The pipe crossing has been designed to have no impact on normal river/stream flow
- Where pipes are laid through a flood plain (1:100-year flood line), a minimum cover level of 1.0m will be maintained.

Construction Methodology

- Conduct a competent site investigation to build up an informed picture of the task
- Conduct a topographical survey of the pipeline route
- Adequate design of all the stages of construction
- All environmental and Health and Safety requirements and good practice to be adhered to.
- Remove topsoil and stockpile for later use
- Excavate trench for pipeline to the design level
- If the material is firm, normal excavation techniques will apply. In soft material shoring of the trench sides may be required. In hard rock material trench excavation may require the use of pneumatic breakers or blasting
- Install temporary dewatering pumps to keep the excavation dry (if required due to ground water ingress)
- Construct storm water diversion berms where required
- Place concrete to encasement if required. The top level will be determined by the storm water channel level
- Place bedding, lay pipe, place and compact selected fill over the pipeline
- Construct manholes where required. Manholes will be constructed along the pipeline route at changes in grade and direction
- Backfill to specification of drawings.
- Dress backfill, topsoil and revegetate all exposed areas.

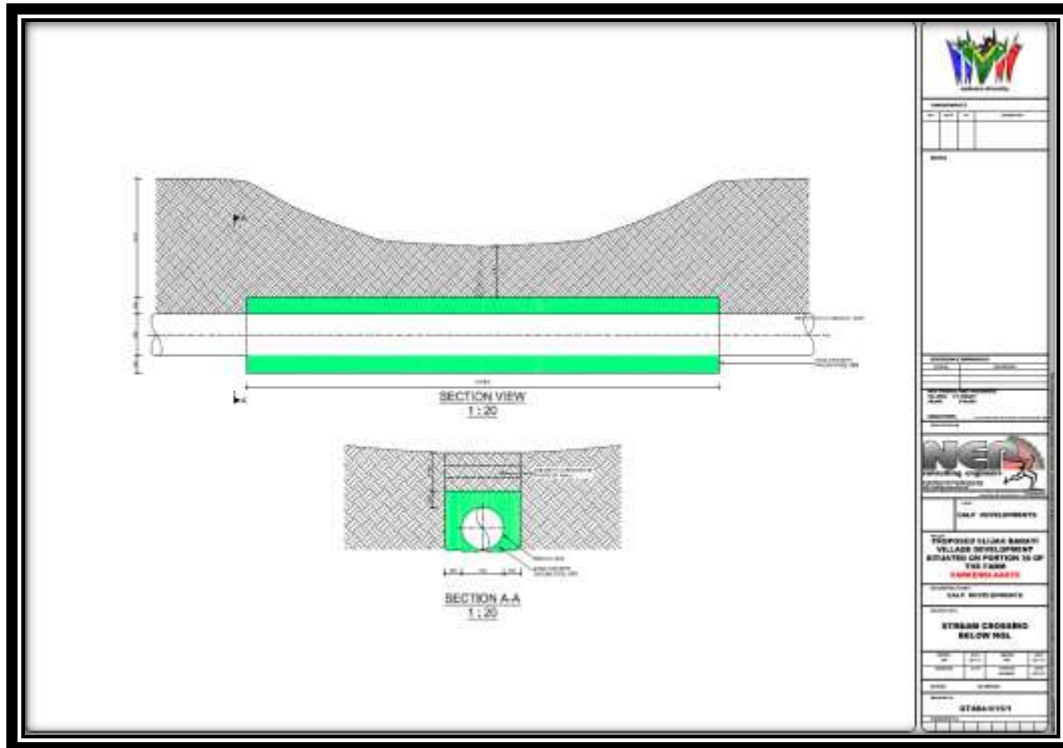


FIGURE 3: PROPOSED PIPELINE INSTALLATION DESIGN

4. DESCRIPTION OF THE PROPERTY

The site comprise a non-perennial stream located on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa –Temane Local Municipality, North West Province.

The active channel and riparian zone at the Stream Crossing area at the site are visibly disturbed in particular by excavations of the past. These disturbances are reflected in the riparian vegetation which does not appear to be intact. Loose clumps of the rush *Juncus rigidus* and the sedge *Scirpoides dioecus* are found at the riparian zone, mixed with a mosaic of terrestrial vegetation. *Persicaria* species (Knotweeds) are found at the small permanent zones of the active channel. Trees and megagraminoids are absent.



FIGURE 4: LOCALITY MAP

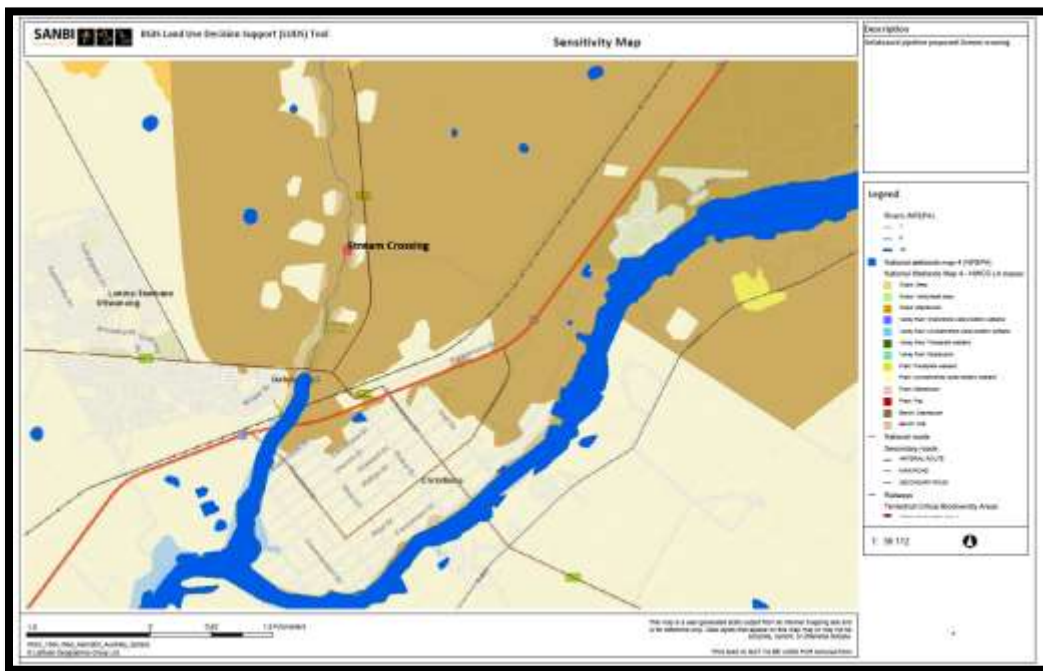


FIGURE 5: SENSITIVITY MAP



Photo 1 Excavations at the northern part of the Stream Crossing area, at the site.
Photo: R.F. Terblanche.



Photo 2 View at the Stream Crossing area at the site.
Photo: R.F. Terblanche



Photo 3 Riparian zone at the Stream Crossing area at the site.
Photo: R.F. Terblanche.



Photo 4 Inflorescence of *Juncus rigidus* at the site.
Photo: R.F. Terblanche

The Surveyor-general 21-digit site reference number is:

T	0	H	0	0	0	0	0	0	0	0	0	0	3	2	5	0	0	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Site Co-ordinates

Latitude (S):

Longitude (E):

- Alternative S1 (preferred or only site alternative)
- Alternative S2 (if any)
- Alternative S3 (if any)

27°	53'	10,57"	25°	09'	25.19"
°	'	"	°	'	"
°	'	"	°	'	"

5. LEGAL AND OTHER REQUIREMENTS

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act No. 107 of 1998 as amended.	NEMA is the guiding legislation that has been considered during the Environmental Impact Assessment process and the compilation of this Scoping Report.	NW:DEDECT	27 November 1998
The Bill of Rights, Constitution of South Africa, Section 27 (1)(b)	The Constitution of the Republic of South Africa is the legal source of all law, including environmental law, in South Africa. The Bill of Rights is fundamental to the Constitution of South Africa and in, section 24 of the Act, it is stated that: Everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through	National Government	1994

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</p> <p>Given that environmental management is founded partly on the principles of public participation, Section 195 of the Constitution is of primary relevance:</p> <p>(1) Public administration must be governed by the democratic values and principles enshrined in the constitution, including the following principles: (a) (b) (c) (d) (e) Peoples needs must be responded to, and the public must be encouraged to participate in policymaking. (f) Public administration must be accountable. (g) Transparency must be fostered by providing the public with timely, accessible and accurate information (Government Gazette, 1996).</p>		
New Regulations 2014 in terms of NEMA	Legislation consulted during the environmental impact assessment process to determine whether any listed activities would be triggered. The Regulations were also consulted to determine inter alia the requirements regarding the contents of Scoping reports and the public participation process that should be followed.	NW: DEDECT	7 April 2017
National Water Act (36 OF 1998)	<p>National Water Act (NWA), 1998 (Act 36 of 1998) is the primary statute providing the legal basis for water management in South Africa and has to ensure ecological integrity, economic growth and social equity when managing and using water.</p> <p>The major objectives of the National Water Act are to:</p> <ul style="list-style-type: none"> •Aid in providing basic human needs; •Meet the growing demand of water in a sustainable manner; •Ensure equal access to water and use of water resources; •Protect the quality of water of natural resources; •Ensure integrated management of water resources; •Foster social and economic development; and •Conserve aquatic and related ecosystems. <p>Section 19 of the National Water Act states that the person responsible for land</p>	Department of water and sanitation	1998

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	upon which any activity is or was performed which causes, has caused or is likely to cause, pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.		
National Environmental Management: Biodiversity Act (NEMBA) (ACT NO. 10 OF 2004)	<p>The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004), provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.</p> <p>In terms of Chapter 4 of the Above Act:</p> <p>52. (1) (a) The Minister may, by notice in the Gazette, publish a national list of ecosystems that are threatened and in need of protection.</p> <p>(b) An MEC for environmental affairs in a province may, by notice in the Gazette, publish a provincial list of ecosystems in the province that are threatened and in need of protection.</p> <p>(2) The following categories of ecosystems may be listed in terms of subsection:</p> <p>(a) critically endangered ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;</p> <p>(b) endangered ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;</p> <p>(c) vulnerable ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human</p>	NW: DEDECT	2004

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<p>intervention, although they are not critically endangered ecosystems or endangered ecosystems; and</p> <p>(d) protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed in terms of paragraphs (a), (b) or (c).</p> <p>(3) A list referred to in subsection (1) must describe in sufficient detail the location of each ecosystem on the list. 53 (1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.</p> <p>(2) A threatening process, identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act (1998) and a listed ecosystem must be regarded as an area identified for the purpose of that section.</p>		
National Environmental Management: Protected Areas Act (ACT NO. 57 OF 2003)	<p>This Act aims to provide for a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity. The Protected Areas Act tries to ensure the protection of the entire range of biodiversity, referring to natural landscapes and seascapes. The Act makes express reference to the need to move towards Community Based natural Resource Management (CBNRM) as its objectives include promoting the participation of local communities in the management of protected areas. The purpose of the Act is:</p> <ul style="list-style-type: none"> •To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes and their ecological integrity. •To conserve biodiversity in those areas; •To protect South Africa's rare species; •To protect vulnerable or ecologically sensitive areas; •To assist in ensuring the sustained supply of environmental goods and services; •To provide for the sustainable use of natural and biological resources; •To create or augment destinations for nature-based tourism; •To manage the interrelationship between natural environmental biodiversity, human settlement and economic development; 	National Department of Environmental Affairs	2003

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	<ul style="list-style-type: none"> •To contribute to human, social, cultural, spiritual and economic development; •To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species. <p>This Act further stipulates various criteria which must be met before an area can be declared as a special nature reserve, national park, nature reserve and protected environment. It also prescribes a range of procedures, including consultation and public participation procedures which must be followed before any of the kinds of protected areas are declared.</p>		
National Heritage Resources Act, Act No. 25 of 1999	Legislation consulted during the impact assessment process, to determine the legal requirements relating to the management of heritage resources that are present in and around the site.	SAHRA	1999
National Environmental Management: Waste Act, Act No. 59 of 2008, DEDECT together with the List of Waste Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment, GN No. 921 of 29 November 2013	Legislation consulted to determine whether a waste licence will have to be obtained for the development.	NW:DEDECT Waste Section	2008
<i>National Environmental Management: Air Quality Act (Act 39 of 2004)</i>	To protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social Development. Construction activities may cause some air pollution.	Department of Environmental Affairs: Directorate Air quality management	2004
<i>The Conservation of Agricultural Resources Act (Act 43 of 1983)</i>	This Act regulates the flow pattern of runoff water, control of weeds and invader plants.	NW: Department of Agriculture	1983
<i>National Veldt and Forest Fire Act (Act 101 of 1998)</i>	Chapter 4 places a duty on owners to prepare and maintain firebreaks.	Department of Agriculture, Forestry and Fisheries	1998
<i>National Forests Act, Act 84 of 1998 (NFA) DEDECT with GN1602 of December 2016.</i>	During the construction phase of the development certain protected trees may be affected. Licences will have to be obtained from the Minister before the affected trees may be cut, disturbed, damaged or destroyed. GN1602 of December 2016 contains the list of protected trees.	Department of Agriculture, Forestry and Fisheries	1998
<i>Occupational Health and Safety Act (Act 85 of 1993)</i>	To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery and the protection of persons other than persons at work against hazards to health.	Department of Employment and labour	1993

5.2 (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and

(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments explanation of how the proposed development complies with and responds to the legislation and policy context

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The proposal is to replace an existing pipeline			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
<p>In terms of the North West Provincial Spatial Development Framework, 2009, the following objectives have been identified in terms of Water resources:</p> <ol style="list-style-type: none"> 1. Manage water demand per district as set out in the North West Water Provision and Management Plan (Department of Water Affairs, 2008) (refer to Chapter 4). 2. Ensure enough water for agriculture and industry, recognising g the trade-offs in the use of water. 3. Increase number of households with access to piped water from 92 <p>and Actions identified:</p> <ol style="list-style-type: none"> 1. Develop and improve water infrastructure (the focus being on re-use, conservation and maintenance). 2. Improve water management per district according to the North West Water Provision and Management Plan Department of Water Affairs, 2008). 			
(b) Urban edge / Edge of Built environment for the area	YES	NO	Please explain
Due to the nature of the project (pipeline and reservoir), the urban edge of town will not be compromised as a result of the development,			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO	Please explain
The development will support the objective of the IDP and SDF as the proposal will assist in the provision of water to the residential area.			

(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
Municipal Infrastructure Grant funding has been allocated to implement the bulk water as well as the internal water services.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO	Please explain
The pipeline will support and provide water to an area which has been earmarked for residential development.			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain
<p>Strategic Infrastructure Plan 4: Unlocking the economic opportunities in North West Acceleration of investments in road, rail, bulk water, water treatment and transmission infrastructure.</p> <p>Rural Development Plan: The proposal is in line with objective of 'meeting basic needs in rural areas'. Spatial guidelines: Intervention Zone 3: Christiana has been identified as a location in which the focus is: Stimulating and kick starting new potential growth nodes. The proposed pipeline will serve a new residential development.</p>			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	Please explain
<p>The project forms part of the objective of township regeneration as defined in Intervention Zone 3: To include Christiana in the SDF as part of intervention zone 3: The proposed IDP project under: Township regeneration strategies (focused on previously disadvantaged areas). Specific IDP project: Provision of social and economic infrastructure.</p>			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	NO	Please explain
The proposed pipeline will overcome a future water shortage and provide in the needs of the townships. Alternatives have been investigated and have found that the current proposal is the best long term solution to addressing the foreseen water shortage.			
5. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO	Please explain
Provision of potable water to townships is a national objective			

6. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	NO	Please explain
The proposed pipeline will replace an existing pipeline			
7. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO	Please explain
<p>Strategic Infrastructure Plan 4: Unlocking the economic opportunities in North West Acceleration of investments in road, rail, bulk water, water treatment and transmission infrastructure.</p> <p>SIP 6: Integrated municipal infrastructure project Develop national capacity to assist the 23 least resourced districts (19 million people) to address all the maintenance backlogs and upgrades required in water, electricity and sanitation bulk infrastructure. The road maintenance programme will enhance service delivery capacity thereby impacting positively on the population</p> <p>SIP 18: Water and sanitation infrastructure A 10-year plan to address the estimated backlog of adequate water to supply 1.4m households and 2.1m households to basic sanitation. The project will involve provision of sustainable supply of water to meet social needs and support economic growth. Projects will provide for new infrastructure, rehabilitation and upgrading of existing infrastructure, as well as improve management of water infrastructure.</p>			
8. What will the benefits be to society in general and to the local communities?	Please explain		
The proposed development will ensure there is sufficient potable water to local communities			
9. Any other need and desirability considerations related to the proposed activity?	Please explain		
Nothing that has not already been addressed.			
10. How does the project fit into the National Development Plan for 2030?	Please explain		
The project contributes to the aim of ensuring all South Africans have access to safe drinking water and clean running water in their homes			

11. Please describe how the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA as amended have been taken into account.

The IEM guidelines encourage a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

informed decision-making;

- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the 'social costs' of development proposals (those borne by society, rather than the developers) be outweighed by the 'social benefits' (benefits to society as a result of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from 'cradle to grave'); and
- the opportunity for public and specialist input in the decision-making process.

The general objectives of Integrated Environmental Management have been taken into account in this Basic Assessment report by means of identifying, predicting and evaluating the actual and potential impacts on the environment, socio-economic conditions and cultural considerations and cultural heritage component. The risks, consequences, alternatives as well as options for mitigation of activities have also been considered with a view to minimise negative impacts, enhance benefits and promote compliance within the principles of environmental management.

Additionally the Basic Assessment process will be undertaken to ensure I&APs have been afforded the opportunity to comment on the proposed activity and that their comments/inputs/concerns will be taken into consideration during the assessment process.

12. Please describe how the principles of environmental management as set out in Section 2 of NEMA as amended have been taken into account.

The principles of NEMA have been considered in this assessment through compliance with the requirements of the relevant legislation in undertaking the assessment of potential impacts, as well as through the implementation of the principle of sustainable development. In addition, the successful implementation and appropriate management of this project will ensure socio-economic upliftment.

This process will be undertaken in a transparent manner and all efforts will be made to involve interested and affected parties, stakeholders and relevant Organs of State such that an informed decision can be made by the Regulating Authority.

The study is conducted in such a way as to comply with the instructions regarding such studies and reports (as contained within the above-mentioned documents).

The following aspects have been dealt with:

SCHEDULE

Actions	Timeframe
1 Communication with authorities and source and analyse relevant baseline information and undertake site inspections	3 days
2 Compile Environmental Application Form for the project	2 days
3 Compile an <i>information requirements list</i> to be distributed to the project team. The Information required would assist with completion of the BAR.	2 days
4 Identify key interested and affected parties (I&APs)	1 day
5 Compilation of terms of reference for specialist studies	2 days
6 Commission specialist studies	1 day
7 Compile draft BAR and make available to the public for a 30 day commenting period and submit the application form to the competent authority. NB: According to the new Regulations a BAR must be submitted 90 days after the application has been submitted. The implication is that all information must be available within 80 days after submitting the Application.	3 days for compilation and 30 days for commenting period (The competent authority has 90 days to request additional information or to refuse the application, from the date of submission)
8 Prepare an Information Sheet (summary of the draft BAR) and distribute to I&APs	1 day
9 Compile and publish media notices (for the BAR) in relevant newspapers	7 – 10 days depending on the day the newspaper is published
10 Compile and place poster/s along the boundary of the site	1 day
11 Hold a public meeting / Open House / focus meeting with I&APs	1 day
12 Receive and address first round of comments from public	3 days
13 Should the draft BAR require substantial changes, these changes will be incorporated into the draft BAR and distributed	Included above (allow an additional 50 days to include #14 below)
14 Allow the identified public to provide comment within a 30 day period on above report.	3 days for compilation and 30 days for commenting period (Competent authority has an additional 50 days)
15 Address comments received on the draft BAR, Finalise BAR and update comments and response table; finalise Basic Assessment Report and submit to authorities	5 days
16 Submit final BAR to authorities for a final decision	1 day, The department has 107 days from the date of receipt to review and come to a final decision.
17 Once the decision is issued, all I&Ps must be formally informed of the decision	20 days
TOTAL AMOUNT OF DAYS:	197 days

6. NEED AND DESIRIBILITY

The land belongs to the local municipality and is in line with the objective to provide services (potable water to residential areas), it is further favourable as the proposal is for the replacement of an existing pipeline. The new pipeline will ensure adequate water capacity for future and existing residential developments in the area, specifically Geluksoord Ext. 2 & 3.

The proposed pipeline will provide job opportunities during the construction phase and thus the unemployment rate of the area will be reduced.

7. ALTERNATIVES

One of the objectives of a BA is to investigate alternatives to the proposed project. The IEM procedure stipulates that the environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, a number of possible proposals or alternatives for accomplishing the same objectives should be identified and investigated. In order to ensure that the proposed development enables sustainable development, *feasible* alternatives must be explored (S. Cliff, 2015).

The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process. Alternatives should be considered as a *norm* within the Environmental Process (S. Cliff, 2015).

Alternatives have been considered in terms of EIA Regulation, 2014 Appendix 1(h). Alternatives considered includes a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative have also been included to act as a baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate have been informed by the specific circumstances of the activity and its environment.

7.1 FEASIBLE AND REASONABLE ALTERNATIVES

“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;**
- (b) the type of activity to be undertaken;**
- (c) the design or layout of the activity;**

- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

a) **Site alternatives**

List alternative sites, if applicable.

Site Alternatives	Description
Alternative Site 1 (preferred or only site alternative)	The replacement pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO.
Alternative Site 2	Alternative 2 will also entail the construction of a new water pipe line. It is however proposed that the stream crossing be constructed over the streams by means of bridges

e) **No-go alternative**

The no-go alternative will entail that the status quo will remain. The implication of this will be that the people of the area will not have their basic needs for potable water addressed.

f) **Please motivate for preferred site, activity and technology alternative**

The stream that will be crossed is a non-perennial stream and whilst excavation will mean the removal of vegetation and disturbance of soil within the streambed, this will be a temporary measure and once covered and rehabilitated there will be no evidence of the pipeline visible. It should be noted, as this is a non-perennial streams, chances are that there will be no water to be diverted at the time of construction. Therefore, in the long term the pipelines will have less visual impact and is less likely to be damaged

Alternative 3: The “no-go” option.

The no-go alternative will entail that the status quo will remain and the need for potable water in the area (Specifically Geluksoord ext. 2 & 3) will not be addressed.

8. DESCRIPTION OF THE ENVIRONMENT THAT MAY BE AFFECTED BY THE PROJECT

8.1 BIO-PHYSICAL ASPECTS

8.1.1 GEOLOGY & SOILS

Geology and soils: Andesitic lavas of the Allanridge formation in the north and west and fine-grained sediments of the Karoo Supergroup in the south and east. Deep sandy (0.6 – 1.2 m) to loamy soils of the Hutton soil form are present on slightly undulating sandy plains (Mucina & Rutherford).

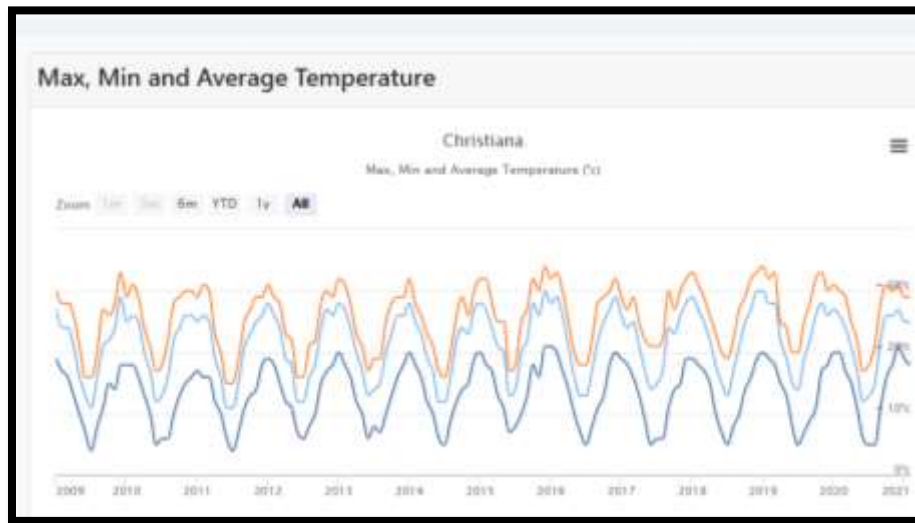
No dolomite occurs in the area and no stability investigation is required.

8.1.2 TOPOGRAPHY

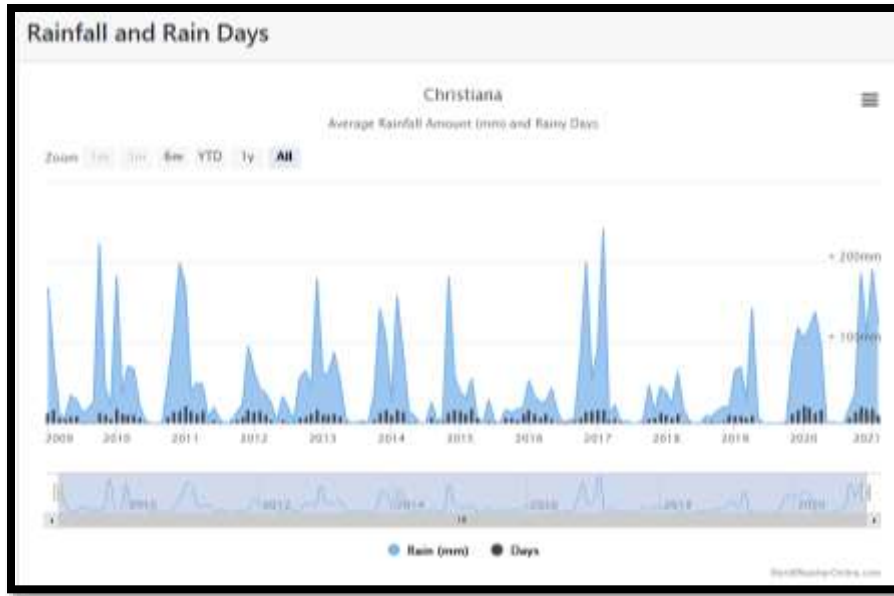
The topography of the study area is mostly flat and open with no rocky outcrops, ridges or hills present.

8.1.3 CLIMATE

The region is characterized by summer rainfall with thunderstorms. Winters are dry with frost common. The warmest months are normally December, January with February the warmest month, and the coldest months are June and July. The Table below provides climatic data for the past 10 years.



Source: <https://www.worldweatheronline.com/christiana-weather-averages/north-west/za.aspx>



Source: <https://www.worldweatheronline.com/christiana-weather-averages/north-west/za.aspx>

Climate Change

According to: WIREs Clim Change 2014, 5605-620. Doi:10.1002/wcc.295: "Climate change is a key concern within South Africa. Mean annual temperatures have increased by at least 1.5 times the observed global average of 0.65°C over the past five decades and extreme rainfall events have increased in frequency. These changes are likely to continue. Climate change poses a significant threat to South Africa's water resources, food security, health, infrastructure, as well as its ecosystem services and biodiversity. Considering South Africa's high levels of poverty and inequality, these impacts pose critical challenges for national development. In relation to water, impact studies for the water resources sector have begun to look beyond changes in streamflow to changes in the timing of flows and the partitioning of streamflow into baseflows and stormflows, reservoir yields, and extreme hydrological events. Spatially the eastern seaboard and central interior of the country are likely to experience increases in water runoff. Higher frequencies of flooding and drought events are projected for the future. Complexities of the hydrological cycle, influences of land use and management and the linkages to society, health, and the economy indicate far higher levels of complexity in the water resources sector than in other sectors. What has emerged is that land uses that currently have significant impacts on catchment water resources will place proportionally greater demands on the catchment's water resources if the climate were to become drier. The influence of climate change on water quality is an emerging research field in South Africa, with assessments limited to water temperature and non-point source nitrogen and phosphorus movement. A critical interaction that has not been explored is between changes in water quality and quantity and the combined impacts, such changes might have impact on various types of water use, e.g., irrigation, domestic consumption, or aquatic ecosystems support".

8.1.4 SURFACE DRAINAGE

The Wetland Riparian assessment notes: "One stream crossing is found at the site. At this Stream Crossing area, a non-perennial river, with a modified active channel and riparian zone, crosses the site. The active channel and riparian zone at the Stream Crossing area at the site are visibly disturbed in particular by

excavations of the past. These disturbances are reflected in the riparian vegetation which does not appear to be in tact. Loose clumps of the rush *Juncus rigidus* and the sedge *Scirpoides dioecus* are found at the riparian zone, mixed with a mosaic of terrestrial vegetation. *Persicaria* species (Knotweeds) are found at the small permanent zones of the active channel. Trees and megagraminoids are absent.

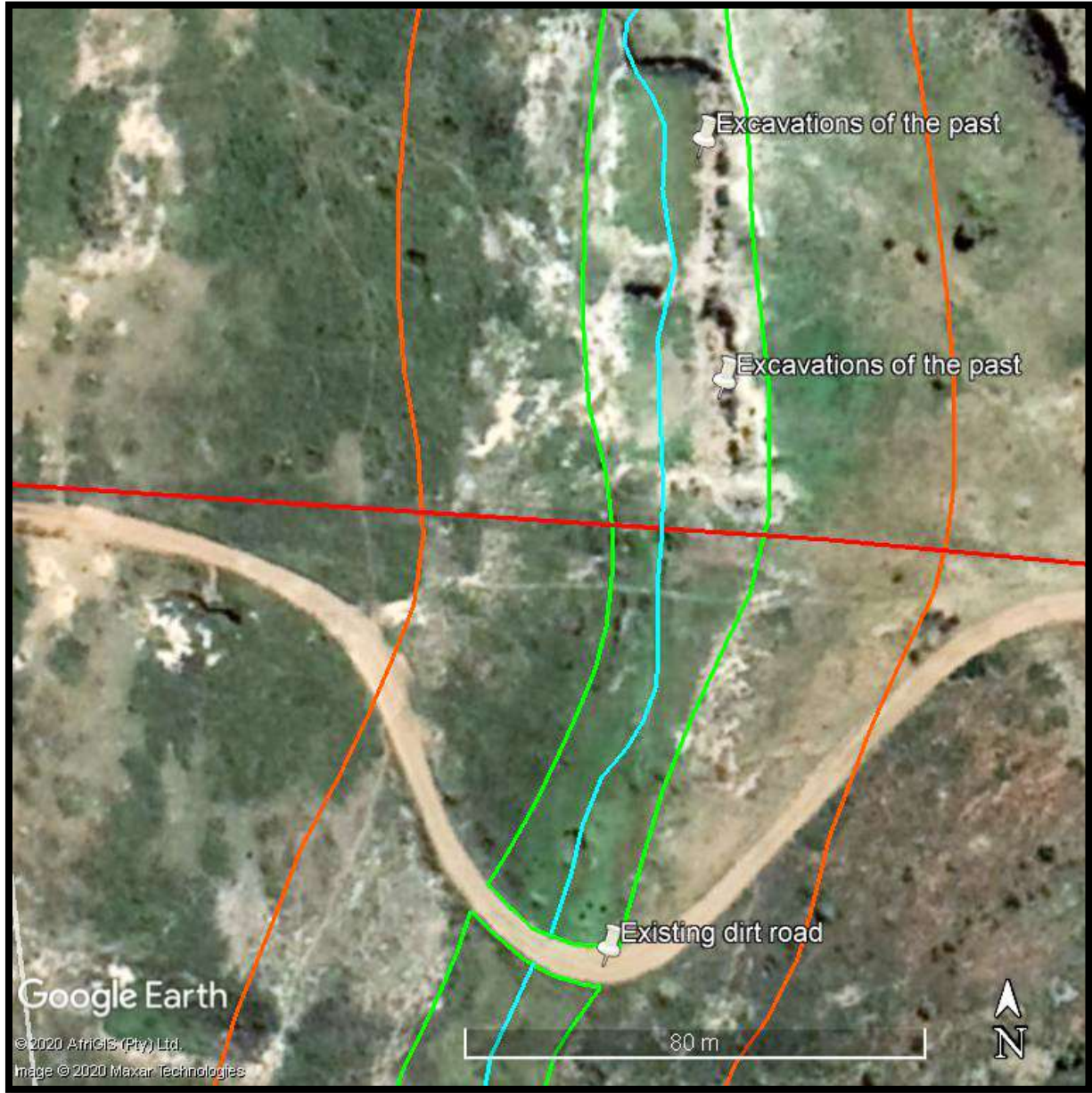


Figure 6: Indication of non-perennial river, riparian zone and buffer zone at the Stream Crossing area at the site.

- | | | |
|--|---------------------------|-------------------------------------|
| — | Light blue outline | Route of active channel at the site |
| — | Green outline and shading | Riparian zone |
| — | Orange outline | Outer edge of buffer zone |

— Red outline

— Approximate route of replacement pipeline

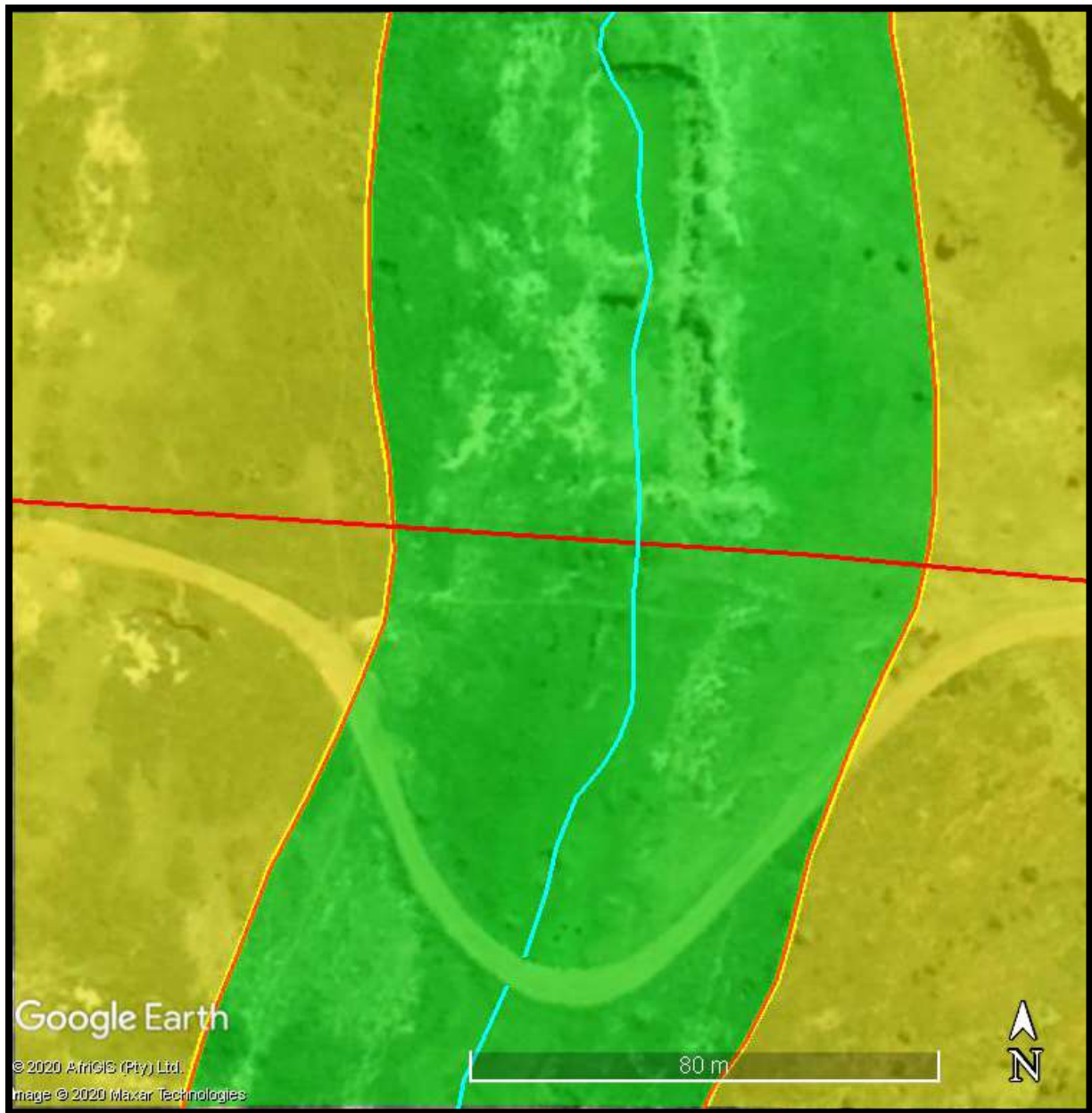


Figure 7: Indications of ecological sensitivity at the Stream Crossing area at the site.

— Red outline

— Approximate route of replacement pipeline

— Light yellow outline and shading

Medium-low Sensitivity

— Green outline and shading

Medium-high Sensitivity

Erosion by sheet flow may occur in disturbed areas. Storm water drainage will have to be considered during the planning phase of the development and will have to be incorporated into the final layout plan. Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures. Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms. All embankments must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.

8.1.6 GROUND WATER

Possible infiltration into the groundwater must be taken into account. During the construction phase, no spills of lubricants or construction worker sewage should be allowed to pollute the ground water. These aspects are addressed in the EMP.

8.1.7 FLORA

The study area is at a strip for proposed replacement of pipelines from pump station to Utlwanang Water Tower and Christiana Water Tower, Geluksoord Extension 2 and Extension 3, Phase 3, approximately 2 km north of Christiana, North West Province, South Africa. The site is situated at the Savanna Biome which is represented by the Kimberley Thornveld vegetation type (Mucina & Rutherford, 2006). A brief overview of the vegetation type, which serves as an outline of the ecological context of the site, follows.

SVk 4 Kimberley Thornveld

Distribution: In South Africa the Kimberley Thornveld is found in the North West, Free State and Northern Cape Provinces. Kimberley Thornveld is present in most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkly West Districts. The distribution also includes pediment areas in the Herbert and Jacobsdal Districts (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains often slightly irregular with well-developed tree layer of *Acacia erioloba*, *Acacia tortilis*, *Acacia karroo* and *Boscia albitrunca* and well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *Acacia mellifera*. Grass layer open with much uncovered soil (Mucina & Rutherford 2006).

Important taxa of the Kimberley Thornveld listed by Mucina & Rutherford (2006): Tall Tree: *Acacia erioloba*. Small Trees: *Acacia karroo*, *Acacia mellifera* subsp. *detinens*, *Acacia tortilis* subsp. *heteracantha*, *Searsia lancea*. Tall Shrubs: *Tarchonanthus camphoratus*, *Diospyros pallens*, *Ehretia rigida* subsp. *rigida*, *Euclea crispa* subsp. *ovata*, *Grewia flava*, *Lycium arenicola*, *Lycium hirsutum*, *Searsia tridactyla*. Low Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum zeyheri*, *Hermannia comosa*, *Lycium pilifolium*, *Melolobium microphyllum*, *Pavonia burchellii*, *Peliostomum leucorrhizum*, *Plinthus sericeus*, *Wahlenbergia nodosa*. Succulent Shrubs: *Aloe hereroensis* var. *hereroensis*, *Lycium cinereum*. Graminoids: *Eragrostis lehmanniana*, *Aristida canescens*, *Aristida congesta*, *Aristida mollissima* subsp. *argentea*, *Cymbopogon pospischilii*, *Digitaria argyrograpta*, *Digitaria eriantha* subsp. *eriantha*, *Heteropogon contortus*, *Themeda triandra*. Herbs: *Barleria macrostegia*, *Dicoma schinzii*, *Harpagophytum procumbens* subsp. *procumbens*, *Helichrysum cerastioides*, *Hermbstaedtia odorata*, *Hibiscus marlothianus*, *Jamesbrittenia*

aurantiaca, *Lippia scaberrima*, *Osteospermum muricatum*, *Vahlia capensis* subsp. *vulgaris*. Succulent Herbs: *Aloe grandidentata*, *Piaranthus decipiens*.

Vegetation at the terrestrial zone at the site is disturbed owing to the route of a previous pipeline development. Savanna which is in fair condition to highly disturbed condition is found in the vicinity of the strip allocated for the proposed development.

Indigenous trees at the terrestrial zone at the site include *Vachellia tortilis* subsp. *heteracantha*, *Searsa lancea* (Karee), *Ziziphus mucronata* (Buffalo Thorn) and *Tarchonanthus camphoratus* (Camphor Bush). The aggressive alien invasive tree *Prosopis glandulosa* (Mesquite) is present at some spots at the site. Indigenous herbaceous species include *Heliotropium ciliatum*, *Barleria macrostegia*, *Gazania krebsiana* and *Bulbine narcissifolia*. Indigenous grass species include *Aristida congesta*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Eragrostis curvula*, *Eragrostis superba* and *Melinis repens*. Owing to disturbances of past and present a number of alien invasive herbaceous weeds occur at the site. Conspicuous exotic weeds at the site are *Argemone ochroleuca*, *Schkuhria pinnata*, *Tagetes minuta*, *Bidens bipinnata*, *Conyza bonariensis*, *Datura* species, *Xanthium spinosum*, *Verbesina encelioides* and *Alternanthera pungens*.

8.1.8 FAUNA

Vertebrates

Mammals

The Ecological habitat survey lists the possible presence or absence of threatened mammal species, near threatened mammal species and mammal species of which the status is uncertain, respectively, at the site. Literature sources that were used are Friedman & Daly (2004), Skinner & Chimimba (2005) and Wilson & Reeder (2005). Since the site falls outside reserves, threatened species such as the black rhinoceros (*Diceros bicornis*) and the African wild dog (*Lycaon pictus*) are obviously not present. No smaller mammals of particular high conservation significance are likely to be found on the site as well.

Birds

The ecological habitat survey lists the possible presence or absence of threatened bird species and near threatened bird species at the site. With bird species which often have a large distributional range, their presence does not imply that they are particularly dependent on a site as breeding location. Therefore the emphasis in the right hand columns of Table 4.12 and Table 4.13 are on the particular likely dependence or not of bird species on the site. Literature sources that were mainly consulted are Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No threat to any threatened bird species or any bird species of particular conservation importance are foreseen.

Reptiles

The ecological habitat survey list the possible presence or absence of Threatened and Near Threatened reptile species on the site. Main Source used for the conservation status and identification of reptiles are Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers (2014). Alexander & Marais (2007) as well as Tolley & Burger (2007) give useful indications of distributions, habitats and identification of the reptile species. There appears to be no threat to any reptile species of particular high conservation importance if the site is developed.

Amphibians

No frog species that occur in the North West are listed as Threatened species (Vulnerable, Endangered or Critically Endangered) or Near Threatened species according to IUCN Amphibian Specialist Group (2013). The ecological habitat survey lists *Pyxicephalus adspersus* (Giant Bullfrog) as Least Concern globally. According to the Biodiversity Management Directorate of GDARD (Gauteng Department of Agriculture and Rural Development) (2014) there are no amphibians in Gauteng that qualify for red listed status (red listed here indicates a category of special conservation concern such as threatened or near threatened). Suitable habitat for Giant Bullfrog at site appears to be absent.

Invertebrates

Butterflies

Studies about the vegetation and habitat of threatened butterfly species in South Africa showed that ecosystems with a unique combination of features are selected by these often localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa can then be regarded as bio-indicators of rare ecosystems.

Four species of butterfly in Gauteng Province and North West Province combined are listed as threatened in the recent butterfly conservation assessment of South Africa (Mecenero *et al.*, 2013). The expected presence or not of these threatened butterfly species as well as species of high conservation priority that are not threatened, at the site (Table 4.18 and Table 4.19) follows.

Assessment of threatened butterfly species

***Aloeides dentatis dentatis* (Roodepoort Copper)**

The proposed global red list status for *Aloeides dentatis dentatis* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.*, 2013). *Aloeides dentatis dentatis* colonies are found where one of its host plants *Hermannia depressa* or *Lotononis eriantha* is present. Larval ant association is with *Lepisiota capensis* (S.F. Henning 1983; S.F. Henning & G.A. Henning 1989). The habitat requirements of *Aloeides dentatis dentatis* are complex and not fully understood yet. See Deutschländer and Bredenkamp (1999) for the description of the vegetation and habitat characteristics of one locality of *Aloeides dentatis* subsp. *dentatis* at Ruimsig, Roodepoort, Gauteng Province. There is not an ideal habitat of *Aloeides dentatis* subsp. *dentatis* on the site and it is unlikely that the butterfly is present at the site.

***Chrysoritis aureus* (Golden Opal/ Heidelberg Copper)**

The proposed global red list status for *Chrysoritis aureus* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.*, 2013) *Chrysoritis aureus* (Golden Opal/ Heidelberg Copper) is a resident where the larval host plant, *Clutia pulchella* is present. However, the distribution of the butterfly is much more restricted than that of the larval host plant (S.F. Henning 1983; Terblanche, Morgenthal & Cilliers 2003). One of the reasons for the localised distribution of *Chrysoritis aureus* is that a specific host ant *Crematogaster liengmei* must also be present at the habitat. Fire appears to be an essential factor for the maintenance of suitable habitat (Terblanche, Morgenthal & Cilliers 2003). Research revealed that *Chrysoritis aureus* (Golden Opal/ Heidelberg Copper) has very specific habitat requirements, which include rocky ridges with a steep slope and a southern aspect (Terblanche, Morgenthal & Cilliers 2003). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon is highly unlikely.

***Lepidochrysops praeterita* (Highveld Blue)**

The proposed global red list status for *Lepidochrysops praeterita* according to the most recent IUCN criteria and categories is Endangered (G.A. Henning, Terblanche & Ball, 2009; Mecenero *et al.*, 2013). *Lepidochrysops praeterita* is a butterfly that occurs where the larval host plant *Ocimum obovatum* (= *Becium obovatum*) is present (Pringle, G.A. Henning & Ball, 1994), but the distribution of the butterfly is much more restricted than the distribution of the host plant. *Lepidochrysops praeterita* is found on selected rocky ridges and rocky hillsides in parts of Gauteng, the extreme northern Free State and the south-eastern Gauteng Province. No ideal habitat appears to be present for the butterfly on the site. It is unlikely that *Lepidochrysops praeterita* would be present on the site and at the footprint proposed for the development.

***Orachrysops mijburghi* (Mijburgh's Blue)**

The proposed global red status for *Orachrysops mijburghi* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.*, 2013). *Orachrysops mijburghi* favours grassland depressions where specific *Indigofera* plant species occur (Terblanche & Edge 2007). The Heilbron population of *Orachrysops mijburghi* in the Free State uses *Indigofera evansiana* as a larval host plant (Edge, 2005) while the Suikerbosrand population in Gauteng uses *Indigofera dimidiata* as a larval host plant (Terblanche & Edge 2007). There is no suitable habitat for *Orachrysops mijburghi* on the site and it is unlikely that *Orachrysops mijburghi* would be present on the site.

Conclusion on threatened butterfly species

There appears to be no threat to any threatened butterfly species if the site is developed.

Assessment of butterfly species that are not threatened but also of high conservation priority

***Colotis celimene amina* (Lilac tip)**

Colotis celimene amina is listed as Rare (Low density) by Mecenero *et al.* (2013). In South Africa *Colotis celimene amina* is present from Pietermaritzburg in the south and northwards into parts of Kwa-Zulu Natal, Gauteng, Limpopo, Mpumalanga and the North West Provinces (Mecenero *et al.* In press.). Reasons for its rarity are poorly understood. It is highly unlikely that *Colotis celimene amina* would be resident at the site.

***Lepidochrysops procera* (Savanna Blue)**

Lepidochrysops procera is listed as Rare (Habitat specialist) by Mecenero *et al.* (2013). *Lepidochrysops procera* is endemic to South Africa and found in Gauteng, KwaZulu-Natal, Mpumalanga and North West (Mecenero *et al.*, 2013). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

***Metisella meninx* (Marsh Sylph)**

Henning and Henning (1989) in the first South African Red Data Book of Butterflies, listed *Metisella meninx* as threatened under the former IUCN category Indeterminate. Even earlier in the 20th century Swanepoel (1953) raised concern about vanishing wetlands leading to habitat loss and loss of populations of *Metisella meninx*. According to the second South African Red Data Book of butterflies (Henning, Terblanche & Ball, 2009) the proposed global red list status of *Metisella meninx* has been Vulnerable. During a recent large scale atlassing project the *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas* (Mecenero *et al.*, 2013) it was found that more *Metisella meninx* populations are present than thought before. Based on this valid new information, the conservation status of *Metisella meninx* is now regarded as Rare (Habitat specialist) (Mecenero *et al.*, 2013). Though *Metisella meninx* is more widespread and less threatened than perceived before, it should be regarded as a localised rare habitat specialist of conservation priority, which

is dependent on wetlands with suitable patches of grass at wetlands (Terblanche In prep.). Another important factor to keep in mind for the conservation of *Metisella meninx* is that based on very recent discoveries of new taxa in the group the present *Metisella meninx* is species complex consisting of at least three taxa (Terblanche In prep., Terblanche & Henning In prep.). The ideal habitat of *Metisella meninx* is treeless marshy areas where *Leersia hexandra* (rice grass) is abundant (Terblanche In prep.). The larval host plant of *Metisella meninx* is wild rice grass, *Leersia hexandra* (G.A. Henning & Roos, 2001). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

***Platylesches dolomitica* (Hilltop Hopper)**

Platylesches dolomitica is listed as Rare (Low density) by Mecenero *et al.* (2013). Historically the conservation status of *Platylesches dolomitica* was proposed to be Vulnerable (Henning, Terblanche & Ball 2009). However this butterfly which is easily overlooked and has a wider distribution than perceived before. *Platylesches dolomitica* has a patchy distribution and is found on rocky ledges where *Parinari capensis* occurs, between 1300 m and 1800m (Mecenero *et al.* 2013, Dobson Pers comm.). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

Fruit chafer beetles

The ecological habitat survey lists the fruit chafer beetle species (Coleoptera: Scarabaeidae: Cetoniinae) that are of known high conservation priority in the North West Province. No *Ichnestoma stobbiai* or *Trichocephala brincki* were found during the surveys. There appears to be no suitable habitat for *Ichnestoma stobbiai* or *Trichocephala brincki* at the site. There appears to be no threat to any of the fruit chafer beetles of particular high conservation priority if the site were developed.

Scorpions

The ecological habitat survey lists the rock scorpion species (Scorpiones: Ischnuridae) that are of known high conservation priority in the North West Province. None of these rock scorpions have been found at the site and the habitat does not appear to be optimal.

8.1.9 AIR QUALITY

The only impact associated with air quality is that the project will however create a certain amount of dust during the construction phase. If proper dust suppression measures are implemented this variable will have very little impact (low in intensity and significance during the construction phase)

8.1.10 NOISE

It is a fact that a certain amount of noise will be generated during the construction phase of the project. Noise levels should however rarely exceed the allowable limits. It is unlikely that the project will create any more noise during the operational phase than that already experienced on site.

8.1.11 ARCHAEOLOGY & CULTURAL SITES

According to the SAHRA Specialist: "Background research indicates that there are some cultural heritage sites and features in the larger geographical area within which the study area falls. The assessment of the specific study area did not identify any sites, features or material of cultural heritage (archaeological and/or historical) origin or significance. Large parts of the proposed new water pipeline route has been transformed through both

formal and informal urban settlement and related developments. This includes roads and the various water towers and waterworks in the area. The new lines also follow existing roads and water lines. Portions of the area would also have been utilized in the historic past for agricultural purposes. As a result of these various activities if any archaeological and/or historical sites did exist here in the past they would have been extensively disturbed or destroyed.

Some sections of the route (specifically on the dirt roads) were impassable as a result of heavy rains and these sections were therefore not assessed in detail. It is however believed that the likelihood of any cultural heritage resources being present here is very small.

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

Finally, from a Cultural Heritage point of view the proposed Geluksoord Extensions 2 & 3 Phase 3 – replacement of pipelines from the pump station to Utlwanang and Christiana Water Tower should be allowed to continue taking the above into consideration”.

8.2 SOCIO ECONOMIC FACTORS

8.2.1 AESTHETICS

Visual Intrusion is defined as the level of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape or townscape.

High visual intrusion – results in a noticeable change or is discordant with the surroundings;

Moderate visual intrusion – partially fits into the surroundings, but clearly noticeable;

Low visual intrusion – minimal change or blends in well with the surroundings.

The pipeline will have no visual impact once it has been constructed, as opposed to Alternative 2 which will imply a bridge with pipeline being visible.

During the construction and operational phases of the proposed development, jobs will be created and thus the unemployment rate of the area will be reduced

9. ENVIRONMENTAL IMPACT ASSESSMENT

9.1 ASSESSMENT CRITERIA

Impacts were rated using the following methodology:

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
Duration (time scale)	Short term	Up to 5 years
	Medium term	6 – 15 years
	Long term	More than 15 years
Extent (area)	Local	Confined to study area and its immediate surroundings
	Regional	Region (cadastral, catchment, topographic)
	National	Nationally (The country)
	International	Neighboring countries and the rest of the world.
Magnitude (Intensity)	Low	Site-specific and wider natural and/or social functions and processes are negligibly altered. ((A low intensity impact will not affect the natural, cultural, or social functions of the environment).
	Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way. (Medium scale impact will alter the different functions slightly).
	High	Site-specific and wider natural and/or social functions and processes are severely altered. (A High intensity impact will influence these functions to such an extent that it will temporarily or permanently cease to exist).
Probability	Improbable	Possibility of occurrence is very low. (Such an impact will have a very slight possibility to materialise, because of design or experience).
	Possible	There is a possibility that the impact will occur
	Probable	It is most likely that the impact will occur
	Definite	The impact will definitely occur
Significance	Insignificant	Impact is negligible and will not have an influence on the decision regarding the proposed activity (No mitigation is necessary)
	Very Low	Impact is very small and should not have any meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Low	The impact may not have a meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Medium	The impact should influence the decision regarding the proposed activity (The project can only be carried through if certain mitigatory steps are taken)
	High	The impact will influence the decision regarding the proposed activity

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
	Very High	The proposed activity should only be approved under special circumstances
Reversibility	Low	There is little chance of correcting the adverse impact
	Medium	There is a moderate chance of correcting the adverse impact
	High	There is a high chance in correcting the adverse impact
Risk	Low	Assessing a risk involves an analysis of the consequences and likelihood of a hazard being realized. In decision-making, low-consequence / low-probability risks (green) are typically perceived as acceptable and therefore only require monitoring.
	Medium	Other risks (amber) may require structured risk assessment to better understand the features that contribute most to the risk. These features may be candidates for management
	High	High-consequence / high-probability risks (red) are perceived as unacceptable and a strategy is required to manage the risk.

Attributes associated with the alternatives were assessed and is outlined below:

Geographical attributes

The Geographical attributes of an area relates to the characteristics of a particular region, area or place. It influences the determination of site alternatives as it relates to the location of a site in relation to relevant features in the area.

Physical attributes

Physical attributes of an area relates to the processes and patterns in the natural environment. For the purpose of this assessment, the following processes and patterns have been investigated. Geology, soil, topography and landforms, climate and meteorology, surface water and ground water.

Biological attributes

Biological attributes for the purpose of this study includes the distribution of species and ecosystems in geographic space and through geological time. Organisms and biological communities often vary in a regular fashion along geographic gradients of latitude, elevation, isolation and habitat area. The two main branches assessed will be:

Phytogeography is the branch of biogeography that studies the distribution of plants.

Zoogeography is the branch that studies distribution of animals.

Social attributes

Social attributes is closely related to social theory in general and sociology in particular, dealing with the relation of social phenomena and its spatial components.

Economic attributes

Economic attributes includes the location, distribution and spatial organization of economic activities and also takes into account social, cultural, and institutional factors in the spatial economy of the development.

Heritage attributes

The broad generic term Cultural Heritage Resources refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of paleontological, archaeological, historical,

aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural attributes

Cultural attributes relates to the specific characteristics such as language, religion, ethnic and racial identity, and cultural history & traditions of people. These attributes influences family life, education, economic and political structures, and, of course, business practices.

It should be noted that the above mentioned attributes do not occur in isolation and it is not uncommon for an identified impact to overlap with two or more of these attributes. Also note, not all risks require comprehensive and detailed assessment. Solid problem formulation should allow decision-makers to evaluate the extent of subsequent analysis required. The level of effort put into assessing each risk should be proportionate to its significance and priority in relation to other risks, as well as its complexity, by reference to the likely impacts. Consideration should be given to stakeholders’ perceptions of the nature of the risk.

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic	The new pipeline will be constructed within a non-perennial streambed.	Duration	Long term	Construct the stream crossings in accordance with the designs and ensure the natural flow of the river is not disturbed in the long term.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Medium		Medium
	Plan to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible. Plan to spray bare surfaces with water to prevent dust pollution.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the provision and maintenance of ablution facilities for construction workers to prevent pollution of surface and underground water.	Duration	Short term	Provide portable ablution facilities that will not cause pollution during the construction phase.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	High		High

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
	Plan to manage possible impacts that the project can have on the soil and geology.	Risk	Low		Medium
		Duration	Long term	Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimised.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
	Risk	Low	Medium		
	Plan for the removal of vegetation (which will lead to the destruction of faunal and floral habitats) during the construction phase.	Duration	Short term	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to safeguard open trenches in order to alleviate the danger of collapse on people or on equipment and people- especially small children who may fall into it.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
Risk		Low	Medium		
Indirect impacts:					
Geographical Physical Social Economic	Plan to control dust generation from the proposed project which could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan and compile method statements to implement measures for the prevention and or handling of spills of lubricants / oils that can take place on bare soil.	Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
	Risk	Low	Medium		
	Plan to provide method statements on the handling of waste materials such as glass, plastic, metal or paper which may present a possible pollution hazard	Extent	Local	Implement the management plan to ensure that: All construction rubble is disposed of in a safe and environmentally acceptable manner.	Local
		Magnitude (Intensity)	Low		Low
Probability		Probable	Probable		
Significance		Medium	Medium		
Reversibility		High	High		

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
		Risk	Low	NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase. All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	Medium
	Plan to ensure all involved is aware of the possible social and environmental problems that may be experienced as a result of non-compliance to the relevant legislation.	Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act. Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to create new employment opportunities. Plan to use local labour to ensure local skills development will take place.	Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
Cumulative impacts:					
Geographical Physical Social Economic	Plan the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for water will be partially addressed in the area.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
	Plan to ensure that the services are designed and constructed in such a manner that it will not cause Environmental degradation.	Extent	Local	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development. Ensure that the development is constructed as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 2:					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical		Duration	Long term	No environmental authorization will have to be obtained for the development, as	Long term
		Extent	Local		Local

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 2:						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
Social Economic	Construct a bridge over the non perennial stream for the pipeline.	Magnitude (Intensity)	High	no soil will have to be moved / excavated within the streambed. Although this is an advantage, the long term operational impacts must be considered.	High	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	Low		Low	
		Risk	Medium		Medium	
	Plan to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible. Spray bare surfaces with water to prevent dust pollution.	Medium term	
		Extent	Local		Local	
		Magnitude (Intensity)	Low		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Plan for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term	
		Extent	Local		Local	
		Magnitude (Intensity)	Low		Low	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Plan for the provision and maintenance of ablation facilities for construction workers to prevent pollution of surface and underground water.	Duration	Short term	Provide portable ablation facilities that will not cause pollution during the construction phase.	Short term	
		Extent	Local		Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Plan to manage possible impacts that the project can have on the soil and geology.	Duration	Long term	Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimised. Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours. The findings of the Geotechnical Engineer must be incorporated into the design of the project. Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Long term	
		Extent	Local		Local	
Magnitude (Intensity)		Low	Medium			
Probability		Definite	Definite			
Significance		Medium	Medium			
Reversibility		High	High			
Risk		Low	Medium			
Plan for the removal of vegetation (which will lead to the destruction of faunal and		Duration	Short term		Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.	Short term
		Extent	Local			Local
		Magnitude (Intensity)	Medium			Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 2:						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
	floral habitats) during the construction phase.	Probability	Definite	The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible. No snares may be set.	Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Plan to safeguard open trenches in order to alleviate the danger of collapse on people or on equipment and people- especially small children who may fall into it.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer. Ensure that the trenches stay open for as short a time as possible. Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	Short term	
		Extent	Local		Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
		Indirect impacts:				
	Geographical Physical Social Economic	Plan to control dust generation from the proposed project which could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction. Start the rehabilitation of disturbed surfaces as soon as possible	Short term
			Extent	Local		Local
Magnitude (Intensity)			Low	Low		
Probability			Probable	Probable		
Significance			Medium	Medium		
Reversibility			High	High		
Risk			Low	Medium		
Plan and compile method statements to implement measures for the prevention and or handling of spills of lubricants / oils that can take place on bare soil.		Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours. Ensure that all construction vehicles are in good working order and not leaking oil and or fuel. No vehicles may be serviced on site.	Local	
		Magnitude (Intensity)	Low		Low	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
Plan to provide method statements on the handling of waste materials such as glass, plastic, metal or paper which may present a possible pollution hazard		Extent	Local	Implement the management plan to ensure that: All construction rubble is disposed of in a safe and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase. All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	Local	
		Magnitude (Intensity)	Low		Low	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
Plan to ensure all involved is aware of the possible social and environmental problems that may be experienced as a result of non- compliance to the relevant legislation.		Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act. Ensure that all contractors are aware of the consequences of non-compliance to	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 2:					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
	Plan to create new employment opportunities. Plan to use local labour to ensure local skills development will take place.	Risk	Low	the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines). No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Medium
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
Cumulative impacts:					
Geographical Physical Social Economic	Plan the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for water will be partially addressed in the area.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
	Plan to ensure that the bulk services are designed and constructed in such a manner that it will not cause Environmental degradation.	Extent	Local	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development. Ensure that the development is constructed as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	High		High

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 3: (No-Go Option)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic Cultural	If the no-go option is implemented, the proposed development will not be constructed and therefore no impacts on the environment are possible	Duration	Long term	No mitigation measures required.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
	No streams will be crossed.	Duration	Long term	No mitigation measures required.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
Indirect impacts:					

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 3: (No-Go Option)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
Geographical Physical Social Economic Cultural	Potable water supply to Geluksoord Ext 2 & 3 will not be met No new employment opportunities will be created during the planning and design phase. No skills enhancement will take place If this option is implemented, the projected boost to the local and regional economy will not take place.	Extent	Local	Ensure that the development is constructed and operated as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	High		High
Cumulative impacts:					
Geographical Physical Social Economic Cultural	If this option is implemented, the projected boost to the local and regional economy will not take place. No new employment opportunities will be created. No improvement to local skills development will take place.	Extent	Local	Ensure that the development is constructed and operated as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
DIRECT IMPACTS:					
Geographical Physical Social Economic	The new pipelines will be constructed within non-perennial streambeds.	Duration	Long term	Construct the stream crossings in accordance with the designs and ensure the natural flow of the river is not disturbed in the long term. Obtain the necessary environmental authorization for the development. Implement the mitigation measures as described in the Environmental Management plan.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Medium		Medium
	Un-rehabilitated, disturbed surfaces can lead to erosion and dust pollution.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
		Probability	Definite	Spray bare surfaces with water to prevent dust pollution.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Foreign plant species are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Poorly planned ablation facilities for construction workers may cause pollution of surface and underground water.	Duration	Short term	Provide portable ablation facilities that will not cause pollution during the construction phase.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
	Risk	Low	Medium		
	The proposed project can impact on the soil and geology.	Duration	Long term	The findings of the Geo-Technical Engineer must be incorporated into the design of the project.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	The vegetation of the area will be removed during the construction phase, which will destroy floral and faunal habitats.	Duration	Short term	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
Probability		Definite	Definite		
Significance		Medium	Medium		
Reversibility		High	High		
Risk		Low	Medium		
Open trenches can be dangerous as they can either collapse on people or on equipment and people-especially small children, can fall into them.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.	Short term	
	Extent	Local		Local	
	Magnitude (Intensity)	Medium		Medium	
	Probability	Definite		Definite	
	Significance	Medium		Medium	

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
		Reversibility	High	Ensure that the trenches stay open for as short a time as possible.	High
		Risk	Low		Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.
Indirect impacts:					
Geographical Physical Social Economic	Dust generation from the proposed project could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Spills of lubricants / oils can take place on bare soil.	Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
		Ensure that all construction vehicles are in good working order and not leaking oil and or fuel. No vehicles may be serviced on site.			
	Waste materials such as glass, plastic, metal or paper present a possible pollution hazard	Extent	Local	Implement the management plan to ensure that: All construction rubble is disposed of in a safe and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase. All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)						
ALTERNATIVE 1: (Preferred Alternative)						
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	
	Non-compliance to the relevant legislation may cause social and environmental problems.	Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	New employment opportunities will be created. Local skills development will take place.	Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	Medium		Medium	
		Risk	Low		Medium	
	Cumulative impacts:					
	Geographical Physical Social Economic	Construct the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for housing will be partially addressed in the area.	Local
Magnitude (Intensity)			Medium	Medium		
Probability			Definite	Definite		
Significance			Medium	Medium		
Reversibility			Medium	Medium		
Risk			Low	Medium		
Ensure that the services are constructed in such a manner that it will not cause Environmental degradation.		Extent	Local	Ensure that the development is constructed as planned.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	High		High	
		Reversibility	High		High	
		Risk	Low		Medium	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
	Significance	Medium		High		
	Reversibility	Low		Low		
	Risk	Medium		Medium		
	Magnitude (Intensity)	Medium		Medium		
	Probability	Definite		Definite		
	Reversibility	Low		Low		

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
		Risk	Medium		Medium
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	Low		Low
		Risk	Medium		Medium
		Extent	Local		Local

ENVIRONMENTAL IMPACT ASSESSMENT (Operational Phase)					
ALTERNATIVE 1: (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
DIRECT IMPACTS:					
Geographical Physical Social Economic Cultural	Poorly maintained and serviced infrastructure may cause environmental problems.	Extent	Local	It will be the responsibility of the Local Municipality to maintain the infrastructure.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium- high		High
		Reversibility	High		Medium
		Risk	High		High
Indirect impacts:					
Geographical Physical Social Economic Cultural	Lack of rehabilitation may cause problems	Extent	Local	It will be the responsibility of the Local Municipality to ensure that the rehabilitation plan is implemented	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium- high		High
		Reversibility	High		Medium
		Risk	High		High
Cumulative impacts:					
Geographical Physical Social Economic Cultural	Enhancement of the social well-being of the local communities for which the development is intended	Extent	Local	No mitigation measures required.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium

10. PUBLIC PARTICIPATION.

10.1 ADVERTISEMENT AND NOTICE

Publication name	Stellalander	
Date published	10/03/2021	
Site notice 1 position	Latitude	Longitude
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Date placed	10/03/2021	

SITE NOTICE:



PROOF OF NEWSPAPER ADVERTISEMENT STELLALANDER 10/03/2021

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NOTICE, ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (BASIC ASSESSMENT) (NWP/ EIA/76/2020) Notice is hereby given of an Environmental Impact Assessment Process to be conducted. This process will be undertaken in terms of Section 24(M) and 44 made under section 24(5) of the National Environmental Management Act (Act No. 107 of 1998) (Amended Regulations promulgated on 07 April 2017). The proposed project is classified as, and will be conducted in terms of Government Notice No. R.326 of 2017 (Government Notice No. R.327 Listing Notice 1; Activity no. 19 and 12(ii)(a)). This advertisement must comply with the instructions regarding such notices, National Environmental Management Act (Act No. 107 of 1998, as amended) (Amended Regulations promulgated on 17 April 2017) (Government Notice No. R.326 of 2017) (Regulation 41(2)(c)(d)). The competent authority is the North West Department Economic Development, Environment, Conservation and Tourism. The Responsible officer is: Mr. Kgahliso Makoli: Tel: 018-389 5273; kmakoli@nwpg.gov.za. PROJECT NAME: The proposed replacement pipe lines from the Pump Station to Utwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO, Lekwa-Tamane Local Municipality, North West Province. PROJECT DESCRIPTION: The replacement of pipe lines from the Pump Station to Utwanang and Christiana which entails the crossing of a non-perennial stream. CLIENT: Dr. Ruth Segomotsi Mompoti District Municipality. CONSULTANT AND CONTACT PERSON: Mr. J.P. De Villiers of AB Enviro Consult, 7 Louis Leipoldt Street, Potchefstroom, 2531. Tel. 083 548 8105. Fax: 018-293 0671. E-mail: jp@abenviro.co.za. Parties wishing to formally object to and/or comment on the proposed development are requested to forward their objections and comments (with reasons) to AB Enviro Consult, not later than 30 days after the date of this advertisement. A copy of the draft Basic Assessment Report is also available from AB Enviro on request.

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K5 10/3

2. DETERMINATION OF APPROPRIATE MEASURES

Details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN R.982.

Key stakeholders (other than organs of state) identified in terms of Regulation 40(2)(d) of GN R.982:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
N/A	Neighbours	

10.3 AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders. Key stakeholders identified in terms of Regulation 7(1) and (2) and Regulation 40(2) (a)-(c) of GN R.982:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Water and Sanitation Mmabatho	Mr C Lobakeng	(018) 387 9500			Cnr Dr. James Moroka Drive and Sekame Road, Mega City Complex, Unit 99 Sekame Street Mmabatho 2735
Head of Department: North-West Department of Agriculture and Rural Development	HOD	018 389 5719/ 5431/ 5688	018 392 4377		Private Bag X2039 Mmabatho 2735
North West Department of Biodiversity	Head of Department	018 389 5719/ 5431/ 5688	018 392 4377		Private Bag X2039 Mmabatho 2735
Dr. Ruth Segomotsi Mompoti District Municipality	The District Municipal Manager	053 928 4700 / 053 927 0858	053 927 2401		PO Box 21 Vryburg 8600
Lekwa Teemane Local Municipality	The Municipal Manager	(053) 441 2206	(053) 441 3735	lesiet@lekwa-teemane.co.za	P.O. Box 13, Christiana 2680
Lekwa Teemane:Ward 6	The Councillor	(053) 441 2206	(053) 441 3735		P.O. Box 13, Christiana 2680
SAHRA	SAHRIS				

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4	The councillor Noid & Lesina-Tsemane Local Municipality P.O. Box 13 Carisburg 2450					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC4675602632A CUSTOMER COPY 301028R
5	Mr MJ Denga, Directorate Biodiversity Management and Conservation Private bag X 2037 Mafabatho 2735					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC4675602502A CUSTOMER COPY 301028R
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Mr C Lobakeng
Department of Water and Sanitation
Cnr Dr. James Moroka Drive and Sekame Road
Mega City Complex
Unit 99 Sekame Street
MMABATHO
2735
Tel: (018) 387 9500

AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

10/03/2021

Dear Sir / Madam

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED REPLACEMENT PIPE LINES FROM THE PUMP STATION TO UTLWANANG AND CHRISTIANA WATER TOWERS, WHICH INCLUDES THE EXCAVATION, REMOVAL OR MOVING OF SOIL, SAND OR ROCK OF MORE THAN 10 CUBIC METRES FROM A NON-PERENNIAL STREAM ON THE REMAINING EXTENT OF PORTION 1 OF THE FARM CHRISTIANA TOWN AND TOWNLANDS 325 HO; LEKWA -TEMANE LOCAL MUNICIPALITY, NORTH WEST PROVINCE.

AB ENVIRO CONSULT was appointed by Dr. Ruth Segomotsi Mompoti Municipality to submit an application to the North West Department Economic Development, Environment, Conservation and Tourism for the above mentioned proposed development. Attached please find a notification and a copy of the Draft Basic Assessment Report of the proposed development for your comments. In the event of your organisation/department not wishing to comment on this matter, it would be appreciated if we could receive written confirmation thereof to enable us to continue with the finalisation of the application.

If no response is however received from your Department/organisation within 30 days of the date of this letter, it will be assumed that your department/organisation does not wish to comment on this matter and the application will be processed further.

Please do not hesitate to contact us should any further information or clarification be required.

Yours sincerely,

PROF. A.B. DE VILLIERS

PROF A B DE VILLIERS (M Sc, Ph D, SACNASP)
MR.J.P. DE VILLIERS (MSc, HED; EAP-EAPASA); MRS.J.E. DU PLOOY (M.E.M; EAP-EAPASA)



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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

Ms Lebo Diale
Department: Agriculture and Rural Development
Private Bag X2039
Mmabatho
2735

10/03/2021

Dear Sir / Madam

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED REPLACEMENT PIPE LINES FROM THE PUMP STATION TO UTLWANANG AND CHRISTIANA WATER TOWERS, WHICH INCLUDES THE EXCAVATION, REMOVAL OR MOVING OF SOIL, SAND OR ROCK OF MORE THAN 10 CUBIC METRES FROM A NON-PERENNIAL STREAM ON THE REMAINING EXTENT OF PORTION 1 OF THE FARM CHRISTIANA TOWN AND TOWNLANDS 325 HO; LEKWA –TEMANE LOCAL MUNICIPALITY, NORTH WEST PROVINCE.

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Mr M. J. Denga
Directorate: Biodiversity Management and Conservation
Private Bag X2039
Mmabatho
2735

AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

10/03/2021

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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

The Municipal Manager
Dr. Ruth Segomotsi Mompoti District Municipality
PO Box 21
Vryburg
8600

10/03/2021

Dear Sir / Madam

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED REPLACEMENT PIPE LINES FROM THE PUMP STATION TO UTLWANANG AND CHRISTIANA WATER TOWERS, WHICH INCLUDES THE EXCAVATION, REMOVAL OR MOVING OF SOIL, SAND OR ROCK OF MORE THAN 10 CUBIC METRES FROM A NON-PERENNIAL STREAM ON THE REMAINING EXTENT OF PORTION 1 OF THE FARM CHRISTIANA TOWN AND TOWNLANDS 325 HO; LEKWA –TEMANE LOCAL MUNICIPALITY, NORTH WEST PROVINCE.

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AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

The Municipal Manager
Lekwa-Teemane Local Municipality
PO Box 13
Christiana
2680

10/03/2021

Dear Sir / Madam

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The Councillor Ward 6
Lekwa-Teemane Local Municipality
PO Box 13
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2680

10/03/2021

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10.4 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
To follow as part of Final BAR	NA

1. 10.5 COMMENTS AND RESPONSE REPORT

I&AP registered:	Comment received:	Response by the EAP:
To follow as part of Final BAR		

11. SUMMARY OF THE FINDINGS AND RECOMMENDATIONS OF SPECIALISTS

11.1 ECOLOGICAL IMPACT ASSESSMENT (See Appendix A for a copy of this report)

Conclusion:

- Vegetation at the terrestrial zone at the site is disturbed owing to the route of a previous pipeline development. Various disturbances occur at the terrestrial zone at and near the strip allocated for the development such as roads, buildings and clearings. The active channel and riparian zone at the Stream Crossing area at the site are visibly, extensively modified and disturbed. Alien invasive plant species are widespread at disturbed places at the site.
- Vegetation at the terrestrial zone at the site is disturbed owing to the route of a previous pipeline development.
- Savanna, which is in fair condition to highly disturbed condition, at the terrestrial zone, is found in the vicinity of the strip allocated for the proposed development. Indigenous trees at the terrestrial zone at the site include *Vachellia tortilis* subsp. *heteracantha*, *Searsa lancea* (Karee), *Ziziphus mucronata* (Buffalo Thorn) and *Tarchonanthus camphoratus* (Camphor Bush). The aggressive alien invasive tree *Prosopis glandulosa* (Mesquite) is present at some spots at the site. Indigenous herbaceous species include *Heliotropium ciliatum*, *Barleria macrostegia*, *Gazania krebsiana* and *Bulbine narcissifolia*. Indigenous grass species include *Aristida congesta*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Eragrostis curvula*, *Eragrostis superba* and *Melinis repens*. Owing to disturbances of past and present a number of alien invasive herbaceous weeds occur at the site. Conspicuous exotic weeds at the site are *Argemone ochroleuca*, *Schkuhria pinnata*, *Tagetes minuta*, *Bidens bipinnata*, *Conyza bonariensis*, *Datura* species, *Xanthium spinosum*, *Verbesina encelioides* and *Alternanthera pungens*.
- No rocky ridges are present at the site.
- No wetlands appear to be present at the footprint proposed for the development. One stream crossing is found at the site. At this Stream Crossing area, a non-perennial river, with a modified active channel and riparian zone, crosses the site.
- The active channel and riparian zone at the Stream Crossing area at the site are visibly disturbed in particular by excavations of the past. These disturbances are reflected in the riparian vegetation which does not appear to be in tact. Loose clumps of the rush *Juncus rigidus* and the sedge *Scirpoides dioecus* are found at the riparian zone, mixed with a mosaic of terrestrial vegetation. *Persicaria* species (Knotweeds) are found at the small permanent zones of the active channel. Trees and megagraminoids are absent.
- The vegetation type that represents the Savanna Biome at the site, the Kimberley Thornveld (SVk 4) is not listed as threatened according to the National List of Threatened Ecosystems (2011).
- No Threatened or Near Threatened plant or animal species appear to be resident at the site. No other plant or animal species of particular conservation concern are likely to be found at the strip allocated for the development.
- There is little scope for most of the site to be part of a corridor of particular conservation importance, excluding the watercourse (with its bufferzone) at the Stream Crossing area. The non-perennial river at that crosses the site, despite being extensively modified, is a corridor of particular conservation concern.
- Site is part of the Lower Vaal Water Management Area (WMA 10). The site is not part of a Freshwater Ecosystem Priority Area (FEPA) or wetland cluster (Nel *et al.*, 2011a, 2011b).

- Ecological sensitivity at most of the site is medium-low. Ecological sensitivity at the non-perennial active channel and riparian zone, despite its visibly modified condition, is medium-high owing to the importance of this watercourse as a conservation corridor in the larger area (Figure 4).
- Continued monitoring and eradication of alien invasive plant species are imperative. It is in particular declared alien invasive species such as *Prosopis glandulosa* (Mesquite), *Melia azedarach* (Syringa) and alien invasive Australian *Acacia* species (Australian wattles) that should not be allowed to establish.

11.2 WETLAND IMPACT ASSESSMENT (See Appendix B for a copy of this report)

CONCLUSION

- Wetlands that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at site.
- One stream crossing is found at the site. At this Stream Crossing area, a non-perennial river, with a modified active channel and riparian zone, crosses the site.
- The active channel and riparian zone at the Stream Crossing area at the site are visibly disturbed in particular by excavations of the past. These disturbances are reflected in the riparian vegetation which does not appear to be in tact. Loose clumps of the rush *Juncus rigidus* and the sedge *Scirpoides dioecus* are found at the riparian zone, mixed with a mosaic of terrestrial vegetation. *Persicaria* species (Knotweeds) are found at the small permanent zones of the active channel. Trees and megagraminoids are absent.
- Present ecological status (PES) of the Non-perennial River at the Stream Crossing area at the site is CATEGORY E which means the watercourse is seriously modified. The losses of natural habitats and basic ecosystem functions are extensive. The present ecological status is outside the general acceptable range (Table 4.2 and Table 4.3). Ecological Importance and Sensitivity (EIS) at the site is CATEGORY C which is Moderate and refers to floodplains that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers (Table 4.4 and Table 4.5).
- Site is part of the Lower Vaal Water Management Area (WMA 10). The site is not part of a Freshwater Ecosystem Priority Area (FEPA) or wetland cluster (Nel *et al.*, 2011a, 2011b).
- The non-perennial river, with its riparian zone and buffer zone, at the site is a corridor of particular conservation importance. The non-perennial river (with active channel, riparian zone and buffer zone) is excluded from the development as far as practical, with invasion limited to a largely existing footprint. Because the soil at the narrow strip allocated for the development will be closed again after inserting the pipeline, the risks for high impact is furthermore limited. The existing roads and footprint that cross the watercourse at present should be used as far as possible.
- The non-perennial river at the site, with its riparian zone and buffer zone, is likely to be impacted by the proposed developments, but to a limited extent on a largely existing footprint where the active channel and riparian zone are already highly modified. If the development is approved the construction should be planned in such a manner that surface flow function well while erosion is limited. There is no distinct indication that interflow plays an important role in the maintenance of the non-perennial river. The geomorphological setting and flow regime should be as similar as possible post development as to prior the development, if the development is approved. Loss of any wetland animal or plant species of particular conservation importance is not expected.
- Loss of wetland Threatened or Near Threatened Plants, Mammals, Reptiles, Amphibians and Invertebrates, or any other plant or animal species of particular conservation concern, at the proposed footprint appears to be unlikely.

- Rubble or waste could lead to infiltration of unwanted pollutants into the soil. Spilling of petroleum fuels and unwanted chemicals onto the soils that infiltrate these soils could lead to pollution of soils and also impact on water quality when the stream flows. Rubble or waste that could accompany the construction effort, if the development is approved, should be removed during and after construction. Measures should be taken to avoid any spills and infiltration of petroleum fuels or any chemical pollutants into the soil during construction phase.
- A rehabilitation plan which include the combating of alien invasive plant species at the watercourse is essential. Infestation by alien invasive species could replace indigenous vegetation or potential areas where indigenous vegetation could recover. Once established combatting these alien invasive plant species may become very expensive to combat in the long term, especially if species such as *Prosopis* (Mesquite) and *Melia azedarach* (Syringa Berry-tree) is allowed to establish. Continued monitoring and eradication of alien invasive plant species are imperative.
- The Negative Risk Rating in accordance with a risk matrix based on Section 21 c and (i) water use Risk Assessment Protocol and Notice 509 of 2016 (Government Gazette No. 40229: 105-133; Republic of South Africa) at the site is Low.

11.3 HERITAGE IMPACT ASSESSMENT (HIA) (See Appendix C for a copy of this report)

Background research indicates that there are some cultural heritage sites and features in the larger geographical area within which the study area falls. The assessment of the specific study area did not identify any sites, features or material of cultural heritage (archaeological and/or historical) origin or significance. Large parts of the proposed new water pipeline route has been transformed through both formal and informal urban settlement and related developments. This includes roads and the various water towers and waterworks in the area. The new lines also follow existing roads and water lines. Portions of the area would also have been utilized in the historic past for agricultural purposes. As a result of these various activities if any archaeological and/or historical sites did exist here in the past they would have been extensively disturbed or destroyed.

Some sections of the route (specifically on the dirt roads) were impassable as a result of heavy rains and these sections were therefore not assessed in detail. It is however believed that the likelihood of any cultural heritage resources being present here is very small.

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

Finally, from a Cultural Heritage point of view the proposed Geluksoord Extensions 2 & 3 Phase 3 – replacement of pipelines from the Pump Station to Utlwanang and Christiana Water Tower should be allowed to continue taking the above into consideration.

12. CONCLUSIONS AND RECOMMENDATIONS

The Dr Ruth Segomotsi Mompati District Municipality has appointed **AB Enviro Consult CC**, an independent environmental consultancy, to undertake an Environmental Impact Assessment for the proposed replacement pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa –Temane Local Municipality, North West Province.T

This Chapter of the BAR provides a summary of the findings of the impact assessment process, including the EAP's opinion as to whether the activity should or should not be authorised.

12.1 ENVIRONMENTAL IMPACT STATEMENT

The detailed environmental assessment for the proposed development, has not found any environmental impacts that *cannot* be mitigated to acceptable and manageable levels.

The proposed replacement pipe lines from the Pump Station to Utlwanang and Christiana water towers, which includes the excavation, removal or moving of soil, sand or rock of more than 10 cubic metres from a non-perennial stream on the Remaining Extent of Portion 1 of the Farm Christiana Town And Townlands 325 HO; Lekwa –Temane Local Municipality, North West Province.T

The land belongs to the local municipality and is in line with the objective to provide services (potable water to residential areas), it is further favourable as the proposal is for the replacement of an existing pipeline. The new pipeline will ensure adequate water capacity for future and existing residential developments in the area, specifically Geluksoord Ext. 2 & 3.

The proposed pipeline will provide job opportunities during the construction phase and thus the unemployment rate of the area will be reduced.

Taking into consideration the 2 Alternatives discussed in the report, the stream that will be crossed is a non-perennial stream and whilst excavation will mean the removal of vegetation and disturbance of soil within the streambed, this will be a temporary measure and once covered and rehabilitated there will be no evidence of the pipeline visible. It should be noted, as this is a non-perennial streams, chances are that there will be no water to be diverted at the time of construction. Therefore, in the long term the pipelines will have less visual impact and is less likely to be damaged. And lastly, considering the no-go alternative will entail that the status quo will remain and the need for potable water in the area (Specifically Geluksoord ext. 2 & 3) will not be addressed.

The **Fauna and Flora Habitat** study conducted revealed that no Threatened or Near Threatened plant or animal species appear to be resident at the site. No other plant or animal species of particular conservation concern appear to be present at the site.

The **Wetland Specialist** found that the non-perennial river at the site, with its riparian zone and buffer zone, is likely to be impacted by the proposed developments, but to a limited extent on a largely existing footprint where the active channel and riparian zone are already highly modified.

The **SAHRA Specialist** found no sites, features or material of cultural heritage (archaeological and/or historical) origin or significance were identified in the study area during the physical assessment. If any sites did exist here in the past it would have been largely disturbed or destroyed by recent development activities in the study and larger area around it.

A full Public Participation Process is being conducted and all objections or comments will be taken into consideration.

12.2 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

EMPR's aim to identify and minimise the potential impacts that the proposed construction and operational phases of the project may have on the receiving environment. An EMPR has been developed which is contained in Appendix D and includes detailed mitigatory measures for the construction phase.

As a general guideline, the EMPR should be based on a comprehensive set of environmental aspects (elements of the facility that can interact with the environment), and hence, the EMPR compiled for this application includes the following key components:

- Mechanisms for the on-going identification and assessment of environmental aspects and impacts;
- Environmental management programmes; objectives and targets;
- Environmental monitoring and reporting framework;
- Environmental management procedures; and,
- Mechanisms for the recording of environmental incidents and implementing corrective and preventative actions.

12.3 EAP OPINION

The information contained in this BAR and Specialist Studies, provides a detailed and comprehensive description of the proposed project, baseline environment and potential environmental impacts associated with the proposed development. As no significant impacts that cannot be mitigated were identified, AB Enviro Consult is of the opinion that the project should proceed, provided that the necessary mitigation and management measures are implemented.

Under South African environmental legislation, the Applicant is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts. The Applicant therefore has overall and total environmental responsibility to ensure that the implementation of the construction phase of the EMPR complies with the relevant legislation and the conditions of the environmental authorisation. The applicant will thus be responsible for the implementation of the EMPR.

The environmental management programme (EMPR) should form part of the contract between the construction company and the applicant. This will help ensure that the EMPR is adhered to. It is suggested that a suitably qualified Environmental Control Officer (ECO) be appointed for the construction phase.

12.4 CONDITIONS RECOMMENDED TO BE INCLUDED IN ANY AUTHORISATION THAT MAY BE GRANTED BY THE COMPETENT AUTHORITY IN RESPECT OF THE APPLICATION

The following recommendations has been identified for the pre-construction and construction phases of the proposed development

1. A full copy of the signed EA from DEDECT in terms of NEMA, granting approval for the development must be available on site
2. A copy of the EMPr as well as any amendments thereof must be available on site
3. A suitably qualified ECO must be appointed.
4. Impacts on the environment must be minimised during site establishment and the development footprint must be kept to the approved development area.
5. Vegetation clearing may not commence until such time as the development footprint has been clearly defined.
6. No clearance of vegetation outside of the development footprint may occur.
7. At the end of the construction phase the site and its surrounding area must be free from any pollution that originated as a result of the construction activities.
8. No disturbance of topsoil & subsoil may commence until such time as the development footprint has been clearly defined.
9. No disturbance of topsoil & subsoil outside of the development footprint may occur.
10. At the end of the construction phase the site and its surrounding area must be free from any chemical, fuel, oil and cement spills that originated as a result of the construction activities.
11. At the end of the construction phase the site and its surrounding area must be free from any sewage that originated as a result of the construction activities.
12. At the end of the construction phase the site and its surrounding area must be free from any hazardous or general waste pollution that originated as a result of the construction activities.
13. Dust prevention measures must be applied to minimise the generation of dust.
14. Noise prevention measures must be applied to minimise the generation of unnecessary noise pollution as a result of construction activities on site.
15. Absolutely no burning of waste is permitted.
16. Fires will only be allowed in facilities especially constructed for this purpose.
17. No hunting of animals will be allowed.
18. No intentional destruction of any sites, features or material of cultural heritage (archaeological and/or historical) origin or significance may occur.
19. All Contractors and sub-contractors must abide to the rules and regulations of the Occupational Health and Safety Act, 85 of 1993.

13. AFFIRMATION BY EAP

- | **Mr. Jean Pierre De Villiers** declare under oath that I:
- a. act as the independent environmental practitioner in this application ;
 - b. do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed;
 - c. do not have and will not have a vested interest in the proposed activity proceeding;
 - d. have no, and will not engage in, conflicting interests in the undertaking of the activity;
 - e. undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required;
 - f. will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
 - g. will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
 - h. will keep a register of all interested and affected parties that participated in a public participation process; and
 - i. will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

Name of company: AB Enviro Consult CC

Date:

Signature of the Commissioner of Oaths:

Date

Designation

Official stamp:

14. LIST OF REFERENCES

Department of Environmental Affairs and Tourism. 1992. Integrated Environmental Management. Pretoria, DEAT.

Department of Environmental Affairs and Tourism. 1998. *Guideline Document - EIA Regulations.* Pretoria, DEAT.

Department of Environmental Affairs. 1988. *Climate of South Africa, climate statistics up to 1984.* Weather Bureau (WB40). Pretoria, Government Printer.

Department of Transport, 19--. *Climate of South Africa Part 1 Climate statistics.* Weather Bureau (WB20). Pretoria Government Printer.

S. Cliff. 2015. Environmental Scoping report for the proposed high density residential township "Tanganani extension 7", to be located on a part of Portion 119 of the farm Diepsloot 388 JR, City of Johannesburg Municipality, Gauteng

**APPENDIX A:
ECOLOGICAL SPECIALIST REPORT**

**APPENDIX B:
WETLAND SPECIALIST REPORT**

**APPENDIX C:
SAHRA SPECIALIST REPORT**

**APPENDIX D:
ENVIRONMENTAL MANAGEMENT PROGRAMME**

**APPENDIX E:
SPECIALIST DECLARATION OF INDEPENDENCE (TO FOLLOW)**

**APPENDIX F:
PROOF OF BAR SENT TO DW&S**