agriculture
& environmental affairs

Department:
Agriculture
& Environmental Affairs
**PROVINCE OF KWAZULU-NATAL**

| | (For official use only) |
|---|---|
| EIA File Reference Number: | **DC23/0004/2013** |
| NEAS Reference Number: | KZN/EIA/ |
| Waste Management Licence Number: (if applicable) | |
| Date Received: | |

# BASIC ASSESSMENT REPORT

**Submitted in terms of the Environmental Impact Assessment Regulations, 2010promulgated in terms of the National Environmental Management Act, 1998(Act No. 107 of 1998)**

**This template may be used for the following applications**:

- **Environmental Authorization** subject to basic assessment for an activity that is listed in Listing Notices 1or 3, 2010 (Government Notices No. R 544 or No. R 546 dated 18 June 2010); or
- **Waste Management Licence** for an activity that is listed in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for which a basic assessment process as stipulated in the EIA Regulations must be conducted as part of the application (refer to the schedule of waste management activities in Category A of Government Notice No. 718 dated 03 July 2009).

**Kindly note that:**

1. This **basic assessment report** meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Agriculture& Environmental Affairs. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

9. The KZN Department of Agriculture& Environmental Affairs may require that for specified types of activities in defined situations only parts of this report need to be completed.
10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. **Please note that this report must be handed in or posted to the District Office of the KZN Department of Agriculture& Environmental Affairs to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).**

# DEPARTMENTAL REFERENCE NUMBER(S)

| | |
|---|---|
| File reference number (EIA): | **DC23/0004/2013** |
| File reference number (Waste Management Licence): | |

# SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

## 1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

| | | | |
|---|---|---|---|
| Business name of EAP: | SiVEST | | |
| Physical address: | VCC Estate, Northview Building | | |
| Postal address: | 170 Peter Brown Drive | | |
| Postal code: | Bush Shrike Close | **Cell:** | 083 657 2536 |
| Telephone: | Montrose | **Fax:** | 033 347 5762 |
| E-mail: | 3201 | | |

## 2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

| Name of representative of the EAP | Education qualifications | Professional affiliations | Experience at environmental assessments (yrs) |
|---|---|---|---|
| Dr. Richard Kinvig | BSc (Ph.D.) | *Pr.Sci.Nat* | 11 |
| Mrs Tarryn Curtis | BSc (Hons) | N/A | 7 |

## 3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

| Name of specialist | Education qualifications | Field of expertise | Section/ s contributed to in this basic assessment report | Title of specialist report/ s as attached in Appendix D |
|---|---|---|---|---|
| **Richard Kinvig *Pr.Sci.Nat.*** | **BSc Hons. (Zoology) Msc. Ph. D. Entomology** | **Vegetation Specialist** | **Section 4** | **Vegetation Assessment Report** |
| **Kurt Barachievy *Pr.Sci.Nat.*** | **Msc. Hydrology** | **Wetland Ecology** | **Section 3 and 4** | **Wetland Assessment Report** |

| | | | | |
|---|---|---|---|---|
| **Frans Prins** | **PhD candidate (Anthropology)** | **Heritage Specialist** | **Section 7** | **Heritage Assessment Report** |

# SECTION B: ACTIVITY INFORMATION

## 1. PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

Proposed Driefontein Complex Bulk Water Supply Pipeline, Phase 2, Kwa-Zulu Natal

## 2. PROJECT DESCRIPTION

Provide a detailed description of the project:

Uthukela District Municipality proposes to construct approximately 56 kilometres of potable bulk water pipe mains ranging between 500 & 600mm Ø from the existing Observation Hill reservoir site in Ladysmith to Hobsland in the Driefontein Complex, from where it will extend further to the existing Zandbult Reservoir at Ekuvukheni.

The proposed pipeline forms part of a larger project, which aims to upgrade infrastructure and supply potable water to the greater part of the uThukela District Municipality area. This pipeline will provide potable water to a number of communities in the greater Emnambithi and Indaka Local Municipality areas. This project will improve the infrastructure and services in the area, as well as to improve the lifestyle of the communities. In turn will potentially promote Local Economic Development.

Phase 1 of the project from Observation Hill to Hobsland has already received approval. Phase 2 of the pipeline, for which this Basic Assessment is undertaken, is 49 km's long with the bulk water pipeline size 600mm Ø. A smaller pipeline of 250mm Ø runs for 5,4 km to Matiwaneskop and a 200m Ø feeds for 8,6 km up to Steincoalspruit. The bulk pipeline ends at the Zandbult Reservoir at Ekuvukheni. 1 new 5 Ml reservoir will be constructed along the pipe route to aid as a balancing and storage structure.

## 3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June 2010) is being applied for as per the project description:

**GNR 544 18 June 2010, Activity 9:**

*The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water*

- *i) With an internal diameter of 0,36 meters or more or*
- *ii) With a peak through put of 120 litres per second or more*

*Excluding where:*

- *a) Such facilities or infrastructure are for bulk transportation of water , sewage or storm water or storm water drainage inside a road reserve*

*Where such construction will occur within urban area but further than 32 metres from a watercourse, measured from the edge of the watercourse.*

**GNR 544 18 June 2010 Activity 11:**

*The construction of:*

- *i) canals;*
- *ii) channels;*
- *iii) bridges;*

*iv) dams;*
*v) weirs;*
*vi) bulk storm water outlet structures;*
*vii) marinas;*
*viii) jetties exceeding 50m² in size;*
*ix) slipways exceeding 50m² in size;*
*x) buildings exceeding 50m² in size;*
*xi) infrastructure or structures covering 50m² or more*

*where such construction occurs within a watercourse or within 32 metres of a watercourse, excluding where such construction will occur behind the development setback line.*

**GNR 544 18 June 2010 Activity 18:**
The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shell grit, pebbles or rock from

(i) a water course
(ii) the sea
(iii) the seashore
(iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater –

but excluding where such infilling, depositing, dredging, excavation, removal or moving

(i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or
(ii) occurs behind the development setback line.

## 4. 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.

Describe alternatives that are considered in this report. Alternatives should include 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 must in all cases be included in the assessment phase as the 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 needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

**Water Pipeline Route Alternatives**

**S1: Alternative Water Pipeline Route Identified by the Specialist Reports**

An alternative route for the water pipeline has been recommended by the vegetation and wetland specialists, which avoids environmentally sensitive areas. in addition, consultation with the landowners also resulted in a diversion from the original route. See **Appendix C**.

**S2: The original Water Pipeline Route**

The first route of the water pipeline suggested by the Applicant is illustrated in the site plan in **Appendix C**.

**Alternatives not considered**

**Property alternatives**

No land owners have objected to the pipeline, therefore there is no need to investigate the need for additional property alternatives.

- The proposed route is the easiest and shortest route and therefore the most cost effective in this regard. The ecological assessments (Wetland and Vegetation) were commissioned to investigate watercourses and sensitive vegetation that will be affected by the route, and to make re-alignment recommendations, where necessary.

**Pipeline design**

- The proposed pipe design is PVC. Although plastic pipes are non-decomposing, they tend to have fewer impacts on the area in which they are located, compared to cement-concrete and steel pipes.
  - ❖ Plastic pipes are rust resistant.
  - ❖ They are light in weight and therefore reduce the cost of handling, transportation and installation.
  - ❖ Fewer joints facilitates the speed of construction and reduces chances of leakage.
  - ❖ These pipes have good elastic properties and have good adaptability to earth movements.
  - ❖ Smooth internal surface of the pipes offer less friction and this saves the energy in the conveyance of water.

The “no-go” option addresses the scenario of the status-quo remaining the same, with no development on the proposed pipe line. The proposed activity has been assessed in this report against the no-go option.

Sections B 5 – 15 below should be completed for each alternative.

## 5. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

| | **Latitude (S):** | **Longitude (E):** |
|---|---|---|
| **Alternative:** | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Alternative S1[1] (preferred or only site alternative) | o | ‘ | “ | o | ‘ | “ |
| Alternative S2 (if any) | o | ‘ | “ | o | ‘ | “ |
| Alternative S3 (if any) | o | ‘ | “ | o | ‘ | “ |

**In the case of linear activities:**

| **Alternative:** | **Latitude (S):** | | | **Longitude (E):** | | |
|---|---|---|---|---|---|---|
| Alternative S1 (preferred or only route alternative) | | | | | | |
| • Starting point of the activity | 28o | 27‘ | 07.29“ | 29o | 52‘ | 37.20“ |
| • Middle point of the activity | 28o | 23‘ | 11.78“ | 29o | 58‘ | 21.83“ |
| • End point of the activity | 28o | 27‘ | 35.63“ | 30o | 08‘ | 38.63“ |
| Alternative S2 (if any) | | | “ | | | “ |
| • Starting point of the activity | 28o | 27‘ | 07.29“ | 29o | 52‘ | 37.20“ |
| • Middle point of the activity | 28o | 23‘ | 11.78“ | 29o | 58‘ | 21.83“ |
| • End point of the activity | 28o | 27‘ | 35.63“ | 30o | 08‘ | 38.63“ |
| Alternative S3 (if any) | | | “ | | | “ |
| • Starting point of the activity | o | ‘ | “ | o | ‘ | “ |
| • Middle point of the activity | o | ‘ | “ | o | ‘ | “ |
| • End point of the activity | o | ‘ | “ | o | ‘ | “ |

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500m along the route for each alternative alignment.

## 6. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

| **Alternative:** | **Size of the activity:** |
|---|---|
| Alternative A1[2] (preferred activity alternative) | m² |
| Alternative A2 (if any) | m² |
| Alternative A3 (if any) | m² |

or, for linear activities:

| **Alternative:** | **Length of the activity:** |
|---|---|
| Alternative A1 (preferred activity alternative) | 47.7km |
| Alternative A2 (if any) | 49km |
| Alternative A3 (if any) | m |

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

| **Alternative:** | **Size of the site/servitude:** |
|---|---|
| Alternative A1 (preferred activity alternative) | m² |

[1] “Alternative S..” refer to site alternatives.
[2] “Alternative A..” refer to activity, process, technology or other alternatives.

| | |
|---|---|
| Alternative A2 (if any) | $m^2$ |
| Alternative A3 (if any) | $m^2$ |

## 7. SITE ACCESS

| | |
|---|---|
| Does ready access to the site exist? | YES✓ NO |
| If NO, what is the distance over which a new access road will be built | m |
| Describe the type of access road planned: | |

There are sections that will need to be cleared for roads.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

## 8. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this report.

The site or route plans must indicate the following:

8.1. the scale of the plan which must be at least a scale of 1:500;
8.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
8.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
8.4. the exact position of each element of the application as well as any other structures on the site;
8.5. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
8.6. walls and fencing including details of the height and construction material;
8.7. servitudes indicating the purpose of the servitude;
8.8. sensitive environmental elements within 100metres of the site or sites including (but not limited thereto):
- rivers, streams, drainage lines or wetlands;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);

8.9. for gentle slopes the 1metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
8.10. the positions from where photographs of the site were taken.

## 9. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

## 10. FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

## 11. ACTIVITY MOTIVATION

### 11.1. Socio-economic value of the activity

| | |
|---|---|
| What is the expected capital value of the activity on completion? | R 100 million |
| What is the expected yearly income that will be generated by or as a result of the activity? | R 2,5 million |
| Will the activity contribute to service infrastructure? | YES / NO |
| Is the activity a public amenity? | YES / NO |
| How many new employment opportunities will be created in the development phase of the activity? | 300 |
| What is the expected value of the employment opportunities during the development phase? | R 10 million |
| What percentage of this will accrue to previously disadvantaged individuals? | 100 % |
| How many permanent new employment opportunities will be created during the operational phase of the activity? | 10 |
| What is the expected current value of the employment opportunities during the first 10 years? | R 12 million |
| What percentage of this will accrue to previously disadvantaged individuals? | 100% |

### 11.2. Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The proposed pipe line forms part of a larger project, which aims to upgrade infrastructure and supply potable water to the greater part of the uThukela District Municipality area. This pipeline will provide potable water to a number of communities in the greater Emnambithi and Indaka Local Municipality areas. This project will improve the infrastructure and services in the area, as well as improve the lifestyle of the communities. In turn will potentially promote Local Economic Development.

Indicate any benefits that the activity will have for society in general:

Potable water will be provided to the local community in the Ladysmith-Indaka area. This will improve their quality of life and access to basic needs.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

Potable water will be provided to the local community in the Ladysmith-Indaka area. This will improve their quality of life and access to basic needs.

## 12. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

| Title of legislation, policy or guideline: | Administering authority: | Date: |
|---|---|---|
| **The Constitution of the Republic of South Africa**, Section 24 (Environmental Right):<br>"*1) Everyone has the right :*<br>*a) to an environment that is not harmful to their health or well-being; and*<br>*b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that*<br>*i) prevent pollution and ecological degradation;*<br>*ii) promote conservation; and*<br>*iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."* | The Constitutional Assembly | 1996 |
| **National Environmental Management Act, Act No. 107 (NEMA)** | National Department of Environmental Affairs (DEA) | 1998 |
| **NEMA EIA Guidelines** | National Department of Environmental Affairs (DEA) | 2010 |
| **National Environmental Management – Air Quality Act, Act No. 39 of 2004** | National Department of Environmental Affairs (DEA) | 2004 |
| **National Environmental Management – Protected Areas Act, Act No. 57 of 2003** | National Department of Environmental Affairs (DEA) | 2003 |
| **National Heritage Act, Act No. 25 of 1999** | South African Heritage Resources Agency | 1999 |
| **National Water Act, Act No. 36 of 1996** | National Department of Water Affairs (DWA) | 1998 |
| **National Forests Act, Act No. 84 of 1998** | National Department of Agriculture | 1998 |
| **Occupational Health and Safety Act, Act No 85** | Department of Labour | 1993 |
| **Hazardous Substances Act, Act No. 15 of 1973** | Department of Health | 1973 |
| **Emnambiti Bylaws** | Emnambiti Municipality | |

## 13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### 13.1. Solid waste management

| | | |
|---|---|---|
| Will the activity produce solid construction waste during the construction/initiation phase? | YES✓ | NO |
| If yes, what estimated quantity will be produced per month? | 10m³ | |

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

| |
|---|
| Solid waste will be transported to the nearest landfill site. |

Where will the construction solid waste be disposed of? (provide details of landfill site)

| |
|---|
| Ladysmith Landfill Site. |

| | | |
|---|---|---|
| Will the activity produce solid waste during its operational phase? | YES | NO✓ |
| If yes, what estimated quantity will be produced per month? | m³ | |

How will the solid waste be disposed of? (provide details of landfill site)

| |
|---|
| |

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

| |
|---|
| |

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

| | | |
|---|---|---|
| Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? | YES | NO✓ |

**If yes, contact the KZN Department of Agriculture& Environmental Affairs to obtain clarity regarding the process requirements for your application**.

| | | |
|---|---|---|
| Is the activity that is being applied for a solid waste handling or treatment facility? | YES | NO✓ |

**If yes, contact the KZN Department of Agriculture& Environmental Affairs to obtain clarity regarding the process requirements for your application.**

### 13.2. Liquid effluent

| | | |
|---|---|---|
| Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? | YES | NO✓ |
| If yes, what estimated quantity will be produced per month? | m³ | |
| Will the activity produce any effluent that will be treated and/or disposed of on site? | Yes | NO✓ |

**If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.**

| | | |
|---|---|---|
| Will the activity produce effluent that will be treated and/or disposed of at another facility? | YES | NO✓ |

If yes, provide the particulars of the facility:

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

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

| |
|---|
| |

### 13.3. Emissions into the atmosphere

| | | |
|---|---|---|
| Will the activity release emissions into the atmosphere? | YES | NO✓ |
| If yes, is it controlled by any legislation of any sphere of government? | YES | NO |

**If yes, contact the KZN Department of Agriculture& Environmental Affairs to obtain clarity regarding the process requirements for your application.**

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

| |
|---|
| |

### 13.4. Generation of noise

| | | |
|---|---|---|
| Will the activity generate noise? | YES✓ | NO |
| If yes, is it controlled by any legislation of any sphere of government? | YES | NO✓ |

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

If no, describe the noise in terms of type and level:

| |
|---|
| General construction noise will be experienced. |

## 14. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

| municipal | water board | groundwater | river, stream, dam or lake | other | the activity will not use water |
|---|---|---|---|---|---|
| | | | | | |

| | | |
|---|---|---|
| If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: | | litres |
| Does the activity require a water use permit from the Department of Water Affairs? | YES | NO✓ |

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report.

## 15. ENERGY EFFICIENCY

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

| |
|---|
| The design of the pipe line is such that all possible opportunities have been identified to ensure that water movement is via gravity as opposed to resorting to alternatives, such as pumping. Pumping of water will be required but is significantly reduced as a result of the current pipe line alignment. |

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

No alternative energy sources have been considered, as currently the only potential energy sources are solar, which will require panels that are often the target of malicious damage.

# SECTION C: SITE/AREA/PROPERTY DESCRIPTION

**Important notes:**

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A): 

- Subsections 1 - 6 below must be completed for each alternative.

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

**Alternative S1:**

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

**Alternative S2 (if any):**

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

**Alternative S3 (if any):**

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

## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site **(Please cross the appropriate box)**.

**Alternative S1 (preferred site):**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ridgeline | Plateau | Side slope of hill/mountain | Closed valley | Open valley | Plain | Undulating plain/low hills | Dune | Sea-front |

**Alternative S2 (if any):**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ridgeline | Plateau | Side slope of hill/mountain | Closed valley | Open valley | Plain | Undulating plain/low hills | Dune | Sea-front |

**Alternative S3 (if any):**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ridgeline | Plateau | Side slope of hill/mountain | Closed valley | Open valley | Plain | Undulating plain/low hills | Dune | Sea-front |

## 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

| | | | |
|---|---|---|---|
| Has a specialist been consulted for the completion of this section? | | YES✓ | NO |
| If YES, please complete the following: | | | |
| Name of the specialist: | Kurt Barachievy | | |
| Qualification(s) of the specialist: | Wetland Ecologist | | |
| Postal address: | P.O.Box 707, Msunduzi, 3231 | | |
| Postal code: | 4320 | | |
| Telephone: | 033 347 1600 | Cell: | 033 347 5762 |
| E-mail: | kurtb@sivest.co.za | Fax: | |
| Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? | | YES✓ | NO |
| If YES, specify and explain: | There are a number of good quality wetland areas that will be crossed by Alternative 2. | | |
| Are their any special or sensitive habitats or other natural features present on any of the alternative sites? | | YES✓ | NO |
| If YES, specify and explain: | Although wetland areas will still be crossed by Alternative 1 the route will be diverted around the most sensitive areas, and wetlands that will be crossed are classed as poor quality. | | |
| Are any further specialist studies recommended by the specialist? | | YES | NO✓ |
| If YES, specify: | | | |
| If YES, is such a report(s) attached in Appendix D? | | YES✓ | NO |

Signature of specialist: 

Date: 5th November 2013

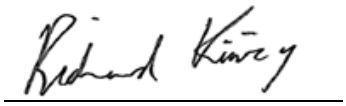
Is the site(s) located on any of the following (cross the appropriate boxes)?

| | Alternative S1: | | Alternative S2 (if any): | | Alternative S3 (if any): | |
|---|---|---|---|---|---|---|
| Shallow water table (less than 1.5m deep) | YES✓ | NO | YES | NO | YES | NO |
| Dolomite, sinkhole or doline areas | YES✓ | NO | YES | NO | YES | NO |
| Seasonally wet soils (often close to water bodies) | YES✓ | NO | YES | NO | YES | NO |
| Unstable rocky slopes or steep slopes with loose soil | YES | NO✓ | YES | NO | YES | NO |
| Dispersive soils (soils that dissolve in water) | YES | NO✓ | YES | NO | YES | NO |
| Soils with high clay content (clay fraction more than 40%) | YES | NO✓ | YES | NO | YES | NO |
| Any other unstable soil or geological feature | YES | NO✓ | YES | NO | YES | NO |
| An area sensitive to erosion | YES✓ | NO | YES | NO | YES | NO |

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

## 4. GROUNDCOVER

| | | | |
|---|---|---|---|
| Has a specialist been consulted for the completion of this section? | | YES✓ | NO✓ |
| If YES, please complete the following: | | | |
| Name of the specialist: | Dr Richard Kinvig | | |
| Qualification(s) of the specialist: | Botanical Specialist | | |
| Postal address: | P.O.Box 707, Msunduzi, 3231 | | |
| Postal code: | 4320 | | |
| Telephone: | 033 347 1600 | Cell: | |
| E-mail: | richardk@sivest.co.za | Fax: | 033 347 5762 |
| Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? | | YES✓ | NO |
| If YES, specify and explain: | Rare and protected species such as *Elephantorrhiza woodii*, *Jatropha woodii, Ipomoea* cf.*bathycolpos*are present along the route. *Crinum bulbispermum, Ledebouria* sp. (three species) and *Cyrtanthus stenophylla* (seen outside of the servitude but will occur within it) will require special attention and will need to be relocated outside of the servitude, should the trenches remain open for extended periods of time. | | |
| Are their any special or sensitive habitats or other natural features present on any of the alternative sites? | | YES✓ | NO |
| If YES, specify and explain: | Rare and protected species such as *Elephantorrhiza woodii*, *Jatropha woodii, Ipomoeac* f.*bathycolpos*were noted along the route. *Crinum bulbispermum, Ledebouria* sp. (three species) and *Cyrtanthus stenophylla* (seen outside of the servitude but will occur within it) will require special attention and will need to be relocated outside of the servitude, should the trenches remain open for extended periods of time. | | |
| Are any further specialist studies recommended by the specialist? | | YES | NO✓ |
| If YES, specify: | | | |
| If YES, is such a report(s) attached in Appendix D? | | YES✓ | NO |

Signature of specialist:  Date: 5th November 2013

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

| | | | | |
|---|---|---|---|---|
| Natural veld - good condition[E] | Natural veld with scattered aliens[E] | Natural veld with heavy alien infestation[E] | Veld dominated by alien species[E] | Gardens |
| Sport field | Cultivated land | Paved surface | Building or other structure | Bare soil |

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

## 5. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

| **Land use character** | | | **Description** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Natural area | YES✓ | NO | The area is dominated by open natural areas. |
| Low density residential | YES | NO✓ | |
| Medium density residential | YES✓ | NO | The pipeline ends close to the town of Ekuvukeni. |
| High density residential | YES | NO✓ | |
| Informal residential | YES✓ | NO | The informal residential area is located adjacent to the N11 and in Ekuvukeni. |
| Retail commercial & warehousing | YES | NO✓ | |
| Light industrial | YES | NO✓ | |
| Medium industrial | YES | NO✓ | |
| Heavy industrial | YES | NO✓ | |
| Power station | YES | NO✓ | |
| Office/consulting room | YES | NO✓ | |
| Military or police base/station/compound | YES | NO✓ | |
| Spoil heap or slimes dam | YES | NO✓ | |
| Quarry, sand or borrow pit | YES | NO✓ | |
| Dam or reservoir | YES✓ | NO | 3 existing reservoirs and a number of small farm dams are located within the pipeline servitude. |
| Hospital/medical centre | YES | NO✓ | |
| School/ creche | YES | NO✓ | |
| Tertiary education facility | YES | NO✓ | |
| Church | YES | NO✓ | |
| Old age home | YES | NO✓ | |
| Sewage treatment plant | YES | NO✓ | |
| Train station or shunting yard | YES | NO✓ | |
| Railway line | YES✓ | NO | A railway line runs adjacent along a portion of the pipeline. |
| Major road (4 lanes or more) | YES | NO✓ | |
| Airport | YES | NO✓ | |
| Harbour | YES | NO✓ | |
| Sport facilities | YES | NO✓ | |
| Golf course | YES | NO✓ | |
| Polo fields | YES | NO✓ | |
| Filling station | YES | NO✓ | |
| Landfill or waste treatment site | YES | NO✓ | |
| Plantation | YES | NO✓ | |
| Agriculture | YES✓ | NO | The pipeline crosses through or near a number of private and small scale subsistence farms. |
| River, stream or wetland | YES✓ | NO | A number of small seasonal streams will be crossed by the pipeline. |
| Nature conservation area | YES✓ | NO | The Nambiti Private Game Reserve is located approximately 100 metres from the pipeline route. |
| Mountain, hill or ridge | YES✓ | NO | A portion of the pipeline, leading to the reservoir which is located on top of a hill. |
| Museum | YES | NO✓ | |
| Historical building | YES | NO✓ | |
| Protected Area | YES | NO✓ | |
| Graveyard | YES✓ | NO | A number of graves are located in the area, |

| | | | |
|---|---|---|---|
| | | | however none along or near the route. |
| Archaeological site | YES | NO✓ | |
| Other land uses (describe) | YES | NO✓ | |

### 6. CULTURAL/HISTORICAL FEATURES

| | | |
|---|---|---|
| Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site? | YES | NO✓ |
| If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment.The heritage impact assessment must be attached as an appendix to this report. | | |
| Briefly explain the recommendations of the specialist: | The construction of the proposed water pipelines along the preferred route as identified by the developer may proceed in terms of heritage values as no known heritage sites are in any immediate danger of being damaged or altered. | |
| Will any building or structure older than 60 years be affected in any way? | YES | NO✓ |
| Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? | YES | NO✓ |
| If YES, please submit the necessary application to AMAFA and attach proof thereof to this report. | | |

## SECTION D: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;

(b) giving written notice to—
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

(iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
(v) the local and district municipality which has jurisdiction in the area;
(vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
(vii) any other party as required by the competent authority;

(c) placing an advertisement in—
(i) one local newspaper; or
(ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation54(c)(ii); and

(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
(i) illiteracy;
(ii) disability; or
(iii) any other disadvantage.

- **10 signboards (5 English and 5 Zulu) were placed along the proposed route on the 10th of April 2013.**
- **An English advert was placed in The Witness and a Zulu Advert in the Ilanga Newspaper on the 16th of April 2013.**
- **Authorities including the Department of Water Affairs, Department of Transport, Ezemvelo KZN Wildlife, WESSA, Uthukela District Municipality, Indaka Local Municipality, Emnambiti Local Municipality and the local ward councillor.**
- **All landowners were notified of the project through email or handouts and were invited to a meeting held on the 4th of September 2013.**

## 2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

(a) indicate the details of the application which is subjected to public participation; and
(b) state—
(i) that an application for environmental authorization has been submitted to theKZN Department of Agriculture& Environmental Affairs in terms of the EIA Regulations, 2010;(ii)
(iii) a brief project description that includes the nature and location of the activity to which the application relates;
(iv) where further information on the application can be obtained; and
(iv) the manner in which and the person to whom representations in respect of the application may be made.

## 3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

## 4. DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Agriculture& Environmental Affairs as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

## 5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

## 6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

| Has any comment been received from the district municipality? | YES | NO✓ |
|---|---|---|

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

| Has any comment been received from the local municipality? | YES | NO✓ |
|---|---|---|

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

| |
|---|
| |

| | | |
|---|---|---|
| Has any comment been received from a traditional authority? | YES | NO✓ |

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

| |
|---|
| |

### 7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

| | | |
|---|---|---|
| Has any comment been received from stakeholders? | YES | NO✓ |

| |
|---|
| |

## SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

| **None raised to date** |
|---|
| |

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached as Appendix E to this report):

| |
|---|
| |

### 2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIEDIMPACTS ANDPROPOSED MITIGATION MEASURES

#### 2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

#### a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the planning and design phase:

**Alternative S1 (Preferred Alternative by the Applicant and Wetland Specialist)**

| ***Direct impacts:*** |
|---|
| Site vegetation |

Construction activities often involve the clearing of large areas of natural vegetation; this can have a significant adverse impact if the vegetation is of good quality and ecologically important. As the majority of the route runs within the road reserve and boundaries of private landowners, very little natural vegetation will be affected. In addition, sections of the route where protected and red data species will be affected, these species can easily be removed and translocated to outside of the route. Therefore no protected species should be lost or affected.

Wetland crossings

Direct disturbances to the wetlands associated with the construction of the underground pipelines include the clearing of wetlands along the pipeline construction zone, the excavation of a trench within the wetland and the compaction of the wetland vegetation and soils by heavy vehicles involved in the excavations and the laying of the pipes. Indirect disturbances arising from these direct impacts include erosion, sedimentation and alien plant encroachment.

The alternative route bypasses sections of good quality wetlands. Wetland units that will be crossed are moderately disturbed and the impact of trenching on the vegetation communities and wetland soils should be low provided that the site is rehabilitated after the completion of construction. However, the clearing of vegetation will increase the risk of erosion, especially during the wet season. In this case, the gradients are low and thus the erosion risk is relatively low. However, there is always the risk of erosion during intense storms and thus measures must be put in place to minimise erosion risks and to maintain the current functionality of the wetland units.

Improved Infrastructure

The provision of the water pipeline will increase the supply of water to the Ladysmith-Indaka area, for which the current bulk water supply is insufficient. This will improve the basic service in the area as well as improve the quality of life, especially to those living in more rural areas.

***Indirect Impacts***

Cultural Resources:

Construction activities can impact on Cultural Resources, however as no heritage artefacts are located along the route this is unlikely to occur.

Private Landowners

As the majority of the pipeline runs inside the boundary of a number of landowners this can have an adverse effect on these owners. As the majority of the properties are farms, construction and operational activities can cause damage to crops or disturbance to livestock. All of the landowners have been consulted with one on one and to date all have given their consent for the pipeline to pass through their land.

***Cumulative Impacts:***

Impact on Biodiversity

The proposed route and associated infrastructure will result in vegetation clearing and impacts on wetlands which can lead to an overall loss of biodiversity. In addition, the influx of construction workers and activities into the area can impact on diversity through improper waste disposal, downstream water pollution, removal of plant species and poaching. However, as the pipeline route is located mainly adjacent to the road reserve and within farmlands, and the most sensitive areas have been avoided this is unlikely.

**Alternative S2 (if any)**

***Direct impacts:***

Site vegetation

Construction activities often involve the clearing of large areas of natural vegetation; this can have a significant adverse impact if the vegetation is of good quality and ecologically important. As the majority of the route runs within the road reserve and boundaries of private landowners very little natural vegetation will be affected. In addition, sections of the route where protected and red data species will be affected these species can easily be removed

and translocated to outside of the route. Therefore no protected species should be lost or affected.

Wetland crossings

Direct disturbances to the wetlands associated with the construction of the underground pipelines include the clearing of wetlands along the pipeline construction zone, the excavation nof a trench within the wetland and the compaction of the wetland vegetation and soils by heavy vehicles involved in the excavations and the laying of the pipes. Indirect disturbances arising from these direct impacts include erosion, sedimentation and alien plant encroachment.

The Alternative 2 route cuts through a number of good quality wetlands. This will have a severely adverse effect on the wetlands and watercourse crossings. In addition, construction and maintenance in wetlands areas will be more challenging.

Improved Infrastructure

The provision of the water pipeline will increase the supply of water to the Ladysmith-Indaka area, for which the current bulk water supply is insufficient. This will improve the basic service in the area as well as improve the quality of life, especially to those living in more rural areas.

***Indirect Impacts***

Private Landowners

As the majority of the pipeline runs inside the boundary of a number of landowners this can have an adverse effect on these owners. As the majority of the properties are farms, construction and operational activities can cause damage to crops or disturbance to livestock. All of the landowners have been consulted with one on one and to date all have given their consent for the pipeline to pass through their land.

Cultural Resources:

Construction activities can impact on Cultural Resources, however as no heritage artefacts are located along the route this is unlikely to occur.

***Cumulative Impacts:***

Impact on Biodiversity

The proposed route and associated infrastructure will result in vegetation clearing and impacts on wetlands which can lead to an overall loss of biodiversity. In addition, the influx of construction workers and activities into the area can impact on diversity through improper waste disposal, downstream water pollution, removal of plant species and poaching. The main concern with Alternative 2 is the location of the pipeline running through good quality wetlands, and the long term impact this may have.

**No-go alternative (compulsory)**

***Direct impacts:***

Wetlands

The wetland areas and watercourses will remain as is. However, proper rehabilitation will ensure that the wetland will continue to function at the same level after construction. Construction and operational activities can impact on wetlands through erosion and loss of riparian vegetation.

Vegetation

The vegetation on the site will not be impacted on and no vegetation species will be lost. In addition, there will be no potential for soil erosion to occur from construction activities and the possibility for alien vegetation encroachment will be reduced. However, the current state of the vegetation on the site is fairly disturbed and in poor condition. By ensuring the site is rehabilitated correctly after construction is complete the impact should be very low.

No improved infrastructure

The current infrastructure for water supply will remain as is. Hence the need to increase the number of people who receive potable water in the Ladysmith-Driefontein Area will not be achieved. The amount of area that will be included into this plan runs along the boundaries of the landowners and hence the vegetation that will be disturbed is disturbed and not of high ecological value.

***Cumulative impacts:***

Impact on Biodiversity

The biodiversity *status quo* of the site will remain as no species will be lost. However, as the site is already disturbed and impacted on daily by human activities, it is highly unlikely that the current environment will recover to a degree where it can sustain a healthy population of diverse species without serious rehabilitation and intervention. In addition, with mitigation measures, the short term construction activities are unlikely to have a high impact on the biodiversity of the site.

Indicate mitigation measures to manage the potential impacts listed above:

**Alternative S1 and S2**

Vegetation Clearance

- The top soil, nominally 250 mm, should be cleared and stockpiled separately. The sub-soil and topsoil should be stock piled on opposite sides of the trench so as to prevent the incorrect sequence of back filling of the soils and the resultant loss of soil profile and integrity.
- The entire working servitude width is to be determined in conjunction with the Engineer and the Environmental Control Officer, however, our recommendation is that should the use of OPVC be accepted then the servitude width should not exceed 8 (eight) metres. In difficult areas and steep portions of the proposed pipe line alignment we would suggest reducing the width to the minimal acceptable width, which would allow for the pipe sections to be walked in and placed in the trench, i.e. reduce the width to 6 (six) metres.
- Sub-soil must be well compacted around the pipe once the pipe has been bedded on the correctly sourced bedding material, traditionally an evenly graded sandy material with a very low clay content.
- The area of excavation should not precede the laying of the pipe line by more than a single working week;
- Once the pipe line excavation has been backfilled the top soil should be placed and lightly compacted;
- Thereafter a light watering of the replaced soil will be essential. It is also advised that the topsoil which has been excavated is lightly watered every second day while outside of the trench however, this may pose a significant issue and may not be possible.
- In steep areas, it is essential that cross berms, or some erosion control mechanisms are put in place to ensure that the pipe line is protected as well as the rehabilitation efforts are afforded an opportunity to succeed;
- This will be required, particularly in areas on Saders Farm, Hobsland and on portions of the two adjoining farms where the pipe line is proposed to traverse steep slopes. Other areas that will require similar measures are the ingress to the reservoir at Jonono's Kop and the ingress to the reservoir in Wasbank and Ekuvhukeni.
- Given the high volume of rock in these areas we would propose that this rock is utilised at intervals of approximately 2 metres on slopes greater than 120, or where its lowest outfall point will coincide with well established vegetation. These rock berms are to be put in place to check storm water velocity, reduce the scour potential of storm water and prevent all the valuable topsoil from being gathered up and displaced at the bottom of the excavation.
- The rapid excavation and replacement of the soils should result in the current seed bank within the

soils being impacted upon only a very low level;
- The seed bank will thus supplement the proposed re-seeding that must take place, utilising the standard NPA mix;
- Regular watering will be required of the seeded areas, unless hydro-seeding is utilised which will have significantly higher initial input costs, however, the results and coverage will reduce the ongoing input costs;
- The regular control and management of alien invasive species will be required. It is our recommendation that every 3 months for a year post construction, the pipe line servitude is revisited and the alien vegetation removed, either through hand-pulling. Where this is not possible or appropriate the very carefully monitored application of chemical herbicides.

Management of Storm water runoff and soil erosion

- Storm water control during construction phase as per the method approved and included in the EMP.
- The trench surface must be engineered and shaped in such a way that rapid and efficient evacuation of runoff is achieved.
- Excavations and other clearing activities should only be done during agreed working times and permitting weather conditions to avoid soil compaction and erosion.
- Avoid excessively steep cuttings and embankments.
- Appropriate design standards should be applied.
- Care must be taken to ensure that water is prevented from entering the excavation. In this regard, consideration could be given to forming an earth bund around the excavation.
- Silt fences, sandbags and spoil rock must be on hand at all times to assist in establishing temporary runoff control measures and should be used wherever necessary to proactively control erosion and trap sediment.
- Silt traps and sandbags must be used to reduce the energy of surface runoff and capture sediment along the sloping portions.
- Erosion gullies and rills within the construction ROW must be rehabilitated immediately and the root cause of the erosion dealt with immediately.
- The unnecessary removal of groundcover vegetation from slopes must be prevented and only vegetation within the demarcated construction right-of-way (ROW) must be cleared.
- Rehabilitate all excavated and cleared sites during construction, as soon as possible after the disturbance has ceased.

Hazardous Substances Handling

- It is recommended that no cement mixing take place on site. Ready mix concrete should be used instead.
- Contaminated water must be contained & disposed of off site at an approved landfill.
- No vehicle maintenance to be allowed on site.
- If oil spills occur the contaminated soil should be disposed of at an approved landfill site.
- No impacts on quality of surface and ground water should be allowed.
- Chemical toilets shall not be placed on steep areas and areas with intact vegetation. Exact location of toilets to be approved with the Engineer and ECO prior to construction.
- Topsoil and subsoil seepage shall be protected from contamination.

Wetlands:

- Silt fences and sandbags should be established down-slope of the construction site to protect the downstream slopes from erosion and sedimentation.
- De-watering must be done in a controlled manor. De-watering should discharge into silt traps / lagoons in order reduce sediment and runoff velocities.
- The in-stream silt fences should be erected downstream before activities are initiated.
- The fluming of the stream was undertaken quickly and efficiently resulting in as little silt kick-up as possible.
- All bare surfaces and slopes must be re-vegetated immediately on completion of platform and embankment shaping with an indigenous grass mix suitable for the area.
- The crossings must be checked for erosion rills and gullies after rainfall events and erosion rills and gullies must be rehabilitated immediately.
- Additional silt fences and sandbags must be used to control and manage runoff along erosion scars and preferential flow paths onsite if necessary.

Biodiversity

- Removal of any indigenous tree species on site shall have prior approval from the Engineer and the ECO.
- Vegetation clearance and exposing soils at places where development is not taking place or where access is not required shall not be permitted.
- Any soil material imported onto site shall have a clearance certificate with regard to potential weed's seeds and be sourced from a registered permitted provider.
- No storage of hazardous materials to be allowed near water courses and no unauthorized access to these storage areas.
- Appropriate piling of topsoil and subsoil, soil erosion control to guard against sedimentation of nearby drainage lines and wetlands is required.
- No construction workers shall be allowed into any areas without permission.

### b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

**Alternative A1 (preferred alternative)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**Alternative A2 (if any)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**No-go alternative (compulsory)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

Indicate mitigation measures to manage the potential impacts listed above:

| **Alternative A1:** | **Alternative A2:** |
|---|---|
| | |

## 2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

### a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

**Alternative S1 (Preferred Alternative by the Applicant and Wetland Specialist)**

***Direct impacts:***

**<u>Implications on Soil and Groundwater Pollution</u>**

Construction activities may result in the spillage of hazardous material such as fuel and oil, which could lead to soil and groundwater contamination. Due to the close proximity of the site to watercourse and wetlands and the fact that numerous watercourse will be crossed this could increase the risk of surface and groundwater pollution.

**<u>Implications on Vegetation on the site</u>**

- The majority of the route runs adjacent to the road reserve and private landowner properties,

however there are a number of rare and protected species that can be impacted on
- The introduction of new alien invasive plants may take place from the soil/fill material to be imported onto the site may possibly carry alien plants seeds.

**Implications for faunal species**

- From a faunal perspective, the proposed construction of pipelines could have an effect on faunal species, in particular game and livestock within the farmlands. If gates are left open and trenches left unfenced it could have a detrimental impact on faunal species.

**Other physical impacts**

- Seasonal weather has implications on the control of storm water on site. Choice of season for commencement of construction is crucial.
- Ground water seepage has implications on engineering design, materials to be used, and storm water control.
- Deep cuttings alter subsoil drainage patterns and could cause pollution of water by construction materials.

***Indirect impacts:***

Biophysical Impacts

- Potential impact on local water quality from contamination caused by construction activities.

Air pollution and associated nuisance and health implications

Sources of air pollution include dust generated by the stockpiling of soils; dust from exposed/cleared surfaces and; dust generated by construction vehicles.

Noise Impacts

Noise generated by delivery vehicles, earth moving machinery, piling works and the workforce have the potential to impact negatively on people living along the property boundaries and in relatively close proximity to the proposed development.

Workers Conduct

Construction workers on site could disrupt residents and landowners by creating noise, generating litter, & through possible loitering and/or anti-social behaviour.

Health & Safety

- Safety of workers and general public must be ensured. Construction activities are by their very nature dangerous.
- Open fires could result in accidents.
- Poor waste management practices and unhygienic conditions at temporary ablution facilities could cause diseases.
- Standing water due to inadequate storm water drainage systems and waste management practices; pose a health hazard by providing breeding grounds for disease vectors such as mosquitoes, flies and rodents.

Employment Generation

- The development will provide employment opportunities for local people during construction.
- Expectations regarding new employment would be high especially among the unemployed individuals in the area.
- The training of unskilled or previously unemployed persons will add to the skills base of the area.

Social Impacts

The pipeline will provide improved service infrastructure and potable water to the local community within and around Driefontein.

***Cumulative impacts:***

Waste Disposal

Disposal of construction waste produced by the proposed activity at a waste disposal site has implications on its capacity to hold additional waste. The activity is however low scale and minimal amounts of waste are expected to be produced.

**Alternative S2 (if any)**

***Direct impacts:***

**Implications on Soil and Groundwater Pollution**

Construction activities may result in the spillage of hazardous material such as fuel and oil, which could lead to soil and groundwater contamination. Due to the close proximity of the site to watercourse and wetlands and the fact that numerous watercourse will be crossed this could increase the risk of surface and groundwater pollution.

**Implications on Vegetation on the site**

- The majority of the route runs adjacent to the road reserve and private landowner properties, however there are a number of rare and protected species that will be impacted on
- The introduction of new alien invasive plants may take place from the soil/fill material to be imported onto the site may possibly carry alien plants seeds.

**Implications for faunal species**

- From a faunal perspective, the proposed construction of pipelines could have an effect on faunal species, in particular game and livestock within the farmlands. If gates are left open and trenches left unfenced it could have a detrimental impact on faunal species.

**Other physical impacts**

- Seasonal weather has implications on the control of storm water on site. Choice of season for commencement of construction is crucial.
- Ground water seepage has implications on engineering design, materials to be used, and storm water control.
- Deep cuttings alter subsoil drainage patterns and could cause pollution of water by construction materials.

***Indirect impacts:***

Biophysical Impacts

- Potential impact on local water quality from contamination caused by construction activities.

Air pollution and associated nuisance and health implications

Sources of air pollution include dust generated by the stockpiling of soils; dust from exposed/cleared surfaces and; dust generated by construction vehicles.

Noise Impacts

Noise generated by delivery vehicles, earth moving machinery, piling works and the workforce have the potential to impact negatively on people living along the property boundaries and in relatively close proximity to the proposed development.

Workers Conduct

Construction workers on site could disrupt residents and landowners by creating noise, generating litter, & through possible loitering and/or anti-social behaviour.

Health & Safety

- Safety of workers and general public must be ensured. Construction activities are by their very nature dangerous.
- Open fires could result in accidents.

- Poor waste management practices and unhygienic conditions at temporary ablution facilities could cause diseases.
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Employment Generation

- The development will provide employment opportunities for local people during construction.
- Expectations regarding new employment would be high especially among the unemployed individuals in the area.
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Social Impacts

The pipeline will provide improved service infrastructure and potable water to the local community within and around Driefontein.

***Cumulative impacts:***

Waste Disposal

Disposal of construction waste produced by the proposed activity at a waste disposal site has implications on its capacity to hold additional waste. The activity is however low scale and minimal amounts of waste are expected to be produced.

**No-go alternative (compulsory)**

Wetlands

The wetland areas and watercourses will remain as is. However, proper rehabilitation will ensure that the wetland will continue to function at the same level after construction. Construction and operational activities can impact on wetlands through erosion and loss of riparian vegetation.

Vegetation

The vegetation on the site will not be impacted on and no vegetation species will be lost. In addition, there will be no potential for soil erosion to occur from construction activities and the possibility for alien vegetation encroachment will be reduced. However, the current state of the vegetation on the site is fairly disturbed and in poor condition. By ensuring the site is rehabilitated correctly after construction is complete the impact should be very low.

No improved infrastructure

The current infrastructure for water supply will remain as is. Hence the need to increase the number of people who receive potable water in the Ladysmith-Driefontein Area will not be achieved. The amount of area that will be included into this plan runs along the boundaries of the landowners and hence the vegetation that will be disturbed is disturbed and not of high ecological value.

***Cumulative impacts:***

Impact on Biodiversity

The biodiversity *status quo* of the site will remain as no species will be lost. However, as the site is already disturbed and impacted on daily by human activities, it is highly unlikely that the current environment will recover to a degree where it can sustain a healthy population of diverse species without serious rehabilitation and intervention. In addition, with mitigation measures, the short term construction activities are unlikely to have a high impact on the biodiversity of the site.

Indicate mitigation measures to manage the potential impacts listed above:

**Alternative S1**

Environmental awareness

Training and awareness of the workforce by an environmental practitioner is required.

Material Spoiling

- Material spoiling shall not take place on site particularly within the watercourse. Any excavated materials for the pipeline shall be taken out of the watercourse immediately.
- Location for spoiling of excavated material shall be confirmed with the Engineer and ECO prior to construction.

Vegetation Clearance

- The top soil, nominally 250 mm, should be cleared and stockpiled separately. The sub-soil and topsoil should be stock piled on opposite sides of the trench so as to prevent the incorrect sequence of back filling of the soils and the resultant loss of soil profile and integrity.
- The entire working servitude width is to be determined in conjunction with the Engineer and the Environmental Control Officer, however, our recommendation is that should the use of OPVC be accepted then the servitude width should not exceed 8 (eight) metres. In difficult areas and steep portions of the proposed pipe line alignment we would suggest reducing the width to the minimal acceptable width, which would allow for the pipe sections to be walked in and placed in the trench, i.e. reduce the width to 6 (six) metres.
- Sub-soil must be well compacted around the pipe once the pipe has been bedded on the correctly sourced bedding material, traditionally an evenly graded sandy material with a very low clay content.
- The area of excavation should not precede the laying of the pipe line by more than a single working week;
- Once the pipe line excavation has been backfilled the top soil should be placed and lightly compacted;
- Thereafter a light watering of the replaced soil will be essential. It is also advised that the topsoil which has been excavated is lightly watered every second day while outside of the trench however, this may pose a significant issue and may not be possible.
- In steep areas, it is essential that cross berms, or some erosion control mechanisms are put in place to ensure that the pipe line is protected as well as the rehabilitation efforts are afforded an opportunity to succeed;
- This will be required, particularly in areas on Saders Farm, Hobsland and on portions of the two adjoining farms where the pipe line is proposed to traverse steep slopes. Other areas that will require similar measures are the ingress to the reservoir at Jonono's Kop and the ingress to the reservoir in Wasbank and Ekuvhukeni.
- Given the high volume of rock in these areas we would propose that this rock is utilised at intervals of approximately 2 metres on slopes greater than 120, or where its lowest outfall point will coincide with well established vegetation. These rock berms are to be put in place to check storm water velocity, reduce the scour potential of storm water and prevent all the valuable topsoil from being gathered up and displaced at the bottom of the excavation.
- The rapid excavation and replacement of the soils should result in the current seed bank within the soils being impacted upon only a very low level;
- The seed bank will thus supplement the proposed re-seeding that must take place, utilising the standard NPA mix;
- Regular watering will be required of the seeded areas, unless hydro-seeding is utilised which will have significantly higher initial input costs, however, the results and coverage will reduce the ongoing input costs;

Management of Storm water runoff and soil erosion

- Storm water control during construction phase as per the method approved and included in the EMP.
- The trench surface must be engineered and shaped in such a way that rapid and efficient evacuation of runoff is achieved.
- Excavations and other clearing activities should only be done during agreed working times and permitting weather conditions to avoid soil compaction and erosion.
- Avoid excessively steep cuttings and embankments.
- Appropriate design standards should be applied.
- Care must be taken to ensure that water is prevented from entering the excavation. In this regard, consideration could be given to forming an earth bund around the excavation.
- Silt fences, sandbags and spoil rock must be on hand at all times to assist in establishing temporary runoff control measures and should be used wherever necessary to proactively control erosion and trap sediment.
- Silt traps and sandbags must be used to reduce the energy of surface runoff and capture sediment along the sloping portions.
- Erosion gullies and rills within the construction ROW must be rehabilitated immediately and the root

cause of the erosion dealt with immediately.
- The unnecessary removal of groundcover vegetation from slopes must be prevented and only vegetation within the demarcated construction right-of-way (ROW) must be cleared.
- Rehabilitate all excavated and cleared sites during construction, as soon as possible after the disturbance has ceased.

Wetlands:
- Silt fences and sandbags should be established down-slope of the construction site to protect the downstream slopes from erosion and sedimentation.
- De-watering must be done in a controlled manor. De-watering should discharge into silt traps / lagoons in order reduce sediment and runoff velocities.
- The in-stream silt fences should be erected downstream before activities are initiated.
- The fluming of the stream was undertaken quickly and efficiently resulting in as little silt kick-up as possible.
- All bare surfaces and slopes must be re-vegetated immediately on completion of platform and embankment shaping with an indigenous grass mix suitable for the area.
- The crossings must be checked for erosion rills and gullies after rainfall events and erosion rills and gullies must be rehabilitated immediately.
- Additional silt fences and sandbags must be used to control and manage runoff along erosion scars and preferential flow paths onsite if necessary.
- Ideally, construction should be undertaken between the months of April and August.
- The wetland and riparian zone boundaries either side of the crossing must be demarcated using shade cloth or snow fencing prior to the construction commencing.
- Disturbance to the wetland and riparian zone soils along the crossing should be restricted to an established construction right-of-way (ROW) corridor.
- The ROW corridor within the wetlands and riparian zones should be as narrow as practically possible and should be demarcated and fenced off during the site setup phase to the satisfaction of the ECO.
- The construction ROW should comprise the trench area and a narrow one-way running track only.
- No refuelling must be done in the designated wetland areas.
- Indigenous wetland and riparian vegetation and topsoil along the running track and ROW must be turfed and stored outside of the wetland. These turfed stockpiles must be regularly wetted to ensure that the wetland plants do not die out and the clayey soils remain moist. The location of these wetland and riparian vegetation/topsoil stockpile area must be agreed upon by the ECO prior to construction commencing.
- Once the running track is turfed, Geotextile / geofabric / bog mats must be laid down along the running track within the wet areas.
- Geotextile / geofabric must be laid down along the sub-soil stockpile corridors to ensure that the stockpiled soils do not mix with the existing wetland soils.
- The subsoils and topsoils must be reinstated in the proper order that they were excavated.
- After the trench soils are re-instated, the geotextile fabric along the soil stockpile corridors should be lifted by hand.
- Excavated soil must not be stockpiled within the wetland or riparian zones.
- All wetland areas outside of the demarcated ROW must be considered no-go areas.
- Wetland and stream pipe crossings should ideally be located within already disturbed areas like existing road crossings and located across the narrowest portions of the wetland.
- The pipe must be routed so that the wetland is crossed at right angles to the direction of flow.
- The Department of Water Affairs must be consulted with if any approvals are required.

Waste Disposal

Contractor to exercise strict care in the disposal of construction waste, with proof of disposal at an approved site provided after offloading each waste load and this logged/registered.

Hazardous Substances Handling

- It is recommended that no cement mixing take place on site. Ready mix concrete should be used instead.
- Contaminated water must be contained & disposed off site at an approved landfill.
- No vehicle maintenance to be allowed on site.
- If oil spills occur the contaminated soil should be disposed of at an approved landfill site.
- No impacts on quality of surface and ground water should be allowed.
- Chemical toilets shall not be placed on steep areas and areas with intact vegetation. Exact location of toilets to be approved with the Engineer and ECO prior to construction.
- Topsoil and subsoil seepage shall be protected from contamination.

Biodiversity

- Removal of any indigenous tree species on site shall have prior approval from the Engineer and the ECO.
- Vegetation clearance and exposing soils at places where development is not taking place or where access is not required shall not be permitted.
- Any soil material imported onto site shall have a clearance certificate with regard to potential weed's seeds and be sourced from a registered permitted provider.
- No storage of hazardous materials to be allowed near water courses and no unauthorized access to these storage areas.
- Appropriate piling of topsoil and subsoil, soil erosion control to guard against sedimentation of nearby drainage lines and wetlands is required.
- No construction workers shall be allowed into any areas without permission.
- Gates into private properties must be closed immediately after entry
- Trenches must be appropriately fenced off to prevent game and livestock from falling in

Noise & Vibrations

- Ensure that machinery in a good state of maintenance. Low intensity machinery is expected to be used on site as most activities will be labour intensive, as confirmed by the applicant.
- Keep adjacent landowners informed of unusually noisy activities planned.
- Limit activities that generate noise to normal working hours and avoid week-ends.
- Ensure compliance with applicable SABS noise standards.

Health & Safety

- Ensure compliance with the Health Act and Occupational Health and Safety Act.
- Secure construction site.
- Use of reputable contractors.
- Excavations to be clearly demarcated.
- Workers should be thoroughly trained in using dangerous equipment.
- Workers have the right to refuse work in unsafe conditions.
- Undertake appropriate waste management practices.

Employment Generation

- The use of labour intensive construction measures is expected, as confirmed by the Applicant.
- Employ local (unskilled) labour if possible
- Training of labour to benefit individuals beyond completion of the project.
- Recruitment of labours should take place off-site.
- Workers conduct on site shall be in accordance with the specifications outlined in the EMP.

### b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

**Alternative A1 (preferred alternative)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**Alternative A2**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**No-go alternative (compulsory)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

Indicate mitigation measures to manage the potential impacts listed above:

| **Alternative A1:** | **Alternative A2:** |
|---|---|
| | |

## 2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

### a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

**Alternative S1 (preferred alternative)**

***Direct impacts:***

As the pipeline will be located underground, and will be transporting water it is very unlikely that it will cause any environmental impacts.

Biophysical

Minimal impacts are expected as the proposed pipeline will require minimal maintenance work. The disturbed areas, such as wetlands, will be restored and can function normally during operation.The cleared areas of vegetation will be rehabilitated and minimal disturbance will occur during the operational phase.

Improved Infrastructure

The provision of the water pipeline will increase the supply of water to the Ladysmith-Driefontein area, for which the current bulk water supply is insufficient. This will improve the basic service in the area as well as improve the quality of life, especially to those living in more rural areas.

Private Landowners

As the majority of the pipeline runs inside the boundary of a number of private properties, maintenance activities can cause disruptions to these farmers. However, maintenance of the pipeline will be minimal and contractors will abide by operational method statements.

**Alternative S2 (if any)**

***Direct impacts:***

As the pipeline will be located underground, and will be transporting water it is very unlikely that it will cause any environmental impacts.

Biophysical

Minimal impacts are expected as the proposed pipeline will require minimal maintenance work. The disturbed areas, such as wetlands, will be restored and can function normally during operation. The cleared areas of vegetation will be rehabilitated and minimal disturbance will occur during the operational phase.

Improved Infrastructure

The provision of the water pipeline will increase the supply of water to the Ladysmith-Driefontein area, for which the current bulk water supply is insufficient. This will improve the basic service in the area as well as improve the quality of life, especially to those living in more rural areas.

Private Landowners

As the majority of the pipeline runs inside the boundary of a number of private properties, maintenance activities can cause disruptions to these farmers. However, maintenance of the pipeline will be minimal and contractors will abide by operational method statements.

**No-go alternative (compulsory)**

***Direct impacts:***

Wetlands

The wetland areas and watercourses will remain as is. However, proper rehabilitation will ensure that the wetland will continue to function at the same level after construction. Construction and operational activities can impact on wetlands through erosion and loss of riparian vegetation.

Vegetation

The vegetation on the site will not be impacted on and no vegetation species will be lost. In addition, there will be no potential for soil erosion to occur from construction activities and the possibility for alien vegetation encroachment will be reduced. However, the current state of the vegetation on the site is fairly disturbed and in poor condition. By ensuring the site is rehabilitated correctly after construction is complete the impact should be very low.

No improved infrastructure

The current infrastructure for water supply will remain as is. Hence the need to increase the number of people who receive potable water in the Ladysmith-Driefontein Area will not be achieved. The amount of area that will be included into this plan runs along the boundaries of the landowners and hence the vegetation that will be disturbed is disturbed and not of high ecological value.

***Cumulative impacts:***

Impact on Biodiversity

The biodiversity *status quo* of the site will remain as no species will be lost. However, as the site is already disturbed and impacted on daily by human activities, it is highly unlikely that the current environment will recover to a degree where it can sustain a healthy population of diverse species without serious rehabilitation and intervention. In addition, with mitigation measures, the short term construction activities are unlikely to have a high impact on the biodiversity of the site.

Indicate mitigation measures to manage the potential impacts listed above:

**Alternative S1**

Maintenance

Maintenance works shall be minimal, as confirmed.

Site Rehabilitation

- The exposed surface where vegetation was removed during construction should be re-grassed with indigenous grass species.
- Compacted wetland and riparian soils along the running track must be ripped to a depth of 20-30 cm. Thereafter, the turfed topsoil and vegetation must be reinstated within the wetland and riparian areas along the running track by hand to the satisfaction of the ECO.
- Where no indigenous vegetation is present, the compacted areas must be ripped and seeded immediately. A deep rooting indigenous plant seed mix should be used as recommended by a wetland specialist.
- The disturbed area should be monitored for erosion once a month during the first wet season after construction.
- The re-instated wetland and riparian areas must be monitored for a year post-construction by a suitably qualified wetland specialist on a bi-monthly basis. During this time, the measures to manage and control alien vegetation in the wetland rehabilitation and management plan must be applied to the re-instated ROW.
- Method statements for all activities within the wetlands and riparian zones must be submitted to the ECO for approval prior to construction commencing.

Alien Invasive Plant Control

It is recommended that the relevant responsible Department remove/clear the invasive plants on site currently impacting on the biodiversity provided by the site.

Illegal Waste Dumping

It is recommended that that the extensive areas of fill and waste dumping affecting the biodiversity of the site be cleared/removed by the relevant responsible Department, to help rehabilitate the site.

Site Access:
Maintenance must be restricted to within the pipeline route. The area will need to be rehabilitated after the site has been assessed for the basic assessment. Areas will have to be cleared for access.

### b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

**Alternative A1 (preferred alternative)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**Alternative A2**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**No-go alternative (compulsory)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

Indicate mitigation measures to manage the potential impacts listed above:

| Alternative A1 | Alternative A2 |
|---|---|
| | |

## 2.4. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING OR CLOSURE PHASE

### a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

**Alternative S1 (preferred alternative)**

Removal of pipes

If the pipeline is decommissioned the current pipes will have to be excavated and removed. This will result in clearance of vegetation and soil disturbance.

Handling of decommissioned material/waste

- Much of the infrastructure that will be removed will have to be properly disposed of.

***Indirect impacts:***

Loss of infrastructure

The water supply to the area will cease.

**Alternative S2**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**No-go alternative (compulsory)**

***Direct impacts:***

Biophysical

The vegetation will not be cleared and the site will not be disturbed through excavation.

***Indirect and cumulative impacts:***

Service Infrastructure

The community will continue to receive potable water.

Indicate mitigation measures to manage the potential impacts listed above:

**Alternative S1**

- No protected plant species may be removed.
- Construction activities near watercourses must be carefully monitored.
- Any waste infrastructure removed should be properly disposed of.
- Proof of disposal shall be required.

### b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

**Alternative A1 (preferred alternative)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**Alternative A2**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

**No-go alternative (compulsory)**

***Direct impacts:***

***Indirect impacts:***

***Cumulative impacts:***

Indicate mitigation measures to manage the potential impacts listed above:

| **Alternative A1** | **Alternative A2** |
|---|---|
| | |

### 2.5. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

**Alternative S1 (preferred site)**

- All phases of development require an Environmental Management Programme (EMPr) setting out clear procedures and including all mitigation measures discussed above. The EMPr must be approved by the relevant authority before construction commences.
- The Developer must appoint a qualified Environmental Impact Practitioner to carry out monthly audits and submit monthly report to contractor and relevant authority.
- The relevant authority must carry out regular site audits with the ECO to ensure the monitoring and compliance requirements are met by the contractor and the developer.
- A more detailed EMPr will need to be submitted to relevant authority for the decommissioning phase should this activity ever be required.

| **Alternative A1 (preferred alternative)** | **Alternative A2** |
|---|---|
| | |

## 3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**Alternative S1 (preferred site)**

The first alternative has been proposed by the Wetland and Vegetation Specialists and accepted by the applicant. The new realignment proposes that the pipeline bypasses wetland areas of high importance.

**Table 1 in Appendix G** shows that the impacts prior to mitigation are medium and medium-high. The significance assessments of each potential impact that may occur have been generated for the life history phases of construction and operational. The significance ratings in **Table 2 in Appendix G** of the proposed development for the majority of the impacts identified is low provided the proposed mitigation measures included in **Section E** of this Draft Basic Assessment Report are adhered to. The exception is the improvement of infrastructure which has a high positive impact.

The proposed activity will benefit the society by way of improved infrastructure and the supply of potable water to the community. The degraded nature of the vegetation and the location of the pipeline along the existing road reserve have eliminated the majority of the predicted impact of the pipeline and ancillary structures.

**Alternative S2**

The first proposed pipeline route (Alternative S2, originally preferred by the Applicant) was to cross a number of wetlands and environmentally sensitive areas for much of its length. Typically, the receiving environment for this proposed development has been fairly disturbed by human activities and impacts to indigenous ecosystems will be limited. However there are a number of sensitive wetland areas that will be impacted through this route.

**Table 3 in Appendix G** outlines an assessment of each of the impacts identified for Alternative S1 and

shows that the impacts are rated between medium to medium-high. Once the mitigation measures form the EMPr and Section E are implemented the impacts drop to a low rating. This is with the exception of the impacts to the wetlands. Even with mitigation measures it is unlikely that these impacts can be reduced to having a low impact, and is still given a medium rating. Hence Alternative 1 is likely to have a lower environmental impact than Alternative 2.

**Alternative A1 (preferred alternative)**

**Alternative A2**

**No-go alternative (compulsory)**

The impacts of the no-go option have been assessed in **Table 5 Appendix G** on the assumption that the suggested improvement/rehabilitation will not take place and that the *status quo* will remain. The proposed site is undeveloped. The site is heavily transformed and there is limited habitat of conservation value along the entire pipeline corridor. The *status quo* is therefore of limited value to the natural environmental and the society at large. The site could however be improved by stringent rehabilitation initiatives including removal of alien invasive plants, litter and rubble.

# SECTION F. RECOMMENDATION OF EAP

| Is the information contained in this report and the documentation attached hereto in the view of the EAPrsufficient to make a decision in respect of this report? If "NO", please contact the KZN Department of Agriculture& Environmental Affairs regarding the further requirements for your report. | YES | NO |
|---|---|---|

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Due to the nature of the generally degraded environment in the Phase 2 routing there is unlikely to be any significant impacts related to the pipeline. Mitigation measures, especially pertaining to the crossing of water course, must be adhered too to ensure these areas are not significantly affected or polluted. Communication has been entered into with the landowners who are all in agreement with the pipeline route as long as they are consulted throughout the process. The EAP recommends that this project is granted authorisation, due to the desperate need for water supply in this area

# SECTION G: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site Map(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and Responses Report

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Environmental Impact Significance Assessment