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# ENVIRONMENTAL MANAGEMENT PROGRAMME

## FOR THE

## THE PROPOSED UPGRADING OF THE HEROLD'S BAY PUMP STATION AND ASSOCIATED RISING MAIN AND THE DEVELOPMENT OF NEW ASSOCIATED INFRASTRUCTURE, ON ERF 116, ERF 113, ERF 110, REMAINDER OF ERF 95, REMAINDER OF FARMS 236 AND 237 AND PORTIONS 10, 35 AND 37 OF FARM BRAKFONTEIN NO. 236, HEROLD'S BAY, GEORGE MUNICIPALITY, WESTERN CAPE.

APPLICATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998
(ACT NO. 107 OF 1998), AS AMENDED, AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014

**PREPARED FOR:** George Municipality
Water & Sanitation: Civil Engineering Services
PO Box 19
George
6530

**DATE:** 9 September 2024

**DEADP REF NO:** 16/3/3/6/7/1/D2/29/0229/23
**SES REF NO:** 14/HBPS/GM/EMP/05/24

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## Appendix 4 of the EIA Regulations 2014 (as amended 2017).

This Environmental Management Programme has been drafted in accordance with Appendix 4 of the Environmental Impact Assessment Regulations 2014 (as amended 2017). The table below shows how the requirements of Appendix 4 have been included within this Environmental Management Programme.

| | |
|---|---|
| (1) An EMPr must comply with section 24N of the Act and include—<br>(a)details of–<br>(i)the EAP who prepared the EMPr; and<br>(ii)the expertise of that EAP to prepare an EMPr, including a curriculum vitae; | Appendix G- EAP CV |
| (b)a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description; | Section 4 – Description of the Activity |
| (c)a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers; | Section 4 - Description of the Activity |
| (d)a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including—<br>(i)planning and design;<br>(ii)pre-construction activities;<br>(iii)construction activities;<br>(iv)rehabilitation of the environment after construction and where applicable post closure; and<br>(v)where relevant, operation activities; | Section 8 - Environmental Impact Management: Planning and Design Phase<br>Section 9 - Environmental Impact Management: Pre-construction Phase<br>Section 10 - Environmental Impact Management : Construction Phase<br>Section 11 - Environmental Impact Management : Post Construction Rehabilitation Phase & Operational Phase |
| (f)a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to —<br>(i)avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;<br>(ii)comply with any prescribed environmental management standards or practices;<br>(iii)comply with any applicable provisions of the Act regarding closure, where applicable; and<br>(iv)comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable; | Section 8 - Environmental Impact Management: Planning and Design Phase<br>Section 9 - Environmental Impact Management: Pre-construction Phase<br>Section 10 - Environmental Impact Management: Construction Phase<br>Section 11 - Environmental Impact Management: Post Construction Rehabilitation Phase & Operational Phase |
| (g)the method of monitoring the implementation of the impact management actions contemplated in paragraph (f); | Section 14 - Roles and Responsibilities<br>Section 16 - Monitoring, Record Keeping and Reporting |
| (h)the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f); | Section 14 - Roles and Responsibilities<br>Section 16 - Monitoring, Record Keeping and Reporting |
| (i)an indication of the persons who will be responsible for the implementation of the impact management actions; | Section 8 - Environmental Impact Management: Planning and Design Phase<br>Section 9 - Environmental Impact Management: Pre-construction Phase<br>Section 10 - Environmental Impact Management: Construction Phase<br>Section 11 - Environmental Impact Management: Post Construction Rehabilitation Phase & Operational Phase<br>Section 14 - Roles and Responsibilities |
| (j)the time periods within which the impact management actions contemplated in paragraph (f) must be implemented; | Section 8 - Environmental Impact Management: Planning and Design Phase<br>Section 9 - Environmental Impact Management: Pre-construction Phase |

| | |
|---|---|
| | Section 10 - Environmental Impact Management: Construction Phase<br>Section 11 - Environmental Impact Management: Post Construction Rehabilitation Phase & Operational Phase |
| (k)the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f); | Section 14 - Roles and Responsibilities<br>Section 16 - Monitoring, Record Keeping and Reporting |
| (l)a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations; | Section 8 - Environmental Impact Management: Planning and Design Phase<br>Section 9 - Environmental Impact Management: Pre-construction Phase<br>Section 10 - Environmental Impact Management: Construction Phase<br>Section 11 - Environmental Impact Management: Post Construction Rehabilitation Phase & Operational Phase<br>Section 14 - Roles and Responsibilities<br>Section 16 - Monitoring, Record Keeping and Reporting |
| (m)an environmental awareness plan describing the manner in which—<br>(i)the applicant intends to inform his or her employees of any environmental risk which may result from their work; and<br>(ii)risks must be dealt with in order to avoid pollution or the degradation of the environment; and | Section 14 - Roles and Responsibilities |
| (n)any specific information that may be required by the competent authority. | tbd |

## DOCUMENT DETAILS

| | |
|---|---|
| **Project Ref. No:** | 14/HBPS/GM/EMP/05/24 |
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| **Reviewer:** | John Sharples | john@sescc.net | • Masters in Environmental Management (UFS)<br>• Bachelor's degree in Conservation. |

**Sharples Environmental Services cc** (SES) has been actively engaged since 1998 in the fields of environmental planning, assessment and management. Clients include private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale residential estates and resorts to golf courses, municipal service infrastructure installations and the planning of major arterials. The consultants have over 40+ years of combined experience and operate in the Southern, Eastern and Western Cape regions.

MICHAEL BENNETT (**Environmental Assessment Practitioner, Report Writer):**
Michael studied at the University of Cape Town completing a Bachelor of Science degree majoring in Environmental and Geographic Science and Ocean and Atmospheric Science. Michael joined SES in 2014 and has extensive experience in assessments and monitoring and has worked on a variety of technical projects. See Appendix G for his curriculum vitae. Michael is registered with EAPASA as a certified Environmental Practitioner (EAPASA # 2021/3163).

JOHN SHARPLES (**Managing Director):**
John started Sharples Environmental Services in 1998 and has overseen the company's growth and development since then. John also started the Cape Town office in 2010. John holds a Masters in Environmental Management from the University of the Free State as well as a Bachelor's degree in Conservation. He has consulted for 18 years running a team of highly trained and qualified consultants and prior to this gained 12 years of experience working for environmental organizations. John is registered with EAPASA as a certified Environmental Practitioner.

LU-ANNE BEETS (**Candidate Environmental Assessment Practitioner, Report Co-Writer):**
Lu-anne studied at North-West University completing a Bachelor of Science degree majoring in Zoology and Botany. Lu-anne also studied at the University of South-Africa completing a Bachelor of Science Honours degree majoring in Environmental Management. Michael joined SES in 2023. See Appendix G for her curriculum vitae. Lu-anne is registered with EAPASA as a Candidate Environmental Practitioner (EAPASA # 2024/7962).

# 1. Introduction

*Sharples Environmental Services cc (SES)* has been appointed by the *George Municipality (the applicant)* to apply for Environmental Authorisation for the Proposed upgrade of the Herold's Bay Pump Station and its associated Rising Main and the development of a new associated infrastructure on Erf 116, Erf 113, Erf 110, Remainder of Erf 95, Remainder of Farm 236 and 237 and Portions 10, 35 and 37 of Farm Brakfontein No. 236, Herold's Bay, George Municipality, Western Cape.

The proposed upgrades and construction will trigger listed activities in terms of the Amended Environmental Impact Assessment Regulations of 2014 (GN No. R.324 - 327 of 7 April 2017). Environmental Authorisation is therefore required from the competent authority (Western Cape Department of Environmental Affairs & Development Planning) before construction can commence.

# 2. About this EMPr

This document is intended to serve as a guideline to be used by *the George Municipality: Water & Sanitation: Civil Engineering Services* (as the Implementing Agent) and any person/s acting on behalf of *George Municipality: Water & Sanitation: Civil Engineering Services*, during the pre-construction, construction, post-construction, and rehabilitation phases of the proposed upgrade and development. This document provides measures that must (where practical and feasible) be implemented to ensure that any environmental degradation that may be associated with the development is avoided, or where such impacts cannot be avoided entirely, are minimised, and mitigated appropriately.

This EMPr has been prepared in accordance with the requirements of an EMPr as specified in the Amended Environmental Impact Assessment Regulations, 2014 (GN No. R. 326 of 7 April 2017), and with reference to the "Guidelines for Environmental Management Programmes" published by the Department of Environmental Affairs and Development Planning (2005).

It is important to note that the EMPr is not designed to manage the physical establishment of the upgrade and development *per se* but should rather be seen as a tool which can be used to manage the environmental impacts of the development.

The rehabilitation, mitigation, management, and monitoring measures prescribed in this EMPr must be seen as binding to *George Municipality: Water & Sanitation: Civil Engineering Services*, and any person acting on its behalf, including but not limited to agents, employees, associates, guests, or any person rendering a service to the development site.

### 2.1 Important caveat to the report

In the past, some developments have had a devastating impact on the environment even though they have had Environmental Management Programmes in place, while other developments have had a low impact even though no management plans have been compiled.

The Implementing Agent and the attitude of the construction team play an integral role in determining the impact that the development will have on the environment. The ECO (see Chapter 14) needs to ensure that all role-players are "on board" with regard to the constraints that the EMPr places on the development and construction team. The end result relies on cooperation and mutual respect and understanding of all parties involved.

## 3. How to use this document

It is essential that this EMPr be carefully studied, understood, implemented, and adhered to as far as reasonably possible, throughout all phases of the proposed development. The *George Municipality: Water & Sanitation: Civil Engineering Services* must retain a copy of this EMPr, and another copy of this EMPr must be kept on site at all times during the pre-construction, construction, and post-construction rehabilitation phases of the development.

This EMPr must be included in all contracts compiled for contractors and subcontractors employed by *George Municipality: Water & Sanitation: Civil Engineering Services*, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction activities are either avoided or reduced. *George Municipality: Water & Sanitation: Civil Engineering Services* and any appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

This EMPr must be seen as a working document, which may be amended from time to time as needed, in order to accommodate changing circumstances on site or in the surrounding environment, or in order to accommodate requests/ conditions issued by the competent authority, the Department of Environmental Affairs & Development Planning. Amendments to this EMPr must first be approved by the competent authority, in writing.

## 4. Background and Location of the activity

### 4.1 Background and description

The Herold's Bay Pump Station no. 1 is located at the Herold's Bay beachfront, at the main parking lot on Uitspanning Street and can be accessed by following the R404 into Herold's Bay. The pump station was refurbished in 2004 and is the main sewage pump station in Herold's Bay, receiving all sewage gravity flows from the area and pumped flows from two smaller pump stations along the cove. The sewage is subsequently pumped to the Herold's Bay Wastewater Treatment Works (WWTW).

The scope of work for this project can further be broken down as follows:
Existing Herold's Bay Pump Station Number 1 (PS1)

- Upgrade the existing pump station's civil infrastructure to handle 20L/s (ultimate design flow) and the mechanical operating capacity from 19 L/s to 20 L/s.
- Refurbish the entire pump station building and equipment, including all mechanical, electrical and electronic equipment. All structures are to be stormproof as much as reasonably possible.
- Install mechanical equipment to cater to the highly abrasive pumping conditions.
- Install new submersible vortex pumps. The pumps shall be operated on a rotational basis as duty/standby.
- Refurbish/replace the odour control unit.
- Refurbish/replace the telemetry and SCADA control equipment.
- Provide a new emergency underground storage tank.
- Provide an emergency generator supply
- Provide a new sand trap and manual coarse screen.
- Provide an architectural conceptual proposal and cost estimate for the aesthetic enhancement of the existing building.

New Pump Station Number 4 (PS4)

- Construct a new high lift pump station (civil works) with an operating capacity of 52 L/s.
- Construct new inlet works comprising of:
    - a screening station,
    - a grit removal station.
- Install new dry well pumps. The pumps shall be operated rotationally as duty/standby.

- Variable-speed drives on all pumps.
- Install odour control unit.
- Installation of electrical and electronic equipment associated with the new pump station.
- Provision of a backup generator.
- Provide underground fuel storage for the generator.
- The civil works will comprise the construction of new buildings, retaining walls, fences, access roads, etc.
- Reduce sound pollution generated by the pump station as far as reasonably possible.

Rising Main

- Construction of a new rising main pipeline between the
    - existing pump station (PS1) and the new pump station (PS4)
    - new pump station (PS4) and the Herold's Bay WWTW.

Bulk Electrical

- Upgrade and relocation of the electrical mini substation located close to the PS 4 site.
- New backup electrical cable between PS 1 and PS 4


**Figure 1: Approximate Locality of the proposed site.**


**Figure 2: Closer view - Locality of the proposed site.**

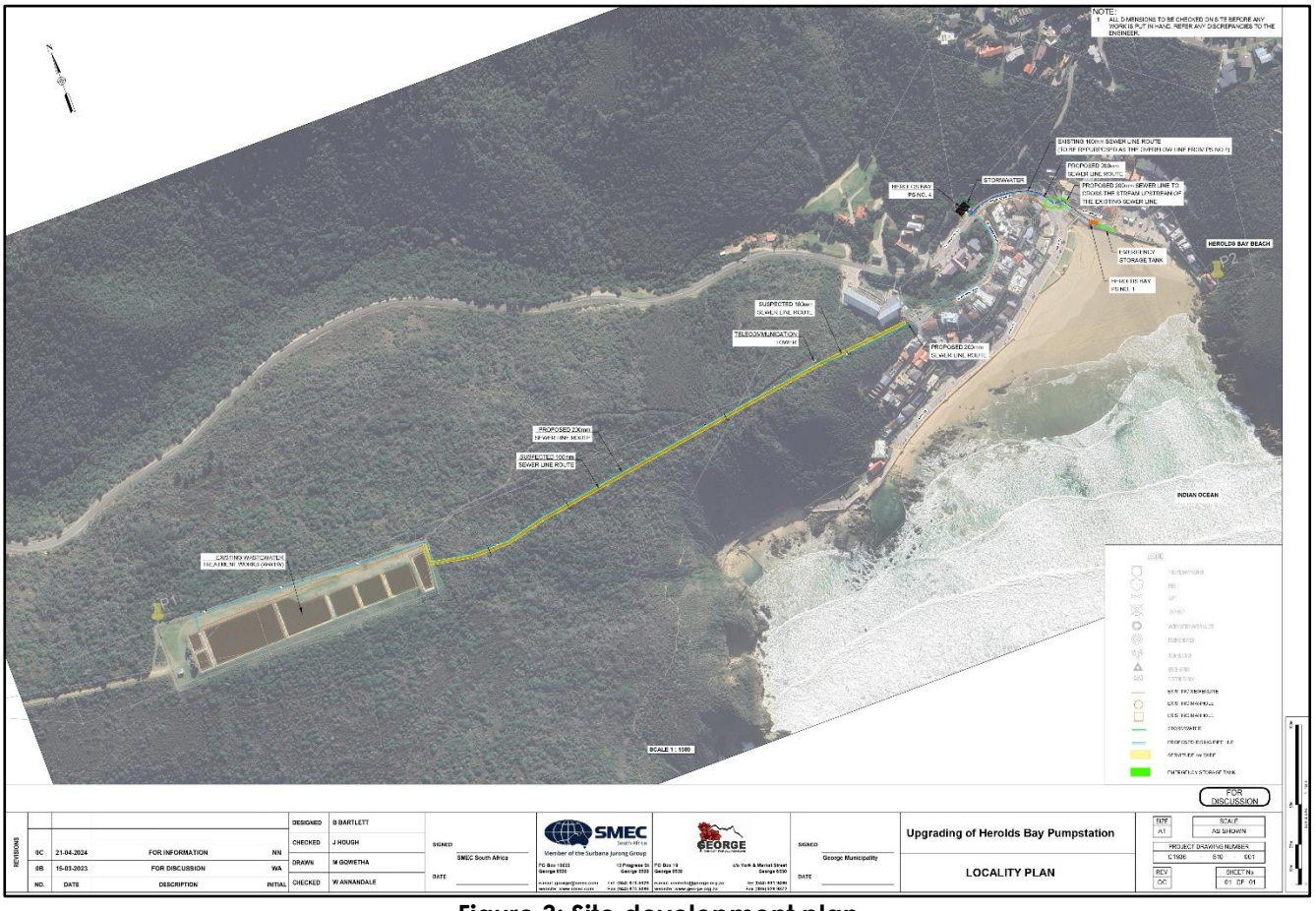



**Figure 3: Site development plan**


**Figure 4: Existing and proposed pipeline between PS1 and PS4**


**Figure 5: Pipeline route from PS4 following Speckie Gericke Drive**


**Figure 6: Pipeline route from the intersection of Speckie Gerecke Drive and Gus Meyer Avenue to the WWTW**


**Figure 7: Pipeline route at the WWTW**


**Figure 8: Proposed PS4**


**Figure 9: Position of PS1 and the proposed emergency storage tank**

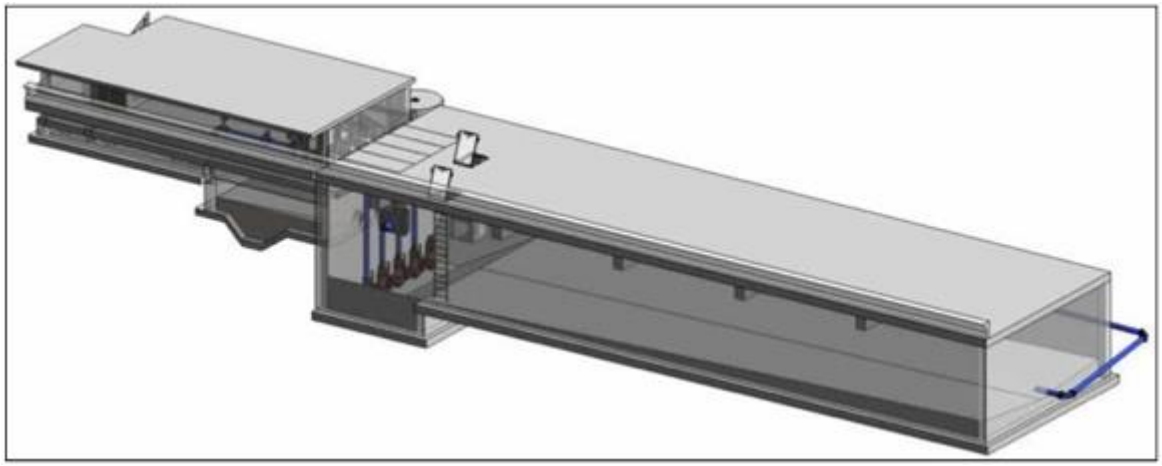


**Figure 10: Model of proposed PS1 and emergency storage tank**

**Site Access and temporary storage/working/laydown areas**

All proposed sites can be accessed from existing roads. The existing Pump Station 1 will be directly accessed via Uitspanning Street. The new Pump Station 4 will be accessed via Skimmelkrans Lane. The pipeline between PS1 and PS4 can be accessed directly through Skimmelkrans Lane. The first 220m of the pipeline between PS4 and the WWTW can be accessed through Skimmelkrans Lane and Spekie Gericke Drive. The rest of the pipeline between PS4 and the WWTW can be accessed by following the R404 road and turning on a gravel road to the WWTW. An existing two-track jeep track will be used to access the pipeline for the steeper sections.

The existing parking in Uitsig road and a Municipal owned campground on Skimmelkrans Lane can be used as a storage/working/laydown area. Any other disturbed/grassed area that will not trigger listed activities can be used as a storage area, the ECO must however confirm if any activities are triggered by the proposed storage area.


**Figure 11: Proposed storage/working/laydown area**

**Table 1:** Summary Table: Site and Erf Details

| | |
|---|---|
| **Province** | Western Cape |
| **District Municipality** | Garden Route District Municipality |
| **Local Municipality** | George Municipality |
| **Ward number** | Ward 23 |
| **Erf name** | Farm 37/236 Brakfontein, Farm 35/236 Brakfontein, Farm 236 Brakfontein, Erf 116, Erf RE/95, Farm 237, Erf 110, Erf 113, Farm 10/236 Brakfontein and Portion 36 of 236. |

## 5. Legal Framework

### 5.1 Environmental Impact Assessment Regulations (2017)

The following listed activities, in terms of the amended Environmental Impact Assessment Regulations, 2017 (GN No. R. 324 – 327) will be triggered by the proposed development:

**Table 2: Listed activities in terms of the amended Environmental Impact Assessment Regulations (2017)**

| Listed Activity No(s): | Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 1 (GN No. R. 983) |
|---|---|
| 12 | **The development of—**<br>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or<br>**(ii) infrastructure or structures with a physical footprint of 100 square metres or more;where such development occurs—**<br>(a) within a watercourse;<br>(b) in front of a development setback; or<br>**(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —**<br>excluding—<br>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;<br>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;<br>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; |

| | |
|---|---|
| | (dd) where such development occurs within an urban area;<br>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or<br>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared. |
| 19A | **The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—**<br>(i) the seashore;<br>**(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater; or**<br>(iii) the sea; —<br><br>but excluding where such infilling, depositing, dredging, excavation, removal or moving—<br>(f) will occur behind a development setback;<br>(g) is for maintenance purposes undertaken in accordance with a maintenance management plan;<br>(h) falls within the ambit of activity 21 in this Notice, in which case that activity applies;<br>(i) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or<br><br>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. |
| 25 | The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres. |
| 48 | The expansion of—<br>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or<br>(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more; where such expansion occurs—<br>(a) within a watercourse;<br>(b) in front of a development setback; or<br>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;<br>excluding—<br>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;<br>(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;<br>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;<br>(dd) where such expansion occurs within an urban area; or<br>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves. |
| Listed Activity No(s): | Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 3 (GN No. R. 985) |
| 12 | **The clearance of an area of 300 square metres or more of indigenous vegetation** except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.<br>**i. Western Cape**<br>**i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;**<br>ii. Within critical biodiversity areas identified in bioregional plans; |

| | |
|---|---|
| | iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;<br>**iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning;** or<br>v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister. |

### 5.2 Other applicable legislation

*George Municipality: Water & Sanitation: Civil Engineering Services,* is responsible for ensuring that all contractors, labourers and any other appointed person/entity acting on their behalf, remain compliant with the conditions of the received environmental authorisation and water-use authorisations, as well as the provisions of all other applicable legislation, including *inter alia*:

- National Environmental Management Act (NEMA) (Act No 107 of 1998, as amended);
- National Environmental Management Biodiversity Act (Act 10 of 2004);
- National Water Act (Act 36 of 1998)
- National Environmental Management: Waste Act (Act 59 of 2008);
- National Forest Act (Act No 84 of 1998);
- National Heritage Resources Act (Act No 25 of 1999);
- Occupational Health and Safety Act (Act 85 of 1993);
- Amended Environmental Impact Assessment Regulations, GN No. R. 324 – 327 (7 April 2017)
- The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)
- Spatial Planning and Land Use Management Act, No. 16 of 2013 (SPLUMA)
- Infrastructure Development Act, 2014 (Act No. 23 of 2014)
- The National Environmental Management Laws Amendment Act, 2022
- Natural Scientific Professions Act, 2003 (Act 27 of 2003)
- Regulation 41 of the EIA Regulations, 2014 (as amended)
- Section 24O (2) and (3) of NEMA and Regulations 7(2) and 43(2) of the EIA Regulations, 2014

The above listed legislation has general applicability to most development applications, and it is George Municipality: Water & Sanitation: Civil Engineering Services responsibility to ensure that all contractors and employees are aware of their obligations in terms of these Acts. This EMPr does not detract from any other legal requirements.

## 6. Scope of this EMPr

This EMPr describes the measures that must be implemented in order to avoid, minimise, manage and monitor the potential environmental impacts of the development, during all phases of the project life cycle, namely:

- Planning and Design Phase
- Pre-construction Phase
- Construction Phase
- Rehabilitation Phase

General environmental management measures that must be applied throughout the project lifecycle (as and where applicable) are described in Chapter 7. Additional management measures that must be

implemented to address specific impacts that may arise during each phase are provided in **Chapters 8-11** of this EMPr.

## 7. General Environmental Management

The following general management measures are intended to protect environmental resources from pollution and degradation during all phases of the project life cycle. These measures must be implemented as and where applicable, reasonable and practicable during the pre-construction, construction and post-construction and rehabilitation phases of the proposed development.

### 7.1 Site access and traffic management

The proposed new pumpstation (PS4) will be located on Skimmelkrans Lane. The existing pumpstation (PS1) is located on Uitspanning Street. The two pumpstations are easily accessed from these roads. The pipeline between PS1 and PS4 can be accessed directly through Skimmelkrans Lane. The first 220m of the pipeline between PS4 and the WWTW can be accessed through Skimmelkrans Lane and Spekie Gericke Drive. The rest of the pipeline between PS4 and the WWTW can be accessed by following the R404 road and turning on a gravel road to the WWTW. An existing two-trek jeep track will be used to access the pipeline for the steeper sections.

In general, all construction vehicles need to adhere to traffic laws. The speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. As far as possible care must be taken to ensure that the local traffic flow pattern is not too significantly disrupted, and all vehicle operators therefore need to be educated in terms of "best-practice" operation to minimise unnecessary traffic congestion or dangers. Construction vehicles must therefore not unnecessarily obstruct the access point or traffic lanes used to access the site. Construction vehicles also need to consider the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. Adequate signage that is both informative and cautionary to passing traffic (motorists and pedestrians) warning them of the construction activities. Signage would need to be clearly visible and need to include, among others, the following:

- Identifying working area as a construction site;
- Cautioning against relevant construction activities;
- Prohibiting access to construction site;
- Clearly specifying possible detour routes and / or delay periods;
- Possible indications of time frames attached to the construction activities, and;
- Listings of which contractors are working on the site.

Other mitigation measures include:

- ECO to do awareness training with the contractor and labourers before construction commences.
- Ensure appropriate behaviour of operators of construction vehicles.

### 7.2 Site demarcation

The following areas must be clearly demarcated on site during the pre-construction or construction phases of the development, as appropriate.

Construction working area

Prior to the commencement of any construction activities, the outer boundary of the development area must be surveyed and pegged. The demarcation boundary must be tight around the site, typically allowing a working area of no more than 2.5m around the development footprint, however for the installation of the pipeline between PS4 and the WWTW (220m – 1470m), a 10m working corridor is allowed due to possible deviations from the existing pipeline route. This demarcation boundary is to ensure that construction activities are restricted to only that area strictly required for the proposed development, and to prevent unnecessary disturbance of soil surfaces and vegetation outside of the development footprint.

No-go areas

Prior to the commencement of any construction activities, all No-Go areas, must be demarcated and must not be disturbed during the construction phase. For guidance purposes, and to prevent indirect impacts, any area outside the developmental footprint, with a reasonable allowance for activities, and the 10m working corridor allowed for the installation of 220m-1470m of the rising main between PS4 and the WWTW, and the areas to be used for site camp and storage is considered a no-go area.

No-go areas must be off-limits to all construction workers, vehicles, and machinery during all phases of the development. No vegetation may be cleared from within the no-go areas, and no dumping of any material (waste, topsoil, subsoil etc.) may occur in these areas. Construction workers must be informed of the no-go areas, and if necessary appropriate signage and/or temporary fencing (e.g., droppers with danger tape) can be used to enforce the no-go areas.

Demarcation of the site camp

The area chosen for the site camp and associated facilities must be the minimum area reasonably required to accommodate the site camp facilities, and which will involve the least disturbance to the environment. It is recommended that easily accessible, transformed areas are used for the site camp. Site selection must be done in consultation with the ECO.

**7.3 Site camp and associated facilities**

The following general management measures pertaining to the set-up, operation and closure of a site camp must be applied where appropriate, reasonable and practicable:

7.3.1 Fencing & Security

The site camp area must be secured to prevent any un-authorised individuals from entering the site camp and possibly getting injured or posing a safety and/or security risk. Adequate signage must be displayed, designating the site office / camp as a restricted area to non-personnel. If required, the site camp and associated areas may be fenced off along the demarcated boundaries of these areas, preferably with 2m high fence and shade netting or similar.

7.3.2 Fire Fighting Equipment

No less than 2 fire extinguishers must be present in the site camp. The extinguishers must be in a working condition and within their service period. A fire extinguisher must always be present wherever any "hot works" (e.g., welding, grinding etc.) are taking place. It is recommended that all construction workers receive basic training in fire prevention and basic fire-fighting techniques and are informed of the emergency procedure to follow in the event of accidental fires. No open fires may be made on the

construction site during any phase of the project. Construction workers may make small, contained fires (e.g., for warming or cooking purposes), within the site camp provided the small fire is encircled by a corrugated iron structure, drum or similar, to prevent wind-blown cinders from causing fires elsewhere. Such fires may not be left unattended and must be thoroughly extinguished after use. No smoking must be allowed on the construction site. In the case of accidental fires, the contractor must (if required) alert the Local Authority's Fire Department as soon as a fire starts prior to the fire becoming uncontrollable.

#### 7.3.3 Waste Storage Area

Sufficient bins for the temporary storage of construction related waste must be provided inside the site camp and/or at the working area and should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Label each waste receptacle for waste separation, and ensure waste is contained either by use of lids or by ensuring waste receptacles are emptied prior to filling up, making them susceptible to wind dispersion. Sufficient signage and awareness should be created to ensure that these bins are properly used.

#### 7.3.4 Hazardous Substances Storage Area

Fuels, chemicals, lubricants and other hazardous substances must be stored in a demarcated, secured and clearly sign-posted area within the site camp away from the watercourses on site. Sufficient signage and awareness should be created to ensure that these bins are properly used. Ensure that when substances are transferred, this is done on an impermeable and/or bunded surface, to contain any spillage. Spillage, should it occur, should be disposed of appropriately.

#### 7.3.5 Potable Water

An adequate supply of potable water must be provided to construction workers at the site camp. It is the Contractors duty to ensure that the labour has adequate access to potable water throughout construction phase, and to monitor weather conditions, to ensure that labour has enough drinking water on hotter days, or construction activity must cease, until conditions are safe to continue.

#### 7.3.6 Ablution Facilities

Chemical toilets should be maintained on the site camp for the duration of the construction phase and rehabilitation, on a level surface and secured from blowing over and located in such a way that the toilets will not cause any form of pollution. As per the SANS10400 requirement, one ablution facility for every 8 male workers and 2 ablution facilities for every 8 female workers will be provided.

The ablution facilities must not be linked to a river system, estuary or the ocean in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved. The toilet facilities should be emptied on a weekly basis, by an appropriately registered service provider. Proof of this weekly servicing must be obtained and filed in the Environmental File on site. Performing ablutions outside of the provided toilet facilities is strictly prohibited and the ECO would need to regularly inspect the state of the chemical toilets to ensure compliance.

#### 7.3.7 Eating Area & Rest Area

A dedicated area within which construction workers can rest and eat during breaks should be provided within the site camp. Seating and shade should be provided.

#### 7.3.8 Vehicle & Equipment Maintenance Yard

Where possible, construction vehicles and equipment that require repair must be removed from site and taken to a workshop for servicing. If emergency repairs and/or basic maintenance of construction vehicles or equipment are necessary on site, such repair work must be undertaken within the designated maintenance yard area away from any watercourses. Repairs must be conducted on an impermeable

surface, and/or a tarpaulin and/or drip trays must be laid down prior to emergency repairs taking place, in order to prevent any fuel, oil, lubricant or other spillages from contaminating the surrounding environment.

#### 7.3.9 House-keeping

The site camp and related site camp facilities must be kept neat and orderly at all times, in order to prevent potential safety risks and to reduce the visual impact of the site during construction.

### 7.4 Vegetation clearing

Where vegetation must be cleared the following measures must be implemented where applicable, reasonable and practical:

- Where feasible vegetation must simply be trimmed to facilitate access/ construction, rather than being completely cleared or removed.
- Vegetation clearing/trimming must be cleared by hand (i.e. brush cut) and stockpiled for use as mulch/ brush-packing during rehabilitation of the site. Any alien vegetation that is cleared must be disposed of in consultation with the ECO, unless the cleared alien vegetation does not contain seeds in which case it may be retained for use in site rehabilitation.
- No bulldozing must be undertaken for the purpose of vegetation clearing.
- Only the areas required to accommodate the construction activities and access to the construction site must be cleared/trimmed of vegetation.
- Vegetation outside of the construction footprint and beyond any No-Go areas must not be cleared.

### 7.5 Topsoil and subsoil management

It is recommended that topsoil be removed from any area where physical disturbance of the surface will occur, including within the footprint of the development site (working area) and possibly within the site camp, ablution area, vehicle maintenance yard, refuelling area and temporary waste storage area. Topsoil removal and stockpiling must be undertaken only after consultation with the ECO.

- Removed topsoil and subsoil must be stockpiled for the duration of the active construction period and utilised for the final landscaping and rehabilitation of disturbed areas on site.
- The removed topsoil must be stockpiled in a berm, in a demarcated area as agreed with the ECO.
- Removed subsoil must be stockpiled separately from topsoil.
- The topsoil & subsoil storage area must be located on a level area outside of any surface drainage channels and at a location where it can be protected from disturbance during construction and where it will not interfere with construction activities.
- Where applicable topsoil and subsoil stockpiles must be adequately protected from being blown away or eroded by storm water. If necessary, shade cloth or other suitable measures must be used to stabilise and protect the stockpile from wind/water erosion. Topsoil stockpiles must not be covered with tarpaulin, as this may smother and decrease the virility of topsoil.
- Handling of topsoil must be minimised as much as possible, and the location of the topsoil berm must be chosen carefully to avoid needing to relocate the topsoil berm at a later date. The ECO must be consulted with regards to the placement of the stockpiles, to ensure that the selected location is in compliance with this EMPr and EA (once granted).
- Ideally, topsoil is to be handled twice only, once to strip and stockpile, and once to replace, level, shape and scarify.

- If soil stockpiles will be stored for an extended period of time, the stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding, (or application of herbicides if agreed with the ECO).
- Spoil material that will not be re-utilised on site may be removed from site and taken to an appropriate site for re-use or disposal.
- Note that the topsoil must be the final layer applied to a rehabilitated/ re-landscaped site, after subsoil/ spoil material has been placed and shaped on the site.

### 7.6 Integrated waste management approach

It is recommended that an integrated waste management system is adopted on site. The system must be based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Waste bins for the different categories of recyclable waste (i.e., paper, plastic, metal) must be provided on site. These bins must be emptied, and the waste must be taken to a registered recycling facility. The receipts from the facility must be kept on file and must be available on request. Images 1 and 2 show two such systems within a construction site.


**Image 1:** Recycling system implemented on a construction site. Skips provided for general waste, plastic, cardboard and metal.


**Image 2:** Recycling system implemented on a construction site. Lidded bins provided for general waste, plastic, cardboard, and metal.

The non-recyclable and non-reusable waste (e.g., builder's rubble, etc.) generated on site must be stored and disposed of at a landfill site licensed in terms of the applicable legislation.

### 7.7 Hazardous substances and fuels

If hazardous substances and fuels such as diesel, oil, lubricant, detergents etc. are to be stored on site for construction purposes, a designated area must be set aside for this within the site camp.

- All hazardous substances must be stored in the designated area within the site camp.

- The area selected for storage of hazardous fuels must be located on a level area, well outside of any water courses, water bodies or surface drainage channels.
- The designated area must be clearly demarcated and secured by use of fencing and/or cages, to prevent access by un-authorised persons and/or animals.
- Access to the hazardous material storage area must be restricted to authorised personnel only and must be treated as a no-go zone to unauthorised personnel.
- Appropriate hazard signage indicating the nature of the stored materials must be prominently displayed at the storage area.
- Those persons tasked with handling any hazardous substances must be equipped with the knowledge, equipment, and safety gear necessary to handle the substance/s safely.
- Material Safety Data Sheets (MSDSs) must be available on site for all hazardous chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes
- Storage vessels of hazardous substances must be situated in an impermeable bunded area large enough to accommodate at least 110% of the capacity of the tank in question. If plastic sheeting is used to line the bunded area, care must be taken to ensure it is not punctured in any way during the course of the construction period.
- Fuel tanks must ideally be elevated so that leaks can easily be detected.
- No smoking may be permitted at or surrounding the area where fuels and hazardous substances are stored.
- Firefighting equipment must be located in close proximity to the storage area.

**7.8 Cement and concrete batching**

Cement and concrete batching is permitted on site, but may only take place on designated impermeable, bunded surfaces, as agreed with the ECO.

- Cement/ concrete must not be mixed on bare ground.
- Cement/concrete must not be mixed within any drainage lines.
- The impermeable/ bunded area must be established in such a way that cement slurry, runoff and cement water will be contained and will not flow into the surrounding environment or contaminate the soil.
- Cement run-off and excess cement slurry must be collected in the designated impermeable area, allowed to dry and then disposed of at an appropriate facility. Alternately, the contaminated water can be collected in sealed tanks and transported to an appropriate disposal site for disposal.
- Empty cement bags are currently not recycled within the Garden Route and must be disposed of in the un-recyclables waste bins on site.

**7.9 Erosion control and stormwater management**

Appropriate measures must be implemented to control the flow of storm water across the construction site, to prevent possible flooding, soil loss and dispersion of pollutants. All exposed earth surfaces must also be protected from wind and water erosion. Stripped areas must not remain uncovered for extended periods of time and must be provided with a suitable cover (vegetation, mulch, brush-packing) as soon as possible.

The scale and nature of the erosion and storm water control measures implemented on site must be appropriate to the conditions on site, and sufficient to achieve the desired outcomes (soil preservation, prevention of flooding, storm water control) to the satisfaction of the ECO and consulting engineer.

It may be necessary to implement small-scale erosion protection measures at the construction site, to prevent soil erosion. Such measures may include the use of shade netting, geo-fabric, brush-packing, logs and stakes or similar barriers in areas susceptible to erosion and along exposed slopes. The netting/fabric is placed directly across the path of flow of storm water. Poles and logs, staked in along the contours of a slope susceptible to erosion may also be used.

**7.10 Construction near a watercourse**

Construction within the vicinity of the aquatic system needs to be conducted in a conscious manner. The Freshwater Assessment Report completed by Confluent Aquatic Consulting & Research highlights the following mitigation measures to be adhered to during construction.

- Excavators and all other machinery and vehicles must be checked for oil and fuel leaks daily. No machinery or vehicles with leaks are permitted to work in the watercourse; No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed within 30m of the banks of the watercourse;
- Refuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, must be located on impervious bases and should have bunds around them (sized to contain 110 % of the tank capacity) to contain any possible spills;
- Cement/concrete used in the construction must not be mixed on bare ground or within the watercourse. An impermeable/bunded area must be established in such a way that cement slurry, runoff and cement water will be contained and will not flow into the surrounding environment, the stream or riparian zone or contaminate the soil;
- The watercourse should be inspected on a regular basis (at least weekly) by an appropriately qualified ECO for signs of disturbance, sedimentation and pollution during the construction phase. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures.
- Areas where instream access is required must be confined to clearly demarcated areas so as to prevent unnecessary disturbance of instream habitat outside of these areas.
- No dumping of waste materials in the watercourse;
- Surface runoff originating from the road surface upslope of the construction area, must be diverted (by means of a barrier – e.g. sandbags) to avoid stormwater flows through any excavated section of the road surface;
- Any diversion of surface runoff must not cause erosion to the bed and banks of the watercourse);
- No construction materials to be stockpiled in the watercourse;
- All waste materials must be removed from the watercourse;

**7.11 Excavations and Earthworks**

Any major earthworks with heavy machinery must be under constant supervision and operators are to be aware of all the environmental obligations, as there is always the potential to inflict damage to the sensitive areas. Any unnecessary or excessive heavy machinery movement must be kept to a minimum i.e., only what is absolutely necessary. Areas to be excavated must be clearly demarcated. It may be necessary to demarcate excavations or earthworks along busier haulage routes with orange barrier netting (or a similar product).

All excavated material must be stored on a flat surface away from any drainage line or area susceptible to erosion. The location must be decided upon in consultation with the ECO. Stored material must be protected from wind and water erosion, and this may entail covering the material with suitable shade cloth material or similar (if and when necessary). The shade cloth may need to be weighed down by logs (or similar material) in such a manner that any stream flow is directed away from the stockpile, reducing the risk of erosion.

### 7.12 Site closure and rehabilitation

Upon completion of the construction phase, all disturbed areas, including the working area (disturbance corridor), temporary access roads, and all areas utilised for the site camp and associated site camp facilities will require rehabilitation as follows:

- On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material.
- All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities must be scarified or ripped to improve filtration and reduce run-off.
- All demarcation fencing, including all droppers, wires, netting and barrier tape must be removed from site and taken to an appropriate site for re-use or disposal.
- Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. Any soil contaminated with oil, fuel or other hazardous substance must be collected and disposed of as hazardous waste.
- All construction waste, litter and rubble is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is prohibited.
- Topsoil that was removed and stockpiled before construction, must be replaced by spreading it evenly over the areas from which it was removed. This topsoil (and the seedbank it contains) will facilitate the re-vegetation of the site.
- Disturbed areas, especially areas where excavations have taken place, must be shaped as appropriate (original topography must be restored where possible), and covered with a layer of stockpiled topsoil as soon as possible.
- Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and disposed of at an appropriate disposal site.
- The disturbed, newly rehabilitated surfaces (particularly steeper slopes and areas recently covered with topsoil) must be protected from wind & water erosion using mulch, brush packing or other appropriate erosion protection measures. Brush-packing/ mulching is done by covering the exposed surface with organic plant material such as branches, plant cuttings and leafy material. Ideally the vegetation removed from site at the start of the construction must be utilised. Brush-packing/ mulching plays a valuable role in erosion control, while also promoting re-vegetation of the site by retaining moisture in the soil, introducing seeds and/or trapping wind-blown seeds and providing organic material (compost) to promote new plant growth.
- Final rehabilitation of the site must be done to the satisfaction of the ECO and must adhere to all conditions/ requirements of the Environmental Authorisation.
- If the site camp was located on the footprint of an erf or road, the location of the site camp must then be rehabilitated in accordance with the site development plan.

## 8. Environmental Impact Management Planning and design phase

No direct environmental impacts are associated with the planning and design phase. However, poor planning or inappropriate design decisions in this phase may result in environmental impacts arising during subsequent phases of the project.

Planning and design activities must therefore take into account the environmental constraints and opportunities identified during the Environmental Impact Assessment process, in order to avoid or minimise the potential future impacts of the development. Proper planning is also essential to ensure that adequate provision is made to implement the environmental requirements of this EMPr, and to ensure that the development remains compliant with the received Environmental Authorisation.

The environmental management objectives (goals) during this phase are to:

- Appoint an Environmental Control Officer.
- Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site

These environmental management outcomes, as well as the management actions that must be implemented in order to achieve the desired outcome and avoid/minimise potential impacts are discussed in more detail below.

**OBJECTIVE 1: APPOINTMENT OF AN ENVIRONMENTAL CONTROL OFFICER**

| ***Impact Management Objective:*** ***To appoint a suitably qualified and experienced Environmental Control Officer.*** | | |
|---|---|---|
| Potential impact to avoid | Failure to appoint an ECO will result in non-compliance with the Environmental Authorisation and the requirements of the EMPr. | |
| Impact Management Outcome | The conditions of Environmental Authorisation and the requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site. | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • A suitably qualified and experienced Environmental Control Officer must be appointed before any activities commence on site.<br>• The appointed ECO must adhere to the requirements stated in Chapter 15 and 17 of the EMPr and any other requirements specified in the Environmental Authorisation.<br>• The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers. | *George Municipality: Water & Sanitation: Civil Engineering Services* | During design phase |

| | |
|---|---|
| Performance Indicator | A qualified ECO is appointed prior to the commencement of any construction activities (including pre-construction set-up activities) on site. |

**OBJECTIVE 2: UPDATE ENVIRONMENTAL MANAGEMENT PROGRAMME**

The Environmental Authorisation issued for the development may require certain amendments to be applied to the EMPr. In addition, the final site layout and detailed design may also necessitate the amendment of the EMPr, in order to ensure that the development is accommodated in the EMPr.

| ***Impact Management Objective:* To ensure the EMPr adheres to the requirements of the Environmental Authorisation and makes provision for the final detailed site layout.** | | |
|---|---|---|
| Potential impact to avoid | • Failure to update the EMPr in accordance with conditions specified in the EA may result in non-compliance with the EA.<br>• Failure to update the EMPr to accommodate the final detailed site layout may result in non-compliance with the EA. | |
| Impact Management Outcome | Good environmental management is promoted on site. | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • An independent Environmental Consultant must be appointed to amend the EMPr.<br>• All amendments to the EMPr specified in the EA must be applied to the EMPr unless agreed otherwise in writing with the Competent Authority.<br>• Amendments to the EMPr must be approved in writing by the Competent Authority.<br>• Public participation may be required on the proposed EMPr amendments. The Competent Authority must be consulted for clarity on these requirements. | *George Municipality: Water & Sanitation: Civil Engineering Services* | During design phase |
| Performance Indicator | An updated EMPr that adheres to the conditions of the EA and that reflects the requirements of the final detailed site layout is approved by the Competent Authority prior to commencing activities on site. | |

## 9. Environmental Impact Management Pre-Construction Phase

Proper set-up during the pre-construction phase can set the foundation for good environmental management during the active construction phase to follow and can avoid potential impacts from arising at a later date.

The Impact Management Objectives for this phase of the project relate to:

- Demarcation of no-go areas and working areas.
- Establishment of site camp and associated site facilities.
- Pre-construction ECO visit.

**OBJECTIVE 1: IDENTIFY & DEMARCATE NO-GO AND WORKING AREAS**

| ***Impact Management Objective:*** ***Identify and demarcate no-go areas, working areas and site facilities.*** | | | |
|---|---|---|---|
| Potential impact to avoid | • Insensitive location of working areas and site facilities may result in environmental impacts during construction phase.<br>• Failure to accurately demarcate working areas may result in increased disturbance footprint.<br>• Failure to demarcate no-go (open spaces) areas may result in disturbance to these areas during construction. | | |
| Impact Management Outcome | Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance. | | |
| **IMPACT MANAGEMENT ACTIONS** | | | |
| Mitigation measure | | Responsible party | Time period |
| • The no-go areas must be identified.<br>• Demarcation of working area and no-go areas must be done in accordance with Section 8.2 of this EMPr.<br>• Site camp facilities must be situated as far away from the No-Go areas as possible. | | Engineer / Contractor | Pre-construction phase (prior to arrival of construction equipment, machinery, or workers on site) |
| Performance Indicator | No-go areas, working areas and areas for site camp facilities have been identified and appropriately demarcated to the satisfaction of the ECO, before construction activities commence on site. | | |

**OBJECTIVE 2: ESTABLISH ENVIRONMENTALLY SENSITIVE SITE CAMP & SITE FACILITIES**

| ***Impact Management Objective:*** ***To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.*** | | |
|---|---|---|
| Potential impact to avoid | • Inappropriate siting of site camp facilities may result in impacts to sensitive resources (e.g. contaminated run-off from refuelling area may contaminate soil).<br>• Failure to properly demarcate and set up site facilities may result in disorganised construction activities and unnecessary disturbance to the site.<br>• Failure to provide the necessary site facilities and/or failure to equip these facilities with the necessary equipment/materials may impede good environmental management & compromise ability to respond to emergencies. | |
| Impact Management Outcome | Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site. | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • The site camp and site facilities described in Section 8 of this EMPr must be provided on site.<br>• The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Section 8 of this EMPr. | Contractor | Pre-construction phase (prior to start of construction activities) |
| Performance Indicator | Appropriate, well organised and properly equipped site facilities are available on site prior to commencement of construction activities. The location and set up of the facilities do not impact on the natural resources. | |

**OBJECTIVE 3: PRE-CONSTRUCTION ECO INSPECTION**

It is essential that the appointed ECO be advised of the intended construction start date before construction activities commence on site, so that the ECO can conduct an initial site inspection to assess the pre-commencement condition of the site. The ECO can also advise on the appropriate siting and demarcation of the site facilities, and the identification and demarcation of the no-go areas. The ECO may also conduct the first round of environmental awareness training at this stage, if the construction workers are present on site.

| ***Impact Management Objective:*** ***Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site.*** | | |
|---|---|---|
| Potential impact to avoid | • Failure to appoint ECO or to notify ECO of commencement prior to commencement will result in non-compliance with the EA.<br>• If a pre-commencement ECO inspection is not performed, the Applicant may be held liable for environmental degradation that took place prior to the Contractor commencing work on site. | |
| Impact Management Outcome | • Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases.<br>• Site facilities are appropriately located on site.<br>• Construction workers receive environmental awareness training before commencing work on site. | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers. | Contractor | Start of construction phase |
| Performance Indicator | A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site. | |

## 10. Environmental Impact Management Construction Phase

A number of potential environmental impacts may arise during the construction phase of the development. These impacts have been identified and assessed during the Environmental Impact Assessment process. Environmental Management outcomes and actions that will prevent the identified potential impacts from arising – or where avoidance is not possible, that will minimise and mitigate the impact – are provided in this section.

The environmental management actions and mitigation measures prescribed in this section must be implemented throughout the construction phase, and must be implemented in conjunction with the general management measures specified in Chapter 8 of this EMPr as well as any other conditions stated in the Environmental Authorisation. The Environmental Control Officer must monitor and enforce the implementation of the relevant environmental management measures and may provide guidance on the implementation of these environmental management measures as and when required.

**The environmental management objectives (goals) for the Construction phase are:**

- Prevent pollution of watercourses
- Limit surface runoff and input of sediment into the watercourse
- Limit the impact on terrestrial biodiversity
- Reduce the loss of indigenous flora and SCC
- Prevent pollution of groundwater
- Limit noise
- Create employment opportunities

The environmental management actions that must be implemented in order to achieve the desired outcomes and avoid/minimise potential impacts are discussed in more detail in the sections below.

**OBJECTIVE 1: PREVENT POLLUTION OF WATERCOURSE**

| ***Impact Management Objective:*** ***To prevent pollution of watercourses*** | | |
|---|---|---|
| Potential impact to avoid | • Pollution of watercourse through leakage of fuels, oils and other pollutants from vehicles<br>• Poor management could lead to sewage spills or leaks | |
| Impact Management Outcome | No change in watercourse quality due to construction activities | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • Excavators and all other machinery and vehicles must be checked for oil and fuel leaks daily.<br>• No machinery or vehicles with leaks are permitted to work in the watercourse; | Contractor | Construction phase |

| | | |
|---|---|---|
| • No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed within 30m of the banks of the watercourse;<br>• Refuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, must be located on impervious bases and should have bunds around them (sized to contain 110 % of the tank capacity) to contain any possible spills;<br>• The area(s) chosen for the stockpiling of imported building materials should be demarcated, and notices put up declaring what must be stockpiled where.<br>• Chemical toilets should be provided on-site at 1 toilet per 10 persons;<br>• Waste from chemical toilets must be disposed of regularly (at least once a week) in a responsible manner by a registered waste contractor;<br>• Cement/concrete used in the construction must not be mixed on bare ground or within the watercourse. An impermeable/bunded area must be established in such a way that cement slurry, runoff and cement water will be contained and will not flow into the surrounding environment, the stream or riparian zone or contaminate the soil;<br>• Workers must be properly instructed in the proper care of the environment, especially with respect to poaching, disturbance of nesting and roosting areas, disposal of human waste, garbage etc.;<br>• The watercourse should be inspected on a regular basis (at least weekly) by an appropriately qualified ECO for signs of disturbance, sedimentation and pollution during the construction phase. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures. | | |
| Performance Indicator | No pollution occurring on the site or surroundings as a result of construction activities. | |

**OBJECTIVE 2: TO LIMIT SURFACE RUNOFF AND INPUT OF SEDIMENT INTO THE WATERCOURSE**

| ***Impact Management Objective:*** ***To prevent pollution of surface water*** | | |
|---|---|---|
| Potential impact to avoid | Surface water runoff through excavated sections of the road surface could lead to input of sediment and other construction materials into the watercourse | |
| Impact Management Outcome | Surface water is not polluted as a result of construction activities | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • No dumping of waste materials in the watercourse<br>• Surface runoff from the originating from the road surface upslope of the construction area, must be diverted (by means of a barrier – e.g. sandbags) to avoid stormwater flows through any excavated section of the road surface<br>• Any diversion of surface runoff must not cause erosion to the bed and banks of the watercourse<br>• No construction materials to be stockpiled in the watercourse<br>• All waste materials must be removed from the watercourse | Contractor | Construction phase |
| Performance Indicator | Surface water is not polluted as a result of construction activities | |

**OBJECTIVE 3: LIMIT THE IMPACT ON TERRESTRIAL BIODIVERSITY**

| ***Impact Management Objective:* To limit the impact on terrestrial biodiversity** | | | |
|---|---|---|---|
| Potential impact to avoid | • Destruction of habitats<br>• Direct mortality of fauna<br>• Impact on biodiversity network<br>• Erosion on steeper slopes due to poor rehabilitation efforts | | |
| Impact Management Outcome | Impact on terrestrial biodiversity is limited to what is only required to undertake the activities | | |
| **IMPACT MANAGEMENT ACTIONS** | | | |
| Mitigation measure | | Responsible party | Time period |
| • Destruction of habitat should be limited to the smallest project footprint possible (i.e., minimisation mitigation).<br>• The 10m-12m working area footprint should be rehabilitated and allowed to regenerate naturally.<br>• Every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint (in the adjoining natural habitats), but under no circumstance to an area further away.<br>• During the construction phase, demarcate/fence off the construction footprint.<br>• Restrict all construction activities, such as stockpiling, parking and cement mixing, to already disturbed areas away from natural vegetation.<br>• The contractor(s) must be made aware of the sensitive surroundings and the presence of SCC and protected trees.<br>• The thicket and fynbos outside the footprint must be declared a 'no-go' area and not be disturbed in any way.<br>• Pollutant substances brought onto site must be properly contained. Cement/concrete mixing must be contained on impervious and bunded surfaces. No cement mixing is allowed inside vegetated areas. Cement water is highly alkaline and considered toxic.<br>• Engage in alien clearing, focussing on invasive species such as black wattle and rooikrans. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Their control will become a short- to medium-term maintenance requirement. | | Contractor | Construction phase |
| Performance Indicator | Impact on terrestrial biodiversity is limited to what is only required to undertake the activities | | |

**OBJECTIVE 4: REDUCE THE LOSS OF INDIGENOUS FLORA AND SCC**

| ***Impact Management Objective:* To reduce the loss of indigenous Flora and SCC** | | | |
|---|---|---|---|
| Potential impact to avoid | Loss of indigenous flora and SCC | | |
| Impact Management Outcome | No avoidable loss of indigenous flora and SCC | | |
| **IMPACT MANAGEMENT ACTIONS** | | | |
| Mitigation measure | | Responsible party | Time period |
| • During the staking out of the construction footprint take cognisance of the presence of SCC and protected trees (Pittosporum viridiflorum & Sideroxylon inerme). Try and avoid these as far as practically possible. Removal of the latter requires a permit from the Department of Forestry. It is recommended that the protected trees be marked prior to the start of construction activities.<br>• Search and rescue succulents and bulbs from the construction footprint for replanting in the disturbed areas after construction. Topsoil, cuttings and seedbearing plant material can also be salvaged for this purpose, especially cuttings from Carpobrotus and Pelargonium species. Geophytes (e.g. Dioscorea sylvatica, Albuca bracteata, Chasmanthe aethiopica and Bonatea speciosa) should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. | | Contractor | Construction phase |
| Performance Indicator | No avoidable loss of indigenous flora and SCC | | |

**OBJECTIVE 5: TO PREVENT POLLUTION OF GROUNDWATER AND SURROUNDING ENVIRONMENT**

| ***Impact Management Objective:* To prevent pollution of groundwater due to spillages of diesel, petrol oils, paints and other harmful chemicals** | | | |
|---|---|---|---|
| Potential impact to avoid | Groundwater pollution due to diesel, petrol, oils, paints and other harmful chemicals | | |
| Impact Management Outcome | No groundwater pollution due to construction activities | | |
| **IMPACT MANAGEMENT ACTIONS** | | | |
| Mitigation measure | | Responsible party | Time period |
| • Install the UST according to applicable national SANS standards.<br>• Install the monitoring network prior to the installation of the UST. This will serve as monitoring of both the construction and operational<br>• phase. | | Contractor | Construction phase |

| | | |
|---|---|---|
| • Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies.<br>• Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.<br>• Cover stockpiles of building materials like cement, sand and other powders.<br>• Regularly inspect stockpiles for spillages and store away from waterways or drainage areas.<br>• Collect any wastewater generated from site activities during construction insettlement tanks then screen, discharge the clean water, and dispose of remaining sludge according to environmental regulations.<br>• Shallow piezometers are to be installed in close proximity of the UST. Minimum installation depth of 3.50 mbgl. | | |
| Performance Indicator | Groundwater is not contaminated within any of the sites or surrounding environment | |

**OBJECTIVE 6: TO LIMIT NOISE AND TRAFFIC CONGESTION**

| ***Impact Management Objective:*** ***To limit noise generated by construction activities*** | | |
|---|---|---|
| Potential impact to avoid | • No unnecessary noise should be allowed<br>• Residents are able to get to and from their houses | |
| Impact Management Outcome | No avoidable noise or traffic impacts emanate from the site during the construction phase | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • Construction should only be allowed during normal construction working hours.<br>• A register will be kept on site in order to report any complaints received.<br>• No unnecessary noise disturbances should be allowed to emanate from the construction site (i.e., loud music).<br>• A stop and go system are implemented in Skimmelkrans lane<br>• Work is done during off seasons to limit traffic disturbances and congestion | Contractor | Construction phase |
| Performance Indicator | No complaints about noise or traffic is received | |

**OBJECTIVE 7: JOB CREATION**

| ***Impact Management Objective:*** ***To create employment opportunities with potential for skills transfer, for members of the local community.*** | | |
|---|---|---|
| Potential impact to be promoted | • Temporary jobs opportunities<br>• There may be opportunities to transfer skills from more experienced workers to less experienced workers. | |
| Impact Management Outcome | The local community benefits from the employment opportunities created during the construction phase. | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • No mitigation required for this positive benefit. However, where practical preference must be given to previously disadvantaged individuals from the local community when appointing contractors/ workers.<br>• Skills transfer between members of the workforce should be encouraged | Contractor | Construction phase |
| Performance Indicator | The majority of the construction team is from the local community, with preference given to historically disadvantaged individuals. Skills transfer from experienced to less experienced workers is actively encouraged on site. | |

## 11. Environmental impact management post construction rehabilitation phase

After all construction activities have ceased, the sites must be cleared of all construction related equipment, materials, facilities and waste. In addition all disturbed surfaces – including disturbed areas around the structures and all areas utilised for site facilities – must be stabilised, rehabilitated and provided with a suitable cover. All temporary access roads constructed must rehabilitated and access must be restricted from the public.

**The environmental management objective (goal) for this phase is to:**

- Prevent pollution of groundwater and surface water
- Rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner
- Prevent alien vegetation establishment on the site
- Limit impact on terrestrial biodiversity

**OBJECTIVE 1: Prevent pollution of groundwater and surface water**

| ***Impact Management Objective:*** ***To prevent pollution of groundwater and surface water due to leaks or damage to the rising mains and underground storage tank*** | | |
|---|---|---|
| Potential impact to avoid | • Leask caused by damage to the pipeline<br>• Contamination of groundwater due to leakage from the underground storage tank | |
| Impact Management Outcome | • No leaks or damage are detected<br>• Groundwater is not contaminated due to leakage from the underground storage tank | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • All areas where potential spillages may occur are to be paved and cemented.<br>• Set up a comprehensive monitoring system, such as observation boreholes, to detect any leakages/groundwater chemistry changes on-site.<br>• Install shallow aquifer piezometers in close proximity to the UST to be monitored regularly for any leakages.<br>• Should a leak be detected or the monitoring boreholes be contaminated, a baseline Phase 1 Contamination Assessment should be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities.<br>• At least two monitoring boreholes are recommended to detect any potential contaminants. boreholes should be drilled, one up-gradient of the proposed UST and one down-gradient. Boreholes to be drilled to a depth of 20m. Drilled at least 165mm in diameter. Fitted with slotted, class 12, flush-fit, threaded ends, uPVC with an end cap (slots ideally from 2m down). The inner diameter of the uPVC casing should not be less than 110 mm. Gravel pack in borehole annulus (typically 3-5 mm in diameter). Top 2m of annulus to be filled with bentonite seal. Borehole to be fitted with lockable protection and to be clearly marked.<br>• Water levels and physical parameters should be recorded at least quarterly, with sampling and chemical analysis of major and trace anions and cations, inclusive of DOC, BTEX and VOC on a bi-annual basis. Samples to be submitted to accredited SANAS laboratory and sample collection and transport as per laboratory standards. | Contractor | Post-Construction phase |
| Performance Indicator | • No leaks or damage is detected<br>• No groundwater pollution is detected | |

**OBJECTIVE 2: SITE CLOSURE & REHABILITATION**

| ***Impact Management Objective:*** ***To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.*** | | |
|---|---|---|
| Potential impact to avoid | • Failure to remove all construction related waste and materials may result in environmental pollution.<br>• Failure to remove all construction related equipment, machinery and site facilities may pose an impact to the natural environment.<br>• Failure to stabilise disturbed surfaces may result in soil erosion and increased storm water run-off, which may limit successful revegetation of the site. | |
| Impact Management Outcome | • The site is neat and tidy, and all exposed surfaces are suitably covered/ stabilised.<br>• There is no construction-related waste or pollution remaining on site. | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material.<br>• Rehabilitate/revegetate all the disturbed surfaces.<br>• Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO.<br>• Any contaminated soil must be collected and disposed of as hazardous waste.<br>• All construction waste, litter and rubble are to be removed from the site and re-used elsewhere or recycled/disposed of at an appropriate facility.<br>• Burying or burning of waste or rubble on site is prohibited.<br>• All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities must be scarified or ripped.<br>• Topsoil removed during the establishment of the site camp and the working area must be spread evenly over the entire site camp area and all other disturbed/ exposed areas after those areas have been ripped, scarified, shaped and contoured (as required).<br>• Where necessary seeding and planting of vegetation can take place after the replacement of the topsoil. Hardy, drought tolerant, non-invasive plant species must be selected. If needed, a layer of mulch can be applied to the newly shaped/ landscaped and topsoiled areas. The mulch will serve to limit erosion and will promote the re-vegetation of the site by retaining moisture in the soil and providing organic material (compost) for new plant growth. Mulched material must be spread to a depth of ± 50mm – a thinner layer is likely to be ineffective in protecting the site, while thicker layers may suppress plant growth. | Contractor | Post-Construction phase |

| | | |
|---|---|---|
| • All exposed soils and recently topsoiled areas are to be re-vegetated or stabilised to the satisfaction of the ECO, to protect these areas from wind and water erosion. No areas are to be left exposed to erosive forces. Erosion protection measures that can be applied include mulching (described above), the placement of geotextile, onion bags filled with wood chips, brush-packing or other similar measures.<br>• Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and reused elsewhere on the property or disposed of at an appropriate disposal site.<br>• Where necessary disturbed soils must be revegetated with the local indigenous vegetation such as that which occurs at the site or provided with other suitable cover.<br>• It is recommended that follow-up alien clearing be conducted 6 months after construction is complete. | | |
| Performance Indicator | • All construction-related materials, equipment, facilities, waste and contaminated soils have been removed from the site.<br>• Compacted soils have been scarified/ ripped and stabilised.<br>• All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised.<br>• No alien vegetation is evident on site. | |

**OBJECTIVE 3: PREVENT ALIEN VEGETATION ESTABLISHMENT ON THE SITE**

| ***Impact Management Objective:* To prevent alien vegetation establishment on the site** | | |
|---|---|---|
| Potential impact to avoid | • Establishment of alien vegetation on site<br>• Displacement of indigenous flora | |
| Impact Management Outcome | The site is free of alien vegetation and indigenous flora is not displaced | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • Remove topsoil and/or seedbearing plant material from the vegetated areas to be disturbed for use in the rehabilitation of disturbed areas after construction. Avoid using seed-bearing alien plant material for rehabilitation purposes.<br>• Rehabilitate/revegetate all the disturbed surfaces. Erosion prevention measures will be needed on the steep slopes, such as silt fences, logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous grass seed may also be needed. | Contractor/ holder of EA | Post-Construction phase |

| | | |
|---|---|---|
| However, due to the linear nature of the project, it is expected that the disturbed areas will recover relatively quickly without the need for much intervention.<br>• Engage in alien clearing, focussing on invasive species such as black wattle and rooikrans. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Their control will become a short- to medium-term maintenance requirement.<br>• Search and rescue succulents and bulbs from the construction footprint for replanting in the disturbed areas after construction. Topsoil, cuttings and seedbearing plant material can also be salvaged for this purpose, especially cuttings from Carpobrotus and Pelargonium species. Geophytes (e.g. Dioscorea sylvatica, Albuca bracteata, Chasmanthe aethiopica and Bonatea speciosa) should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering.<br>• Alien and invasive vegetation should be cleared by hand<br>• All regrowth and seed germination to be monitored and any new recruitment be removed | | |
| Performance Indicator | The site is free of alien vegetation and indigenous flora is not displaced | |

**OBJECTIVE 4: LIMIT IMPACT ON TERRESTRIAL BIODIVERSITY**

| ***Impact Management Objective:* To limit the impact on terrestrial biodiversity** | | |
|---|---|---|
| Potential impact to avoid | • Collision of fauna with vehicles<br>• Illegal waste dumping<br>• Illegal hunting<br>• Fire risk | |
| Impact Management Outcome | Only authorise vehicles and people are allowed on the access road | |
| **IMPACT MANAGEMENT ACTIONS** | | |
| Mitigation measure | Responsible party | Time period |
| • The access road should be access controlled so as not to allow novel indirect impacts into this previously undisturbed part of the landscape.<br>• Access control should also be applied to the new rising main footprint. | Contractor/ holder of EA | Post-Construction phase |
| Performance Indicator | Terrestrial biodiversity is not impacted | |

## 12. Emergency Preparedness

### 12.1 Emergency response procedures

The potential environmental risks that may arise as a result of construction activities must be identified, and appropriate emergency response procedures must be compiled for each emergency scenario. Potential environmental emergencies that require an emergency response include – but are not limited to – unplanned fires, sewage spills, spills of hazardous chemicals, snake bites etc.

- The construction contractor is responsible for ensuring that the requirements of the Occupational Health & Safety Act (OHSA) are adhered to during the construction phase. The Applicant is responsible for ensuring compliance with the OHSA during the undertaking of construction activities.

### 12.2 Emergency preparedness

The following measures must be implemented, as appropriate, to ensure effective responses to emergencies:

- All workers on site during the construction and maintenance phase must be properly educated about possible emergency incidents that may arise, how to avoid such incidents and how to respond in the event of an incident. "Refresher" training sessions on emergency procedures must be held if needed.
- All workers must ideally be given basic fire-awareness training and advised on basic firefighting and safety techniques. Fire-fighting equipment must be available on site during construction activities (see section 7.3).
- All workers must be trained on how to respond in the event of a spill of a hazardous substance(fuel, chemicals etc.), if hazardous substances are to be used on site.
- A spill kit for containing and/or neutralising spills of hazardous substances (e.g., hydrocarbons) must be available on site at all times, when hazardous substances are present.
- Any incidents of pollution or spillage of hazardous materials during construction must be reported to the ECO as soon as possible. The ECO must then (depending on the nature of the spill) notify the relevant authorities, if needed. A first aid kit must be available on site at all times.
- Emergency contact numbers (including the fire department, police and ambulance) must be prominently displayed on site at all times and regularly updated.
- All emergency incidents must be recorded in a site incident log. The cause of the incident, the measures taken in response to the incident and the efficacy of those measures must also be recorded. This information must be used to inform future emergency preparedness planning, and to avoid prevent similar incidents from arising again.

### 12.3 Control of emergency incidents

In the event of an emergency incident, Section 30 of the National Environmental Management Act. 1998, must be complied with.

**Any incidents must be reported to the relevant authorities and within the prescribed period.**

**Table 3: NEMA Section 30**

30.(1) in this section
(a) "incident" means an unexpected sudden occurrence. including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment. Whether immediate or delayed.

(b) "responsible person" includes any person who
(i) is responsible for the incident
(ii) owns any hazardous substance involved in the incident; or
(iii) was in control of any hazardous substance involved in the incident at the time of the incident

(c) "relevant authority" means
(i) a municipality with jurisdiction over the area in which an incident occurs
(ii) a provincial head of department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs:
(iii) the Director-General
(iv) any other Director-General of a national department

(2) Where this section authorises a relevant authority to take any steps. such steps may only be taken by
(a) the person referred to in subsection (1)(c)(iv) if no steps have been taken by any of the other persons listed in subsection (1)(c):
(b) the person referred to in subsection (1)(c)(iii) if no steps have been taken by 20 any of the persons listed in subsection (1)(c)(i) and (c)(ii):
(c) the person referred to in subsection (1)(c)(ii) if no steps have been taken by the person listed in subsection (1)(c)(i):
Provided that any relevant authority may nevertheless take such steps if it is necessary to do so in the circumstances and no other person referred to in subsection (1)(c) has yet taken such steps.
(3) The responsible person or. where the incident occurred in the course of that persons employment. his or her employer must forthwith after knowledge of the incident. report through the most effective means reasonably available.
(a) the nature of the incident
(b) any risks posed by the incident to public health. safety and property
(c) the toxicity of substances or by-products released by the incident; and
(d) anv steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to
(i) the Director- General
(ii) the South African Police Services and the relevant fire prevention service:
(iii) the relevant provincial head of department or municipality: and
(iv) all persons whose health may be affected by the incident

(4) The responsible person or. where the incident occurred in the course of that person's employment. his or her employer. must. as soon as reasonably practicable after knowledge of the incident

(a) take all reasonable measures to contain and minimise the effects of the incident. including its effects on the environment and any risks posed by the incident to the health. safety and property of persons;
(b) undertake clean-up procedures:
(c) remedy the effects of the incident:
(d) assess the immediate and long-term effects of the incident on the environment and public health:

(5) The responsible person or, where the incident occurred in the course of thatpersons employment. his or her employer. must. within 14 days of the incident, report to the Director-General. provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including
(a) the nature of the incident
(b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;
(c) initial measures taken to minimise impacts:
(d) causes of the incident, whether direct or indirect. including equipment, technology. system. or management failure; and
(e) measures taken and to be taken to avoid a recurrence of such incident.

(6) relevant authority may direct the responsible person to undertake specific measures within a specific time to fulfil his or her obligations under subsections (4) and (5): Provided that the relevant authority must. when considering any such measure or time period. have regard to the following:
(a) the principles set out in section 2
(b) the severity of any impact on the environment as a result of the incident and the costs of the measures being considered;
(c) any measures already taken or proposed by the person on whom measures are to be imposed, if applicable:
(d) the desirability of the state fulfilling its role as custodian holding the environment in public trust for the people
(e) any other relevant factors.

(7) A verbal directive must be confirmed in writing at the earliest opportunity. Which must be within seven days.

(8) Should
(a) the responsible person fail to comply, or inadequately comply with a directive under subsection (6):
(b) there be uncertainty as to who the responsible person is: or
(c) there be an immediate risk of serious danger to the public or potentially serious detriment to the environment
A relevant authority may take the measures it considers necessary to
(i) contain and minimise the effects of the incident:
(ii) undertake clean-up procedures: and
(iii) remedy the effects of the incident.

(9) A relevant authority may claim reimbursement of all reasonable costs incurred by it in terms of subsection (8) from every responsible person jointly and severally.

(10) A relevant authority which has taken steps under subsections (6) or (8) must. As soon as reasonably practicable. prepare comprehensive reports on the incident. Which reports must be made available through the most effective means reasonably available to
(a) the public:
(b) the Director-General
(c) the South African Police Services and the relevant fire prevention service;
(d) the relevant provincial head of department or municipality: and
(e) all persons who may be affected by the incident.
(11) A person who contravenes or fails to comply with subsection (3), (4), (5) or (6) is guilty of an offence and liable on conviction to a fine not exceeding R1 million or to imprisonment for a period not exceeding 1 year, or to both such a fine and such imprisonment.

## 13. Method statements

The Competent Authority and/or the ECO may require the Applicant or Construction Contractor to submit Method Statements for one or more construction-related activity, or any aspect of the management of the site, before the activity is undertaken or during the performance of the activity if the activity is causing or may cause significant environmental damage or pose a health and safety risk.

Method Statements need not be complex and lengthy, but must clearly state **how**, **when** and **where** the activity concerned will be undertaken, and must specify **who** will be responsible for undertaking each component of that activity. Method Statements must be prepared by the Construction Contractor and submitted to the ECO for approval before undertaking the activity concerned.

The ECO and / or Competent Authority have the authority to request method statements for other activities, including but not limited to:

- Establishment of site camp and stockpile area.
- Cement/ concrete batching, disposal and emergency contingencies.
- Topsoil and sub-soil storage/ stockpiling.
- Storage of fuels and hazardous chemicals and emergency contingencies.
- Waste management system.
- Storm water management and control.
- Emergency preparedness plan / emergency response procedure (see Chapter 13).

The ECO has the authority to prevent activities from being undertaken until such time as a satisfactory Method Statement has been submitted to the ECO and approved by the ECO.

## 14. Roles and Responsibilities

This EMPr, once approved by the competent authority (DEADP), should be seen as binding to the Applicant, and any person acting on the Applicant's behalf, including but not limited to agents, employees, associates, contractors and service providers.

The Applicant and all other persons who may be directly involved in the development are also bound by their general Duty of Care, as stated in Section 28 of the National Environmental Management Act, 1998:

> ***Duty of Care:***
>
> *"Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the*

### 14.1 Duties and Responsibilities of the Applicant

The Applicant is ultimately responsible for ensuring that the environmental management measures specified in this EMPr, as well as any other conditions specified by the competent authority, are implemented and adhered to during the construction phase of the proposed development.

The Applicant or party delegated by the applicant is responsible for monitoring during the construction phase. The Applicant must ensure that all appointed service providers, contractors and workers are capable of complying with all statutory requirements of this EMPr and the conditions of the Environmental Authorisation. The Applicant is responsible for ensuring that this EMPr and the conditions of the Environmental Authorisation are implemented and adhered to during construction activities undertaken by the Applicant.

The Applicant or appointed consultant is responsible for identifying emergency situations that may arise during operational activities undertaken by the Applicant and must formulate appropriate emergency response procedures for these emergency scenarios.

### 14.2 Duties and Responsibilities of the Contractor

The "Construction Contractor" is the entity responsible for undertaking the physical construction of the residential development. The construction contractor is responsible for ensuring that all environmental management measures specified in this EMPr and in the EA are implemented during the pre-construction, construction and post-construction rehabilitation phases, unless agreed otherwise with the Applicant. The contractor will be responsible for all costs incurred in the rehabilitation of the site and for ensuring effective environmental management during construction. The contractor must therefore make adequate financial provision for the implementation of all prescribed measures.

It is strongly recommended that the Construction Contractor appoint an Environmental Site Officer (ESO), who will act as the Contractor's representative to monitor and enforce compliance with the conditions of this EMPr, throughout all phases of construction.

In addition to the above, the Construction Contractor is responsible for the following:

- Identify emergency situations that may arise as a result of construction activities and formulate appropriate emergency response procedures (see Chapter 12).
- Ensure that all construction workers, including sub-consultants and service providers, undergo environmental awareness training prior to commencing work on site, or as soon as possible thereafter (see Chapter 15).
- Compile the required method statements, which must be to the satisfaction of the ECO, before commencing with the activity to be governed by the method statement (Chapter 13).

- Respond to concerns or issues identified by the ECO, as relates to environmental management, and implement the appropriate management or remediation measures, at the Contractor's own expense (unless agreed otherwise)
- Should third parties be called to the site to perform clean up and rehabilitation procedures, the Construction Contractor will be responsible for all associated costs.

Note that failure to comply with the requirements and conditions of this EMPr and the Environmental Authorisation may result in fines or other penalties being levied against the Construction Contractor by the Competent Authority.

### 14.3 Duties and Responsibilities of the ECO

The appointed Environmental Control Officer (ECO) is responsible for undertaking regular site visits to monitor and report on the implementation of the EMPr and adherence to the conditions of the Environmental Authorisation during the pre-construction, construction and post-construction rehabilitation phases. The ECO is not required to monitor the site during the operational phase of the development.

#### Competency of the ECO

The ECO must be independent of the Applicant, Engineer, Construction Contractor and their service providers. The appointed ECO must be suitably qualified and experienced, and must be able to demonstrate that he / she is of sufficient competency to undertake the required task. The ECO should preferably be a resident in close proximity to the development area to ensure quick response if required. The ECO must work in close co-operation with the Construction Contractor, resident engineer or ESO (where applicable) and all contractors in order to identify potential problems before they occur, and provide suitable guidance as to how the identified problems (environmental impacts) can be avoided.

#### Duties of the ECO

The duties of the ECO include, but are not limited to:

- Conduct a pre-construction site inspection to ascertain the pre-commencement condition of the site (i.e. the status quo) and determine whether faunal search-and-rescue is required;
- Conduct environmental awareness training (see Chapter 15);
- Undertake regular site visits to monitor compliance with all mitigation, monitoring and management measures contained in the EMPr and the Environmental Authorisation, during the pre-construction, construction and rehabilitation phases of the development (see section below regarding frequency of ECO visits).
- Evaluate the achievement of the performance indicators associated with each impact management outcome specified in this EMPr (Chapters 8-11)
- Liaise with site contractors, engineers and other members of the development team with regard to the requirements of the EMPr;
- Provide guidance as and when required regarding the implementation of the environmental management measures contained in the EMPr and EA, so as to assist the Applicant and contractor in remaining compliant with these measures;
- Assist in finding environmentally acceptable solutions to construction problems;
- Ensure that the working area, site camp facilities, access roads and no-go areas are properly demarcated;
- Ensure that proper topsoil management practices are adhered to on site;
- Ensure that proper waste management & pollution prevention strategies are practised on site;

- Examine method statements;
- Email contractors with potential non compliance notices in case of contravention of the EMPr;
- Ensure satisfactory rehabilitation of disturbed areas on site, after construction is complete;
- Keep detailed records of all site activities that may pertain to the environment, and produce compliance-monitoring reports (ECO Reports) for submission to the Applicant, and the Competent Authority at regular intervals during the construction phase;
- Submit a final post-construction inspection report, within 6 months of completion of the construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.
- All ECO Reports and Inspection Reports must be submitted to the Applicant and Competent Authority.

**Frequency of ECO visits**

The ECO must conduct weekly site visits during the initial clearing and earthwork activities until the activities shift to internal mechanical aspects of the pump stations. Thereafter, the frequency of the site visits may taper at the discretion of the ECO, to check compliance with the conditions of the EA, mitigation measures and recommendations of this EMPr. The ECO has the discretion to undertake additional visits if he / she feels this is justified due to the actions of the contractors, and to make *ad hoc* visits in order to ensure compliance.

The ECO must also undertake a final inspection (audit) 6 months of completion of construction activities. The purpose of this final inspection is to ensure that the rehabilitation measures applied at the conclusion of the construction phase have been sufficient to promote the successful rehabilitation of the site, and to identify any further issues that require attention or follow-up.

**Authority of the ECO**

The ECO has the authority to recommend that the Engineer suspend all works (or part thereof) occurring on site, should any action being undertaken on site not comply with the environmental requirements, and where such actions pose a serious threat to any element of the surrounding environment.

The ECO has the authority to recommend measures to the Engineer, regarding measures that must be implemented on site in order to ensure compliance with the EMPr and Environmental Authorisation, and/or to prevent environmental degradation or pollution from occurring.

The ECO has the authority to issue verbal and written warnings to contractors. Should verbal and written instructions and/or warnings be ignored, the ECO has the authority to request the Engineer to issue pre-determined fines or other penalties.

## 15. Environmental Awareness Plan

Environmental Awareness Training must be conducted prior to the commencement of construction activities. It is the applicant's responsibility to familiarise himself/herself with the content and requirements of this EMPr. The applicant is also responsible to ensure that the contractor and all labourers working on site during the construction phase are familiar with the content of this EMPr.

The following actions must be taken to ensure that all relevant parties are aware of their environmental role and duties:

1. This EMPr must be kept on site at all times.
2. The provisions of this EMPr and the conditions of the Environmental Authorisation must be explained in detail to all staff during Awareness Training.
3. Training booklets will be handed out to all labourers and must be explained to them.
4. Weekly checks to be done by the Applicant's environmental representative (where available) who must be on site at all times.
5. The ECO to do frequent site visits, as recommended in Section 14.3 of the EMPr.
6. Monthly monitoring reports to be compiled by the ECO. These reports will be circulated to all parties involved (including the applicant, contractor and the competent authority).

The Construction Contractor must make allowance for all construction site staff, including all subcontractors that will be working at the site, to attend environmental awareness training sessions (undertaken by the ECO) before commencing any work on site. During this training, the ECO will explain the EMPr and the conditions contained therein. Attention will be given to the construction process and how the EMPr fits into this process. Other items relating to sound environmental management which must be discussed and explained during the environmental awareness training sessions include:

- The demarcated "No-Go" areas;
- General do's and don'ts of the site;
- Making of fires;
- Waste management, use of waste receptacles and littering;
- Use of the toilets provided;
- Use and control of construction materials and equipment etc.;
- Control, maintenance and refuelling of vehicles;
- Methods for cleaning up any spillage;
- Access and road safety;
- Emergency procedures (e.g. in case of fire, spillage etc.)
- General "best practice" principles, with regards to the protection of environmental resources.

Environmental awareness training and education must be ongoing throughout the construction phase and must be undertaken regularly if deemed necessary (especially if it becomes apparent that there are repeat contraventions of the conditions of the EMPr), or as new workers come to site. Translators must be utilised where needed. An Environmental Awareness Guideline has been compiled and is included in Appendix F of the EMPr.

## 16. Monitoring, Record Keeping and Reporting

### 16.1 Environmental Auditing

In accordance with the requirements of the Amended Environmental Impact Assessment Regulations of 2014 (GN No. R.327 of 7 April 2017), the holder of the Environmental Authorisation (i.e. the Applicant) must, for the period that the Environmental Authorisation is valid, appoint a suitably qualified independent person to conduct an environmental audit to audit compliance with the conditions of the Environmental Authorisation and the EMPr.

The appointed auditor must undertake environmental audits within 6 months after the completion of the rehabilitation measures. Following each audit the environmental auditor must submit an audit report to the Competent Authority (in this instance the DEA&DP). The Auditor must be independent from the EAP and ECO.

- Environmental auditing and environmental audit reports must adhere to the requirements of the Environmental Impact Assessment Regulations, in particular Section 34 (*Auditing of Compliance with Environmental Authorisation, Environmental Management Programme*) and Appendix 7 (*Objective and Content of Environmental Audit Report*).
- The audit report must provide verifiable findings on the level of compliance with the provisions/ conditions of the Environmental Authorisation and the EMPr, and must also comment on the ability of the measures contained in this EMPr to sufficiently avoid, manage and mitigate environmental impacts.
- Where the findings of the audit report indicate that the impact management measures stated in the EMPr are insufficient to adequately address environmental impacts, recommendations as to how the EMPr must be amended so as to address the identified shortcomings must be made and submitted to the competent authority together with the audit report.

**16.2 Construction phase monitoring, reporting and record keeping.**

The appointed Environmental Control Officer (ECO) is responsible for monitoring the site at regular intervals during the construction phase, in order to ensure that the provisions of this EMPr and the Environmental Authorisation are adhered to and that sound environmental management is ensuing on site.

The ECO must compile a monthly ECO report detailing the ECO's observations on site, any instances of non-compliance and any issues or aspects that require attention, follow-up or remedial action. The ECO reports must be submitted to the Applicant, and to the Competent Authority as requested by the DEADP in the EA. The ECO inspection reports must include both photographic and written records.

**ECO Inspections - Photographic Records**

The condition of the surrounding natural environment must be monitored regularly in order to ensure that construction and management activities are not impacting negatively on the condition of the landscape and any sensitive ecosystems. The most effective way to achieve this is by means of a detailed photographic record. In this way, a record of any shift in ecosystem condition can be maintained and potential impacts be detected at an early stage. It is thus recommended that fixed-point photo-monitoring sites could be set up, and photographs should be taken at these sites during each ECO inspection. Where necessary, the entire working area should be well documented and photographed.

**ECO Inspections - Written Records**

The following record-keeping during the pre-construction, construction and rehabilitation phases of the development is recommended:

- The ECO must compile an ECO monitoring report and submit this to the Applicant, the Contractor and the Competent Authority (the latter only if required by the Competent Authority). The monthly reports must be a summary of the ECO inspections from the preceding month and must highlight the key concerns/ issues on site, instances of non- compliance with the EA and EMPr, all instructions issued to the contractor, actions taken and aspects that still require attention.
- All ECO reports and ECO instructions must be retained on file by the Applicant at least for the duration of the construction period (retaining reports for a period of at least 5 years is recommended, in the event that the Competent Authority should request information).

- A record (minutes) of construction site meetings, liaison site meetings between the ECO and resident engineer or contractor, monitoring reports, ECO instructions and ECO observations should be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) should be kept on site at the site office for the recording of any environmental incidents (e.g., fires, spills etc.), observations which are contrary to the stipulations within the EMPr and any other contravention deemed necessary for the attention of the resident engineer. Actions taken to remedy the incidents should also be recorded.
- A complaints register should be kept on site in which complaints by any member of the public should be logged.
- The ECO must compile a final post-construction audit report, within 6 months of completion of each construction phase. The audit report should detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.

***Construction Phase Record Keeping***

A copy of the approved EMPr, the Environmental Authorisation and any relevant construction method statements must be kept on site at all times during pre-construction, construction and rehabilitation activities. The ECO Reports must be retained by the Applicant for a period of at least 5 years and must be provided to the Competent Authority upon request. Additionally any groundwater or water quality results must be made available to all relevant authorities upon request.

**16.3 Corrective Action Procedure**

Correction actions need to be followed in the event where there is non-compliance with a condition of the EA and any recommendation and mitigation measure as stipulated in this EMPr in order to rectify the non-compliance and to prevent reoccurrence.

The ECO will be responsible for reporting non-compliance with any condition of the EA and the recommendations and mitigation measures as included in this EMPr. The ECO will also be responsible for the compilation of non-compliance reports and identifying steps to correct the non-compliance.

The ECO must report all non-compliance issues to the contractor whose responsibility it is to correct. A timeframe for the completion of the corrective actions must be agreed to the ECO. Once the corrective actions have implemented the contractor must notify the ECO. The ECO must review the effectiveness of the corrective actions and if it is found to be inadequate, additional measures must be implemented. Only once the corrective actions have been completed to the satisfaction of the ECO will the matter be considered as closed.

In instances where there are repeated instances where the requirements and conditions of this EMPr and the Environmental Authorisation are contravened or not fully complied with, the Construction Contractor may be liable for financial penalties. Penalties shall be issued by the Engineer, in accordance with the Schedule of Fines contained in the table below. Penalties may be issued at the Engineer's discretion, and/or upon the request/ recommendation of the ECO or Competent Authority.

Depending on the nature of transgression, the Engineer and/or ECO may issue one or more warnings to the Contractor prior to the issuing of a fine. Warnings may be given in writing or orally, but oral warnings must be followed up with written confirmation of the warning within 48 hours of the oral warning. The Engineer has the discretion to issue a fine without first issuing a warning, if the severity of the transgression is judged by the Engineer and/or ECO and/or Competent Authority to warrant such action.

The Engineer must ensure that the levying of fines/penalties forms part of the contract between the Construction Contractor and the Engineer and is subject to the provisions of South African contract law.

The table below specifies the transgressions for which the Construction Contractor may incur financial penalties, and the amount of the fines that may be levied. Levying of fines/ penalties is subject to alignment with South African Contractual Law. For repeat offences of the same/ similar transgression by the same party, the value of the fine shall be doubled for each subsequent repeat offence to a maximum value of **R50 000.00** per offence.

*Note: "Provisions", as stated in the table below, relates to the requirements specified in this EMPr and any requirements or conditions specified in the EA, as well as any other requirements governing the environmental management aspects of the development, which the Contractor is responsible for implementing.*

| # | Finable Transgression | Min Fine | Max Fine |
|---|---|---|---|
| 1 | Failure to notify the ECO of the commencement of construction or pre-construction activities, prior to the commencement of such activities | R1 000 | R2 000 |
| 2 | Failure to comply with the provisions relating to the demarcation of the working area, site camp and associated facilities, and the maintenance of the demarcated boundaries. | R1 000 | R5 000 |
| 3 | Failure to comply with the provisions relating to the demarcation of all "no-go" areas, and the maintenance of the demarcated boundaries. | R2 000 | R5 000 |
| 4 | Failure to provide secured ablution facilities (1:30 ratio) on site. | R500 | R15 000 |
| 5 | Failure to comply with the provisions relating to the clearance of vegetation on site. | R2 000 | R5 000 |
| 6 | Clearance of indigenous vegetation (regardless of the density of alien vegetation present) outside of the demarcated boundaries of the working area and site camp. | R2 500 | R15 000 |
| 7 | Damage to indigenous vegetation in the surrounding areas within No-Go areas | R2 000 | R10 000 |
| 8 | Failure to apply herbicide to alien vegetation when required to do so. | R500 | R2 000 |
| 9 | Failure to adhere to designated access routes and/or the driving of vehicles through undeveloped vegetation outside of the demarcated working area or site camp. | R1 000 | R5 000 |
| 10 | Movement of vehicles and/or construction workers in no-go areas; | R1 000 | R10 000 |
| 11 | Empty cement bags found on site or surrounding vegetation. Open cement bags on site with cement blowing from the bag | R2 500 | R15 000 |
| 12 | Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, within designated "no-go" areas. | R1 000 | R10 000 |
| 13 | Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, outside of the areas demarcated for such parking/storage. | R500 | R5 000 |
| 14 | Failure to comply with the provisions relating to the management of topsoil and subsoil. | R1 000 | R5 000 |
| 15 | Excessive excavation of material in areas not depicted for such purpose / activity on the approved design plans. | R2 500 | R10 000 |
| 16 | Failure to comply with the provisions relating to waste management on site i.e. recycling of waste | R500 | R5 000 |
| 17 | Failure to comply with the provisions relating to the storage, use and management of hazardous substances and fuels on site and/or the spillage of hydrocarbons or hazardous substances on site. | R1 000 | R10 000 |
| 18 | Mixing cement or concrete on bare ground and/or failure to comply with any other provision regarding cement/ concrete batching | R1 000 | R5 000 |

| | | | |
|---|---|---|---|
| 19 | Failure to provide adequate fire-fighting equipment (in working order) on site at all times and/or failure to comply with the provisions relating to fire prevention and/or the occurrence of unattended or out of control fires. | R500 | R5 000 |
| 20 | Refuelling of vehicles, machinery or equipment outside of the designated refuelling area. | R500 | R2 000 |
| 21 | Maintenance of vehicles, machinery or equipment outside of the designated maintenance yard, except in emergencies | R500 | R2 000 |
| 22 | Failure to undertake refuelling or repairs over a drip tray or other impermeable bunded surface to collect spilled hydrocarbons (fuels, lubricants, oils etc.) and other hazardous substances; failure to provide drip trays under fuel burning equipment (including pumps and generators) where there is a risk of hydrocarbon leakage. | R500 | R2 000 |
| 23 | Storing / placing fuel containing equipment (i.e. bowsers and other fuel containers) within a drainage line. | R2 500 | R10 000 |
| 24 | Failure to produce a required method statement/s to the engineer's and ECO's satisfaction prior to undertaking the activity concerned and/or failure to adhere to an approved method statement | R1 000 | R5 000 |
| 25 | Waste found to be buried or burnt on site | R5 000 | R15 000 |

## 17. CONCLUSION

The recommendations and mitigation measures prescribed in this EMPr have been formulated with the intention of addressing potential pre-construction, construction and operational phase impacts on the environment. It is likely that if the conditions, requirements and recommendations of the above EMPr are implemented as described and the relevant stakeholders adhere to the various mitigation measures, then the project will be completed without unforeseen negative environmental impacts. Familiarity with the contents of this EMPr by the contractors and other individuals involved in the development project will assist in achieving "environmental best-practice", which ultimately ensures that the project arrives at a sustainable outcome.

**APPENDIX A**
**LOCALITY MAP**


Legend

Farm Portions

Map Center: Lon: 22°23'14.4"E
Lat: 34°3'5.8"S

Scale: 1:18,056

Date created: 2024/20/03

Western Cape Government
FOR YOU

PREPARED FOR GEORGE MUNICPALITY
SEPTEMBER 2024

# APPENDIX A
# LOCALITY MAP


PREPARED FOR GEORGE MUNICPALITY
SEPTEMBER 2024

APPENDIX B


NOTE:
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

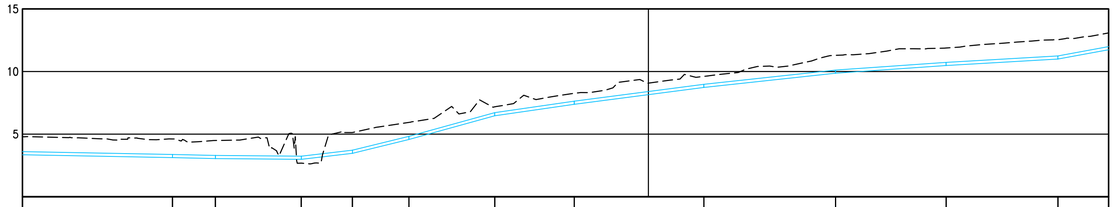
## SEWER RISING MAIN PIPE TABLE

| NAME | SIZE | LENGTH | SLOPE | MATERIAL |
|---|---|---|---|---|
| P(32) | 250 mm | 24.0 m | -0.95% | uPVC |
| P(33) | 250 mm | 6.9 m | -1.14% | uPVC |
| P(34) | 250 mm | 13.7 m | -0.43% | uPVC |
| P(35) | 250 mm | 8.2 m | 5.88% | uPVC |
| P(36) | 250 mm | 9.0 m | -12.25% | uPVC |
| P(37) | 250 mm | 13.7 m | 13.80% | uPVC |
| P(38) | 250 mm | 12.7 m | 7.22% | uPVC |
| P(39) | 250 mm | 20.7 m | 6.51% | uPVC |
| P(40) | 250 mm | 21.0 m | 5.40% | uPVC |
| P(41) | 250 mm | 17.7 m | 3.47% | uPVC |
| P(42)(0) | 250 mm | 17.9 m | 2.89% | uPVC |
| P(43) | 250 mm | 8.1 m | 9.19% | uPVC |

NGL
PIPE

SCALES:
Horizontal 1:500
Vertical 1:250

DATUM 0.000




| | P(32) 200ø CLASS | P(33) 200ø CLASS | P(34) 200ø CLASS | P(35) 200ø CLASS | P(36) 200ø CLASS | P(37) 200ø CLASS | P(38) 200ø CLASS | P(39) 200ø CLASS | P(40) 200ø CLASS | P(41) 200ø CLASS | P(42)(0) 200ø CLASS | P(43) 200ø CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REFERENCE | | | | | | | | | | | | |
| DISTANCE (m) | 0.000 23.973 | 30.829 | 44.545 | 52.712 | 61.738 | 75.450 | 88.151 | 108.856 | 129.896 | 147.556 | 165.422 | ??? |
| GROUND LEVEL | | | | | | | | | | | | |
| PIPE INVERT LEVEL | 3.353 3.125 | 3.125 3.047 | 3.047 2.987 | 2.987 3.467 | 3.467 4.573 | 4.573 6.465 | 6.465 7.382 | 7.382 8.729 | 8.729 9.865 | 9.865 10.478 | 10.478 10.995 | 10.995 11.740 |
| DEPTH TO INVERT | | | | | | | | | | | | |
| SLOPE / LENGTH | −0.95% −1:105.0 23.97m | −1.14% −1:88.0 6.86m | −0.43% −1:230.0 13.72m | 5.88% 1:17.0 8.15m | −12.25% −1:8.2 9.03m | 13.80% 1:7.2 13.71m | 7.22% 1:13.9 12.70m | 6.51% 1:15.4 20.71m | 5.40% 1:18.5 21.04m | 3.47% 1:28.8 17.66m | 2.89% 1:34.5 17.87m | 9.19% 1:10.9 8.11m |

LONGSECTION PROPOSED RISING MAIN 1
FROM 0.000 TO 173.527

LEGEND:
- FIRE HYDRANT/ MARKER
- TREE
- GATE
- LAMP POLE
- WATER METER/ WATER VALVES
- TELEPHONE POLE
- ROCK OUTCROP
- BENCH MARKS
- ELECTRICITY BOX
- EXISTING SEWERLINE
- EXISTING MANHOLE
- EXISTING MANHOLE
- STORMWATER
- PROPOSED RISING PIPELINE
- SERVITUDE 4m WIDE
- EMERGENCY STORAGE TANK

FOR DISCUSSION

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| | | | | DESIGNED | T CRONJE |
| | | | | CHECKED | J HOUGH |
| | | | | DRAWN | M GQWETHA |
| 0B | 07-07-2023 | FOR DISCUSSION | WA | CHECKED | W ANNANDALE |
| NO. | DATE | DESCRIPTION | INITIAL | | |

SIGNED
SMEC South Africa
DATE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SIGNED
George Municipality
DATE

# Upgrading of Herolds Bay Pumpstation

## Sewer Rising Main From Herolds Bay PS No. 1 to Herolds Bay PS No. 4 SV 0 to SV 171

| SIZE | SCALE |
|---|---|
| A1 | AS SHOWN |

PROJECT DRAWING NUMBER: C1936 - 520 - 001

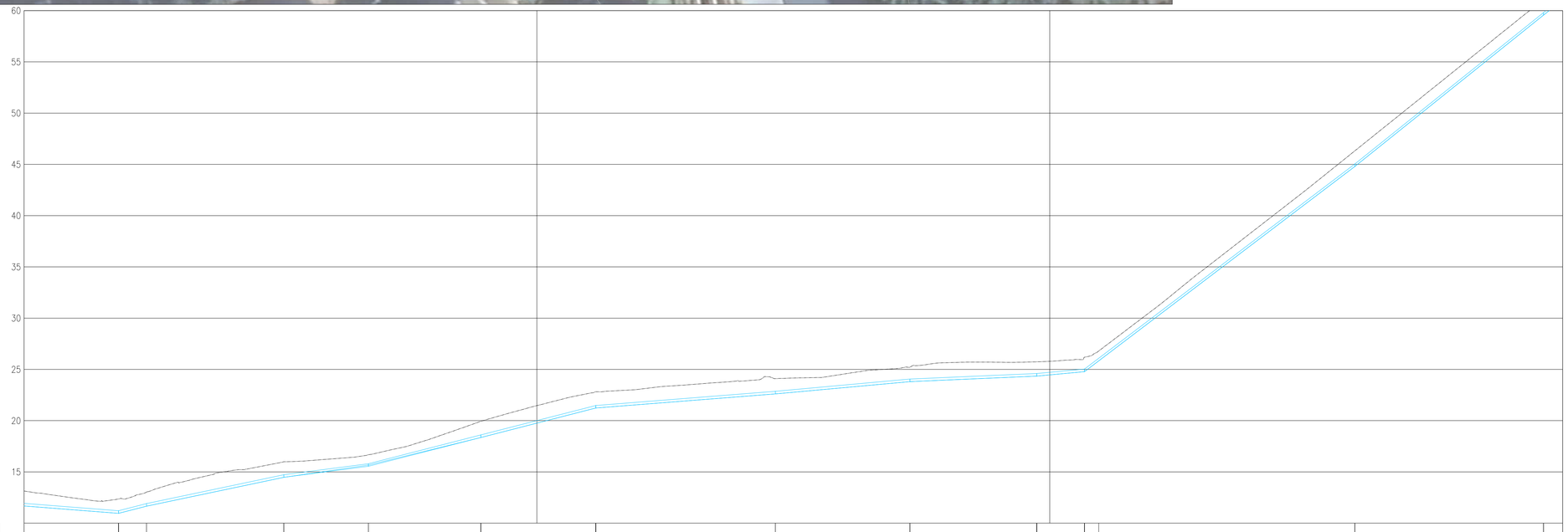
| REV | SHEET No. |
|---|---|
| OB | 01 OF 05 |

SCALE BAR 1 : 1000
0 10m 25m 50m 100m


## SEWER RISING MAIN PIPE TABLE

| NAME | SIZE | LENGTH | SLOPE | MATERIAL |
|---|---|---|---|---|
| P(1) | 250 mm | 18.4 m | -3.92% | uPVC |
| P(2) | 250 mm | 5.4 m | 12.84% | uPVC |
| P(3) | 250 mm | 26.8 m | 10.51% | uPVC |
| P(4) | 250 mm | 16.5 m | 6.51% | uPVC |
| P(5) | 250 mm | 21.9 m | 12.83% | uPVC |
| P(6) | 250 mm | 22.4 m | 12.80% | uPVC |
| P(7) | 250 mm | 35.0 m | 3.96% | uPVC |
| P(8) | 250 mm | 26.2 m | 4.54% | uPVC |
| P(9) | 250 mm | 24.7 m | 2.18% | uPVC |
| P(10) | 250 mm | 9.3 m | 4.72% | uPVC |
| P(11) | 250 mm | 52.7 m | 37.95% | uPVC |
| P(12) | 250 mm | 36.8 m | 40.13% | uPVC |
| P(13) | 250 mm | 27.3 m | 40.48% | uPVC |

NOTE:
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.




NGL ——— - ———
PIPE ═══

SCALES:
Horizontal 1:500
Vertical 1:250

DATUM 10.000

| REFERENCE | | P(1) 200ø CLASS | P(2) 200ø CLASS | P(3) 200ø CLASS | P(4) 200ø CLASS | P(5) 200ø CLASS | P(6) 200ø CLASS | P(7) 200ø CLASS | P(8) 200ø CLASS | P(9) 200ø CLASS | P(10) 200ø CLASS | P(11) 200ø CLASS | P(12) 200ø CLASS | P(13) 200ø CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DISTANCE (m) | 0.000 | 18.423 | 23.872 | 50.662 | 67.142 | 89.071 | 111.489 | 146.502 | 172.733 | 197.466 | 206.767 | 259.478 | 296.292 | 323.639 |
| GROUND LEVEL | 13.132 | 12.354 | 13.015 | 15.990 | 16.684 | 19.941 | 22.830 | 24.099 | 25.217 | 25.736 | 26.182 | 46.315 | 61.000 | |
| PIPE INVERT LEVEL | 11.679 | 10.956<br>10.956 | 11.656<br>11.656 | 14.473<br>14.473 | 15.545<br>15.545 | 18.359<br>18.359 | 21.227<br>21.227 | 22.613<br>22.613 | 23.805<br>23.805 | 24.343<br>24.343 | 24.782<br>24.782 | 44.786<br>44.786 | 59.558<br>59.558 | 70.629 |
| DEPTH TO INVERT | 1.453 | 1.397 | 1.358 | 1.517 | 1.014 | 1.583 | 1.603 | 1.485 | 1.412 | 1.393 | 1.400 | 1.530 | 1.550 | 1.549 |
| SLOPE / LENGTH | | -3.92%<br>-1:25.5<br>18.42m | 12.84%<br>1:7.8<br>5.45m | 10.51%<br>1:9.5<br>26.79m | 6.51%<br>1:15.4<br>16.48m | 12.83%<br>1:7.8<br>21.93m | 12.80%<br>1:7.8<br>22.42m | 3.96%<br>1:25.3<br>35.01m | 4.54%<br>1:22.0<br>26.23m | 2.18%<br>1:46.0<br>24.73m | 4.72%<br>1:21.2<br>9.30m | 37.95%<br>1:2.6<br>52.71m | 40.13%<br>1:2.5<br>36.81m | 40.48%<br>1:2.5<br>27.35m |

LONGSECTION PROPOSED RISING MAIN 2
FROM 0.000 TO 300.000

LEGEND:
- FIRE HYDRANT/ MARKER
- TREE
- GATE
- LAMP POLE
- WATER METER/ WATER VALVES
- TELEPHONE POLE
- ROCK OUTCROP
- BENCH MARKS
- ELECTRICITY BOX
- EXISTING SEWERLINE
- EXISTING MANHOLE
- EXISTING MANHOLE
- STORMWATER
- PROPOSED RISING PIPELINE
- SERVITUDE 4m WIDE

FOR DISCUSSION

| REVISIONS | | | | | DESIGNED | T CRONJE |
|---|---|---|---|---|---|---|
| | | | | | CHECKED | J HOUGH |
| | | | | | DRAWN | M GQWETHA |
| 0B | 07-07-2023 | FOR DISCUSSION | WA | | CHECKED | W ANNANDALE |
| NO. | DATE | DESCRIPTION | INITIAL | | | |

SIGNED
SMEC South Africa
DATE

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website: www.george.org.za | Fax (086) 529 9872

SIGNED
George Municipality
DATE

# Upgrading of Herolds Bay Pumpstation

## Sewer Rising Main from Herolds Bay PS No. 4 to Existing WWTW SV 0 to SV 300

| SIZE | SCALE |
|---|---|
| A1 | AS SHOWN |

PROJECT DRAWING NUMBER: C1936 - 520 - 002

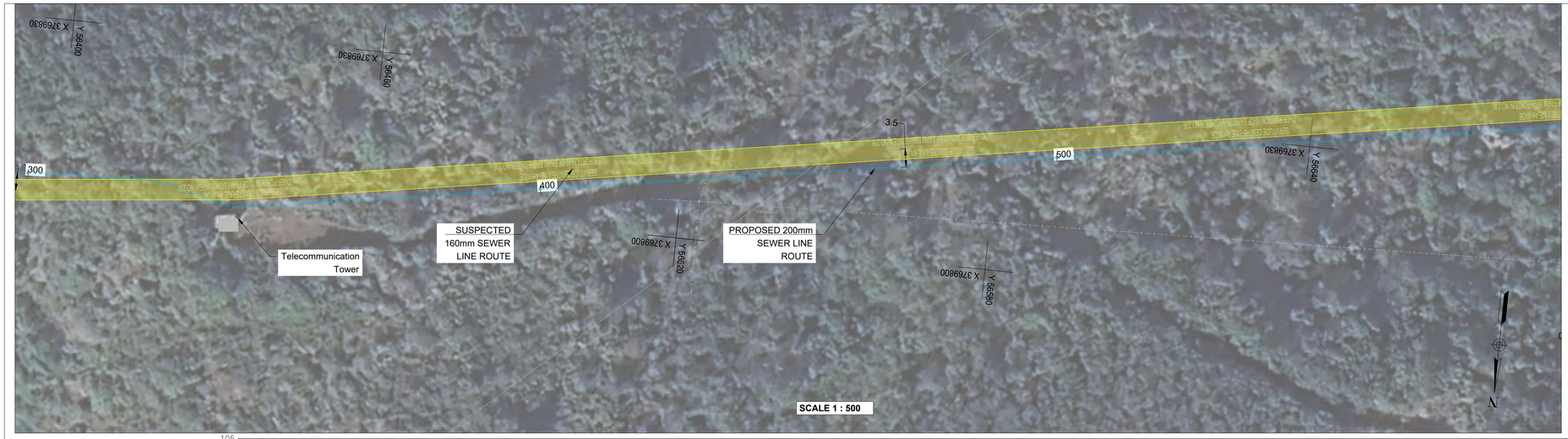
| REV | SHEET No. |
|---|---|
| OB | 02 OF 05 |

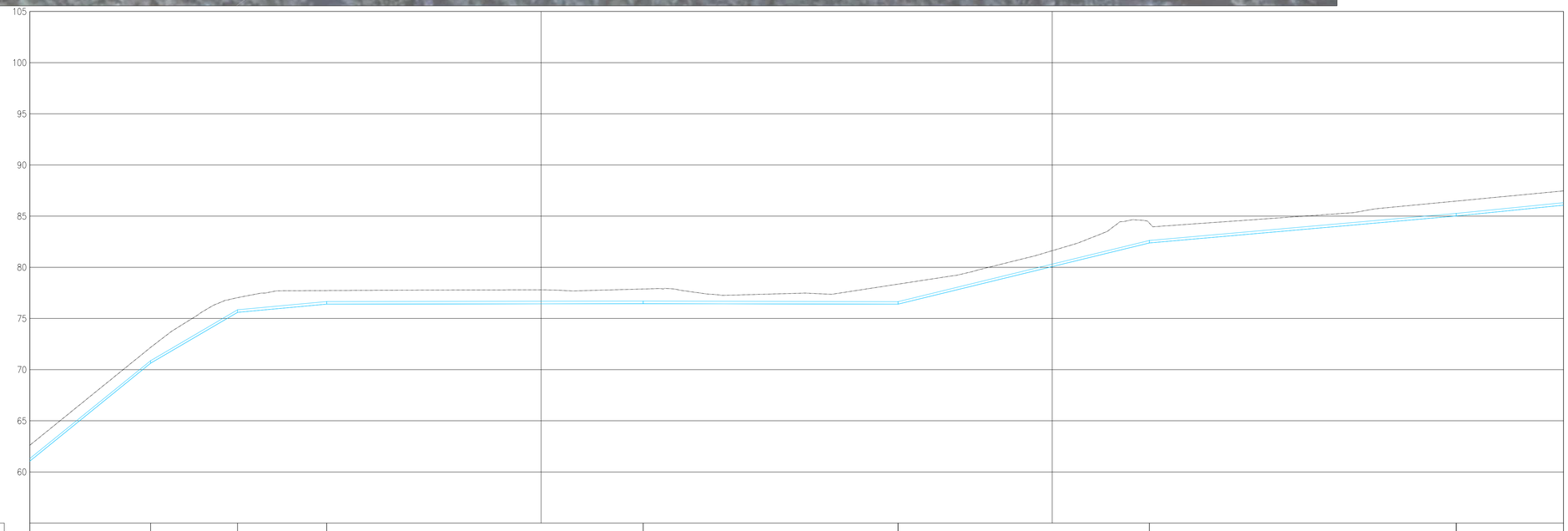
SCALE BAR: 100m, 50m, 25m, 10m, 0 — 1 : 1000

NOTE:
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

## SEWER RISING MAIN PIPE TABLE

| NAME | SIZE | LENGTH | SLOPE | MATERIAL |
|---|---|---|---|---|
| P(13) | 250 mm | 27.3 m | 40.48% | uPVC |
| P(14) | 250 mm | 17.0 m | 29.23% | uPVC |
| P(15) | 250 mm | 17.4 m | 4.63% | uPVC |
| P(16) | 250 mm | 61.9 m | 0.07% | uPVC |
| P(17) | 250 mm | 49.9 m | -0.10% | uPVC |
| P(18) | 250 mm | 49.2 m | 12.17% | uPVC |
| P(19) | 250 mm | 60.0 m | 4.40% | uPVC |
| P(20) | 250 mm | 23.5 m | 5.00% | uPVC |




NGL ——— - ———
PIPE ═══

SCALES:
Horizontal 1:500
Vertical 1:250

DATUM 55.000

| REFERENCE | | P(13) 200ø CLASS | P(14) 200ø CLASS | P(15) 200ø CLASS | P(16) 200ø CLASS | P(17) 200ø CLASS | P(18) 200ø CLASS | P(19) 200ø CLASS | P(20) 200ø CLASS | |
|---|---|---|---|---|---|---|---|---|---|---|
| DISTANCE (m) | 296.292 | 323.639 | 340.632 | 358.074 | 419.983 | 469.839 | 519.011 | 579.021 | 602.536 | |
| GROUND LEVEL | | 72.173 | 77.036 | | 77.877 | 78.354 | 84.314 | 86.469 | | |
| PIPE INVERT LEVEL | 59.558 | 70.629 / 70.629 | 75.596 / 75.596 | 76.404 / 76.404 | 76.446 / 76.446 | 76.394 / 76.394 | 82.377 / 82.377 | 85.017 / 85.017 | 86.193 | |
| DEPTH TO INVERT | 1.549 | 1.544 | 1.440 | 1.323 | 1.431 | 1.960 | 1.938 | 1.451 | 1.399 | |
| SLOPE / LENGTH | | 40.48% 1:2.5 27.35m | 29.23% 1:3.4 16.99m | 4.63% 1:21.6 17.44m | 0.07% 1:1484.1 61.91m | −0.10% −1:965.6 49.86m | 12.17% 1:8.2 49.17m | 4.40% 1:22.7 60.01m | 5.00% 1:20.0 23.52m | |

LONGSECTION PROPOSED RISING MAIN 2
FROM 300.000 TO 600.000

LEGEND:
- FIRE HYDRANT/ MARKER
- TREE
- GATE
- LAMP POLE
- WATER METER/ WATER VALVES
- TELEPHONE POLE
- ROCK OUTCROP
- BENCH MARKS
- ELECTRICITY BOX
- EXISTING SEWERLINE
- EXISTING MANHOLE
- EXISTING MANHOLE
- STORMWATER
- PROPOSED RISING PIPELINE
- SERVITUDE 4m WIDE

FOR DISCUSSION

SCALE BAR 1 : 1000 (100m, 50m, 25m, 10m, 0)

| REVISIONS | | | | | DESIGNED | T CRONJE |
|---|---|---|---|---|---|---|
| | | | | | CHECKED | J HOUGH |
| | | | | | DRAWN | M GQWETHA |
| 0B | 07-07-2023 | FOR DISCUSSION | WA | | CHECKED | W ANNANDALE |
| NO. | DATE | DESCRIPTION | INITIAL | | DATE | |

SIGNED _____ SMEC South Africa
DATE _____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e-mail: civilinfo@george.org.za | Tel (044) 801 9496
website: www.george.org.za | Fax (086) 529 9872


SIGNED _____ George Municipality
DATE _____

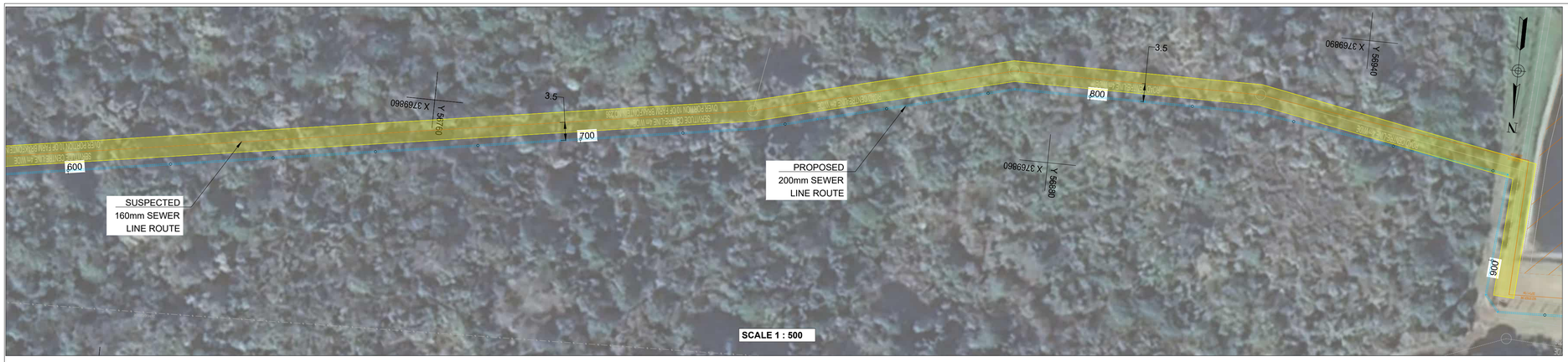
# Upgrading of Herolds Bay Pumpstation

## Sewer Rising Main from Herolds Bay PS No. 4 to Existing WWTW SV 300 to SV 600

| SIZE | SCALE |
|---|---|
| A1 | AS SHOWN |

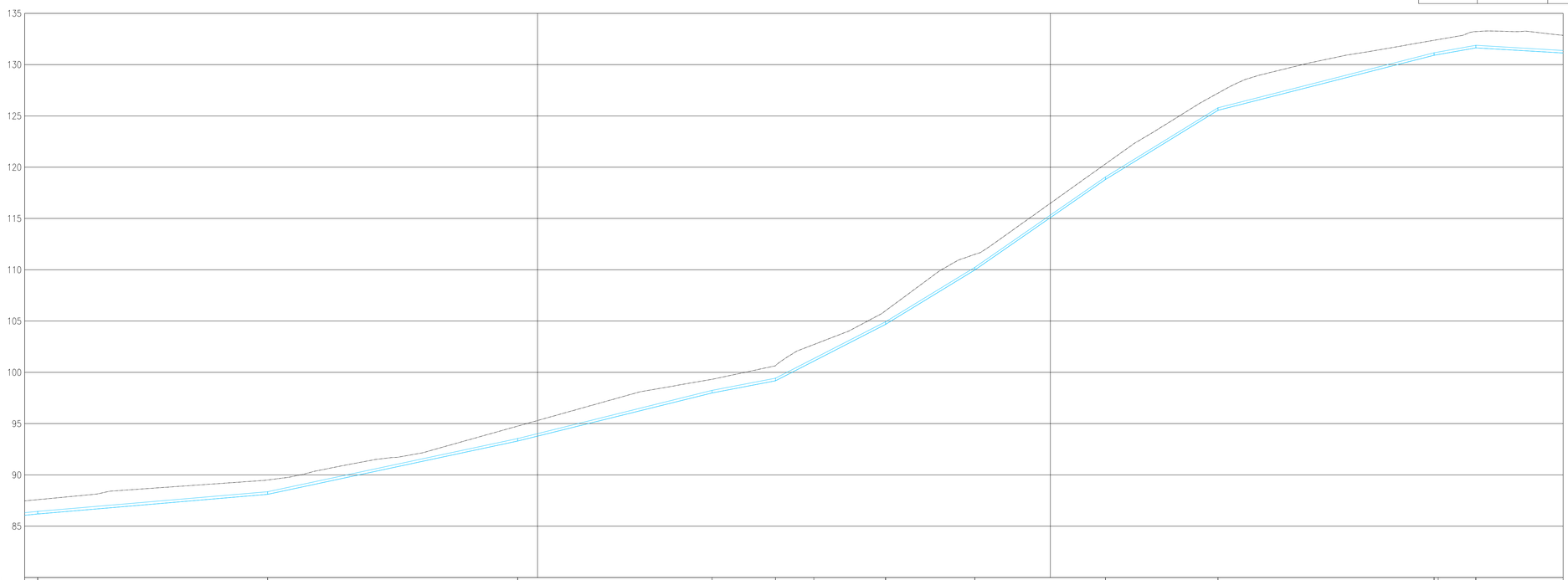
PROJECT DRAWING NUMBER: C1936 - 520 - 003

| REV | SHEET No. |
|---|---|
| OB | 03 OF 05 |




## SEWER RISING MAIN PIPE TABLE

| NAME | SIZE | LENGTH | SLOPE | MATERIAL |
|---|---|---|---|---|
| P(20) | 250 mm | 23.5 m | 5.00% | uPVC |
| P(21) | 250 mm | 44.8 m | 4.26% | uPVC |
| P(22) | 250 mm | 48.8 m | 10.64% | uPVC |
| P(23) | 250 mm | 37.9 m | 12.39% | uPVC |
| P(24) | 250 mm | 12.4 m | 9.60% | uPVC |
| P(25) | 250 mm | 21.5 m | 25.61% | uPVC |
| P(26) | 250 mm | 17.4 m | 30.48% | uPVC |
| P(27) | 250 mm | 25.5 m | 34.64% | uPVC |
| P(28) | 250 mm | 21.9 m | 30.71% | uPVC |
| P(29) | 250 mm | 42.1 m | 12.73% | uPVC |
| P(30) | 250 mm | 8.2 m | 8.90% | uPVC |




NGL
PIPE

SCALES:
Horizontal 1:500
Vertical 1:250

DATUM 80.000

| | P(20) 200ø CLASS | P(21) 200ø CLASS | P(22) 200ø CLASS | P(23) 200ø CLASS | P(24) 200ø CLASS | P(25) 200ø CLASS | P(26) 200ø CLASS | P(27) 200ø CLASS | P(28) 200ø CLASS | P(29) 200ø CLASS | P(30) 200ø CLASS | P(31) 200ø CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DISTANCE (m) | 579.021<br>602.536 | 647.369 | 696.132 | 734.038 | 746.411 | 767.877 | 785.274 | 810.746 | 832.686 | 874.823 | 882.983 | 906.761 |
| GROUND LEVEL | 87.655 | 94.759 | 99.319 | 100.648 | 111.502 | 127.222 | 132.369 | 133.216 | | | | |
| PIPE INVERT LEVEL | 85.017<br>86.193 | 86.193<br>88.105 | 88.105<br>93.296 | 93.296<br>97.991 | 97.991<br>99.179 | 99.179<br>104.676 | 104.676<br>109.978 | 109.978<br>118.802 | 118.802<br>125.541 | 125.541<br>130.906 | 130.906<br>131.632 | 131.632<br>130.930 |
| DEPTH TO INVERT | 1.399<br>1.393 | 1.402 | 1.463 | 1.328 | 1.469 | 1.332 | 1.524 | 1.513 | 1.681 | 1.463 | 1.583 | 1.717 |
| SLOPE / LENGTH | 5.00%<br>1:20.0<br>23.52m | 4.26%<br>1:23.4<br>44.83m | 10.64%<br>1:9.4<br>48.76m | 12.39%<br>1:8.1<br>37.91m | 9.60%<br>1:10.4<br>12.37m | 25.61%<br>1:3.9<br>21.47m | 30.48%<br>1:3.3<br>17.40m | 34.64%<br>1:2.9<br>25.47m | 30.71%<br>1:3.3<br>21.94m | 12.73%<br>1:7.9<br>42.14m | 8.90%<br>1:11.2<br>8.16m | −2.95%<br>−1:33.8<br>23.78m |

LONGSECTION PROPOSED RISING MAIN 2
FROM 600.000 TO 900.000

LEGEND:

- FIRE HYDRANT/ MARKER
- TREE
- GATE
- LAMP POLE
- WATER METER/ WATER VALVES
- TELEPHONE POLE
- ROCK OUTCROP
- BENCH MARKS
- ELECTRICITY BOX
- EXISTING SEWERLINE
- EXISTING MANHOLE
- EXISTING MANHOLE
- STORMWATER
- PROPOSED RISING PIPELINE
- SERVITUDE 4m WIDE
- EMERGENCY STORAGE TANK

NOTE:
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

FOR DISCUSSION

SCALE BAR: 0, 10m, 25m, 50m, 100m — 1 : 1000

| REVISIONS | | | | | | |
|---|---|---|---|---|---|---|
| NO. | DATE | DESCRIPTION | INITIAL | | | |
| 0B | 07-07-2023 | FOR DISCUSSION | WA | | | |
| | | | | DESIGNED | T CRONJE | |
| | | | | CHECKED | J HOUGH | |
| | | | | DRAWN | M GQWETHA | |
| | | | | CHECKED | W ANNANDALE | |

SIGNED
SMEC South Africa
DATE

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SIGNED
George Municipality
DATE

# Upgrading of Herolds Bay Pumpstation

## Sewer Rising Main from Herolds Bay PS No. 4 to Existing WWTW SV 600 to SV 900

| SIZE | SCALE |
|---|---|
| A1 | AS SHOWN |

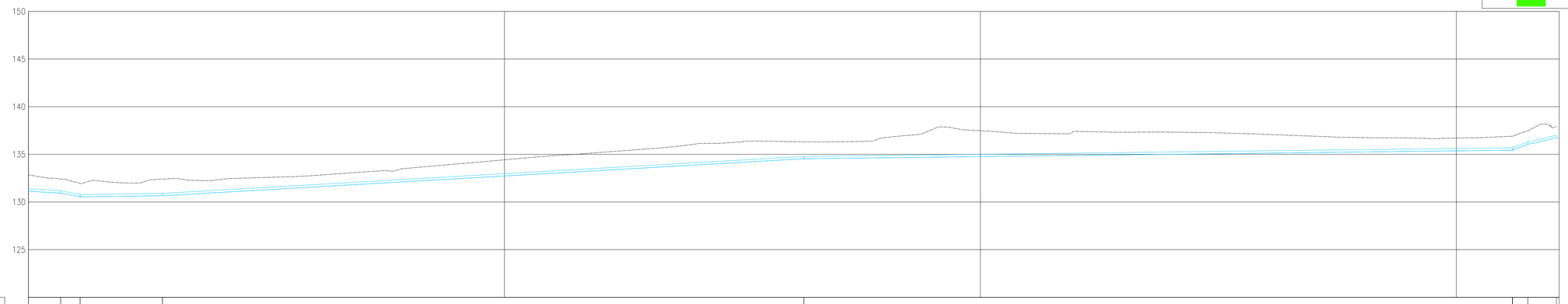
PROJECT DRAWING NUMBER: C1936 - 520 - 004

| REV | SHEET No. |
|---|---|
| OB | 04 OF 05 |


## SEWER RISING MAIN PIPE TABLE

| NAME | SIZE | LENGTH | SLOPE | MATERIAL |
|---|---|---|---|---|
| P(31) | 250 mm | 23.8 m | -2.95% | uPVC |
| P(32) | 250 mm | 4.1 m | -9.73% | uPVC |
| P(33) | 250 mm | 17.3 m | 0.71% | uPVC |
| P(34) | 250 mm | 134.7 m | 2.88% | uPVC |
| P(35) | 250 mm | 148.9 m | 0.61% | uPVC |
| P(36) | 250 mm | 3.2 m | 19.23% | uPVC |
| P(37) | 250 mm | 6.0 m | 11.36% | uPVC |

LEGEND:
- FIRE HYDRANT/ MARKER
- TREE
- GATE
- LAMP POLE
- WATER METER/ WATER VALVES
- TELEPHONE POLE
- ROCK OUTCROP
- BENCH MARKS
- ELECTRICITY BOX
- EXISTING SEWERLINE
- EXISTING MANHOLE
- EXISTING MANHOLE
- STORMWATER
- PROPOSED RISING PIPELINE
- SERVITUDE 4m WIDE
- EMERGENCY STORAGE TANK




SCALES:
Horizontal 1:500
Vertical 1:250

DATUM 120.000

| | P(31) 200ø CLASS | P(32) 200ø CLASS | P(33) 200ø CLASS | P(34) 200ø CLASS | P(35) 200ø CLASS | P(36) 200ø CLASS | P(37) 200ø CLASS |
|---|---|---|---|---|---|---|---|
| DISTANCE (m) | 882.983 / 906.761 | 910.854 | 928.159 | 1062.908 | | 1211.783 / 1215.001 | 1221.005 |
| GROUND LEVEL | 132.394 | 131.941 | 132.404 | 136.313 | | 136.885 | 137.461 / 137.936 |
| PIPE INVERT LEVEL | 131.632 / 130.930 | 130.930 / 130.531 | 130.654 | 134.531 | | 136.435 / 136.054 | 136.736 |
| DEPTH TO INVERT | 1.717 / 1.464 | 1.410 | 1.751 | 1.782 | | 1.450 | 1.407 / 1.200 |
| SLOPE / LENGTH | -2.95% 1:33.8 23.78m | -9.73% 1:10.3 4.09m | 0.71% 1:141.1 17.30m | 2.88% 1:34.8 134.75m | 0.61% 1:164.7 148.87m | 19.23% 1:5.2 3.22m | 11.36% 1:8.8 6.00m |

LONGSECTION PROPOSED RISING MAIN 2
FROM 900.000 TO 1221.608

NOTE:
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS PUT IN HAND. REFER ANY DISCREPANCIES TO THE ENGINEER.

FOR DISCUSSION

| REVISIONS NO. | DATE | DESCRIPTION | INITIAL |
|---|---|---|---|
| 0B | 07-07-2023 | FOR DISCUSSION | WA |

| | |
|---|---|
| DESIGNED | B BARTLETT |
| CHECKED | J HOUGH |
| DRAWN | M GQWETHA |
| CHECKED | W ANNANDALE |

SIGNED
SMEC South Africa
DATE

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SIGNED
George Municipality
DATE

# Upgrading of Herolds Bay Pumpstation

## Sewer Rising Main From Herolds Bay PS No. 4 to Exisiting WWTW SV 900 to SV 1227

| SIZE | SCALE |
|---|---|
| A1 | AS SHOWN |

PROJECT DRAWING NUMBER: C1936 - 520 - 005

| REV | SHEET No. |
|---|---|
| AB | 05 OF 05 |

SCALE BAR: 0, 10m, 25m, 50m, 100m — 1 : 1000

APPENDIX C

# CURRICULUM VITAE

## MICHAEL JON BENNETT

### PERSONAL

**Profession:** Principle Environmental Assessment Practitioner and Senior Environmental Control Officer, Sharples Environmental Services cc, George

**Nationality:** South African

**Date of Birth:** 22 October 1985

**Languages:** English (read, write and speak) & Afrikaans (read, write and speak)

**Marital Status:** Single

**Drivers License:** Code B

**Health:** Excellent

**EAPASA Reg:** 2021/3163

**IAIASA Membership**: 7334

### WORK EXPERIENCE

**2014 – Present:** Sharples Environmental Services cc, George, WC

*Environmental Assessment Practitioner*

I have gained extensive experience in assessments and monitoring and have worked on a variety of multidisciplinary projects and am proficient in:

- Basic Assessments Reports
- Water Use Authorisation Applications
- Environmental Monitoring and Reporting
- Environmental Management Programmes
- Environmental Control Officer Training
- Conducting Outeniqua Sensitive Coastal Area licensing applications

**2016 – 2017:** Sharples Environmental Services cc, Cape Town, WC

*Intrim Office Manager, Environmental Assessment Practitioner*

**2011 – 2014:** Peninsula Permits & NCC Group, Cape Town, WC

*Environmental Control Officer*

- Environmental Monitoring

### TERTIARY EDUCATION

**2010** University of Cape Town

- I hold a Bachelor of Science Degree specialising in Environmental and Geographic Science & Ocean and Atmospheric Science

## PROJECTS

**2023** George Urban Country Estate (Pty) Ltd

- Basic Assessment Report for the proposed residential development on erf 19374 (remainder erf 6182, erven 6179 and 6156), George, Western Cape

**2023** George George Municipality

- Basic Assessment Report for the Upgrading of the Eden Pumpstation, George, Western Cape

**2023** Mossel Bay Paprenax Trading 6 cc

- Amendment of Environmental Authorisation (Part 2, Substantive amendment) for the proposed establishment of a filling station and associated business infrastructure on a portion of erf 13996, Kwanonqaba, Mossel Bay, Western Cape

**2023** George George Municipality

- Basic Assessment Report for proposed upgrade of the Schaapkop Pumpstation rising main on remainder of erf 464 and erf 13486, George, Western Cape

**2023** George Garden Route Gateway Plaza

- Basic Assessment Report for proposed mixed-use development on portions 278 and 282 of farm Kraaibosch no. 195, George, Western Cape

**2023** George George Municipality

- Basic Assessment Report for proposed development of a Photovoltaic Solar Plant on erf 2819, George, Western Cape

**2023** George EARP Construction

- Basic Assessment Report for the proposed commercial development on portion 49 of Farm Hansmoeskraal 202, George, Western Cape

**2022** George Pieterkoen Trust

- Basic Assessment Report for the proposed residential development on Portion 21 of the Farm Kraaibosch No. 195 (Pieter Koen), George, Western Cape

**2022** Mossel Bay Dalmar

- Amendment of Environmental Authorisation (Part 2, Substantive amendment) for the Proposed Residential Development On A Portion Of The Farm Vaale Valley 219, Mossel Bay (Hartenbos Landgoed II), Western Cape

**2022** George Dalmar

- Amendment of Environmental Authorisation Proposed Development of Herold's Bay Country Estate on A Portion of Portion 7 of The Farm Buffelsfontein No. 204, Herold's Bay, Western Cape

**2022** George Pieterkoen Trust

- Basic Assessment Report for the proposed residential development on Portion 21 of the Farm Kraaibosch No. 195 (Pieter Koen), George, Western Cape

**2022** Still Bay W. Nel & Irma Oosthuizen Trust IT 1596/2008

- Basic Assessment Report for the development of 5 residential units on erven 4139, 4140, 4141, 4142, 4143, 4144, 4145 (Erf 3997), Still Bay West, Western Cape

**2022** George Octo Trading 377 cc

- Section 24 G Retrospective Environmental Authorisation for the alleged unlawful construction of a road clearance of vegetation to establish a house on remainder of Farm Holle Kloof 91 and Portion 1 of the Farm Plattekloof 131, Waboomskraal, George, Western Cape

**2022** Knysna CapeNature

- Basic Assessment Report for the Proposed development on Portions 38 and 39 of Farm 205 and Remainder of Farm 211, Goukamma Nature Reserve, Knysna, Western Cape

**2021** Prince Albert Jurie Klue

- Section 24 G Retrospective Environmental Authorisation for the alleged unlawful clearance of vegetation on Farm Angliers Bosch (Fernkloof), Remainder of Farm 157, Klaarstroom, Prince Albert, Western Cape

**2021** Mossel Bay Mossel Bay Municipality

- Basic Assessment Report for the proposed Dana Bay Emergency Access Road on Remainder of Portion 7 of the Farm 225, Dana Bay, Mossel Bay, Western Cape

**2021** Willowmore LEZMIN 2087cc

- Basic Assessment Report for the proposed development of Portion 1 of the Farm Matjiesfontein No. 206, Baviaanskloof, Division Willowmore, Eastern Cape

**2020** Sedgefield Knysna Municipality

- Basic Assessment Report for the proposed housing development on erven 3861, 3865, 3866, 3917, 3918 and 5010 in Sedgefield, Knysna, Western Cape

**2020** Mossel Bay Paprenax Trading 6 cc

- Basic Assessment Report for the proposed establishment of a filling station and associated business infrastructure on a portion of erf 13996, Kwanonqaba, Mossel Bay, Western Cape

**2020** Ladismith Department of Transport and Public Works

- Maintenance Management Plan for the periodic maintenance of Trunk Road 31, section 4, km 30.8 to km 76.06, Barrydale to Ladismith, Western Cape

**2020** Knysna Knysna Municipality

- Maintenance Management Plan for the Maintenance of the potable water pipeline system on Erven 4197, RE/1352, RE/1351, RE/1146 and 1316 in Knysna, Western Cape

**2020** Humansdorp Kouga Municipality

- Environmental Control Officer for the Phase 1A of New municipal 66kV double circuit overhead line between the Melkhout substation at Humansdorp and the main intake substation at Jefferys Bay, Eastern Cape

**2020** Humansdorp Kouga Municipality

- Environmental Control Officer for the Construction of a new 22kv overhead powerline between Melkhout substation and Allison Street, Humansdorp, Eastern Cape

**2020** Knysna Knysna Municipality

- Environmental Control Officer for the Charlesford raw water pumping scheme: Upgrade and refurbishment of pumpstation: Mechanical and electrical, Knysna, Western Cape

**2020** Seweweekspoort, Department of Transport & Public Works

- Amendment of Environmental Authorisation (Part 2, Substantive amendment) for the flood damage repairs to road structures on MR309 in Seweweekspoort, Western Cape

**2019 – 2021** Seweweekspoort, Department of Transport & Public Works

- Environmental Control Officer for the flood damage repairs to road structures on MR309 in Seweweekspoort, Western Cape

**2019** George George Municpality

- Environmental Control Officer for the Raising of the Garden Route Dam Spillway on Portion 3/352, Remainder of 536 of Erf 221, Erf 3055 and Erf 3056, George, Western Cape

**2019** Laingsburg Department of Agriculture

- Environmental Control Officer for the Construction Of Erosion Prevention Structures Within The One In Ten Year Flood Line Of The Buffels River, Laingsburg, Western Cape

**2019** Williston Williston Municipality

- Environmental Control Officer for the Upgrading of bulk water network in Williston – Phase 3, Williston, Northern Cape

**2019** George George Municipality

- Environmental Control Officer for the construction of new 66kV overhead line between Ballots Bay and Glanwood substations, George, Western Cape

**2019** Oudtshoorn Department of Transport & Public Works

- Environmental Control Officer for the Periodic maintenance of Trunk Road 31, Section 6, km 23.3 to km 47.8 Calitzdorp to Oudtshoorn, Western Cape

**2019** Kleinbrak Mossel Bay Municipality

- Environmental Control Officer for the Upgrading of Beyers Street, Klienbrak River, Western Cape

**2019** George Outeniqua Eye Clinic Body Corporate

- Environmental Control Officer for the proposed expansion of parking area on erf 5950 and part of remainder erf 464, George, Western Cape

**2019** Mossel Bay Hey Innovations

- Basic Assessment Report for the proposed establishment of a residential development on Erf 2839, Great Brak River, Western Cape

**2019** Oudtshoorn Oudtshoorn Municipality

- Environmental Management Programme for the Blossoms Emergency Supply Scheme, Oudtshoorn, Western Cape

**2019** Humansdorp Clinkscales Maughan-Brown

- Environmental Management Programme for the proposed construction of a new 22kV overhead powerline between Melkhout Substation and Allison Street, Humansdorp, Eastern Cape

**2019** George PN&MR Lotter Family Trust

- Addendum to the Environmetnal Management Programme for the Establishment of a Township (Rivendale) on Portions 5, 15, 16 and 31 of the Farm Hansmoeskraal 202, Western Cape

**2019** Oudtshoorn Department of Transport and Public Works

- Basic Assessment Report for the Proposed Maintenance Activities of Trunk Road 33/4 between km 4.6 and km 14.4, Meiringspoort, Western Cape

**2019** George Dynarc Capital

- Substantive amendment of environmental authorisation for the proposed Development of Portion 130, 131 and 132 of the Farm Gwayang 208

**2019** George Department of Transport & Public Works

- Basic Assessment Report for the proposed Upgrading of Bridge No. 2221 on Trunk Road 2/9 at km 15.1 over the Maalgate River.

**2018 - 2019** Oudtshoorn Department of Transport and Public Works

- Maintenance Management Plan for the proposed periodic maintenance of Trunk Road 31, section 6, km 23.3 to km 47.8, Western Cape

**2018 - 2019** Humansdorp Clinkscales Maughan-Brown

- Applicability of the EIA regulations Checklist for the proposed new 22kV overhead line between Melkhout Substation and Allison Street, Eastern Cape

**2018 - 2019** Knysna Knysna local Municipality

- Applicability of the EIA regulations Checklist for the proposed Rheenendal infill housing, subdivision and rezoning of portions of erf 42, 36 and 387 as well as erven 535, 536, 553, 54, 393, 406, 672, 673 and 68, Rheenendal, Western Cape

**2018 - 2019** Knysna Knysna local Municipality

- Applicability of the EIA regulations Checklist for the proposed infill housing and subdivision of erven in Welsyndorp and the rezoning and subdivision of erven in Bosdorp, Karatara, Western Cape.

**2018** Port Elizabeth ACSA P.E.

- Applicability of the EIA regulations Checklist for the proposed ACSA Port Elizabeth Airport Photovoltaic Plant, Eastern Cape Province

**2018** Mossel Bay TopUp Prop Inv.

- Applicability of the EIA regulations Checklist for the proposed Farm Stall Centre and filing Station on Portion 65 of the Farm Hartenbosch 217, Hartenbos

**2018** George Outeniqua Eye Clinic Body Corporate

- Basic Assessment Report for the proposed expansion of parking area on erf 5950 and part of remainder erf 464

**2018** Beaufort West Beaufort West Municipality

- Environmental Control Officer for the First and Second Environmental Audit for the provision of adequate water supply within the jurisdiction of the Beaufort West municipality

**2018** Mossel Bay Element Consulting Engineers

- Environmental Management Programme update for the replacement of 22kV overhead powerline between Power Town and Hartenbos and between Hartenbos and the Hartenbos sewage substation and the construction of a new 22kV overhead power line between the Midbrak and Kleinbrak Substations.

**2018** Mossel Bay Element Consulting Engineers

- Environmental Control Officer for the construction of a new 22kV overhead power line between the Midbrak and Kleinbrak Substations

**2018** Mossel Bay Element Consulting Engineers

- Environmental Control Officer for the Upgrade of Amy Searle Canal – Phase 5, Great Brak River

**2018** Gouritsmond Hessequa Consulting Engineers

- Environmental Control Officer for the Upgrade and expansion of the Gouritsmond Water Water Treatment Works on remainder of erf 140, Gouritsmond

**2018** George Biprops 14

- Environmental Control Officer for the residential development on portion 5 of the farm Kraaibosch No. 195, Groenkloof Woods: Phase C & D

**2018** Knynsa Knysna Municipality

- Environmental Control Officer for upgrading of Knysna bulk water supply scheme: phase 2B

**2018** Plettenberg Bay Bitou Municipality

- Environmental Control Officer for the upgrade of the Kranshoek Bulk Water Supply Scheme: Construction of Pipelines, reservoirs and associated infrastructure near Plettenberg Bay.

**2018** Mossel Bay SMEC

- Environmental Control Officer for the Upgrade of Kusweg and associated infrastructure in Rheebok

**2017** George EARP Construction

- Invasive Alien Management Plan for the proposed residential development on portions 21, 23, 24 & 48 of Farm Hansmoeskraal 202 near George

**2017** Mossel Bay Mossel Bay Municipality

- Environmental Control Officer for the development of the new Mossel Bay municipal cemetery on erf 2001/0

**2017** Knynsa Knysna Municipality

- Environmental Control Officer for the remedial work to prevent further settlement of the low-lift pump sump and retaining wall at Gouna River Pump Station

**2017** Knynsa Knysna Municipality

- Environmental Control Officer for upgrading of Knysna bulk water supply scheme: phase 1

**2017** George Biprops 14 (Pty) Ltd

- Environmental Control Officer for the residential development on portion 5 of the farm Kraaibosch No. 195

**2017** Still Bay Hessequa Municipality

- Environmental Control Officer for the construction of a reservoir, booster pump station and associated infrastructure in Melkhoutfontein near Still Bay

**2016 - 2017** Heidelberg Department of Transport & Public Works

- Environmental Control Officer for the flood damage repairs to structures in the Central Eden District Municipality Region, Heidelberg North

**2016 - 2017** Riversdale Department of Transport & Public Works

- Environmental Control Officer for the flood damage repairs to structures in the Central Eden District Municipality Region, Riversdale East area

**2016 - 2017** Still Bay Department of Transport & Public Works

- Environmental Control Officer for the upgrade of main road 332 near Still Bay

**2016 - 2017** Mossel Bay The South Cape College

- Environmental Control Officer for the extension of the South Cape College: Phase 3, Mossel Bay Campus

**2016 - 2017** Klein Brak Mossel Bay Municipality

- Environmental Control Officer for the removal of obstructions in the lower floodplain of the Klein Brak River Estuary

**2016** Prince Albert Milway Trade and Invest 1014cc

- Basic Assessment for the proposed guest lodge on remainder of Farm Rietpoort 13

**2016** Plettenberg Bay Bitou Municipality

- Basic Assessment for the proposed Qolweni phase 5 development near Plettenberg Bay

**2016** Mossel Bay Element Consulting Engineers

- Environmental Management Programme for the replacement of 22kV overhead powerline between Power Town and Hartenbos and between Hartenbos and the Hartenbos sewage substation

**2016** George SMEC

- Environmental Policy for the resurfacing of York Street, George

**2016** Mossel Bay Department of Transport & Public Works

- Maintenance Management Plan for proposed upgrade of Louis Fourie Road.

**2016** George Oaklands Bridge Country Estate HOA

- Maintenance Management Plan for proposed repair and maintenance of the riverbank at Oaklands Bridge Country Estate in Heather Park

**2016** Gouritz Department of Transport & Public Works

- Update of the Maintenance Management Plan for proposed repair and maintenance of the Gouritz River Bridge bank protection along the R325 near Gouritzmond

**2016** George Ivorybell Investment (Pty) Ltd

- Outeniqua Sensitive Coastal Area Environmental Impact Report for the proposed new house on erf 379 in Heralds Bay

**2016** George George Municipality

- Environmental Assessment Report for the substantive amendment of environmental authorisation of the proposed upgrade and extension of the overhead power lines and associated substations

**2016** Oudtshoorn SA Army Infantry School

- Environmental Control Officer for the construction of a fighting in built up areas (FIBUA) range on portion 10 of the farm Blaauwtjes Drift 110 in Oudtshoorn

**2015 - 2016** Gouritz Department of Transport & Public Works

- Environmental Control Officer for the repair and maintenance of the Gouritz River Bridge bank protection along the R325 near Gouritzmond

**2015 - 2016** Albertinia Garden Route Game Lodge (Pty) Ltd

- Environmental Control Officer for the five new units at the Garden Route Game Lodge

**2015 - 2016** Mossel Bay Element Consulting Engineers

- Environmental Control Officer for the replacement of 22kV overhead powerline between Power Town and Hartenbos and between Hartenbos and the Hartenbos sewage substation

**2014 - 2016** Plettenberg Bay Chauke Quanity Surveyers

- Environmental Control Officer for the Qolweni and Kwanokuthula High Density Units and engineering services

**2016** Plettenberg Bay Bitou Municipality

- Environmental Control Officer for the civil engineering works for Kwanokuthula Phase 4 and the extension of Sishuba Street

**2014 - 2016** Mossel Bay The South Cape College

- Environmental Control Officer for the extension of the South Cape College, Mossel Bay Campus

**2016** George SMEC

- Environmental Control Officer for the resurfacing of York Street

**2014 - 2015** Mossel bay The Muller Murray Trust

- Environmental Control Officer for the construction of gravity pipeline from the Nautilus take-off to the Boggomsbaai Reservoir phase 2

**2015** Swellendam Casidra SOC Ltd

- Environmental Control Officer for the Grootvaderbos Groynes in the Buffeljags River

**2015** George Element Consulting Engineers

- Environmental Control Officer for the upgrading and extension of overhead power lines and substations: construction of a new 66kV overhead line between Protea and Ballots Bay substation

**2014 - 2015** George Department of Transport & Public Works

- Environmental Control Officer for the flood damage repair projects in the George and Knysna local municipal areas

**2015** George BDE Consulting Engineers (Pty) Ltd

- Environmental Control Officer for the photovoltaic solar plant for the ACSA George Airport

**2015** Heidelberg Bergstan South Africa

- Environmental Control Officer for the Duiwenhoks River stabilization works: Sites B31, B38 and B39

**2015** Krakeel Element Consulting Engineers

- Environmental Control Officer for the construction of filling station at SSK Tuinrote Agri on portion 5 of the farm no. 320

**2014 - 2015** Herbertsdale SMEC

- Environmental Control Officer for the flood damage repairs to structures in the Eden region: Herbertsdale area

**2014 - 2015** George Department of Transport & Public Works

- Environmental Control Officer for the flood damage repair projects in the George and Knysna local municipal areas

**2015** George SMEC

- Environmental Control Officer for the improvements to the Pacaltsdorp interchange and new pedestrian bridge

**2014 - 2015** Still Bay De Villiers & Moore Consulting Engineers

- Environmental Control Officer for the Still Bay 66kV substation and overhead powerline

**2014** Beaufort West Worley Parsons Consulting Engineers

- Environmental Control Officer for the Nelspoort bulk water supply scheme northeast of Nelspoort

# CURRICULUM VITAE

## LU-ANNE BEETS

### PERSONAL

**Profession:** Candidate Environmental Assessment Practitioner, Sharples Environmental Services cc, George

**Nationality:** South African

**Date of Birth:** 28 October 2000

**Languages:** English (read, write and speak) & Afrikaans (read, write and speak)

**Marital Status:** Single

**Drivers License:** Code B

**Health:** Excellent

**EAPASA Reg**: 2024/7962

### WORK EXPERIENCE

**2023 – Present:** Sharples Environmental Services cc, George, WC
*Candidate Environmental Assessment Practitioner*

- Basic Assessments Report
- Environmental Monitoring
- Environmental Management Programmes

***2023 – March 2024:*** Sharples Environmental Services cc, George, WC
*Environmental Consultant*

- Environmental Monitoring

### TERTIARY EDUCATION

**2023** University of South-Africa
Bachelor of Science Honours – Environmental Management

**2022** North-West University
Bachelor of Science – Zoology & Botany

### PROJECTS

**2024** **Herold's Bay** George Municipality

- Basic Assessment Report for the proposed upgrading of the Herold's Bay Pump station and associated rising main and development of new associated infrastructure

**2023-2024** **George** Potgieter Familie Trust (TMP3113)

- Amendment of Environmental Management Programme for the proposed development of Pansy Villas

**2023** **George** Lukhozi Consulting Engineers

- Environmental Control Officer for repair and rehabilitation of flood damages along Camphersdrift River, Van Riebeeck Gardens

**2023-2024** **George** SNA Consulting Engineers

- Environmental Control Officer for the upgrade of Bridge No. 2221 on Trunk Road 2/9 at KM 15.1 over Maalgate River

**2023-2024** **Mossel Bay** Western Cape Provincial Government: Department of Transport and Public Works

- Environmental Control Officer for the upgrade of Louis Fourie Road

**2023-2024** **Herold's Bay** Long Island Trading 44 (Pty) Ltd

- Environmental Control Officer for the proposed development of Herold's Bay Country Estate.

**2023** **George** George Municipality

- Applicability Checklist for the proposed new steel monopole structures for the 66kV overhead line between Proefplaas and Herold's Bay

**2023** **George** The Board of Trustees Biprops 14 (Pty) Ltd

- Application for amendment of environmental authorisation for the residential development on the Farm Kraaibosch

**2023** **Mossel Bay** Confuel (PTY) Ltd

- Environmental Control Officer for the proposed truck stop and associated infrastructure

**GEORGE**
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**CAPE TOWN**
**TEL:** +27 (0) 21 554 5195 **FAX:** +27 (0) 86 575 2869
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**ADDRESS:** Tableview, Cape Town, 7441
**PO BOX:** 443, Milnerton, 7435

# ENVIRONMENTAL AWARENESS TRAINING BOOKLET

## APPENDIX D

# Environmental Monitor's Foreword

SES is here to ensure that everyone complies with the conditions of "Duty to Care". If these conditions are not complied with the project can be stopped and fines can be issued.

We hope that with your co-operation the project won't be stopped and fines won't be issued, and a successful project can be finished on time.

Notes:

- Workers working on this project must undergo environmental training.

- The information contained in this document should be used during day-to-day activities.

## HOW IS THIS PROJECT IMPLEMENTING ENVIRONMENTAL MANAGEMENT?

This project is implementing Environmental Management on an ongoing basis throughout the duration of the project. The following aspects would be implemented to achieve the above stated:

- A dedicated Environmental Manager or Environmental Control Officer appointment to the project to implement and monitor Environmental Management.
- Regular environmental inspection on the site.
- Regular environmental training for workers
- Environmental audits on a regular basis.

## WASTE TREATMENT

**Refuse:**

- Refuse waste includes: waste food, food containers, packaging materials, cans, bottles, newspapers and magazines.
- Day to day household waste should always be disposed of in the containers provided on site by the company.
- No dumping of waste anywhere other than in the bins provided.
- No burning of refuse.
- If there are not enough refuse containers on site, the ECO or supervisor needs to be informed.

**Construction Waste:**

- Construction waste includes: concrete, steel, cement, rock, pre-coated chips, wood, plastic, empty bags and rubble.
- Construction waste must be discarded in skips located in strategic areas for removal.
- Construction waste must not be discarded in holes or burned on site.

- Small amounts of construction waste should be collected and not discarded into vegetation or down fill slopes.
- Material should only be spoiled if a rehabilitation plan has been designed for the area.

**Liquid waste:**

- Liquid waste includes: concrete, paint, thinners, diesel, hydraulic fluids, cooking oil, chemicals, other fuel and sewage.
- Use facilities provided for waste.
- The liquid waste should be recycled as far as possible.
- Use chemical toilets and ablution facilities.

**INFORM THE ENVIRONMENTAL CONTROL OFFICER (ECO) IMMEDIATELY OF ANY IMMEDIATE OR POTENTIAL ENVIRONMENTAL INCIDENT.**

# SPECIFIC ENVIRONMENTAL ISSUES

# SPESIFIEKE OMGEWINGSKWESSIES
# IMIBA ETHILE YEZOBUME BEMEKO YENDALO

The basic Do's and Don'ts towards environmental awareness are as follows:

*Die basiese Moets en Moenies van omgewingsbesinning is as volg:*

Oondoqo bo mawukwenze no mawungakwenzi kwilinge lezobume be meko yendalo bume ngoluhlobo:

## Toilet Facilities:
## *Toilet Fasiliteite:*
## Izindlu Zangasese:

**DO:**
USE THE TOILET FACILITIES PROVIDED - REPORT FULL FACILITIES
***MOET:***
*GEBRUIK MAAK VAN TOILET FASILITEITE WAT VOORSIEN WORD – RAPPORTEER AS FASILITEITE VOL IS*
**OMAWUKWENZE:** SEBENZISA IZINDLU ZANGASESE EZIBONELELWEYO- NIKA INGXELO NGAMALUNGISELELO AGCWELEYO.

**DO NOT**:
USE THE BUSH
***MOENIE:***
*DIE BOS GEBRUIK NIE*
**OMAWUNGAKWENZI:** UKUSEBENZISA ITYHOLO.

**Vehicles operation and maintenance:**
***Voertuig werking en onderhoud:***
**Ulawulo nophatho lezithuthi:**

**DO:**
ENSURE THAT VEHICLES AND MACHINERY DO NOT LEAK FUEL OR OILS. REFUELLING, MAINTENANCE, SERVICING OR WASHING MUST BE DONE WITHIN THE DESIGNATED AREA IN THE CONSTRUCTION CAMP AREA ONLY.
***MOET:***
*VERSEKER DAT VOERTUIE EN MASJINERIE NIE OLIES OF BRANDSTOF LEK NIE. VOLMAAK, ONDERHOUD, DIENS OF SKOONMAAK VAN VOERTUIE MOET SLEGS IN AANGEWYSTE AREAS IN DIE KONSTRUKSIE KAMP GESKIED.*
**OMAWUKWENZE:** QINISEKISA IZITHUTHI NOMATSHINI ABAVUZI MAFUTHA OKANYE I OYILE, UKUGALELA, UKUPHATHA, UKULUNGISA OKANYE UKUHLAMBA KUFUNEKA KWENZIWE KUMMANDLA OTYUNJIWEYO KWINKAMPI YOLWAKHIWO KUPHELA NGOKUKHAWULEZILEYO.

**DO:**
REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL CONTINUING.
***MOET:***
*RAPPORTEER ENIGE BRANDSTOF OF OLIE STORTE & VERHOED DAT DIE STORT AANHOU.*
**OMAWUKWENZE:** NIKA INGXELO NGE OLI NAMAFUTHA ACHITHEKILEYO, UZE UNQANDE UCHITHEKO LUNGAQHUBEKI.

**DO:**
PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.
***MOET:***
*VERHOED DIE KONTAMINASIE EN BESOEDELING VAN STROME & WATERKANALE.*
**OMAWUKWENZE :** NQANDA USULELEKO OKANYE UNGCOLISEKO LWEMILAMBO NEMISELE YAMANZI.

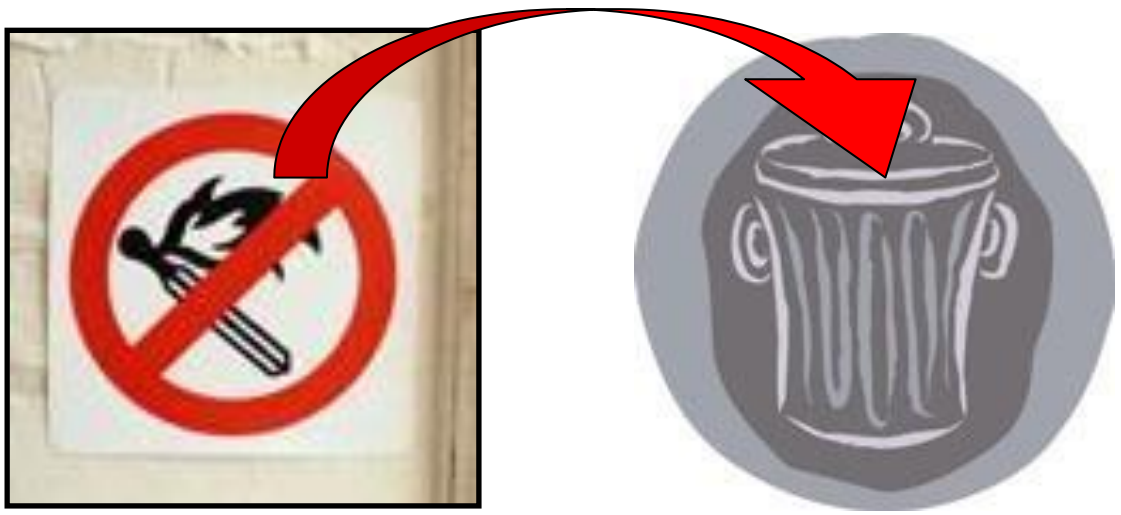
**DO NOT:**
ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM
***MOENIE:***
*TOELAAT DAT AFVALPRODUKTE, GEMORS, OLIES OF VREEMDE MATERIALE IN STROME BELAND NIE.*
**OMAWUNGAKWENZI:** MUSA UKUVUMELA INCITHO, ULAHLO, IOYILE OKANYE EZINYE IZINTO EMILANJENI.

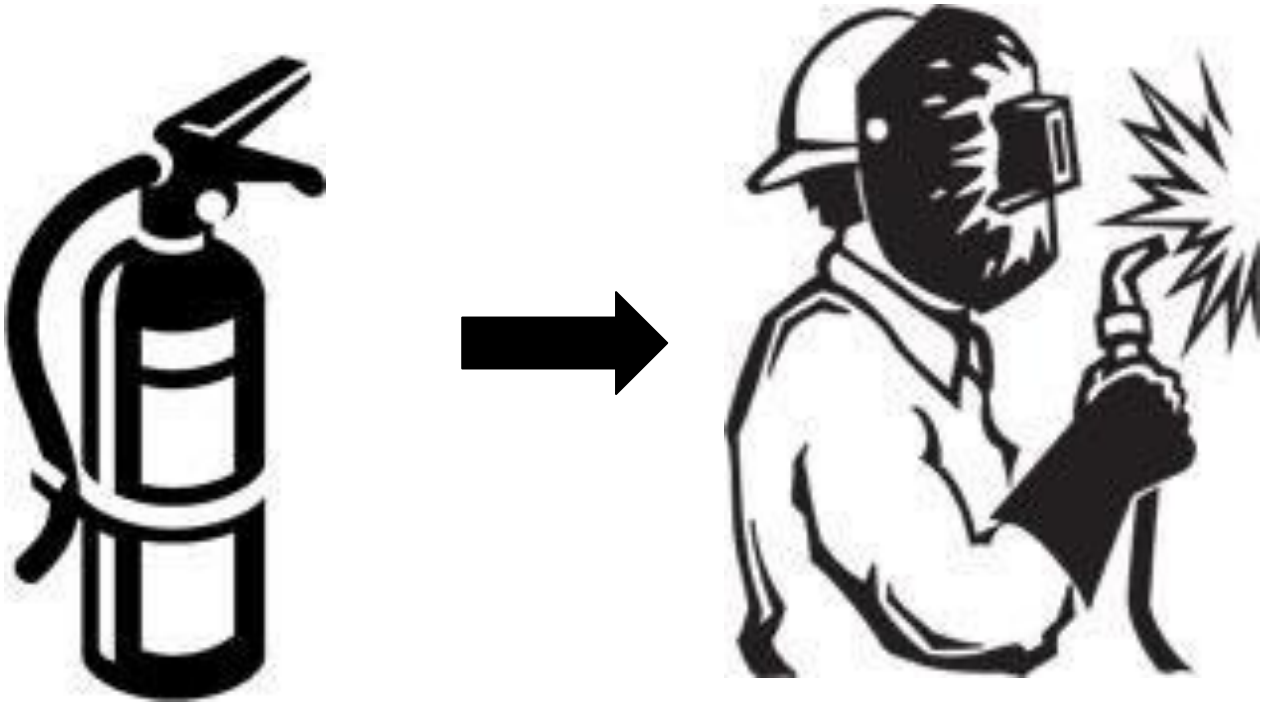
**Fire Control:**
***Vuur Beheer:***
**Ulawulo Lemililo:**

**DO:**
DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.)
***MOET:***
*GOOI SIGARETTE & VUURHOUTJIES OP GEPASTE MANIER WEG WEG (rommelstrooi is 'n oortreding)*
**OMAWUKWENZE:** LAHLA ISIGARETE NOOMATSHISI NGONONOPHELO (ukulahla lityala).

**DO:**
ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY "HOT WORK" IS UNDERTAKEN e.g. welding, grinding, gas cutting etc.
***MOET:***
*VERSEKER DAT 'N WERKENDE BRANDBLUSSER BYDERHAND IS INDIEN "WARM WERK" GEDOEN WORD bv. Sweiswerk.*
**OMAWUKWENZE:** QINISEKISA ISICIMA-MLILO ESISEBENZAYO SISESANDLENI UKUBA KUKHO UMSEBENZI "OTSHISAYO" OWENZIWAYO, umz. ukuwelda, ugubo, ukuqhawula ugesi, njl.

**DO NOT:**
MAKE ANY FIRES
***MOENIE:***
*ENIGE VURE MAAK OF ENIGEIETS VERBRAND NIE*
**OMAWUNGAKWENZI:** UKWENZA IMILILO OKANYE UTSHISE NOKUBA YINTONI.





**Fencing and Restricted Areas:**
***Omheining en Beperkte Areas:***
**Ubiyelo Nemimanndla Engavumelekanga:**

**DO:**
CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.
***MOET:***
*BEPERK ALLE WERK EN STOOR VAN GEREEDSKAP TOT IN DIE GEGEWE WERKAREA.*
**OMAWUKWENZE:**GCINA UMSEBENZI NEZIXHOBO ZOKUSEBENZA NGAKUMMANDLA OKUSETYENZELWA KUWO.

**DO NOT:**
ENTER ANY FENCED OFF OR MARKED AREA. SUCH AREAS HAVE BEEN MARKED WITH "NO-GO AREA" SIGNS AND SHOULD BE ADHERED TO.
**MOENIE:**
*ENIGE OMHEINDE OF GEMERKTE AREAS BINNEGAAN NIE. SULKE AREAS IS MET "NO-GO AREA" TEKENS GEMERK EN MOET GEHOORSAAM WORD.*
**OMAWUNGAKWENZI:** MUSA UKUNGENA KWI NDAWO EBIYIWEYO OKANYE EPHAWULWEYO. IMIMANDLA ENJALO IPHAWULWE NGAMAGAMA ATHI **" NO-GO AREA**".

**NO-GO AREA**

**Safety:**
***Veiligheid:***
**Ukhuseleko:**

**DO:**
USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES.
***MOET:***
*GEBRUIK ALLE VEILIGHEIDSGEREEDSKAP EN VOLDOEN AAN ALLE VEILIGHEIDS PROSEDURES.*
**OMAWUKWENZE:** SEBENZISA ZONKE IZIXHOBO ZOKHUSELEKO, UZE UTHOBELE YONKE IMIGAQO YOKHUSELO.

**Driving and Dust:**
***Bestuur en Stof:***
**Uqhubo Nothuli:**

**DO:**
DRIVE ON DESIGNATED ROUTES ONLY.
***MOET:***
*NET OP AANGEWYSTE ROETES BESTUUR.*
**OMAWUKWENZE:** QHUBA KWIMIMANDLA EPHAWULWEYO KUPHELA.

**DO NOT:**
SPEED OR DRIVE RECKLESSLY
***MOENIE:***
*JAAG OF ROEKELOOS BESTUUR NIE.*
**OMAWUNGAKWENZI:** SUKUQHUBA NGESANTYA ESIPHEZULU OKANYE NGOKUNGAKHATHALI.

**DO NOT:**
ALLOW CEMENT TO BLOW AROUND.
***MOENIE;***
*TOELAAT DAT SEMENT WEGWAAI NIE.*
**OMAWUNGAKWENZI:** MUSUKUVUMELA ISAMENTE ISASAZWE.

**DO NOT:**
CAUSE EXCESSIVE DUST
**MOENIE:**
OORDREWE STOF VEROORSAAK NIE.


SLOW


PPC

**Vegetation protection:**
***Plantegroei Beskerming:***
**Ukhuselo Lwezityalo:**

**DO NOT:**
DAMAGE OR REMOVE ANY VEGETATION WITHOUT DIRECT INSTRUCTION.
***MOENIE:***
*ENIGE PLANTEGROEI SONDER DIREKTE INSTRUKSIE BESKADIG OF VERWYDER NIE.*
**OMAWUNGAKWENZI:** MUSA UKUTSHABALALISA OKANYE USUSE NASIPHINA ISITYALO NGAPHANDLE KOMYALELO.

**Animals:**
***Diere:***
**Izilwanyana:**

**DO NOT:**
INJURE, CAPTURE/SNARE, FEED OR CHASE ANIMALS – this includes birds, frogs, snakes, lizards, tortoises, etc.
**MOENIE:**
ENIGE DIERE BESEER, VANG, VOER OF JAAG NIE – dit sluit in: voëls, paddas, slange akkedisse, skilpaaie ens.
**OMAWUNGAKWENZI:** MUSA UKWENZAKALISA, UKUBAMBA, UKONDLA OKANYE UKULEQA IZILWANYANA- okuquka iintaka, amasele, iinyoka, amacilikishe, izikolopati.

**DO:**
REPORT ANY INJURY OF AN ANIMAL.
**MOET:**
DIE BESERING VAN 'N DIER RAPPORTEER.
**OMAWUKWENZE:** XELA NASIPHI ISENZAKALO SESILWANYANA.

**Preventing Pollution:**
***Voorkoming van Besoedeling:***
**Ukhuselo Longcoliseko:**

**DO:**
CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBLE AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away.
***MOET:***
*RUIM NA ELKE DAG DIE WERK AREA OP EN GOOI ENIGE ROMMEL WEG IN DIE GEGEWE HOUERS – maak seker dat rommel nie kan wegwaai nie.*
**OMAWUKWENZE:** COCA INDAWO OSEBENZA KUYO, IZINTO EZILAHLIWEYO NENKUNKUMA YOKWAKHA QHO EKUPHELENI KWEMINI-sebenzisa imigqomo yenkunkuma uze uqiniseke ukuba inkunkuma ayivuthuzwa ngumoya.

**DO NOT:**
ALLOW WASTE BINS TO OVERFLOW OR WASTE TO BLOW AROUND.
***MOENIE:***
*TOELAAT DAT ROMMELHOUERS OORVLOEI OF DAT ROMMEL ROND WAAI NIE.*
**OMAWUNGAKWENZI:** MUSA UKUVUMELA IMIGQOMO YENKUNKUMA IGCWALE KAKHULU OKANYE INKUNKUMA ISASAZEKE.

**DO NOT:**
LITTER OR LEAVE FOOD LAYING AROUND
***MOENIE:***
*ROMMEL OF KOS LAAT RONDLÊ NIE.*
**OMAWUNGAKWENZI:** MUSA UKUNGCOLISA OKANYE USHIYE UKUTYA KULELE INDAWO YONKE.

**DO NOT:**
BURY ANY LITTER OR WASTE IN THE GROUND.
***MOENIE:***
*ENIGE ROMMEL OF GEMORS IN DIE GROND BEGRAWE NIE.*
**OMAWUNGAKWENZI:** MUSA UKUNGCWABA INKUNKUMA EMHLABENI.


GLASS
CARDBOARD
PAPER