GEORGE
TEL: +27 (0) 44 873 4923 **FAX:** +27 (0) 44 874 5953
EMAIL: info@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: Unit 17 Cathedral Square, Cathedral Street, George, 6530
PO BOX: 9087, George, 6530

CAPE TOWN
TEL: +27 (0) 21 554 5195 **FAX:** +27 (0) 86 575 2869
EMAIL: betsy@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: Tableview, Cape Town, 7441
PO BOX: 443, Milnerton, 7435

DRAFT
BASIC ASSESSMENT REPORT

FOR THE

THE PROPOSED UPGRADING OF THE HEROLD'S BAY SEWAGE PUMP STATION 1 AND ASSOCIATED RISING MAIN AND THE DEVELOPMENT OF PUMP STATION 4 AND NEW ASSOCIATED INFRASTRUCTURE, ON ERF 116, ERF 110, ERF 113, ERF 114, REMAINDER OF ERF 95, FARM 386, REMAINDER OF FARMS 236 AND 237 AND PORTIONS 0, 10, 35 AND 37 OF FARM BRAKFONTEIN NO. 236, HEROLDS BAY, GEORGE MUNICIPALITY, WESTERN CAPE

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the amended (April 2017) Environmental Impact Assessment Regulations, 2014

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

DATE: 23 January 2026

DEADP REF: 16/3/3/1/D2/29/0003/26
SES REF NO: 14/HBPS/GM/04/23

Western Cape Government

Department of Environmental Affairs and Development Planning

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

APRIL 2024

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

APRIL 2024

(For official use only)	
Pre-application Reference Number (if applicable):	
EIA Application Reference Number:	
NEAS Reference Number:	
Exemption Reference Number (if applicable):	
Date BAR received by Department:	
Date BAR received by Directorate:	
Date BAR received by Case Officer:	

GENERAL PROJECT DESCRIPTION

(This must Include an overview of the project including the Farm name/Portion/Erf number)

The proposed upgrading of the Herold's Bay Sewage Pump Station 1 and associated rising main and the development of Pump Station 4 and new associated infrastructure, on Erf 116, Erf 113, Erf 110, Erf 114, Remainder of Erf 95, Remainder of Farms 386, 236 and 237 and Portions 0, 10, 35 and 37 of Farm Brakfontein No. 236, Herold's Bay, George Municipality, Western Cape.

IMPORTANT INFORMATION TO BE READ PRIOR TO COMPLETING THIS BASIC ASSESSMENT REPORT

1. **The purpose** of this template is to provide a format for the Basic Assessment report as set out in Appendix 1 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended) in order to ultimately obtain Environmental Authorisation.

2. The Environmental Impact Assessment ("EIA") Regulations is defined in terms of Chapter 5 of the National Environmental Management Act, 19998 (Act No. 107 of 1998) ("NEMA") hereinafter referred to as the "NEMA EIA Regulations".

3. *Submission of documentation, reports and other correspondence:*

   The Department has adopted a digital format for corresponding with proponents/applicants or the general public. If there is a conflict between this approach and any provision in the legislation, then the provisions in the legislation prevail. If there is any uncertainty about the requirements or arrangements, the relevant Competent Authority must be consulted.

   The Directorate: Development Management has created generic e-mail addresses for the respective Regions, to centralise their administration. Please make use of the relevant general administration e-mail address below when submitting documents:

   DEADPEIAAdmin@westerncape.gov.za
   Directorate: Development Management (Region 1):
   City of Cape Town; West Coast District Municipal area;
   Cape Winelands District Municipal area and Overberg District Municipal area.

   DEADPEIAAdmin.George@westerncape.gov.za
   Directorate: Development Management (Region 3):
   Garden Route District Municipal area and Central Karoo District Municipal area

   General queries must be submitted via the general administration e-mail for EIA related queries. Where a case-officer of DEA&DP has been assigned, correspondence may be directed to such official and copied to the relevant general administration e-mail for record purposes.

   All correspondence, comments, requests and decisions in terms of applications, will be issued to either the applicant/requester in a digital format via email, with digital signatures, and copied to the Environmental Assessment Practitioner ("EAP") (where applicable).

4. The required information must be typed within the spaces provided in this Basic Assessment Report ("BAR"). The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided.

5. All applicable sections of this BAR must be completed.

6. Unless protected by law, all information contained in, and attached to this BAR, will become public information on receipt by the Competent Authority. If information is not submitted with this BAR due to such information being protected by law, the applicant and/or Environmental Assessment Practitioner ("EAP") must declare such non-disclosure and provide the reasons for believing that the information is protected.

7. This BAR is current as of **April 2024**. It is the responsibility of the Applicant/ EAP to ascertain whether subsequent versions of the BAR have been released by the Department. Visit this Department's website at http://www.westerncape.gov.za to check for the latest version of this BAR.

8. This BAR is the standard format, which must be used in all instances when preparing a BAR for Basic Assessment applications for an environmental authorisation in terms of the NEMA EIA Regulations when the Western Cape Government Department of Environmental Affairs and Development Planning ("DEA&DP") is the Competent Authority.

9. Unless otherwise indicated by the Department, one hard copy and one electronic copy of this BAR must be submitted to the Department at the postal address given below or by delivery thereof to the Registry Office of the Department. Reasonable access to copies of this Report must be provided to the relevant Organs of State for consultation purposes, which may, if so indicated by the Department, include providing a printed copy to a specific Organ of State.

10. This BAR must be duly dated and originally signed by the Applicant, EAP (if applicable) and Specialist(s) and must be submitted to the Department at the details provided below.

11. The Department's latest Circulars pertaining to the "One Environmental Management System" and the EIA Regulations, any subsequent Circulars, and guidelines must be taken into account when completing this BAR.

12. Should a water use licence application be required in terms of the National Water Act, 1998 (Act No. 36 of 1998) ("NWA"), the "One Environmental System" is applicable, specifically in terms of the synchronisation of the consideration of the application in terms of the NEMA and the NWA. Refer to this Department's Circular EADP 0028/2014: One Environmental Management System.

13. Where Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA") is triggered, a copy of Heritage Western Cape's final comment must be attached to the BAR.

14. The Screening Tool developed by the National Department of Environmental Affairs must be used to generate a screening report. Please use the Screening Tool link https://screening.environment.gov.za/screeningtool to generate the Screening Tool Report. The screening tool report must be attached to this BAR.

15. Where this Department is also identified as the Licencing Authority to decide on applications under the National Environmental Management: Air Quality Act (Act No. 29 of 2004) ('NEM:AQA"), the submission of the Report must also be made as follows, for-
    Waste Management Licence Applications, this report must also (i.e., another hard copy and electronic copy) be submitted for the attention of the Department's Waste Management Directorate (Tel: 021-483-2728/2705 and Fax: 021-483-4425) at the same postal address as the Cape Town Office.

    Atmospheric Emissions Licence Applications, this report must also be (i.e., another hard copy and electronic copy) submitted for the attention of the Licensing Authority or this Department's Air Quality Management Directorate (Tel: 021 483 2888 and Fax: 021 483 4368) at the same postal address as the Cape Town Office.

DEPARTMENTAL DETAILS	
CAPE TOWN OFFICE: **DIRECTORATE: DEVELOPMENT MANAGEMENT (REGION 1)** (City of Cape Town, West Coast District, Cape Winelands District & Overberg District)	**GEORGE REGIONAL OFFICE:** **DIRECTORATE: DEVELOPMENT MANAGEMENT (REGION 3)** (Central Karoo District & Garden Route District)
The completed Form must be sent via electronic mail to: DEADPEIAAdmin@westerncape.gov.za Queries should be directed to the Directorate: Development Management (Region 1) at: E-mail: DEADPEIAAdmin@westerncape.gov.za Tel: (021) 483-5829 Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 1) Private Bag X 9086 Cape Town, 8000	The completed Form must be sent via electronic mail to: DEADPEIAAdmin.George@westerncape.gov.za Queries should be directed to the Directorate: Development Management (Region 3) at: E-mail: DEADPEIAAdmin.George@westerncape.gov.za Tel: (044) 814-2006 Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 3) Private Bag X 6509 George, 6530

MAPS

Provide a location map (see below) as Appendix A1 to this BAR that shows the location of the proposed development and associated structures and infrastructure on the property.	
Locality Map:	The scale of the locality map must be at least 1:50 000. For linear activities or development proposals of more than 25 kilometres, a smaller scale e.g., 1:250 000 can be used. The scale must be indicated on the map. The map must indicate the following: • an accurate indication of the project site position as well as the positions of the alternative sites, if any; • road names or numbers of all the major roads as well as the roads that provide access to the site(s) • a north arrow; • a legend; and • a linear scale. For ocean based or aquatic activity, the coordinates must be provided within which the activity is to be undertaken and a map at an appropriate scale clearly indicating the area within which the activity is to be undertaken. Where comment from the Western Cape Government: Transport and Public Works is required, a map illustrating the properties (owned by the Western Cape Government: Transport and Public Works) that will be affected by the proposed development must be included in the Report.
Provide a detailed site development plan / site map (see below) as Appendix B1 to this BAR; and if applicable, all alternative properties and locations.	
Site Plan:	Detailed site development plan(s) must be prepared for each alternative site or alternative activity. The site plans must contain or conform to the following: • The detailed site plan must preferably be at a scale of 1:500 or at an appropriate scale. The scale must be clearly indicated on the plan, preferably together with a linear scale. • The property boundaries and numbers of all the properties within 50m of the site must be indicated on the site plan. • On land where the property has not been defined, the co-ordinates of the area in which the proposed activity or development is proposed must be provided. • The current land use (not zoning) as well as the land use zoning of each of the adjoining properties must be clearly indicated on the site plan. • The position of each component of the proposed activity or development as well as any other structures on the site must be indicated on the site plan. • Services, including electricity supply cables (indicate aboveground or underground), water supply pipelines, boreholes, sewage pipelines, storm water infrastructure and access roads that will form part of the proposed development **must** be clearly indicated on the site plan. • Servitudes and an indication of the purpose of each servitude must be indicated on the site plan. • Sensitive environmental elements within 100m of the site must be included on the site plan, including (but not limited to): o Watercourses / Rivers / Wetlands o Flood lines (*i.e.,* 1:100 year, 1:50 year and 1:10 year where applicable); o Coastal Risk Zones as delineated for the Western Cape by the Department of Environmental Affairs and Development Planning ("DEA&DP"): o Ridges; o Cultural and historical features/landscapes; o Areas with indigenous vegetation (even if degraded or infested with alien species). • Whenever the slope of the site exceeds 1:10, a contour map of the site must be submitted. • North arrow A map/site plan must also be provided at an appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred and alternative sites indicating any areas that should be avoided, including buffer areas.
Site photographs	Colour photographs of the site that shows the overall condition of the site and its surroundings (taken on the site and taken from outside the site) with a description of each photograph. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan as applicable. If available, please also provide a recent aerial photograph. Photographs must be attached to this BAR as **Appendix C**. The aerial photograph(s) should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Please note that the above requirements must be duplicated for all alternative sites.
Biodiversity Overlay Map:	A map of the relevant biodiversity information and conditions must be provided as an overlay map on the property/site plan. The Map must be attached to this BAR as **Appendix D**.

Linear activities or development and multiple properties	GPS co-ordinates must be provided in degrees, minutes and seconds using the Hartebeeshoek 94 WGS84 co-ordinate system. Where numerous properties/sites are involved (linear activities) you must attach a list of the Farm Name(s)/Portion(s)/Erf number(s) to this BAR as an Appendix. For linear activities that are longer than 500m, please provide a map with the co-ordinates taken every 100m along the route to this BAR as **Appendix A3**.

ACRONYMS

DFFE:	Department of Forestry, Fisheries and Environment
DEA:	Department of Environmental Affairs
DEA& DP:	Department of Environmental Affairs and Development Planning
DHS:	Department of Human Settlement
DoA:	Department of Agriculture
DoH:	Department of Health
DWS:	Department of Water and Sanitation
EMPr:	Environmental Management Programme
HWC:	Heritage Western Cape
NFEPA:	National Freshwater Ecosystem Protection Assessment
NSBA:	National Spatial Biodiversity Assessment
TOR:	Terms of Reference
WCBSP:	Western Cape Biodiversity Spatial Plan
WCG:	Western Cape Government

ATTACHMENTS

Note: The Appendices must be attached to the BAR as per the list below. Please use a ✓ **(**tick) or a **x** (cross) to indicate whether the Appendix is attached to the BAR.

The following checklist of attachments must be completed.

APPENDIX			**✓ (Tick) or x (cross)**
Appendix A:	**Maps**		
	Appendix A1:	**Locality Map**	✓
	Appendix A2:	**Coastal Risk Zones as delineated in terms of ICMA for the Western Cape by the Department of Environmental Affairs and Development Planning**	✓
	Appendix A3:	**Map with the GPS co-ordinates for linear activities**	✓
Appendix B:	**Appendix B1:**	**Site development plan(s)**	✓
	Appendix B2	**A map of appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffer areas;**	N/A
Appendix C:	**Photographs**		✓
Appendix D:	**Biodiversity overlay map**		✓
Appendix E:	**Permit(s) / license(s) / exemption notice, agreements, comments from State Department/Organs of state and service letters from the municipality.**		

	Appendix E1:	**Final comment/ROD from HWC**	✓
	Appendix E2:	**Copy of comment from Cape Nature**	×
	Appendix E3:	**Final Comment from the DWS**	✓
	Appendix E4:	**Comment from the DEA: Oceans and Coast**	×
	Appendix E5:	**Comment from the DAFF**	✓
	Appendix E6:	**Comment from WCG: Transport and Public Works**	×
	Appendix E7:	**Comment from WCG: DoA**	×
	Appendix E8:	**Comment from WCG: DHS**	×
	Appendix E9:	**Comment from WCG: DoH**	×
	Appendix E10:	**Comment from DEA&DP: Pollution Management**	✓
	Appendix E11:	**Comment from DEA&DP: Waste Management**	×
	Appendix E12:	**Comment from DEA&DP: Biodiversity**	×
	Appendix E13:	**Comment from DEA&DP: Air Quality**	N/A
	Appendix E14:	**Comment from DEA&DP: Coastal Management**	
	Appendix E15:	**Comment from the local authority**	×
	Appendix E16:	**Confirmation of all services (water, electricity, sewage, solid waste management)**	N/A
	Appendix E17:	**Comment from the District Municipality**	×
	Appendix E18:	**Copy of an exemption notice**	×
	Appendix E19	**Pre-approval for the reclamation of land**	×
	Appendix E20:	**Proof of agreement/TOR of the specialist studies conducted.**	✓

	Appendix E21:	**Proof of land use rights**	×
	Appendix E22:	**Proof of public participation agreement for linear activities**	×
Appendix F:	**Appendix F1: register of I&APs** **Appendix F2: Proof of Pre-Application PPP** **Appendix F3: Comments** **Appendix F4: Comments and Responses Report**		✓ ✓ ✓ ✓
Appendix G1:	**Botanical Impact Assessment Mark Berry**		✓
Appendix G2:	**Aquatic Assessment James Dabrowski**		✓
Appendix G3:	**Terrestrial and Avifaunal Impact Assessment Dr. Jacobus H. Visser of Blue Skies Research**		✓
Appendix G4:	**Groundwater Impact Assessment**		✓
Appendix G5:	**Heritage Assessment**		✓
Appendix H:	**EMPr**		✓
Appendix I:	**Screening tool report**		✓
Appendix J:	**The impact and risk assessment for each alternative**		N/A
Appendix K:	**Need and desirability for the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013)/DEA Integrated Environmental Management Guideline**		N/A
Appendix L:	**Engineering Design Report**		✓
Appendix M:	**Water Use License**		✓

SECTION A: ADMINISTRATIVE DETAILS

Highlight the Departmental Region in which the intended application will fall	CAPE TOWN OFFICE: REGION 1		**GEORGE OFFICE: BEGION 3**
	(City of Cape Town, West Coast District	(Cape Winelands District & Overberg District)	**(Central Karoo District & Garden Route District)**
Duplicate this section where there is more than one Proponent Name of Applicant/Proponent:	Johannes Franciscus Koegelenberg George Municipality: Civil Engineering Services Directorate		
Name of contact person for Applicant/Proponent (if other):	Melanie Geyer		
Company/ Trading name/State Department/Organ of State:	George Municipality: Civil Engineering Services Directorate		
Company Registration Number:			
Postal address:	PO Box 19		
	George	Postal code: 6530	
Telephone:	044 801 9268 044 801 9278	Cell:	
E-mail:	mgeyer@george.gov.za jkoegelenberg@george.gov.za	Fax: ( )	
Company of EAP:	Sharples Environmental Services cc		
EAP name:	Michael Bennett (Registered EAP) Lu-anne Beets (Candidate EAP) Onela Mhobo(Candidate EAP)		
Postal address:	PO Box 9087		
	George	Postal code: 6530	
Telephone:	044 873 9087	Cell:	
E-mail:	michael@sescc.net Onela@sescc.net luanne@sescc.net	Fax: ( )	
Qualifications:	Michael:	BSc Environmental & Geographic Sciences and Ocean and Atmospheric Science	
	Lu-anne:	BSc Zoology & Botany BSc Honours Environmental Management	
	Onela	BSc Environmental Science BSc Honours Environmental Management	
EAP registration no:	Michael: 2021/3163 Lu-anne: 2024/7962 Onela: 2022/4522		
Duplicate this section where there is more than one landowner Name of landowner:	George Municipality		
Name of contact person for landowner (if other):	Johannes Franciscus Koegelenberg Melanie Geyer		
Postal address:	PO Box 19		
	George	Postal code: 6530	
Telephone: E-mail:	044 801 9268 044 801 9278	Cell:	
	mgeyer@george.gov.za jkoegelenberg@george.gov.za	Fax: ( )	
Duplicate this section where there is more than one Municipal Jurisdiction	George Municipality		

Municipality in whose area of jurisdiction the proposed activity will fall:		
Contact person:	Godfrey Louw	
Postal address:	PO Box 19	
	George	Postal code: 6530
Telephone	(044) 8019111	Cell:
E-mail:	tlduplooy@george.go.za	Fax: ( )

SECTION B: CONFIRMATION OF SPECIFIC PROJECT DETAILS AS INLCUDED IN THE APPLICATION FORM

1.	Is the proposed development (please tick):	**New**	✖	**Expansion**	✖
	Please note that the existing Pumpstation (referred to as pump station 1) will be upgraded, a new pumpstation (referred to as pump station 4) and new pipeline form part of the proposal, therefore the proposal is mainly considered upgrading of the existing sewerage network however there are new aspects to the proposal.				
2.	Is the proposed site(s) a brownfield of greenfield site? Please explain.				
The existing PS site is a brownfield site with existing infrastructure, the existing pipeline traverses a greenfield site in theoretical terms, although the new pipeline traverses the same site. The proposed new pump station will be constructed on a greenfield site.					
3.	**For Linear activities or developments**				
3.1.	Provide the Farm(s)/Farm Portion(s)/Erf number(s) for all routes: **(PROPERTIES WHERE THE PIPELINES WILL CROSS OVER)**				
o Farm 236 Brakfontein o Farm number 10/236 Brakfontein o Farm 237 o Erf 113 o RE/95 / Erf 95 o Farm number 36/236 o Erf 110 o Farm 386 o 35/236 o 37/236 o Erf 114					
3.2.	Development footprint of the proposed development for all alternatives:	RE Farm 236 Brakfontein	6 369,33 m²		
		Farm 10/236 Brakfontein	3347.25 m²		
		Farm 237	211.36 m²		
		Erf 113	22.14 m²		
		RE/95	55.05 m²		
		36/236	35.12 m²		
		Erf 110	998.14 m²		
		Farm 386	4,033.58 m²		
		35/236	1,583.67 m²		
		37/236	613.66 m²		
		Erf 114	2100 m²		
3.3.	Provide a description of the proposed development (e.g. for roads the length, width and width of the road reserve in the case of pipelines indicate the length and diameter) for all alternatives.				

PLEASE NOTE: This section only elaborates on the linear aspect of this project. (e.g. the pipelines). Associated infrastructure and new developments relating to this project will be discussed under "Other developments" point 4.4.

The George Municipality proposed to undertake upgrades to the Sewerage network in Herolds Bay. According to the Design Report for the "Upgrading of Herold's Bay Sewer Pump Station No. 1 and Associated Rising Main", dated 13 December 2024, compiled by SMEC South Africa (Pty) Ltd:

Pipeline between Pump Station 1 (PS1) to Pump Station 4 (PS4)

The new rising main will start at PS1 and be installed adjacent to the existing pipeline and will be approx. 175m - 200m in length. The new pipeline route will follow the alignment of the existing pipeline with an offset of 2m. The existing pipeline runs in the Skimmelkrans Drive reserve and is installed below ground level. The new pipeline will be in the road reserve and will require a minimum cover of 1m, therefor local deviations may be required to avoid existing services. The road is an average of 6m wide, and the final route will have to be assessed very carefully to minimise the impact on vehicle access to the beachfront and properties during construction. The pipeline will be designed to accommodate the ultimate flow of 32L/s; however, the line will be evaluated against the interim design flow of 19L/s. The stream crossing at Uitspanning Road will be done at the same position as the existing pipe crossing, which is upstream from the roadway. The suspended section of pipe will be of 316L stainless steel and will be self-supporting.

The minimum internal diameter of the new pipeline will be upgraded to 200mm. The existing rising main will be repurposed and utilised to convey sewage to the emergency storage tank that will be constructed in the parking space near PS 1, during emergency or maintenance events.

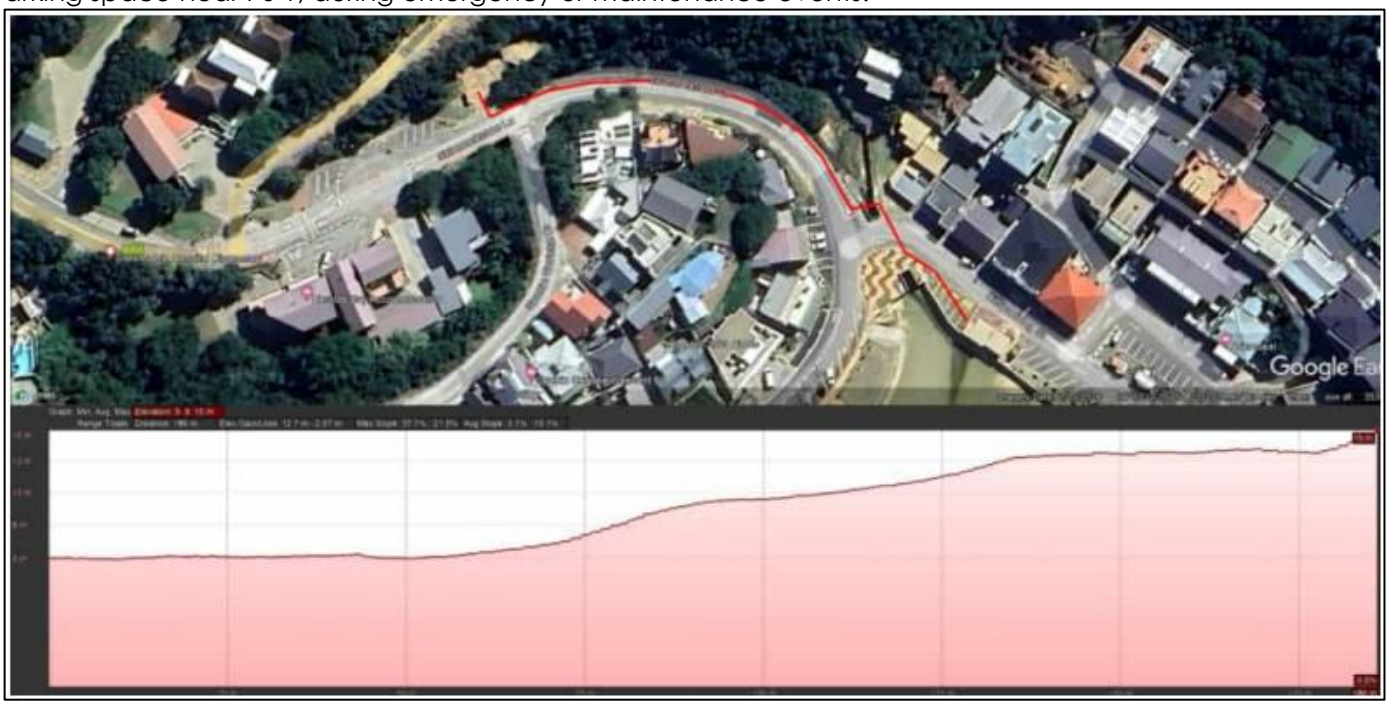


Figure 1: 5 Route and vertical profile pipeline between PS1 and PS4

Figure 2: Existing (black) and proposed (blue) pipeline between PS1 and PS4

Pipeline between PS4 and Herold's Bay WWTW

The new pumping main will leave PS4 and follow Speckie Gericke Drive up to the intersection of Gus Meyer Avenue (0-220m). From there, it will follow the existing pipeline and servitude up the ridge to the WWTW (220m - 1,470m). Although the existing pipeline runs within the servitude, the width of the servitude is insufficient to accommodate the second pipeline. Accordingly, an additional servitude will have to be applied for. The extent of the additional servitude is 4m on the northern side of the existing servitude.

The first 205 meters of the pipeline will be installed in the road reserve of Speckie Gericke Drive. The slopes are moderate, but from here on, the route follows the existing servitude and pipeline. The route will cut through thick coastal shrubs and granite fynbos vegetation and up a steep slope to the WWTW. A 10-meter-wide area within a 30m corridor (assessed by the specialists) will need to be cleared to allow for adequate working space during construction. The disturbed area through the vegetation will be rehabilitated however vehicles will still be able to access the pipeline using the servitude for future maintenance. The only way to access the area will be via the existing jeep track from the WWTW to the cellular mast.

The pipeline will be designed to accommodate the ultimate flow of 52L/s. The minimum internal diameter of the new pipeline will be 300mm. The existing rising main between PS4 and the WWTW will be retained as a backup in the event of an issue with the new rising main.

The pipeline will terminate in a new reinforced concrete screenings chamber at the WWTW. The new chamber will consist of a manual 316 LSS 15mm bar screen, from where the flow will pass through a prefabricated Parshall flume, before entering a division chamber that will discharge into the pond system.

The chamber will be like the existing chamber and will replace it. (A temporary discharge will have to be created, to allow the existing line to pump into the ponds, while the existing structure is replaced. The chamber will be constructed within the footprint of the WWTW and will not result in a capacity increase.

Figure 3: Pipeline route and vertical profiles for the pipeline between PS4 to WWTW

Figure 4: Pipeline route from PS4 following Speckie Gericke Drive

Figure 5: Pipeline route from the intersection of Speckie Gericke Drive and Gus Meyer Avenue to the WWTW

Figure 6: Pipeline route at the WWTW

3.4.	Indicate how access to the proposed routes will be obtained for all alternatives.

The pipeline between PS1 and PS4 can be accessed directly through Skimmelkrans Drive.

The first 220m of the pipeline between PS4 and the WWTW can be accessed through Skimmelkrans Drive and Speckie 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 and the servitude will be used to access the pipeline for the steeper sections.

3.5.	SG Digit codes of the Farms/Farm Portions/Erf numbers for all alternatives			
	RE Farm 236 Brakfontein	C02700000000023600000		
	Farm 10/236 Brakfontein	C02700000000023600010		
	Farm 237	C02700000000023700000		
	Erf 113	C02700040000011300000		
	RE/95	C02700040000009500000		
	36/236	C02700000000023600036		
	Erf 110	C02700040000011000000		
	Farm 386	C02700000000038600000		
	35/236	C02700000000023600035		
	Erf 114	C02700040000011400000		
	37/236	C02700000000023600037		
3.6.	**Starting point co-ordinates for all alternatives**			
	Latitude (S)	34°	3‘	9.91“

	Longitude (E)	22º	23‘	29.12“
	Middle point co-ordinates for all alternatives			
	Latitude (S)	34º	3‘	13.75“
	Longitude (E)	22º	23‘	17.45“
	End point co-ordinates for all alternatives			
	Latitude (S)	34º	3‘	15.81“
	Longitude (E)	22º	22‘	46.91“
Note: For Linear activities or developments longer than 500m, a map indicating the co-ordinates for every 100m along the route must be attached to this BAR as Appendix A3.				
4.	**Other developments (PUMP STATION AND PIPELINE PROPERTIES)**			
4.1.	Property size(s) of all proposed site(s):		Farm 37/236 Brakfontein	2 ha 20 000 m²
			Farm 35/236 Brakfontein	1.56 ha 15 600 m²
			RE Farm 236 Brakfontein	785.55 ha 7 855 500 m²
			Farm 10/236 Brakfontein	8.22 ha 82 200 m²
			Farm 237	28.90 ha 28 900 m²
			Erf 116	168.8 m²
			Erf RE/95	1 604 m²
			Erf 113	647m²
			36/236	0.44 ha
			Erf 110	5135.70 m²
			Farm 386	310.54 ha
			Erf 114	2100 m²
4.2.	Developed footprint of the existing facility and associated infrastructure (if applicable):		Farm 37/236 Brakfontein	1.1 ha
			Farm 35/236 Brakfontein	1.56 ha 15 600 m²
			RE Farm 236 Brakfontein	295 268,57 m²
			Farm 10/236 Brakfontein	0 m²
			Farm 237	2 795,49 m²
			Erf 116	0 m²
			Erf RE/95	1 064 m²
			Erf 113	158.6 m²
			36/236	4400 m²
			Erf 110	2895.70 m²
			Erf 114	0 m²
4.3.	Development footprint of the proposed development and associated infrastructure size(s) for all alternatives:		Farm 37/236 Brakfontein	1030.39 m²
			Farm 35/236 Brakfontein	3750.71 m²
			RE Farm 236 Brakfontein	6 369,33 m²
			Farm 10/236 Brakfontein	3347.25 m²
			Farm 237	211.36 m²
			Erf 116	168.8 m²
			Erf RE/95	55.05 m²
			Erf 113	22.14 m²
			36/236	35.12 m²
			Erf 110	998.14 m²
			Farm 386	4,033.58 m²

		Erf 114	1064 m²
4.4.	Provide a detailed description of the proposed development and its associated infrastructure (This must include details of e.g. buildings, structures, infrastructure, storage facilities, sewage/effluent treatment and holding facilities).		

PLEASE NOTE: This section only elaborates on the Associated infrastructure and new developments relating to this project

The George Municipality proposed to undertake upgrades to the Sewerage network in Herolds Bay. According to the Design Report for the "Upgrading of Herold's Bay Sewer Pump Station No. 1 and Associated Rising Main", dated 13 December 2024, compiled by SMEC South Africa (Pty) Ltd, the proposal is to establishment a new pump station located inland from the beachfront, on Erf 116 and portion 0 of farm 236, situated higher up in the valley. The high-level scope of work for this project includes:

- Refurbishing and upgrading the existing pump station (PS1) located on the beachfront
- Constructing the new pump station (PS4)
- Installing the interlinking pipelines

The scope of work for this proposal will include the following:

Existing Herold's Bay Pump Station Number 1 (PS1)

- Upgrade the existing pump station's civil infrastructure to handle 32L/s (ultimate design flow) and the mechanical operating capacity from 5 L/s (low season) to 32 L/s (extreme events).
- 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 three (3) new submersible vortex pumps. The pumps shall be operated on a rotational basis as duty/assist/standby.
- Replace the odour control unit.
- Provide a new emergency storage tank.
- Provide an emergency generator supply indoor integrated from PS4
- 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 a normal operating capacity of 52 L/s, and an emergency operating capacity of 70L/s.
- Construct new inlet works comprising of:
    - a screening station,
    - a grit removal station,
    - a Parshall flume for inflow measurement.
- Install two (2) new dry well pumps. The pumps shall be operated rotationally as duty/standby.
- New MCC with variable-speed drives on all pumps, complete with PLC and HMI.
- Install odour control unit.
- Installation of electrical and electronic equipment associated with the new pump station and inlet works.
- Provision of an indoor backup generator, supplying PS1 and PS4.
- Provide above-ground fuel storage for the generator, within a dedicated room.
- 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.

New Herold's Bay PS 4

Due to space constraints at the allocated site of the new pump station number 4, a double-storey standalone structure was designed to house all the equipment. A client's requirement was for all equipment to be housed

out of view from the public and for the building to be aesthetically pleasing and contribute to the existing surroundings of Herold's Bay.

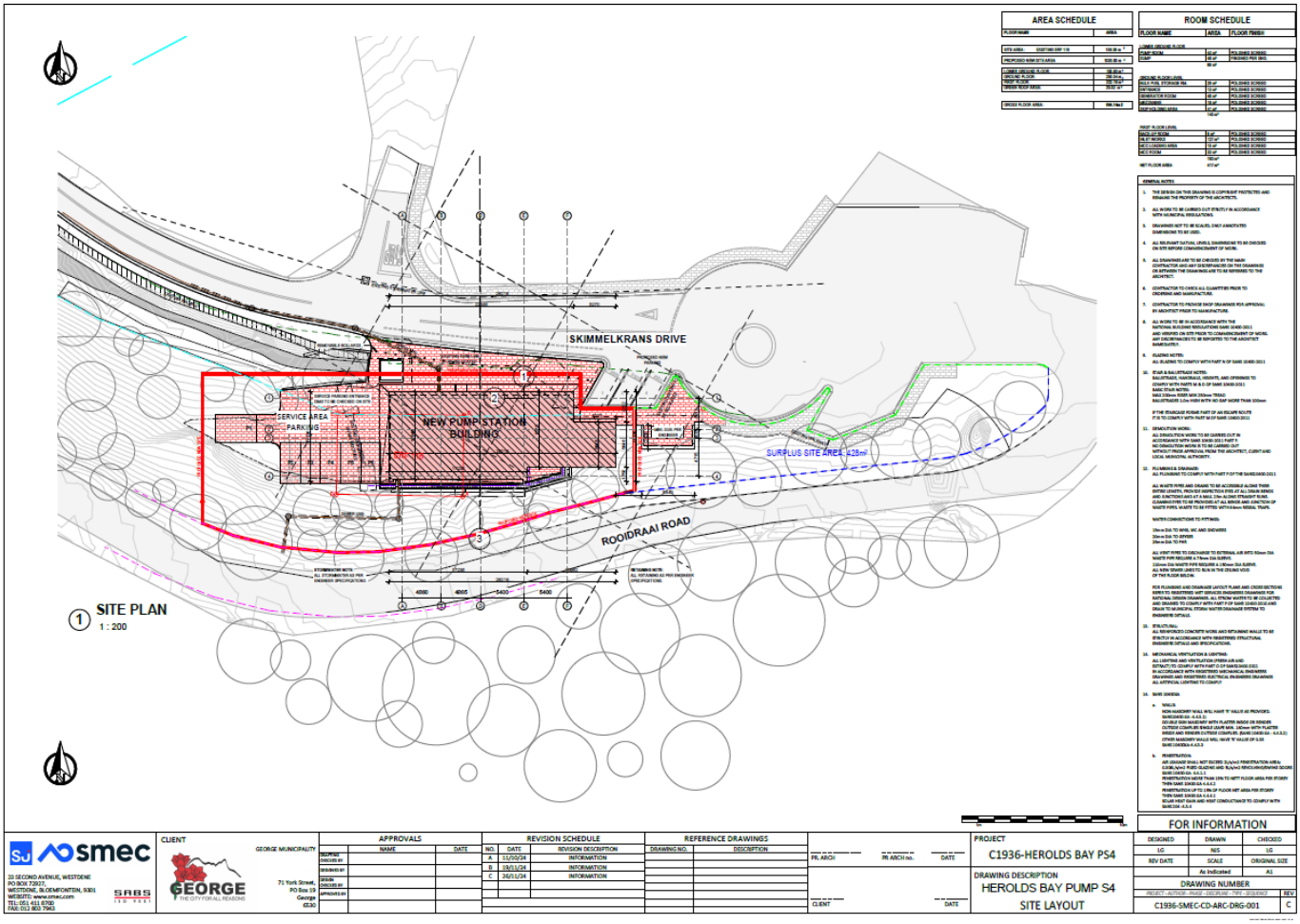


Figure 7: Proposed new PS4

Please refer to Section 4.6.2 of the Design report for the architectural designs of PS4 under consideration

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 currently located on PS4 site, including all affected MV and LV cables.
- Install new LV electrical supply cable between PS4 and PS1, integrated with generator changeover.

Odour Control System

Due to the pump station's proximity to residential and recreational areas, an odour control system shall be installed to treat the odorous gases / substances present at the pump station. An odour control specialist was approached to assist with selecting the odour control technology suitable for the pump station and its associated footprint.

Due to the limited available space, and the lower amount of maintenance required, a dry scrubbing system will be installed. Foul air shall be extracted via ducting by an exhaust fan from the sump and passed over / through a series of reactant / adsorbent media beds housed in sealed vessels in the pump station building, and will be discharged to the outside. Two exhaust fans, with associated isolation valves, shall be installed to operate as a duty/standby configuration.

All ducting shall be of uPVC and will be sized to suit the required flow rates. The media beds are designed to remove targeted pollutants / odorants from the extracted air. The multi-layered media beds oxidise odorous compounds present in gases to non-odorous and environmentally friendly byproducts. The system does not require any chemical dosing or water supply.

The system is designed to treat the volume of air displaced in the sump during peak wet weather inflow to the pump station, including the overflow from Herold's Bay Sewage Pump Station 4. With a safety factor included, the system's designed flow rate is 220 m³/h.

The volume of media required is based on the concentration of foul air of the air being treated and the service design life of the media. Without an H2S study, the service life of the media bed cannot be accurately estimated. Based on typical domestic sewage constituents assumed, the system was designed for a media lifespan of 4 years. The variance between the foul air concentration assumptions to the actual foul air concentration will influence the media lifespan and not affect the effectivity of the odour control system.

Spatial allowance has been made for two 1m diameter and 1.5m high vessels, ducting, and two exhaust fans. Shorter vessels were chosen due to the height restrictions in the existing pump station building for ease of service / replacement of the media beds.

Electrical

Since the flow to PS1 will be reduced due to the diversion of a significant amount of sewage under gravity to PS4, the intended pump station upgrade, with associated pumps, motors and ancillary equipment, will require less power than the current pump station. The maximum expected electrical demand for the pump station is calculated to be rounded to 52 kVA (for final future flows). That equates to roughly 80-90A load. The current supply cable and breaker size (150A) is rated for higher load requirements than the above estimated maximum load demand. The current supply is sufficient to supply the pump station after the upgrade.

Due to the location of PS1 (adjacent to houses and the sea), this Pump Station will be supplied with existing connection and back-up power from the PS4 changeover panel. The new bulk supply at PS4 will, under normal supply conditions, supply PS1 with the necessary power as well. The new supply cable, fed from PS4's changeover panel, will be sized for current and voltage drop, taking final route and burial conditions into account (derating factors). The cable will be installed along with the new pipeline and due to timeline constraints, most likely be installed within a sleeve that will be provided by the civil contractor.

The existing supply to PS1 is sufficient size for the upgrade requirement and will be kept as an emergency backup.

Existing LV electrical cables running along the road and parking area, as well as main feeds into pump station will be affected by the infrastructure and will have to be relocated. The existing backup generator will need to be removed, or relocated to another location, for the emergency sump excavations.

Existing Pump Station 1 Building Alternations

- Superstructure
    - The existing building will be completely refurbished as per the best practice guidelines. The existing pumps and pipework will be removed, and all the new pipework will be installed in the existing building.
- Electrical Control Room
    - It is proposed that the MCC be installed inside a separate section of the existing building to better screen and protect against water vapour/spray and possible gases. The submersible pumps will be provided with junction boxes for remote start/stop and a motor cable termination point in close proximity to the sump (hidden from the public eye and needing authorised access).
- Access
    - One emergency access with doors opening outward for use during emergencies.
    - All external doors will be made of galvanised steel and equipped with stainless steel locking mechanisms to protect against corrosion.
    - All internal doors will be made of galvanized steel and equipped with stainless steel locking mechanisms to protect against corrosion.
- Lighting

- Make use of as much natural light as possible, but given the location, existing buildings as well protection against sea/water ingress, lighting design based upon zero-natural light.
- Accessibility
  - Adequate demarcated parking and accessibility to the pump station for emergency operation and maintenance activities. Particular consideration during the peak holiday season.

Expansion onto coastal public property of PS1

The alterations to PS1 will result in encroachment onto Coastal Public Property of approximately 46m^2 as shown in the figure below. This expansion will however not trigger coastal listed activities (Listing Notice 1: Activities 15, 17, 19A, 52) as the expansion footprint is less than the 50m^2 threshold and will result in less than 5m^3 of material being placed in the footprint of the expansion.

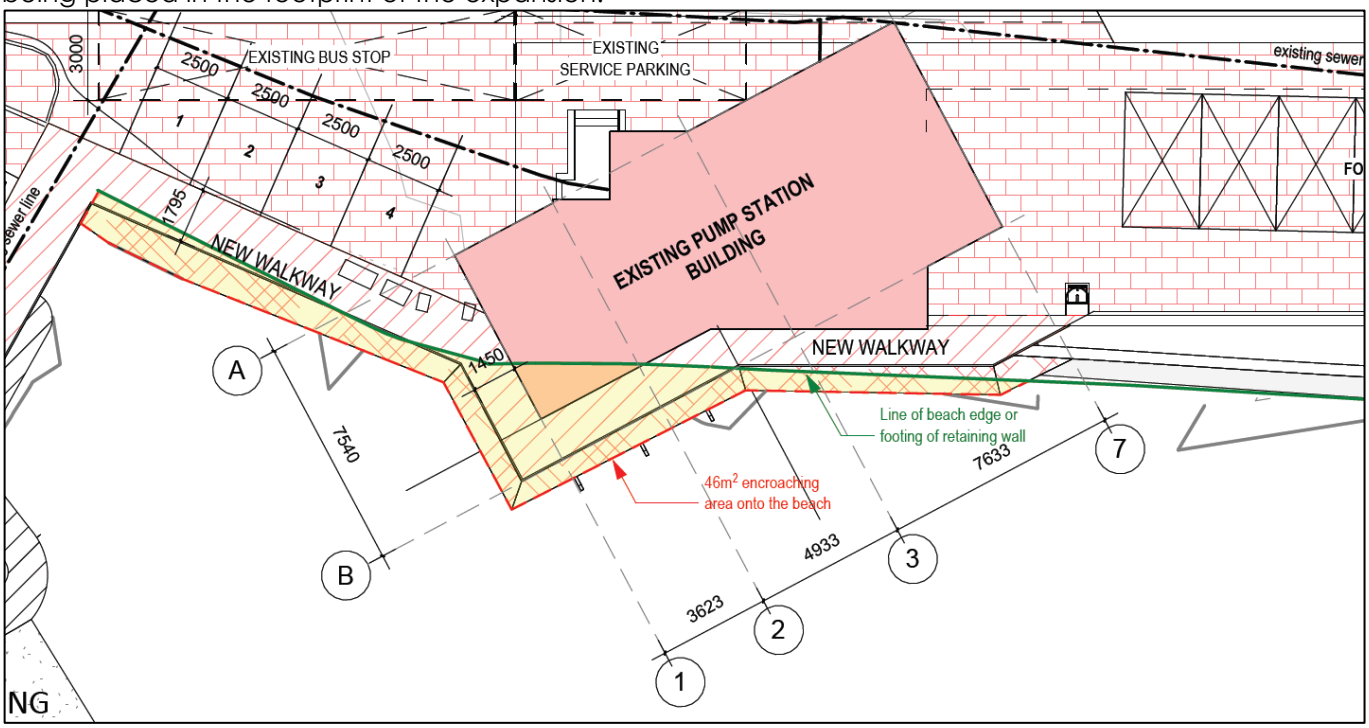


Figure 8: PS1 expansion footprint onto coastal public property

Pipe Bridge

A 200mm diameter gravity sewer line draining sewage from the higher areas of Herold' Bay along Rooidraai Road must be connected to the inlet works on the first floor of the new pump station. Due to the elevation difference between Rooidraai Road and ERF 116, a pipe bridge spanning 25m will be required to support the pipeline. This bridge will consist of a 2m deep, 1.5m wide galvanised lattice steel structure supported on reinforced concrete foundations and plinths as support. As part of the pump station construction contract, the new pipeline along Rooidraai Road needs to be connected to the pump station, and the existing reticulation needs to be changed over to the Rooidraai Road outfall sewer.

Figure 9: Pipe Bridge location

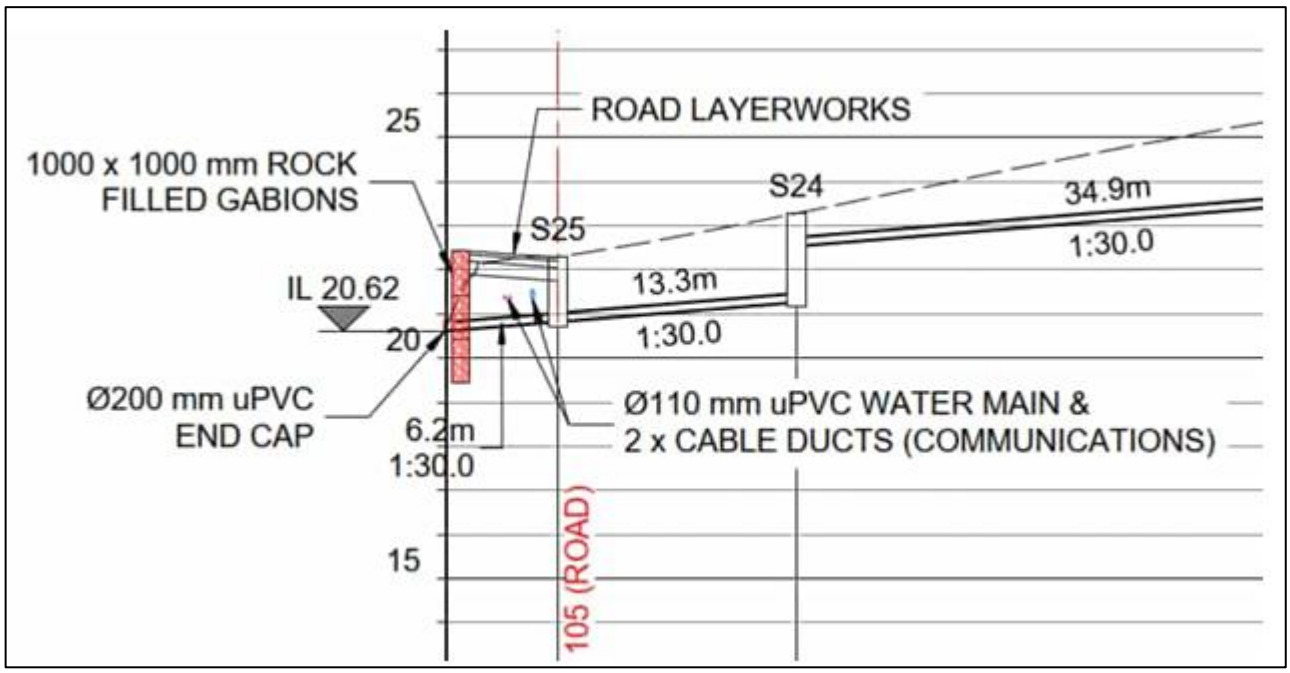


Figure 10: Road connection detail

Sump and emergency storage

If the proposed emergency storage tank cannot be accommodated next to the existing PS1 the emergency storage tank and PS1 will have to move within the existing parking area as shown in Figure 11.

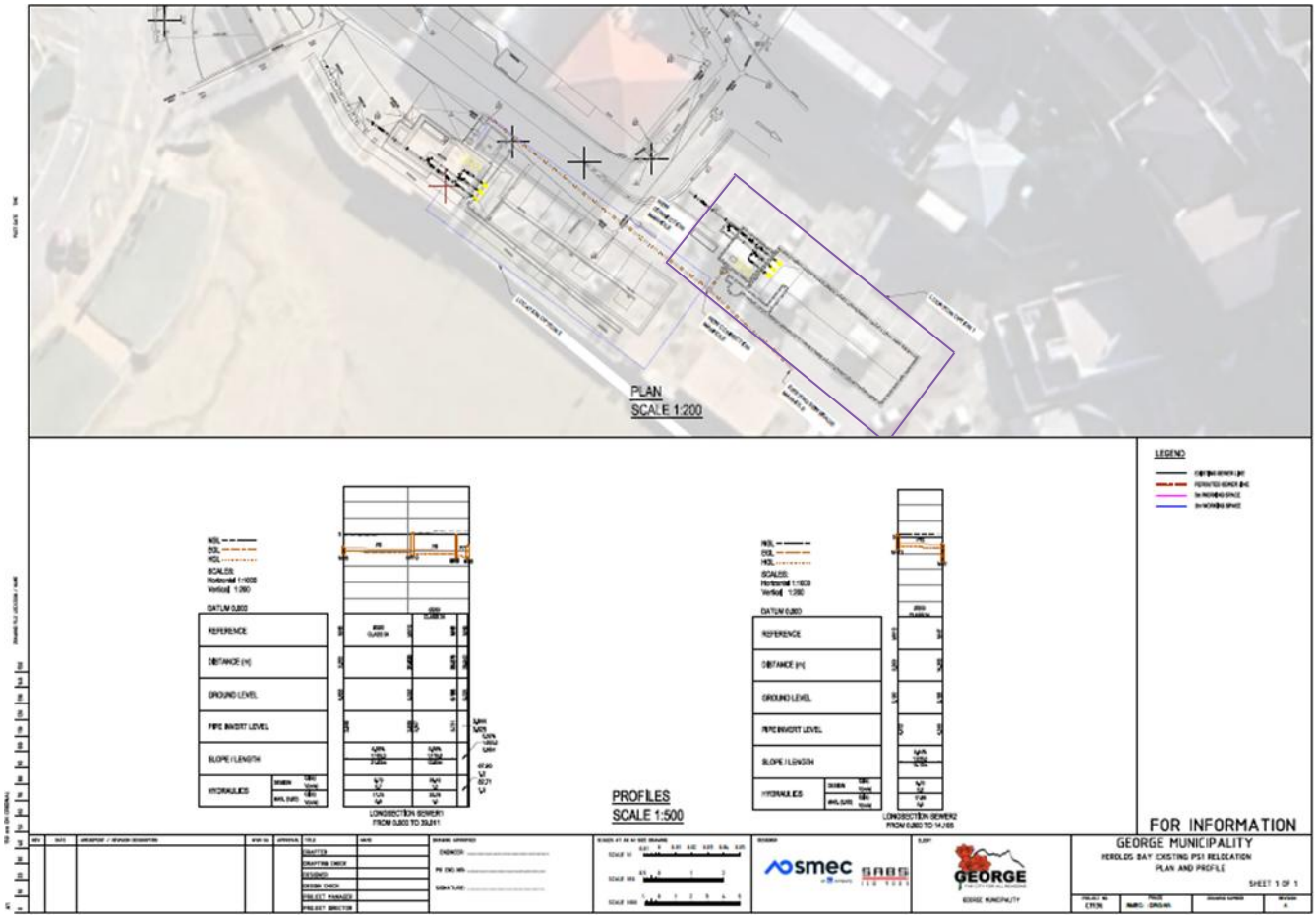


Figure 11:Plan for the proposed emergency storage tank and two possible locations of proposed emergency storage tank and PS1

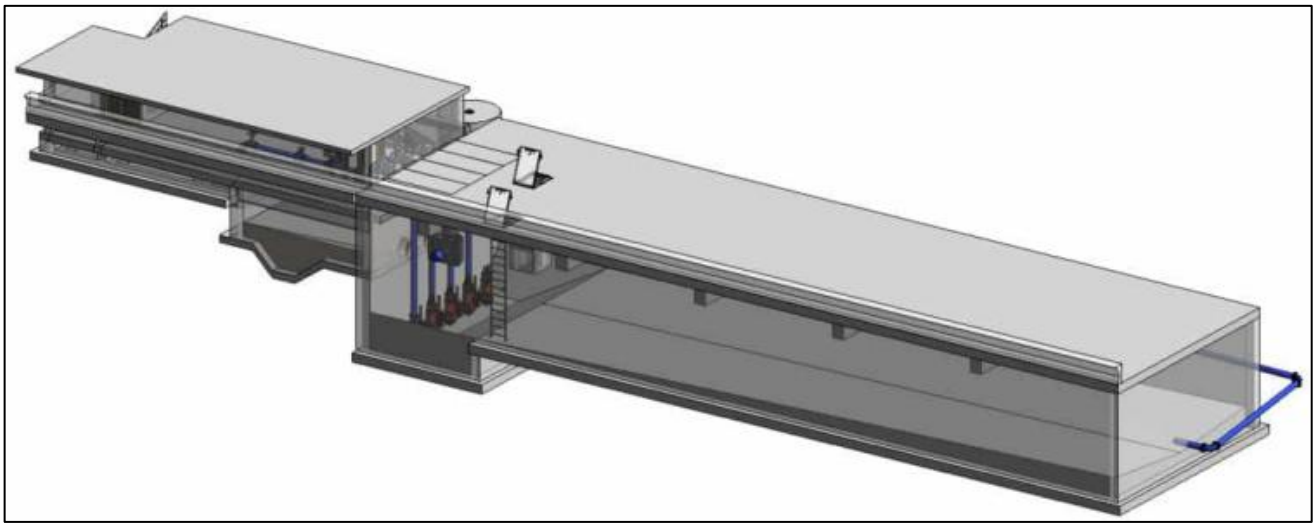


Figure 12: Model of proposed PS1 and emergency storage tank

Pump Station 1 will primarily operate on a level control in the local sump, with a communication interlink to PS4. If PS4 is not functioning for any reason, the pumps at the PS1 will not activate. Under other conditions, the pumps will operate one duty, two standby, on a rotational basis. In the event of the liquid rising above the preset levels, the second and possibly third pumps will activate in sequence. If the pumps at PS4 are not operational or the emergency sump is full, then the pumps in PS1 shall not start or if operational, stop, and the emergency storage volume must be used to accommodate incoming sewage.

The sump provided at PS4 will act as both an operational and emergency storage sump. Sizing of the sump resulted in a capacity in the region of 25-30m^3 with an emergency volume of 170m^3. This will provide sufficient

storage and suction head for the pumps to operate at their best efficiencies. The sump will be located adjacent to the pump room to reduce suction pipe lengths as well as to ensure minimal secondary losses in the suction pipework. By having the sump adjacent to the pump room rather than below it, the pump suction pipework will be flooded, removing the need for self-priming pumps and making operations and required maintenance easier.

The emergency overflow from the sump will utilise the existing pumping main repurposed as a gravity sewer to drain the overflowing sewage from PS4 to the emergency storage tank at PS1. In the event that the emergency overflow fails, the sewage shall be discharged to the environment.

The pumping main from PS4 to the WWTW will scour back into the Pump Station 4 sump and ultimately to the emergency storage tank. The combined sump capacities of pump station 1 and 4 is more than capable of handling the scoured volume of the rising main.

Pumpstation 4 Design Considerations

Please also refer to Section 4.6.2 of the Design report for the architectural designs of PS4 under consideration

Figure 13: Street View, south elevation of PS4

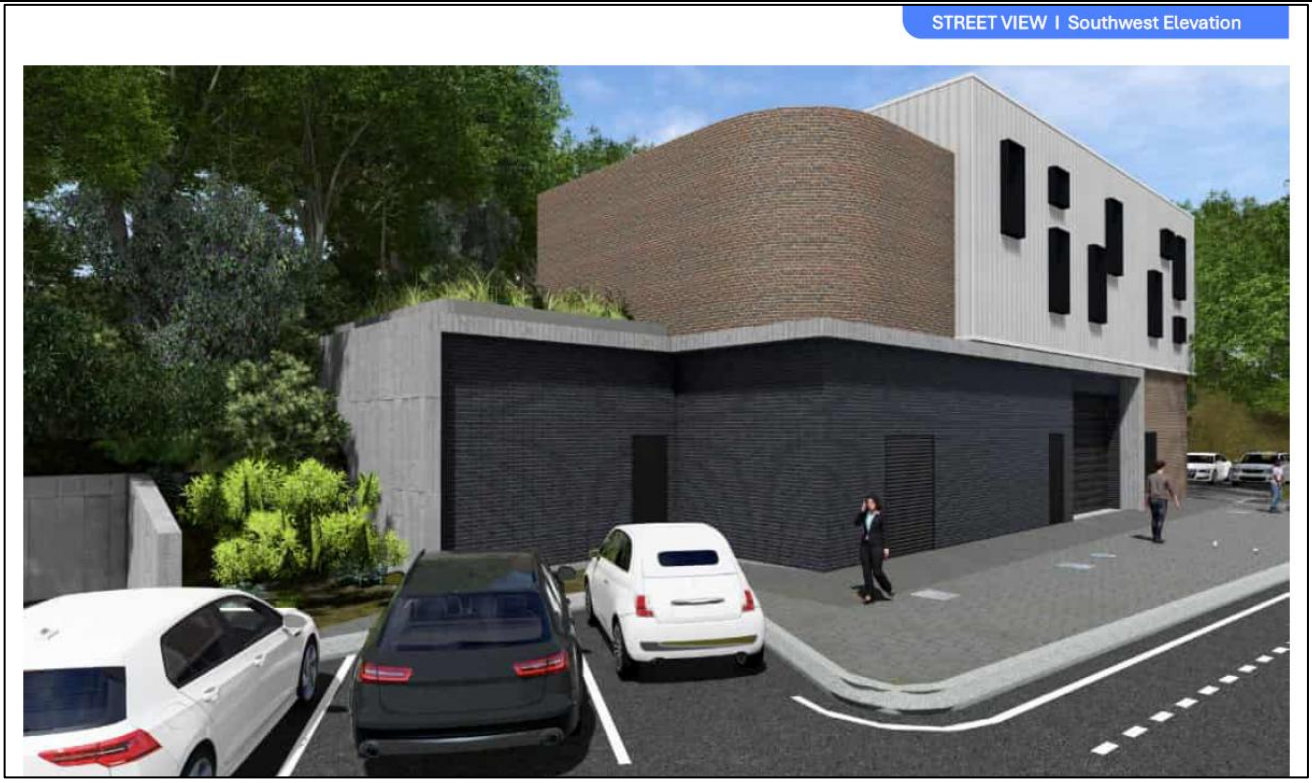


Figure 14: Street View, south elevation of PS4

Figure 15: PS4 Birds eye view

4.5.	Indicate how access to the proposed site(s) will be obtained for all alternatives.		
The proposed new pumpstation (PS4) will be located on Skimmelkrans Drive. The existing pumpstation (PS1) is located on Uitspanning Street. The two pumpstations are easily accessed from these roads.			
4.6.	SG Digit code(s) of the proposed site(s) for all alternatives:	Farm 37/236 Brakfontein	C02700000000023600037

		Farm 35/236 Brakfontein	C02700000000023600035		
		Erf 116	C02700040000011600000		
		Farm 236	C02700000000023600000		
		Erf RE/95	C02700040000009500000		
		Erf 114	C02700040000011400000		
4.7.	Coordinates of the proposed site(s) for all alternatives:				
	Farm 37/236 Brakfontein	Latitude (S)	34°	3‘	15.81“
		Longitude (E)	22°	22‘	46.91“
	Farm 35/236 Brakfontein	Latitude (S)	34°	3‘	15.81“
		Longitude (E)	22°	22‘	54.80“
	Farm 236 Brakfontein	Latitude (S)	34°	3‘	16.13“
		Longitude (E)	22°	23‘	6.24“
	Erf 116	Latitude (S)	34°	3‘	9.91“
		Longitude (E)	22°	23‘	29.12“
	Erf RE/95	Latitude (S)	34°	3’	12.24”
		Longitude (E)	22°	23’	34.71”
	Farm 237	Latitude (S)	34°	3'	9.88"
		Longitude (E)	22°	23'	31.83"
	Erf 110	Latitude (S)	34°	3'	12.81"
		Longitude (E)	22°	23'	28.67"
	Erf 113	Latitude (S)	34°	3'	10.67"
		Longitude (E)	22°	23'	33.10"
	Farm 10/236 Brakfontein	Latitude (S)	34°	3‘	13.75“
		Longitude (E)	22°	23‘	17.45“
	Portion 36 of 236	Latitude (S)	34°	3'	12.13"
		Longitude (E)	22°	23'	22.90"
	Erf 114	Latitude (S)	34°	03'	12.54"
		Longitude (E)	22°	23'	36.63"

SECTION C: LEGISLATION/POLICIES AND/OR GUIDELINES/PROTOCOLS

1. Exemption applied for in terms of the NEMA and the NEMA EIA Regulations

Has exemption been applied for in terms of the NEMA and the NEMA EIA Regulations. If yes, include a copy of the exemption notice in Appendix E18.	YES	**NO**

2. Is the following legislation applicable to the proposed activity or development.

The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) (“ICMA”). If yes, attach a copy of the comment from the relevant competent authority as Appendix E4 and the pre-approval for the reclamation of land as Appendix E19.	**YES**	NO
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (“NHRA”). If yes, attach a copy of the comment from Heritage Western Cape as Appendix E1.	**YES**	NO
The National Water Act, 1998 (Act No. 36 of 1998) (“NWA”). If yes, attach a copy of the comment from the DWS as Appendix E3.	**YES**	NO
The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (“NEM:AQA”). If yes, attach a copy of the comment from the relevant authorities as Appendix E13.	YES	**NO**
The National Environmental Management Waste Act (Act No. 59 of 2008) (“NEM:WA”)	YES	**NO**
The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004 (“NEMBA”).	**YES**	NO
The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (“NEMPAA”).	YES	**NO**
The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). If yes, attach comment from the relevant competent authority as Appendix E5.	YES	**NO**

3. Other legislation

List any other legislation that is applicable to the proposed activity or development.

- 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
- National Water Act, 1998 (Act No. 36 of 1998)
- National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- National Forest Act (Act No 84 of 1998);
- National Environmental Management Act (NEMA) (Act No 107 of 1998, as amended);

4. Policies

Explain which policies were considered and how the proposed activity or development complies and responds to these policies.

- George Municipality by-law (Streets and Stormwater)

5. Guidelines

List the guidelines which have been considered relevant to the proposed activity or development and explain how they have influenced the development proposal.

National Environmental Management Laws Amendment Act, 2022 (Act No. 2 of 2022)	
Guideline on Need and Desirability (2013/2017)	Guideline considered during the assessment of the Need and Desirability of the proposed development project.
Guideline on Environmental Management Plans (2005)	Guideline considered in the compilation of the EMP attached to this Basic Assessment Report.
Guideline for the Review of Specialist Input into the EIA Process (2005)	Guideline considered during the review and integration of specialist input into this Basic Assessment Report
External Guideline: Generic Water Use Authorization Application Process (2007)	Guideline considered during the process of applying for the required water use authorization
Integrated Environmental Management Information Series 5: Impact Significance (2002)	Guideline considering during the identification and evaluation of potential impacts associated with the proposed development, and the reporting thereof in this Basic Assessment Report
Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Guideline considering during the assessment of the cumulative effect of the identified impacts.
Guideline on Public Participation (2013)	Guideline considered in the undertaking of the public participation for the proposed development. All relevant provisions contained in the guideline were adhered to in the basic assessment process as appropriate, except where an exemption/ deviation has been granted by the Competent Authority.

Guideline on Alternatives (2013)	Guideline considered when identifying and evaluating possible alternatives for the proposed development. Alternatives that were considered in the impact assessment process are reported on in this Basic Assessment Report (see section E)

Other guidelines:

- Guideline on Generic Terms of Reference for EAPs and Project Schedules (March 2013)
- Guideline for determining the scope of specialist involvement in EIA processes, June 2005.
- Guideline for involving visual and aesthetic specialists in the EIA process, June 2005.

6. Protocols

Explain how the proposed activity or development complies with the requirements of the protocols referred to in the NOI and/or application form

The following specialist studies were undertaken for this proposal:

No.	Specialist Assessment	Assessment Protocol
1.	Terrestrial Biodiversity Impact Assessment	Terrestrial Biodiversity Assessment Protocol
2.	Aquatic Biodiversity Impact Assessment	Aquatic Biodiversity Assessment Protocol
3.	Plant Species Assessment	Plant Species Assessment Protocol
4.	Animal Species Assessment	Animal Species Assessment Protocol
5.	Archaeological and Cultural Heritage Impact Assessment	General Protocol
6.	Geotechnical Assessment	General Protocol
7.	Geohydrological Assessment	General Protocol

The corresponding protocols were used by the specialists to compile and structure their reports.

SECTION D: APPLICABLE LISTED ACTIVITIES

List the applicable activities in terms of the NEMA EIA Regulations

Activity No(s):	Provide the relevant **Basic Assessment Activities** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	**The development of—** (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs— (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —** excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (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;	The new pump station 4 pump station will be located within 32m of a non-perennial river and exceeds 100m². This activity is therefore triggered by the proposal.

	(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; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (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—** (i) the seashore; **(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high water mark of the sea or an estuary, whichever distance is the greater; or** (iii) the sea; — but excluding where such infilling, depositing, dredging, excavation, removal or moving— (f) will occur behind a development setback; (g) is for maintenance purposes undertaken in accordance with a maintenance management plan; (h) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (i) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or 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.	According to the Aquatic Site Assessment, the pipeline from PS1 to PS4 crosses the lower most, transitional section of the watercourse which can be best described a small temporarily closed estuary. Therefore, this activity is triggered by the proposal.
48	**The expansion of—** **(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or** (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—** **(a) within a watercourse;** (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;** excluding— (aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (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; (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;	This activity will be triggered due to the stormwater channel which the pipeline will cross.

	(dd) where such expansion occurs within an urban area; or (ee) where such expansion occurs within existing roads, road reserves or railway line reserves.	
52	**The expansion of structures in the coastal public property where the development footprint will be increased by more than 50 square metres,** excluding such expansions within existing ports or harbours where there will be no increase in the development footprint of the port or harbour and excluding activities listed in activity 23 in Listing Notice 3 of 2014, in which case that activity applies.	Herold's Bay Pumpstation 1 is located within the coastal public area; however, the facility will not be expanded and the proposed emergency storage tank will be located underneath the existing car park. This activity is therefore not triggered.
57	The expansion and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage where the capacity will be increased by 15 000 cubic metres or more per day and the development footprint will increase by 1 000 square meters or more	The new pump station 4 will receive an ultimate capacity of 52l/s, which is 4492.8 m³/d, and an emergency operating capacity of 70l/s, which is 6,048 m³/d. This is below the 15 000 cubic meter per day threshold. Therefor this activity will not be triggered.
Activity No(s):	Provide the relevant **Basic Assessment Activities** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
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. **i. Western Cape** **i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;** ii. Within critical biodiversity areas identified in bioregional plans; 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; **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** 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.	More than 300 m² of endangered and critically endangered vegetation will have to be cleared to lay the new rising main and for the access road. This activity is therefore triggered by the proposal.
Activity No(s):	Provide the relevant **Scoping and EIR Activities** as set out in **Listing Notice 2**	Describe the portion of the proposed development to which the applicable listed activity relates.

Note:

- Only those activities listed which will be applied for shall be considered for authorisation. The onus is on the Applicant to ensure that all applicable listed activities are included in the application.

Environmental Authorisation must be obtained prior to commencement with each applicable listed activity. If a specific listed activity is not included in an Environmental Authorisation, a new application for Environmental Authorisation will have to be submitted.

- The Minister responsible for mineral resources is the Competent Authority to deal with all applications where the listed or specified activity is directly related to-
  (a) prospecting or exploration of a mineral or petroleum resource; or
  (b) extraction and primary processing of a mineral or petroleum resource.

List the applicable waste management listed activities in terms of the NEM:WA

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Category A**	Describe the portion of the proposed development to which the applicable listed activity relates.

List the applicable listed activities in terms of the NEM:AQA

Activity No(s):	Provide the relevant **Listed Activity(ies)**	Describe the portion of the proposed development to which the applicable listed activity relates.

SECTION E: PLANNING CONTEXT AND NEED AND DESIRABILITY

1.	Provide a description of the preferred alternative.

The preferred and only alternative is to upgrade and expand the existing Pump station 1 on RE/95 or move PS1 to Erf 116, construct the new pump station 4 on Erf 116 and a section of Farm 236, install a new pipeline from PS1 to PS4 next to the existing pipeline within the road reserve and install a new pipeline from PS4 to the WWTW next to the existing pipeline.

The scope of work for this proposal will include the following:

<u>Existing Herold's Bay Pump Station Number 1 (PS1)</u>

- Upgrade the existing pump station's civil infrastructure to handle 32L/s (ultimate design flow) and the mechanical operating capacity from 5 L/s to 32 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 three (3) new submersible vortex pumps. The pumps shall be operated on a rotational basis as duty/assist/standby.
- Replace the odour control unit.
- Provide a new emergency storage tank.
- Provide an emergency generator supply, integrated from PS4, with existing supply as a backup
- 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.

<u>New Pump Station Number 4 (PS4)</u>

- Construct a new high lift pump station (civil works) with a normal operating capacity of 52 L/s, and an emergency operating capacity of 70L/s.
- Construct new inlet works comprising of:
  - a screening station,
  - a grit removal station,

- a Parshall flume for inflow measurement.

- Install two (2) new dry well pumps. The pumps shall be operated rotationally as duty/standby.
- New MCC with variable-speed drives on all pumps, complete with PLC and HMI.
- Install odour control unit.
- Installation of electrical and electronic equipment associated with the new pump station and inlet works.
- Provision of an indoor backup generator, servicing both PS1 and PS4.
- Provide above-ground fuel storage for the generator, within a dedicated room.
- 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.

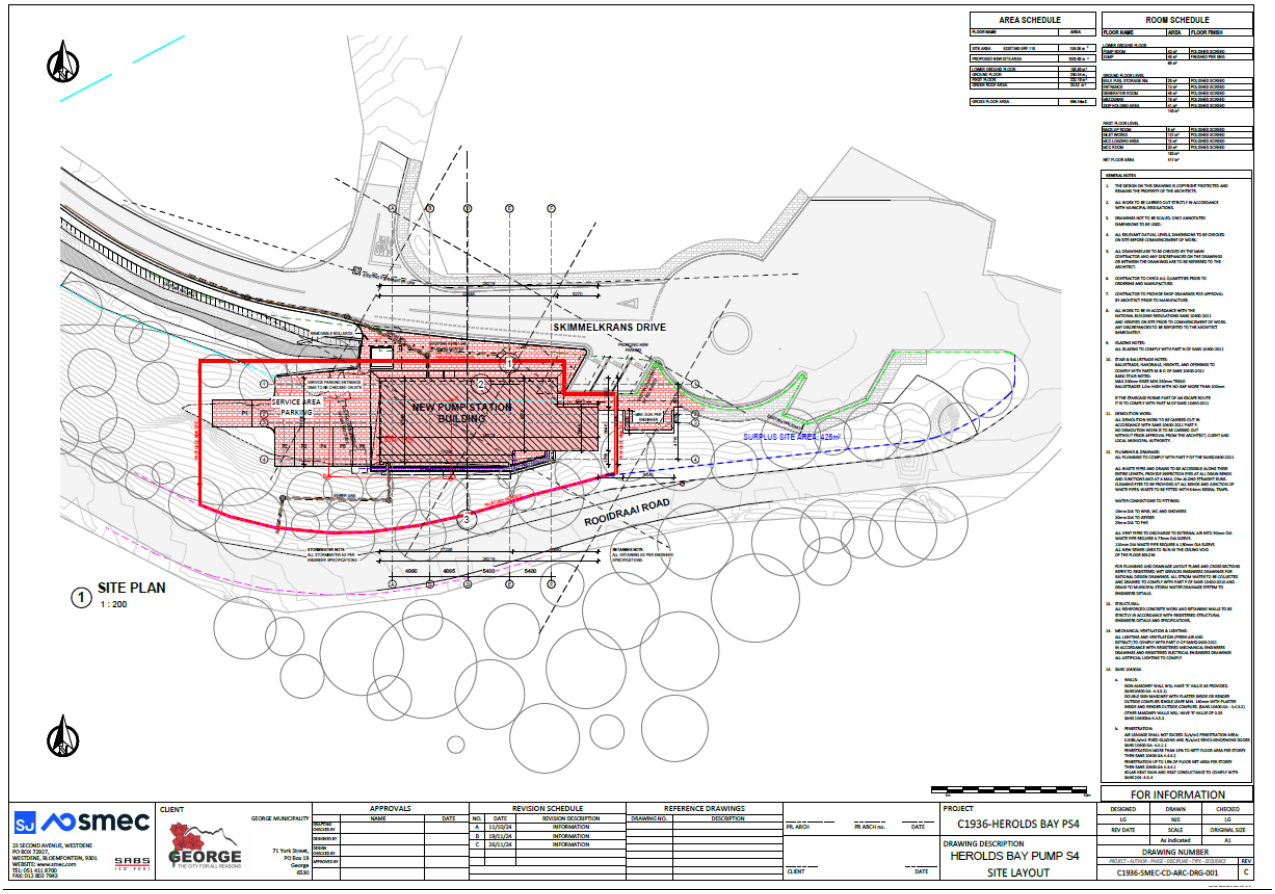


Figure 16: Proposed new PS4

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 currently located on PS4 site, including all affected MV and LV cables.
- Install new LV electrical supply cable between PS4 and PS1, integrated with generator changeover.

2.	Explain how the proposed development is in line with the existing land use rights of the property as you have indicated in the NOI and application form? Include the proof of the existing land use rights granted in Appendix E21.

Table 1: Properties zones

37/236	No Zoning Data to show
35/236	No Zoning Data to show

Farm 286	No Zoning Data to show
Farm 10/236	Agricultural Zone I
Farm 236 Erf 110	Agricultural Zone I Open Space Zone II Utility Zone
36/236	General Residential Zone VI
Erf 116	Transport Zone II
Farm 237	Open Space Zone III Transport Zone II Agricultural Zone I Subdivisional Area
Erf 113	Transport Zone II
Erf 95	Transport Zone II Utility Zone
Erf 114	Transport Zone II

The following land use approvals are required:

- A consent use of an Open Space Zone I as Utility service.
- A consent use of a Transport Zone II as air and underground rights – the pipeline will be installed within the road reserve.
- A consent use of a Transport Zone II as a Utility Zone

3.	Explain how potential conflict with respect to existing approvals for the proposed site (as indicated in the NOI/and or application form) and the proposed development have been resolved.

The existing pumpstation and associated infrastructure was developed before 1998 and therefore does not have existing authorisation, therefore there will be no potential conflicts.

4.	Explain how the proposed development will be in line with the following?
4.1	The Provincial Spatial Development Framework.

PS1 and WWTW are existing facilities. The pump station needs an upgrade, a new pipeline will be installed, and the new PS4 will provide pre-treatment (grit & screening removal) of the sewage which is vital to preserve the longevity of the progressive cavity pumps. The site for the proposed new PS4 is zoned as Transport Zone II and Agricultural Zone I.

4.2	The Integrated Development Plan of the local municipality.

According to the George Municipality IDM, 2012-2017:

Strategic Goal 1: Deliver quality services in George

It is essential that all citizens in George have access to basic services as provided by local government. Access to basic services by all citizens should be 100%. All service-delivery constraints need to be mitigated. It is also essential that the municipality ensures that strategic measures are in place to manage risk areas for service delivery such as shortage of electricity and water, and that the green industry is stimulated to increase recycling practices and water- and electricity-saving practices are encouraged.

Table 2: Strategic goals

PRIORITY	DEPARTMENTAL OBJECTIVES/PREDETERMINED OBJECTIVES (PDOS)
WASTEWATER MANAGEMENT	a) To provide and maintain safe and sustainable sanitation management and infrastructure b) Accelerated delivery in addressing sanitation backlogs c) To provide basic services to informal settlements that comply with the minimum standards d) To enhance the quality of sanitation
WATER	a) To provide world-class water services in George to promote development and fulfil basic needs b) To provide basic services to informal settlements that comply with the minimum standards c) To improve service delivery practices

The proposal is therefore aligned with the Integrated Development Plan of the local municipality.

4.3.	The Spatial Development Framework of the local municipality.

According to the George Municipality SDF, March 2013:

Strategy 3: Deliver Quality Services

Towards offering residents, visitors, and investors a unique lifestyle, and ensuring that all have equal access to a quality living environment the Municipality are embarking on a wide-ranging initiative in both the built and natural environment. These encompass delivery of services to all households, upgrading of informal settlements and degraded neighbourhoods, housing delivery to subsidy market; promotion of "green" household technologies and protection of the municipal area's natural and cultural heritage.

Strategy 4: Good Governance in George

The Municipality strive towards institutional excellence in providing a high standard of services to consumers and functioning as developmental local government. To this end the required human resource capacity is being built up, administrative systems are being streamlined, and financial planning, control and management systems are being upgraded.

4.4.	The Environmental Management Framework applicable to the area.

The Screening Tool Report has indicated that there are no intersections with EMF areas found.

5.	Explain how comments from the relevant authorities and/or specialist(s) with respect to biodiversity have influenced the proposed development.

To be included in the Final Basic Assessment Report.

6.	Explain how the Western Cape Biodiversity Spatial Plan (including the guidelines in the handbook) has influenced the proposed development.

(Source: Berry, M.G. 2024. Botanical assessment: proposed upgrading of the Herold's Bay pump station and sewer pipelines. MB Botanical Surveys, Somerset West.cc – T/A MB Botanical Surveys)

The proposed pipelines fall largely inside the Western Cape biodiversity network (Figure 17). They run through a mixture of terrestrial critical biodiversity areas (CBA's), degraded terrestrial critical biodiversity areas (CBA2's) and a degraded ecological support area (ESA2). In addition, an aquatic CBA has been mapped next to the pipeline route to the WWTW. The terrestrial CBA's and CBA2's are aligned with the vegetated slopes above Herold's Bay, while the ESA2 corresponds with the watercourses in Herold's Bay. CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet, 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet, 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors. Loss of designated CBA's is therefore not recommended. ESA's, on the other hand, are supporting zones required to prevent the degradation of CBA's and Protected Areas.

(Source: Dr Jacobus H. Visser. 2023. TERRESTRIAL FAUNAL AND AVIFAUNAL SPECIES IMPACT ASSESSMENT REPORT FOR THE UPGRADING OF HEROLD'S BAY SEWER PUMP STATION AND ASSOCIATED RISING MAIN ON REMAINDER OF FARM BRAKFONTEIN 236, PORTION 10 OF FARM BRAKFONTEIN 236 AND ERVEN RE/95 AND 116, HERHOLDS BAY, GEORGE MUNICIPALITY– Blue Skies Research)

Critical Biodiversity Areas (CBAs) are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan (Purves and Holmes, 2015). Ecological Support Areas (ESAs) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of CBAs and/or in delivering ecosystem services.

The project footprint intersects a terrestrial CBA over the central section, and over a small part in the eastern section. Furthermore, an aquatic CBA is located to the north of the central section of the footprint. The part of the footprint in the western section adjacent to the WWTP overlaps with a

degraded CBA (CBA2). Finally, a large part in the eastern section of the footprint intersects a degraded ESA.

The project footprint only intersects these CBA over a very small area (<1 hectare). The area may be rehabilitated at the end of the construction phase, and the resident faunal components are highly likely to remain in the study area landscape, and will return once any disturbance has ceased, the current provided project layout is acceptable as this will not cause irreversible loss of biodiversity, ecosystem dynamics or impact highly on SCC subpopulations.

A large part in the eastern section of the footprint intersects a degraded ESA (ESA2) which appears to follow the drainage line of the non-perennial stream in this area. Even so, the flow of this stream has been changed by man-made berms. Development in this area is supported, given that the flow of this stream has already been changed.

(Source: Construction of a New Sewage Pumpstation and Rising Main in Herold's Bay, Western Cape. Specialist Aquatic Assessment Report, May 2024, Compiled by Dr. J.M. Dabrowski of Confluent.)

A section of the rising main stretching from the end of Spekie Gericke Drive to the WWTW is indicated to cross a Critical Biodiversity Area (CBA1) wetland (Figure 17). CBA1 wetlands are considered to be in a natural or near-natural state and are essential for meeting biodiversity targets. Development should avoid these areas where possible or result only in low, biodiversity sensitive impacts.

No wetland was present in the area indicated as a CBA wetland (Figure 17). The designation of the area by the WCBSP as a CBA wetland most likely stems from the earlier NFEPA Wetland Atlas (Nel, 2011) which identified this area as a channelled valley-bottom wetland. The wetland is indicated to occur along a high lying ridge which slopes down to the north and south and is therefore not consistent with the terrain morphology required for a channelled valley bottom wetland to form (i.e. there is no valley within the delineated wetland area). The more recent NWMV5 (CSIR, 2018) map does not highlight this area as a wetland and no wetland was observed across this area during the site visit. No additional watercourses are affected by the new rising main along its route from PS4 to the WWTW.

Figure 17: Biodiversity Overlay Map for the site and surrounding area.

7.	Explain how the proposed development is in line with the intention/purpose of the relevant zones as defined in the ICMA.

It is anticipated that a water use license application (WULA/GA) be made since a significant amount of work will be performed on the coast and within 30m meters of a watercourse.

8.	Explain whether the screening report has changed from the one submitted together with the application form. The screening report must be attached as Appendix I.

No changes to the screening report.

9.	Explain how the proposed development will optimise vacant land available within an urban area.

PS1 and the WWTW are existing facilities. Only PS4 will be constructed on vacant land on Erf 116 and a portion of Farm number 236.

The WWTW is located outside the Urban area. The existing PS1 and the new PS4 will be located within the urban area. The rising main between PS1 and PS4 will be located within an urban area. A section of the new rising main between PS4 and the WWTW will be located within the urban area (0m – 220m), while the rest of the pipeline will be located outside of the urban area (220m – 1470m).

10.	Explain how the proposed development will optimise the use of existing resources and infrastructure.

The site has existing resources and infrastructure which will be upgraded and the new PS4 will expand the existing sewerage infrastructure.

11.	Explain whether the necessary services are available and whether the local authority has confirmed sufficient, spare, unallocated service capacity. (Confirmation of all services must be included in Appendix E16).

It is proposed to upgrade an existing pipeline (service). The construction of PS4 is an addition to the bulk sewer system. The proposal will therefor increase the sewerage network capacity and reliability.

12.	In addition to the above, explain the need and desirability of the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013) or the DEA's Integrated Environmental Management Guideline on Need and Desirability. This may be attached to this BAR as Appendix K.

The George Municipal Sanitation master plan includes the upgrade of the Herolds Bay PS 1 for both current and future needs. The master plan includes an interim upgrade to 32l/s (20-year horizon) and an ultimate upgrade to 52l/s. The upgrade of the pump station is required to occur in the next couple of years to meet the current sewage inflow. During peak seasons the existing pump station experiences higher than average inflows and struggles to cope. In addition, the mechanical and electrical components were upgrade in 2004, considering a 15-year design life, these components have reached the end of their useful life.

In addition, the existing pump station has no emergency storage apart from a standby generator that provides back-up power during power outages. With frequent and lengthy periods of load shedding, the Municipality has an immense financial burden to supply fuel to generators. To ensure efficient handling and management of wastewater, preventing sewage spills during peak seasons and power outages due to load shedding and an increasing population growth, the pump station must be upgraded. The upgrade therefor includes an emergency storage volume.

In order to properly interpret the EIA Regulations' requirement to consider "need and desirability", it is necessary to turn to the principles contained in NEMA, which serve as a guide for the interpretation, administration and implementation of NEMA and the EIA Regulations. With regard to the issue of "need", it is important to note that this "need" is not the same as the "general purpose and requirements" of the activity. While the "general purpose and requirements" of the activity might to some extent relating to the specific requirements, intentions and reasons that the applicant has for proposing the specific activity, the "need" relates to the interests and needs of the broader public. In this regard the NEMA principles specifically inter alia require that environmental management must:

- "place people and their needs at the forefront of its concern" and equitably serve their interests;
- "be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option;

- pursue environmental justice "so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person";
- ensure that decisions take "into account the interests, needs and values of all interested and affected parties"; and
- ensure that the environment is "held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage".

Community Wellbeing – Clean Water and Sanitation
Sewer systems are essential to the wellbeing of a community. They help to transport wastewater filled with bacteria out of the area and to a place for treatment, so that clean water can be safely distributed back into the environment. But there's a lot that goes into maintaining this essential infrastructure, and every section of it requires routine inspections and upkeep to protect the community it serves.

SECTION F: PUBLIC PARTICIPATION

The Public Participation Process ("PPP") must fulfil the requirements as outlined in the NEMA EIA Regulations and must be attached as Appendix F. Please note that If the NEM: WA and/or the NEM: AQA is applicable to the proposed development, an advertisement must be placed in at least two newspapers.

1. Exclusively for linear activities: Indicate what PPP was agreed to by the competent authority. Include proof of this agreement in Appendix E22.

Not applicable

2. Confirm that the PPP as indicated in the application form has been complied with. All the PPP must be included in Appendix F.

Please refer to Appendix F for the proof of the Pre-Application PPP

3. Confirm which of the State Departments and Organs of State indicated in the Notice of Intent/application form were consulted with.

- Nina Viljoen - Garden Route District Municipality
- Brandon Laymen - WCG: Department of Agriculture
- Carlo Abrahams - Breede-Olifants Catchment Management Agency
- Megan Simons - Cape Nature
- Lizelle Stroh - South African Civil Aviation Authority
- Arabel McClelland - Department of Environmental Affairs and Development Planning: Pollution and Chemical management
- Stephanie-Ann Barnardt - Heritage Western Cape
- Xander Smuts - WC Department of Transport and Public Works
- Lindsay Mooiman - George Municipality: Civil Engineering
- Clinton Petersen - George Municipality: Town Planning
- Browen Johnson - George Municipality: Ward 23 Councillor
- Paulina Saaiman - Ward committee operations
- Nicole Abrahams - SANRAL: Environmental Coordinator: Western Region
- Francois Naude - Department of Environmental Affairs and Development Planning

4. If any of the State Departments and Organs of State were not consulted, indicate which and why.

Only relevant state departments were requested to provide comments on the Pre-Application BAR

5. if any of the State Departments and Organs of State did not respond, indicate which.

Garden Route District Municipality

WCG: Department of Agriculture Cape Nature WC Department of Infrastructure Dept, Forestry, Fisheries & the Environment Oceans And Coasts - Coastal Development & Protection

6. Provide a summary of the issues raised by I&APs and an indication of the manner in which the issues were incorporated into the development proposal.

Please refer to the Appendix F for the Comments and responses report

Note:

A register of all the I&AP's notified, including the Organs of State, and all the registered I&APs must be included in Appendix F. The register must be maintained and made available to any person requesting access to the register in writing.

The EAP must notify I&AP's that all information submitted by I&AP's becomes public information.

Your attention is drawn to Regulation 40 (3) of the NEMA EIA Regulations which states that *"Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but **must** be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority."*

All the comments received from I&APs on the pre -application BAR (if applicable and the draft BAR must be recorded, responded to and included in the Comments and Responses Report and must be included in Appendix F.

All information obtained during the PPP (the minutes of any meetings held by the EAP with I&APs and other role players wherein the views of the participants are recorded) and must be included in Appendix F.

Please note that proof of the PPP conducted must be included in Appendix F. In terms of the required "proof" the following is required:

- a site map showing where the site notice was displayed, dated photographs showing the notice displayed on site and a copy of the text displayed on the notice;
- in terms of the written notices given, a copy of the written notice sent, as well as:
  - if registered mail was sent, a list of the registered mail sent (showing the registered mail number, the name of the person the mail was sent to, the address of the person and the date the registered mail was sent);
  - if normal mail was sent, a list of the mail sent (showing the name of the person the mail was sent to, the address of the person, the date the mail was sent, and the signature of the post office worker or the post office stamp indicating that the letter was sent);
  - if a facsimile was sent, a copy of the facsimile Report;
  - if an electronic mail was sent, a copy of the electronic mail sent; and
  - if a "mail drop" was done, a signed register of "mail drops" received (showing the name of the person the notice was handed to, the address of the person, the date, and the signature of the person); and
- a copy of the newspaper advertisement ("newspaper clipping") that was placed, indicating the name of the newspaper and date of publication (of such quality that the wording in the advertisement is legible).

SECTION G: DESCRIPTION OF THE RECEIVING ENVIRONMENT

All specialist studies must be attached as Appendix G.

1. Groundwater

1.1.	Was a specialist study conducted?	**YES**	NO
1.2.	Provide the name and or company who conducted the specialist study.		
DHS Groundwater Consulting Services (Pty) Ltd – Divan Stroebel PeraGage - Duan Swart, Fernando Pequenino			
1.3.	Indicate above which aquifer your proposed development will be located and explain how this has influenced your proposed development.		

	(Source: Groundwater Impact Assessment for the Proposed Installation of an Underground Diesel Storage Tank – Herold's Bay Sewage Pump Station, Western Cape, 13 March 2024, by Divan Stroebel) The aquifer system in the study area can be classified as a "Minor Aquifer System" which is defined as "fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability. Aquifer extent may be limited and water quality variable. Although these aquifers seldom produce large quantities of water, they are important for local supplies and in supplying base flow for rivers." The proposal was not greatly influenced by the aquifer but instead influenced the proposed monitoring program and placement of monitoring boreholes.
1.4.	Indicate the depth of groundwater and explain how the depth of groundwater and type of aquifer (if present) has influenced your proposed development.
	(Source: Groundwater Impact Assessment for the Proposed Installation of an Underground Diesel Storage Tank – Herold's Bay Sewage Pump Station, Western Cape, 13 March 2024, by Divan Stroebel) According to DWAF, the site is underlain by a low-yielding, intergranular and fractured aquifer, which suggests groundwater presence in both the shallow, unconsolidated rock as well as in deeper, fractured rock. This is supported by the fact that groundwater was intersected in the two geotechnical boreholes, BH1 and BH2, at depths of 2.40- and 0.98 mbgl respectively at the site of the proposed new pumpstation (PS4). No boreholes were identified during the hydrocensus or from various DWS databases within a reasonable distance of the site (1 km radius and maximum 3 km) or within the defined Groundwater Response Unit. It is thus assumed that groundwater use within the area is very limited to non-existent. Based on the national scale electrical conductivity map of South Africa, groundwater within the area typically exhibits a poor water quality ranging between 370- to 520 mS/m. The aquifer vulnerability of the site is classified as "least", according to the DRASTIC method which is consistent with the Aquifer System Management Index and Groundwater Quality Management index of "low". The lack of or absence of fractures present in the deeper bedrock may attribute to the low aquifer vulnerability. However, the intergranular aquifer which comprises the shallow, unconsolidated material, are likely to be more vulnerable and would require a higher degree of protection. The ratings for the Aquifer System Management Classification and Aquifer Vulnerability Classification yield a Groundwater Quality Management Index of 2 for the study area, indicating that a "low" level of groundwater protection is required in terms of groundwater quality management. Given the vulnerability rating of the aquifer, the "Source-Pathway-Receptor" principle is applied to determine the impact of the planned installation of the underground diesel storage tank. This is applied to both the construction and operational phase. Identified sources of contamination include spillages of toxic and harmful chemicals and leakages from the UST and associated pipework. The underlying aquifer, which includes the identified shallow aquifer as well as the deeper aquifer, represents both a pathway for contaminants as well as being a receptor. Evidence is seen of a fluctuation saturated level which may be an indication of groundwater-surface water interaction. Potential contaminants may enter the shallow aquifer and percolate into the adjacent stream. The pathway is identified is the main area of concern. The receptors of potential contaminants are thus mostly the shallow aquifer and to a lesser extent the deeper aquifer. No groundwater users were identified as receptors. Further potential receptors include the adjacent stream and surrounding environment. Potential contamination will be limited to the site proximity with the furthest extent being the coastal plain, situated approximately 150 m south-east of the site, should contaminants enter the stream. The risk assigned to the construction and operational phase of the proposed UST is classified as minor - negative. Special note should be taken of the identified shallow aquifer which may place the UST in proximity or within the water table. The shallow water table will, however, enable early leak detection through installed piezometers. It is thus imperative that stringent mitigation measures are implemented to decrease the risk to the indicated negligible

	– negative. To prevent any contamination of the groundwater, regular monitoring thereof is strongly recommended. **(Source: The Geotechnical Investigation for the Upgrading of Herold's Bay Pump Station, by Duan Swart and Fernando Pequenino. 2023)** No ground water or shallow water seepage was encountered in the trial pits. All trial pit excavations were logged as dry to slightly moist. The investigation was conducted in the wet months of the year. The presence of the ferricrete and mottling indicates seasonal soil moisture changes. Shallow subsurface seepage is expected to occur at the bedrock-soil interface, and at depths where ferricrete and mottling have been observed, during and after heavy rainfall events. The groundwater at PS1 was recorded at 2.40 m and 0.98 m BGL in BH01 and BH02, respectively. The groundwater at PS4 was recorded at 3.00 m and 4.60 m BGL in BH03 and BH04, respectively. The groundwater table is expected to be at the bedrock-soil interface at approximately 2.40 m BGL.

2. Surface water

2.1.	Was a specialist study conducted?	**YES**	NO
2.2.	Provide the name and/or company who conducted the specialist study.		
Confluent Environmental – James Dabrowski			
2.3.	Explain how the presence of watercourse(s) and/or wetlands on the property(ies) has influenced your proposed development.		

(Source: Construction of a New Sewage Pumpstation and Rising Main in Herold's Bay, Western Cape. Specialist Aquatic Assessment Report, May 2024, Compiled by Dr. J.M. Dabrowski of Confluent.)

Watercourse classification

The watercourse adjacent to the new pumpstation (PS4) and rising main between PS1 and PS4 is a non-perennial watercourse which has been moderately modified from reference conditions, largely due to urbanisation along the lower most reaches. Given its small size and non-perennial characteristics, the EIS is low. At its lower most extent, the watercourse grades into a small temporarily closed estuary which periodically opens to the sea through the main Herold's Bay beach. This estuarine zone is located below the 5 m contour, which is typically used to delineate the Estuarine Functional Zone (EFZ). It is perched above normal tidal levels and is only occasionally influenced by extreme tidal events (e.g. spring tides and storm surges). The bed substrate is sandy (of marine origin) and flooding from the catchment area occasionally opens a narrow, shallow channel that can pass through the Herold's Bay Beach to the sea. The banks of this estuarine zone have been stabilised by various methods, including gabion baskets and retaining walls. Freshwater flows from the catchment area are intermittent and as a result there is frequently no open surface water body present. Occasional tidal surges or freshwater inflows can result in a temporary open surface water body of no more than 1 000 m² in extent.

Figure 18: Map indicating the non-perennial watercourse running along Skimmelkrans Drive terminating into a small temporarily closed estuary at the Herolds Bay beach.

Further upstream, the watercourse grades into a freshwater non-perennial stream with a distinct channel, characterised by a bedrock and boulder substrate. The channel is narrow and confined by a steep, well vegetated slope to the north. Skimmelkrans Drive runs immediately along the southern edge of the watercourse. The southern banks have been filled in and lined with concrete retaining walls to support the road. Further upstream the watercourse runs beneath Skimmelkrans Drive and then runs along Spekie Gericke Drive, before cutting underneath the R404 and up towards its catchment area to the north. No wetland was present in the area indicated as a CBA wetland. The designation of the area by the WCBSP as a CBA wetland most likely stems from the earlier NFEPA Wetland Atlas (Nel, 2011) which identified this area as a channelled valley-bottom wetland. The wetland is indicated to occur along a high lying ridge which slopes down to the north and south and is therefore not consistent with the terrain morphology required for a channelled valley bottom wetland to form (i.e. there is no valley within the delineated wetland area). The more recent NWMV5 (CSIR, 2018) map does not highlight this area as a wetland and no wetland was observed across this area during the site visit. No additional watercourses are affected by the new rising main along its route from PS4 to the WWTW.

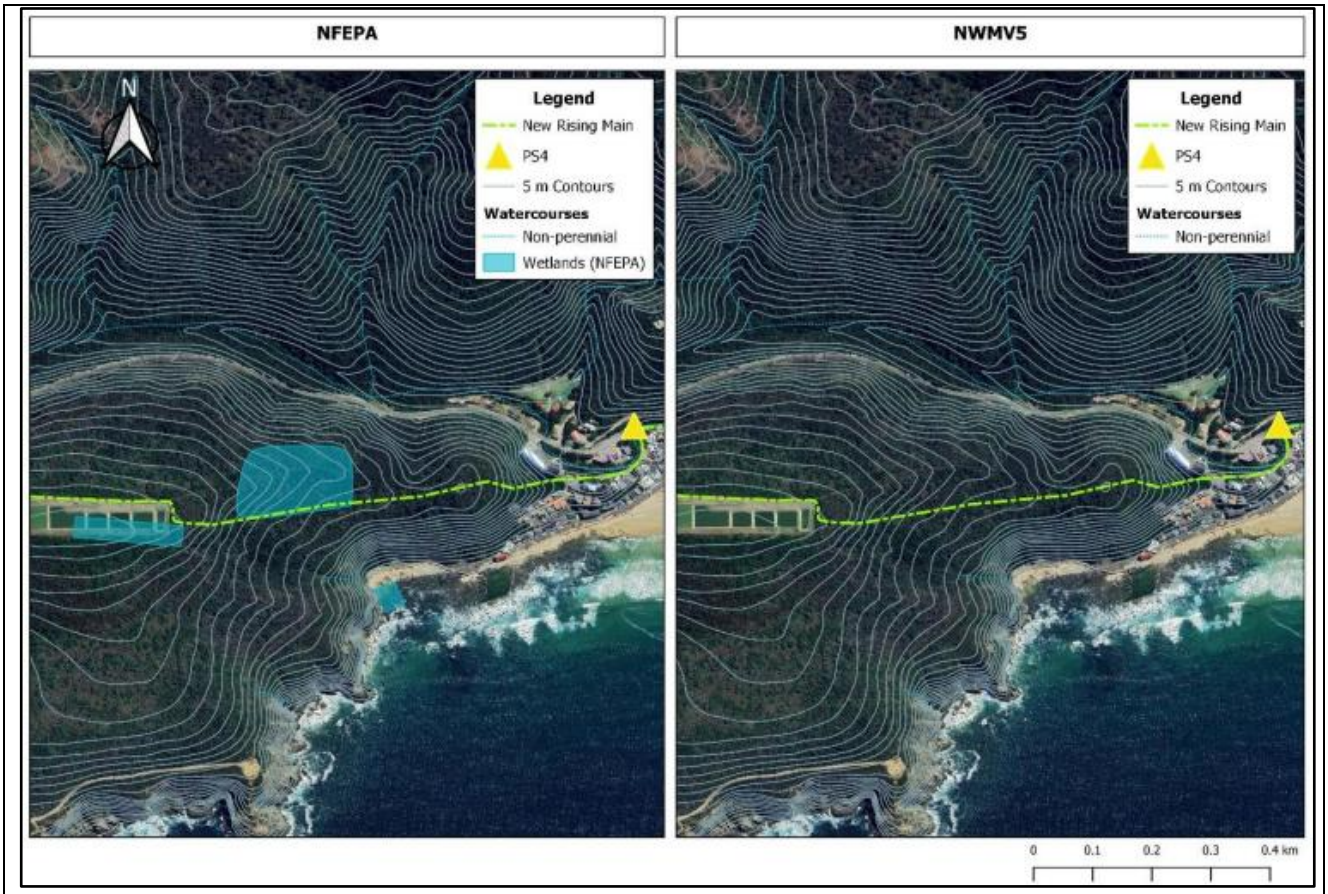


Figure 19: Comparison of wetlands mapped according to the NFEPA (Nel et al. 2011) and the NBA (CSIR, 2018).

The study site is located within sub-quaternary catchment (SQC) 9151, which, according to the National Freshwater Ecosystem Priority Atlas (NFEPA, Nel et al., 2011), has not been classified as a FEPA (Freshwater Ecosystem Priority Area). The project area therefore falls within an SQC that is not considered as being a priority for maintaining freshwater biodiversity at a national scale.

Figure 20: Map of the rising main alignment in relation to the Western Cape Biodiversity Spatial Plan (WCBSP).

Ecological Importance and Sensitivity:
Given the ephemeral hydroperiod, its location in an urbanised area and modifications to the bed and banks of the channel, the watercourse offers little with respect to instream and riparian habitat options and therefore supports relatively low biodiversity. It is relatively well connected to a broader hydrological network and offers a good migration route from the estuary all the way to the upper reaches of the catchment area. Overall, the EIS of the stream is considered to be Low.

Table 3: Ecological Importance and Sensitivity scores for the watercourse adjacent to Skimmelkrans Lane.

Determinant	Scores
Presence of Rare & Endangered Species	**1** – Low probability.
Populations of Unique Species	**1 –** Low probability.
Intolerant Biota	**1** - Very low proportion of the biota is expected to be dependent on flowing water for the completion of their life cycle.
Species/Taxon Richness	**1** - Moderate diversity of fauna and flora expected on a local scale.
Diversity of Habitat Types or Features	**2**– Moderate diversity of aquatic habitats due to estuarine features.
Refuge value of habitat types	**2** – Non-perennial and therefore offers limited refuge. Its location in an urban environment is however relatively important.
Sensitivity of habitat to flow changes	**1** – A relatively small non-perennial river which is not likely to be sensitive to changes in flow.
Sensitivity to flow related water quality changes	**2** - The stream is small but non-perennial and is therefore moderately sensitive to modifications in water quality.
Migration route for instream and riparian biota	**2** – Moderate importance due to estuarine characteristics and good connectivity to a broader hydrological network and catchment area.
Protection Status	**1** – ESA2 under the WCBSP.
EIS Score	**1 (Low EIS)**

Present Ecological State (PES):
The mid to upper reaches of the watercourse originate from a relatively undeveloped part of the catchment area and are relatively unimpacted. Vegetation is predominantly natural, albeit slightly invaded by *Acacia mearnsii*. Farming activities take place in the upper most reaches, where some storage and abstraction of water takes place. The lower most reaches of the watercourse pass through the urban area of Herold's Bay. The watercourse receives stormwater runoff from Skimmelkrans Drive and Spekie Gericke Drive, which will affect water quality and has resulted in some minor erosion of the banks. Parts of the watercourse have been canalised to accommodate roads (Skimmelkrans Drive), road crossings (and associated culverts) and residential properties. Minor dumping of waste, garden refuse and litter was observed. Instream habitat is relatively undisturbed, and no major signs of bank erosion or sedimentation of the bed was observed. The lower reach of the watercourse adjacent to Skimmelkrans Drive is picturesque and displays relatively good aquatic habitat which can be viewed from an elevated boardwalk that runs alongside the watercourse. The lower most section of the watercourse is estuarine in nature and has been canalised to accommodate residential property and roads. Based on the impacts described above, the Present Ecological State (PES) of instream habitat of the watercourse is classified as Moderately Modified. The riparian habitat is relatively intact, comprising predominantly of indigenous vegetation. Vegetation removal and channel modification has occurred at various points associated with road crossings, canalisation of the channel and residential encroachment. The PES of riparian habitat is Largely Natural to Moderately Modified and overall, the PES (taking instream and riparian habitat into consideration) is Moderately Modified.

Risk Assessment
While Option 1 (buried pipeline) is located in close proximity to the watercourse, the pipeline will be buried beneath the road surface. The pipeline will not be located in the riparian zone of the watercourse, and, assuming the road is above the 100-year floodline, the pipeline is located outside of the regulated area of the watercourse. Nevertheless, risks associated with construction and operational phase activities have been assessed. Option 2 (suspended pipeline) will fall within the

alignment of the bed and banks of the watercourse and will therefore be located within the regulated area. The risk of the pipeline crossing the estuarine zone was not assessed as an estuary is not defined as a watercourse and therefore Section 21 c and i water uses (as defined by the NWA) are not applicable. All other risks/impacts were assessed given the proximity of the watercourse to the proposed rising main alignment options. Risks for both options are considered to be Low and would ordinarily qualify for a General Authorisation. Bulk and main sewage pipelines are however excluded from a General Authorisation when these pipelines are located within the regulated area of a watercourse. Option 2 would therefore most likely require a WULA. Consultation with BOCMA is recommended to determine whether authorisation is required for Option 1 as a floodline assessment was not available at the time of compiling this report.

Conclusion
Activities associated with the construction and operational phase of the pumpstation and rising main can be realistically mitigated to a negligible to minor level of impact. Of the two alternatives, Alternative A is recommended as, due to the pipeline being buried beneath the road surface, impacts and risks associated with the operational phase of the pipeline are lower. Under Alternative B the pipeline will be above surface and aligned along the channel of the watercourse and thus more vulnerable to vandalism and environmental damage. In terms of the DWS Risk Assessment matrix, risks for both alternatives are considered to be Low. Alternative B would most likely require a WULA. Consultation with BOCMA is recommended to determine whether authorisation is required for Alternative 1 as a flood line assessment was not available at the time of compiling this report.

3. Coastal Environment

3.1.	Was a specialist study conducted?	YES	**NO**
3.2.	Provide the name and/or company who conducted the specialist study.		
No study conducted			
3.3.	Explain how the relevant considerations of Section 63 of the ICMA were taken into account and explain how this influenced your proposed development.		

a) Representations made by the applicant and by interested and affected parties:
The BAR will be out for two rounds of public participation which will give the relevant authorities and interested and affected parties the opportunity to comment on the proposal.

b) The extent to which the applicant has in the past complied with similar authorisations:
The applicant is the George Municipality. They have dealt with numerous Environmental Authorization for the upgrading and development of infrastructure to better the services for the George community.

c) Whether coastal public property, the coastal protection zone or coastal access land will be affected, and if so, the extent to which the proposed development or activity is consistent with the purpose for establishing and protecting those areas:
The proposed project is not located within a protected area. PS1 is located on the beach front in Herold's Bay and its upgrading will affect public access to the beach. The George Municipality acknowledge the affect that it will have and have proposed to only work on PS1 during off seasons when minimum tourists will be in Herold's Bay to minimize the effect on public access. This is however a short-term impact.

d) The estuarine management plans, coastal management programme and coastal management objectives applicable in the area:
The Western Cape Provincial Coastal Management Programme 2022 – 2027, is applicable to this area. The project aligns with all objectives of this programme.

e) The socio-economic impact if the activity:
The upgrade of the pump station is in the best interest of all the residents and holiday makers in Herold's Bay. The failure of the pumpstation will have various impacts on the resident's as well as potentially on the environment. The socio-economic aspects of the proposal are thus known and straight forward in nature. Please also see Section G.8.

f) The likely impact of the proposed activity on the coastal environment including the cumulative effect of its impact together with those of existing activities:

All impacts of the proposed activities can be mitigated to a low or low significance after mitigation. Please also see Section I.1 for a summary of the impacts post mitigation.

g) The likely impact of coastal environmental processes on the proposed activity:

The upgrade of Pump Station 1 will be protected against any future storm surges and against increased sea levels since all the pumps and electronics will be submersible, therefor any seawater that might ingress into the facility will just be pumped up to the WWTW.

h) Whether the development or activity:

i. Is situated within coastal public property and is inconsistent with the objective of conserving and enhancing coastal public property for the benefit of current and future generations:

PS1 is located within coastal public property. The objective of this upgrade is to improve the sewerage system of Herold's Bay since the current one is aged and needs to be increased to handle the current and future expansion. It is in the public's best interest for this upgrade to take place since the upgrades will increase the pumping capacity and resilience of the sewerage network which will benefit Herold's Bay and it will create direct employment opportunities associated with the operational and construction phase.

ii. Is situated within the coastal protection zone and is inconsistent with the purpose for which a coastal protection zone is established as set out in section 17:

According to DEA&DP Coastal Management Map Viewer the scope of works does not fall within a coastal protection zone.

iii. Is situated within coastal access land and is inconsistent with the purpose for which coastal access land is designated as set out in section 18:

According to DEA&DP Coastal Management Map Viewer PS1 and its associated infrastructure falls within coastal access points, however it is consistent with the purpose set out in section 18.

iv. Is likely to cause irreversible or long-lasting adverse effects to any aspect of the coastal environment that cannot satisfactorily be mitigated:

PS1 located on the beachfront has experienced leaks onto the beach before due to insufficient capacity. The upgrades will be increasing the capacity and will add an emergency storage tank to mitigate potential spills during loadshedding and part failures.

v. Is likely to be significantly damaged or prejudiced by dynamic coastal processes:

Specialists have assessed all aspects of this project and has found that the impact significance after mitigation to be low or negligible.

vi. Would substantially prejudice the achievement of any coastal management objective:

No coastal management objective will be prejudiced against.

vii. Would be contrary to the interests of the whole community:

The upgrade of the sewerage system is of interest to the whole of Herold's Bay since the upgrades will be increasing the capacity and will add an emergency storage tank to mitigate potential spills during loadshedding and part failures.

i) Whether the very nature of the proposed activity or development requires it to be located within coastal public property, the coastal protection zone or coastal access land:

PS1 is an existing pump station that is already within coastal public property and coastal access land, therefore the activity must be located within these areas.

j) Whether the proposed activity or development will provide important services to the public when using coastal public property, the coastal protection zone, coastal access land or a coastal protected area:

The proposal will not provide public service related to the coast, but since PS1 is an existing structure on coastal land the activities must take place there. It will however provide an important basic service to the whole of Herold's Bay.

3.4.	Explain how estuary management plans (if applicable) has influenced the proposed development.
	Not applicable
3.5.	Explain how the modelled coastal risk zones, the coastal protection zone, littoral active zone and estuarine functional zones, have influenced the proposed development.
	The pipeline crosses the lower most, transitional section of the watercourse which can be best described a small temporarily closed estuary. This estuarine zone is located below the 5 m contour, which is typically used to delineate the Estuarine Functional Zone (EFZ). It is perched above normal tidal levels and is only occasionally influenced by extreme tidal events (e.g. spring tides and storm surges). The bed substrate is sandy (of marine origin) and flooding from the catchment area occasionally opens up a narrow, shallow channel that can pass through the Herolds Bay Beach to the sea. The banks of this estuarine zone have been stabilised by various methods, including gabion baskets and retaining walls. Freshwater flows from the catchment area are intermittent and as a result there is frequently no open surface water body present. Occasional tidal surges or freshwater inflows can result in a temporary open surface water body of no more than 1 000 m² in extent. The upgrade of Pump Station 1 will be protected against any future storm surges and against increased sea levels since all the pumps and electronics will be submersible, therefor any seawater that might ingress into the facility will just be pumped up to the WWTW.

4. Biodiversity

4.1.	Were specialist studies conducted?	**YES**	NO
4.2.	Provide the name and/or company who conducted the specialist studies.		
Mark Berry of Mark Berry Botanical (Appendix G1) Dr. Jacobus H. Visser of Blue Skies Research (Appendix G3)			
4.3.	Explain which systematic conservation planning and other biodiversity informants such as vegetation maps, NFEPA, NSBA etc. have been used and how has this influenced your proposed development.		

Vegetation map: A product of The Vegetation of South Africa, Lesotho and Swaziland (VEGMAP) (Mucina & Rutherford, 2006). The South African National Biodiversity Institute (SANBI) has updated the VEGMAP (2018). These shapefiles were used. In addition, the National Web-based Environmental Screening Tool was applied to determine the Relative Plant Species Theme Sensitivity as is required of botanical specialists.

The 2018 Vegetation Map of South Africa classifies the main vegetation types found here as **Garden Route Granite Fynbos** and **Groot Brak Dune Strandveld.** The latter is a questionable unit as the vegetation (structurally) resembles coastal thicket more, which falls under the Albany Thicket Biome.

Groot Brak Dune Strandveld stretches along the coast from Klein Brak in the west to Victoria Bay near Wilderness in the east. It is described as a dense and tall, spiny, sclerophyllous scrub with gaps supporting shrublands with ericoids or succulent-leaved shrubs (Mucina, 2006).

Garden Route Granite Fynbos occurs as three main blocks from Botterberg (south of Robinson Pass) in the west to Hoogekraal Pass (west of Karatara) in the east (Mucina, 2006). The site occurs inside a narrow strip of granite fynbos south of the large middle block. It is described as a dense proteoid and ericoid shrubby grassland (Mucina, 2006). In the west, most of the remnants are dominated by proteas (Mucina, 2006). Eastwards, graminoid and ericaceous fynbos are dominant on the flatter areas (Mucina, 2006). Like all fynbos types, Garden Route Granite Fynbos is maintained by a regular fire regime. Unfortunately, landscape fragmentation is disrupting this 'maintenance' requirement, often leading to localised species loss and bush encroachment or alien infestation (pers. obs.). Fire is an important ecological driver in the Fynbos Biome and regular fires are needed for biodiversity maintenance and recruitment purposes. On the other hand, thicket, which is found on steeper, more protected slopes, is not a fire prone type.

The vegetation across the site, as described by M. Berry (Appendix G1):

The proposed pipelines through Herold's Bay itself are located mostly inside transformed road verges. The rising main between Herold's Bay and the WWTW runs through coastal thicket in the lower part,

which then transitions into granite fynbos in the upper part. The natural vegetation is of fair quality although considerable alien infestation was noted inside the granite fynbos, especially rooikrans and black wattle. Only the vegetation on the steepest bits can be described as near pristine. The site proposed for the new pump station is devoid of natural vegetation.

A section of pipeline route to the WWTW runs alongside an existing tweespoor to a cellular (radio) mast facility. Structurally, the thicket can be described as a tall (>2 m) closed large-leaved shrubland following Campbell's classification (Campbell, 1981). It is uncertain why this has been mapped as a strandveld type as the latter has a lower and more open structure. The fynbos on the slope above the thicket can be described as a mid-high to tall, closed small-leaved shrubland following Campbell's classification. It's tall, woody structure can be ascribed to senescence due to the lack (or prevention) of regular fires. As a result, the fynbos has become 'invaded' by thicket species, such as *Sideroxylon inerme, Pittosporum viridiflorum* and *Pterocelastrus tricuspidatus*. Typical fynbos species recorded here include a few Erica species, *Leucadendron salignum* and *Thamnochortus glaber*.

Observed associations with granite fynbos (F) or thicket (T) vegetation are superscripted. *Carpobrotus edulis* is a useful soil binder. All the recorded species are widespread and fairly common in the region. *Cullumia carlinoides* is the only regional endemic recorded. Floristic association for the fynbos component with Garden Route Granite Fynbos is strong with several important taxa recorded. For the thicket component several important Groot Brak Dune Strandveld taxa were recorded. Only two SCC were recorded, namely *Cullumia carlinoides* (Near Threatened) and *Dioscorea sylvatica* (Vulnerable). The former is associated with coastal fynbos and is fairly common in the coastal strip between Witsand and George. It is being threatened by coastal developments and alien infestation. *Dioscorea sylvatica* is also frequently encountered in Garden Route area (see iNaturalist records).

Figure 21: Approximate route of proposed pipeline (red arrow) through coastal thicket towards the WWTW. (Extract from M. Berry's Botanical Assessment)

Figure 22: Senescent and rooikrans infested fynbos halfway up ridge towards the WWTW. (Extract from M. Berry's Botanical Assessment)

Figure 23: Site proposed for the new pump station PS4. (Extract from M. Berry's Botanical Assessment)

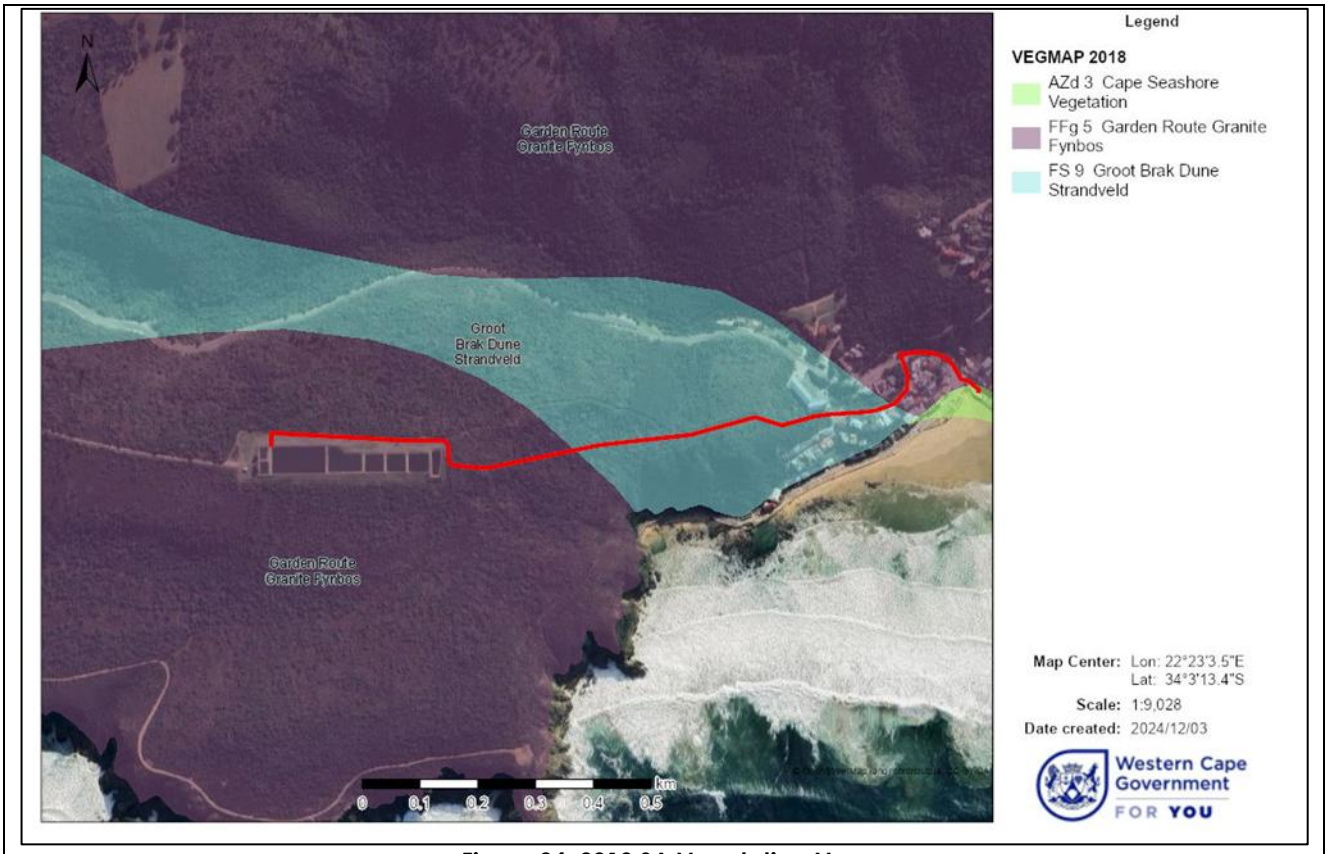


Figure 24: 2018 SA Vegetation Map

Indigenous vegetation

The indigenous species recorded along the proposed pipeline route are typical fynbos and coastal thicket species, such as *Erica peltata*, *Leucadendron salignum, Sideroxylon inerme, Cassine peragua* and *Thamnochortus glaber*. A fair number of indigenous tree and shrub species were recorded, including *Leucadendron salignum, Erica peltate* (dominant), *E. discolor var. speciosa* (dominant in places) and *Phylica axillaris* (dominant).

The recorded SCC has a wide distribution from the George area eastwards and is currently threatened by the "exploitation of tubers for the local medicinal plant trade" according to the online Red List. *Pittosporum viridiflorum* (cheesewood) and *Sideroxylon inerme* (milkwood) are protected tree species in terms of the National Forests Act (Act 84 of 1998). Several of these trees were recorded in the immediate vicinity of the proposed pipeline route. The removal of these trees requires a permit from the Department of Forestry Fisheries and Environment.

Figure 25: A few indigenous species recorded on site by M. Berry.

Invasive vegetation

Invasive species recorded include *Acacia mearnsii* (black wattle, category 2), *A. cyclops* (rooikrans, 1b), *Pinus sp* (pine, probably also 1b) and *Opuntia ficus-indica* (sweet prickly pear, 1b). As indicated above, they are all Category 1b and 2 invaders. In terms of the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004) Alien and Invasive Species List (2016), category 1b invasive species require compulsory control as part of an invasive species control programme. Also, the harbouring of category 2 species, such as black wattle, is prohibited without a permit. The presence of the woody aliens, especially black wattle and rooikrans, also present a fire risk.

*Please refer to the botanical assessment report (Appendix G1) for the full list of plant species recorded by the botanist on site.

Ecosystem threat status: Informed by (1) The National List of Threatened Terrestrial Ecosystems (Government Gazette, 2011), (2) The Western Cape State of Biodiversity 2017 Report (Turner, 2017), and (3) The National Biodiversity Assessment (2018)(SANBI, 2019).

Due to their transformed state, both Groot Brak Dune Strandveld and Garden Route Granite Fynbos are currently listed as Critically Endangered in the Revised National List of Threatened Ecosystems (DEA, 2022), with only 45% and 37% left, respectively. They have been transformed mainly for agricultural purposes (croplands), pine plantations and to a lesser extent for road building and urban development (Mucina, 2006). Remnants of Garden Route Granite Fynbos largely remain in isolated pockets on steeper slopes (Mucina, 2006). About 2% of Groot Brak Dune Strandveld is conserved, mainly in private nature reserves, such as Kleinbaai, Blydskap and Kwelanga. Less than 1% of Garden Route Granite Fynbos is conserved in the Garden Route National Park (Mucina, 2006). Their protection should therefore remain a priority in the coastal areas.

Biodiversity planning: The 2017 Western Cape Biodiversity Spatial Plan (CapeNature, 2017) GIS (Geographical Information System) shapefiles for the George Municipality is important for determining the conservation importance of the designated habitat. Ground-truthing is an essential component in terms of determining the habitat condition.

Important species: The presence or absence of threatened (i.e., species of conservation concern) and ecologically important species informs the ecological condition and sensitivity of the site. The latest conservation status of species is checked in the Red List of South African Plants (Raimondo et al. 2009) (www.redlist.sanbi.org).

Site boundary: these and other resource layers were used to define the site boundary and to compile several maps. This information is available on the CapeFarmMapper website (Department of Agriculture: gis.elsenberg.com).

4.4.	Explain how the objectives and management guidelines of the Biodiversity Spatial Plan have been used and how has this influenced your proposed development.

The 2017 WCBSP Handbook (Pool-Stanvliet et al., 2017) distinguishes between the various conservation planning categories. Critical Biodiversity Areas are habitats with high biodiversity and ecological value. Such areas include those that are likely to be in a natural condition (CBA 1) and those that are potentially degraded or represent secondary vegetation (CBA 2). Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the functioning of Protected Areas or CBAs and are often vital for delivering ecosystem services. A distinction is made between ESAs that are still likely to be functional (i.e., in a natural, near natural or moderately degraded condition; (ESA 1) and Ecological Support Areas that are severely degraded, or have no natural cover remaining, and therefore require restoration (ESA 2). Other Natural Area (ONA) sites are not currently identified as a priority but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although not prioritised, they are still an important part of the natural ecosystem.

The proposed pipelines fall largely inside the Western Cape biodiversity network. They run through a mixture of terrestrial critical biodiversity areas (CBA's), degraded terrestrial critical biodiversity areas (CBA2's) and a degraded ecological support area (ESA2), which form part of an extensive coastal biodiversity corridor that runs between Wilderness in the east and Groot Brak in the west. Apart from providing a backbone to the local biodiversity network, the corridor serves as an important passage along which fauna can migrate between the vegetation remnants. The degraded areas are recommended for rehabilitation. The terrestrial CBA's and CBA2's are aligned with the vegetated slopes above Herold's Bay, while the ESA2 corresponds with the watercourses in Herold's Bay.

In addition, an aquatic CBA has been mapped next to the pipeline route to the WWTW. According to CapeFarmMapper, the proposed sewer pipes cross two non-perennial watercourses in the eastern part of the site. Another notable feature is a mapped NFEPA (National Freshwater Ecosystem Priority Area) wetland (unchannelled valley-bottom wetland) next to the pipeline route on the ridge leading up to the WWTW. No evidence of the latter wetland was found on site during the survey. Instead, the area in question was found to be partly covered by invasive aliens, mainly black wattle (*Acacia mearnsii)*. The WWTW itself has been mapped as an artificial wetland. The wetland and watercourses have been included in the biodiversity network.

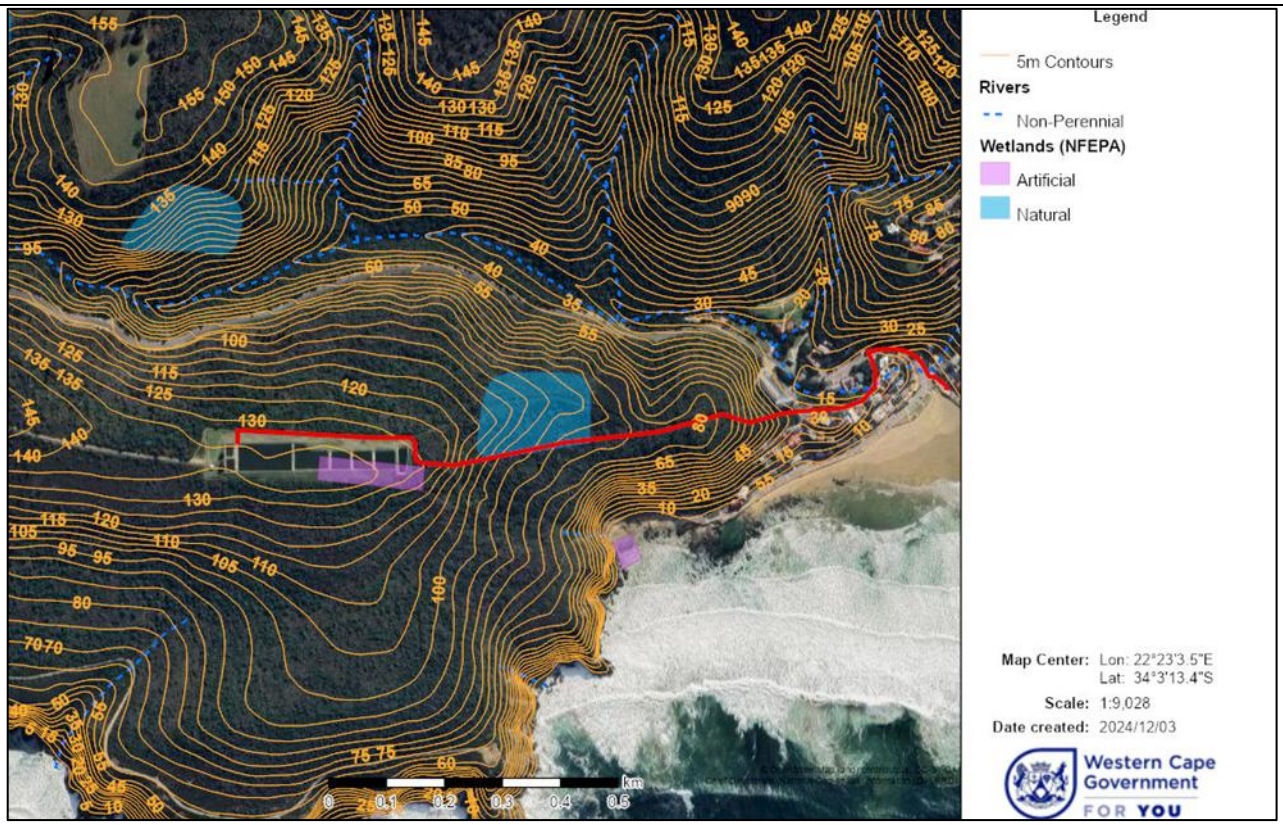


Figure 26: Combined topography and hydrology map.

Reasons for the importance of the CBA's, CBA2's and ESA2 include the presence of ecological processes, threatened vegetation types (Groot Brak Dune Strandveld and Garden Route Granite Fynbos), threatened forest type (Western Cape Milkwood Forest), threatened vertebrate habitat (bontebok), water resource protection (Southern Coastal Belt) and a wetland type (unchannelled valley bottom wetland). The closest protected area is the Kwelanga Private Nature Reserve, which is located 8 km east of Herold's Bay.

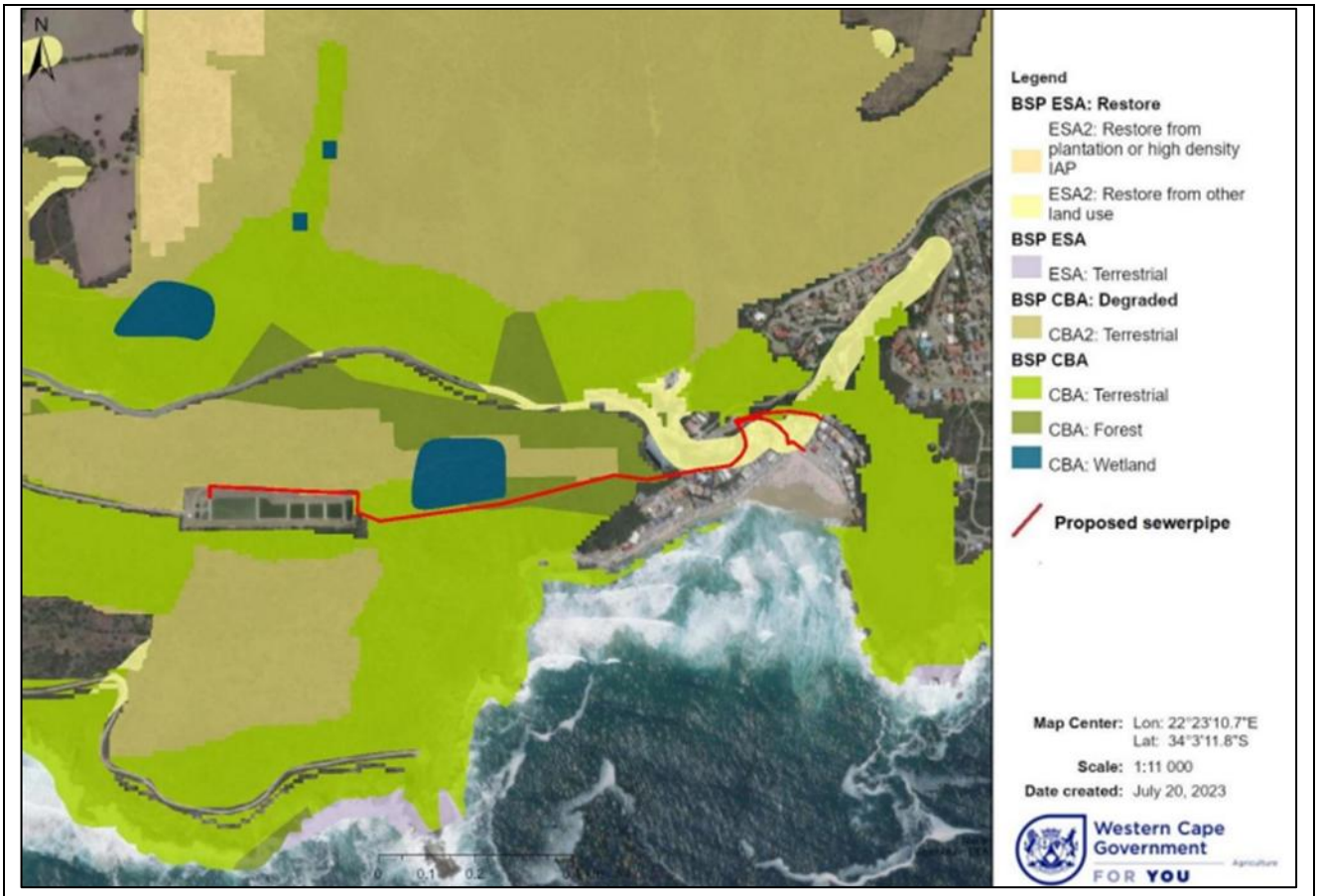


Figure 27: Western cape Biodiversity network map.

4.5.	Explain what impact the proposed development will have on the site specific features and/or function of the Biodiversity Spatial Plan category and how has this influenced the proposed development.
	Only two Species of Conservation Concern (SCC) were recorded from the Botanical Assessment, namely *Cullumia carlinoides* (Near Threatened) and *Dioscorea sylvatica* (Vulnerable). The former is associated with coastal fynbos and is fairly common in the coastal strip between Witsand and George. It is being threatened by coastal developments and alien infestation. Dioscorea sylvatica is also frequently encountered in Garden Route area (see iNaturalist records). It has a wide distribution from the George area eastwards and is currently threatened by the "exploitation of tubers for the local medicinal plant trade" according to the online Red List. Cheesewood) and Milkwood are protected tree species in terms of the National Forests Act (Act 84 of 1998). Several of these trees were recorded in the immediate

vicinity of the proposed pipeline route. The removal of these trees requires a permit from the Department of Forestry Fisheries and Environment.

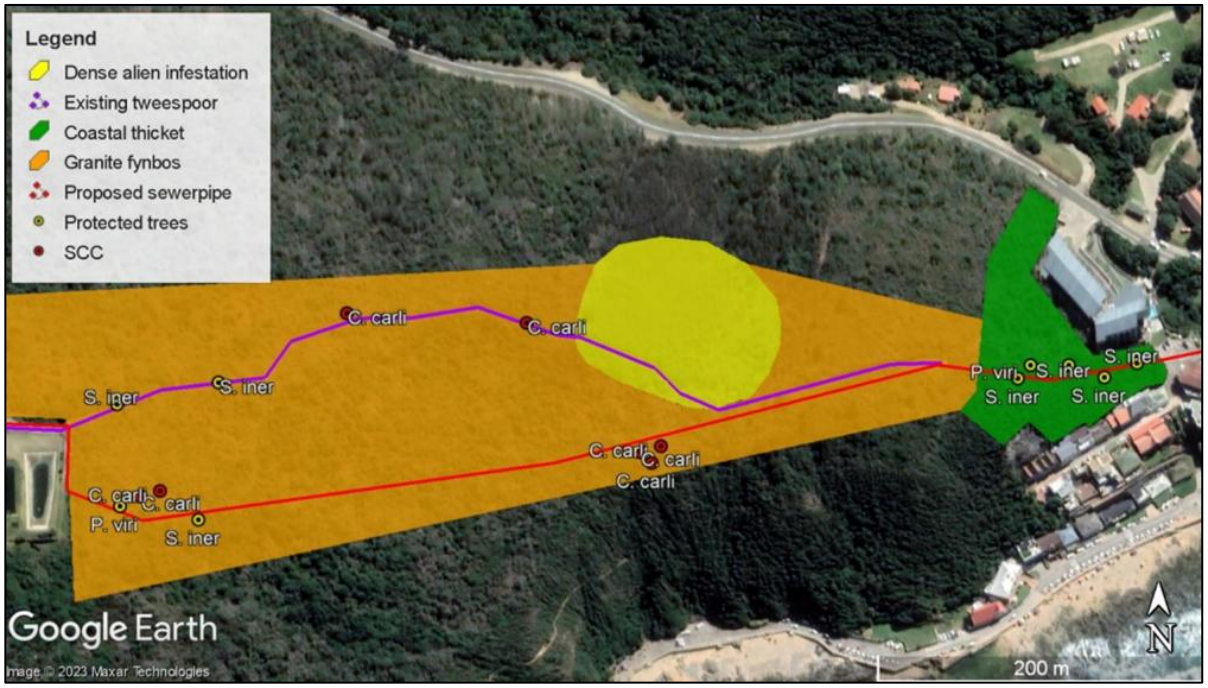


Figure 28: Botanical attributes of the western part of the site

The presence of one avifaunal SCC *(Bradypterus sylvaticus*) was confirmed one the site, with three further avifaunal SCC (*Buteo trizonatus, Campethera notata* and *Phalacrocorax capensis*) likely also occurring within the study area landscape given suitable habitat characteristics. As suitable habitat for P. capensis could only follow an ephemeral association to the existing man-made WWTW, this species is not considered during the impact assessment phase of this project.

Among the remaining three avifaunal SCC, no data on tis available on the Area of Occupancy (AOO) of these species, however their on-site habitats currently form a very small part of their Extent of Occurrence (EOO) and it is highly unlikely that their threat statuses may change if these habitats are destroyed. Given the confirmed or possible presence of all four SCC therefore, their on-site habitats are considered during calculation of SEI as well as during the impact assessment. In addition, the major threats to the persistence of these species are also taken into account during the impact assessment.

Site Ecological Importance

Evaluation of the Site Ecological Importance (SEI) for the habitats of SCC confirmed or possibly occurring in the study area was performed following the methods and criteria outlined in the Species Environmental Assessment Guideline (SANBI, 2020). Evaluation of SEI was performed only for avifauna (given the higher likelihood of SCC from this faunal group being present over the site) considering their habitat requirements in conjunction with the spatial distribution of habitats within the project footprint.

Although all the natural habitats on the site offer suitable habitat for the confirmed or possibly occurring avifaunal SCC, the project footprint itself is of a very small spatial extent, meaning that the footprint overlaps with less than one hectare of each habitat type. In addition, it is highly likely that all avifaunal species will return to area adjacent to the project footprint when the disturbances from the construction phase have ceased. Taken together, this renders habitats over the project footprint as of a **"Very low"** SEI, allowing for development activities of medium to high impact without restoration activities being required.

Table 4: Evaluation of SEI for habitats within the study area landscape. BI = Biodiversity Importance, RR = Receptor Resilience

Habitat type	Conservation Importance	Functional Integrity	Receptor Resilience	Site Ecological Importance
Forest/Woodland	**High** - Potential suitable habitat for *B. trizonatus* classified as "Near-Threatened" under Criterion D, *B. sylvaticus* classified as "Vulnerable" under Criteria B and C, and *C. notata* classified as "Near-Threatened" under Criteria C and D.	**Very low** - Very small area (<1 hectare)	**Very high** - Because the proportion of this habitat impacted by the proposed development is very small (<1 hectare), the avifaunal species composition of the surrounding landscape will remain unaltered, and will traverse the site again as soon as the development disturbances has ceased.	**Very low** - BI = Low; RR = Very high
Fynbos	**High** - Confirmed presence of *B. sylvaticus* classified as "Vulnerable" under Criteria B and C.	**Very low** - Very small area (<1 hectare)	**Very high** - Because the proportion of this habitat impacted by the proposed development is very small (<1 hectare), the avifaunal species composition of the surrounding landscape will remain unaltered, and will traverse the site again as soon as the development disturbances has ceased.	**Very low** - BI = Low; RR = Very high
Alien vegetation	**High** - Potential suitable habitat for *B. trizonatus* classified as "Near-Threatened" under Criterion D, and *C. notata* classified as "Near-Threatened" under Criteria C and D.	**Very low** - Very small area (<1 hectare). Furthermore, this habitat exhibits several major impacts (a high incidence of alien and invasive vegetation.	**Very high** - Because the proportion of this habitat impacted by the proposed development is very small (<1 hectare), the avifaunal species composition of the surrounding landscape will remain unaltered, and will traverse the site again as soon as the development disturbances has ceased. Furthermore, this habitat exists in an altered state (given the presence of alien and invasive vegetation) and can only recover to this state.	**Very low** - BI = Low; RR = Very high

4.6.	If your proposed development is located in a protected area, explain how the proposed development is in line with the protected area management plan.

N/A – The site is not located in a protected area.

4.7.	Explain how the presence of fauna on and adjacent to the proposed development has influenced your proposed development.

(Source: TERRESTRIAL FAUNAL AND AVIFAUNAL SPECIES IMPACT ASSESSMENT REPORT FOR THE UPGRADING OF HEROLD'S BAY SEWER PUMP STATION AND ASSOCIATED RISING MAIN ON REMAINDER OF FARM BRAKFONTEIN 236, PORTION 10 OF FARM BRAKFONTEIN 236 AND ERVEN RE/95 AND 116, HERHOLDS BAY, GEORGE MUNICIPALITY, 2023, Prepared by Dr. J.H. Visser of Blue Skies Research (Appendix G3)).

The study area landscape is comprised of five broadly identified habitat types based on habitat composition and habitat integrity. The central section of the project footprint harbours the most intact habitats, intersecting intact Fynbos habitats of South Outeniqua Sandstone Fynbos, with a small section harbouring alien and invasive trees such as Black Wattle. Small portions in the east further intersect with Forest/Woodland habitat. Conversely, the western section of the project footprint intersects with the existing footprint of the Herold's Bay Water Waste Treatment Works with the eastern section largely located within the existing residential area. Collectively therefore, only a small part (<1 hectare) of the proposed footprint overlaps with intact natural habitats.

Faunal and avifaunal diversity and abundances appears high over the study area landscape and is largely comprised of relatively common species of "Least Concern", albeit one avifaunal SCC, the Knysna Warbler (*Bradypterus sylvaticus*) is present in the thick and tangled Fynbos vegetation. While mammal diversity and abundances appear relatively low, avifauna is by far the most prominent faunal component in the study area landscape, likely owing to the availability of dense Forest/Woodland and Fynbos habitats. Furthermore, the presence of aquatic and moist habitats leads to the presence of amphibians within the landscape. Although no predator-prey dynamics were observed (as is evidenced by the lack of mammal and avifaunal predators), ecosystem dynamics do appear intact with habitats here forming a functional ecological link in the study area landscape.

Mammals

Sixty-four (64) mammal species were recorded within the study area, all of which most are currently classified as "Least concern" by the IUCN. Among these, 57 species are currently listed as "Least Concern" by the IUCN (IUCN, 2021), with the remaining seven species representing mammal SCC. These mammal SCC include the following:

- The Duthie's Golden Mole (*Chlorotalpa duthieae*) classified as "Vulnerable",
- Fynbos Golden Mole (*Amblysomus corriae*) classified as "Near-Threatened",
- Leopard (*Panthera pardus*) classified as "Vulnerable",

- African Clawless Otter (*Aonyx capensis*) classified as "Near-Threatened",
- Grey Rhebok (*Pelea capreolus*) classified as "Near-Threatened",
- Long-tailed Forest Shrew (*Myosorex longicaudatus*) classified as "Endangered", and
- White-tailed Rat (*Mystromys albicaudatus*) classified as "Vulnerable" by the IUCN.

Figure 29: Spatial locations of the different mammal species recorded within the study area.

Amphibians

Two amphibian species were recorded within the study area, both of which are currently classified as "Least concern". The Clicking Stream Frog (*Strongylopus grayii*) is the most abundant amphibian species and is found along all freshwater environments on the site. A single individual of the Rattling Frog (*Semnodactylus wealii*) was also observed vocalising in the thicket habitat to the south of the WWTP.

Figure 30: Spatial locations of the different amphibian species recorded within the study area.

Avifauna

In total, 34 bird species were recorded within the study area, 33 of which are currently classified as "Least concern" and one, the Knysna Warbler (Bradypterus sylvaticus), classified as "Vulnerable" by the IUCN. The presence of this species is linked to the thick and tangled Fynbos vegetation in the study area landscape offering a dense understorey. The remaining avifauna on the site constitutes common vegetation associated species, freshwater associated (at or near the WWTW) or marine associated species (near the coast and at or near the WWTW).

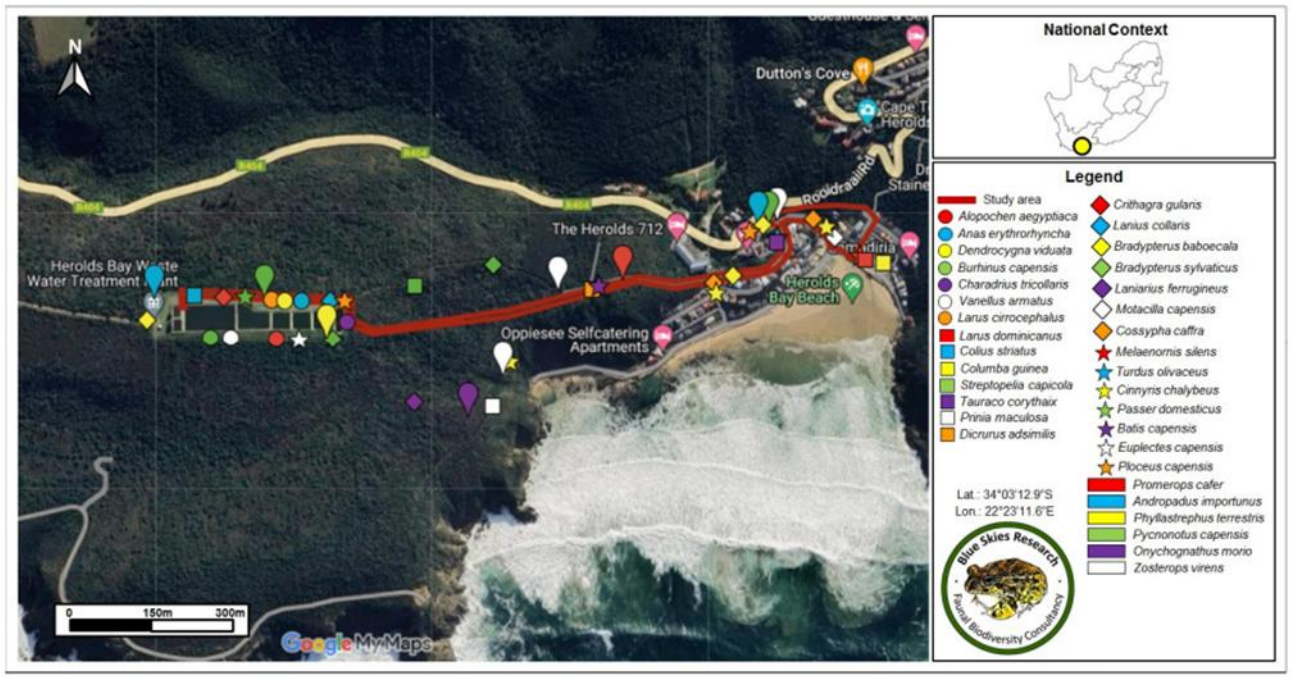


Figure 31: Spatial locations of the different avifaunal species recorded within the study area.

Grasshoppers

The presence of the Yellow-winged Agile Grasshopper was evaluated based on suitable habitat (recently burnt Schlerophyll on south-facing slopes) for this species - a habitat type which is not

present on the site. To this end, suitable habitat for the Yellow-winged Agile Grasshopper is not present on the site, and it is highly unlikely that this species will occur here.

5. Geographical Aspects

Explain whether any geographical aspects will be affected and how has this influenced the proposed activity or development.

The new rising main starts at near sea level at the existing pump station and increases in elevation, through moderate, convex slopes, to 135.0 m above mean sea level (AMSL) at the sewerage works. Both pump stations are confined in small, anthropogenically flattened areas with the existing and new pump station sites situated at 3.00 m and 15.0 m AMSL, respectively.

Due to the steep elevation of the pipeline route, no feasible alternatives were accepted, however two alternatives were discussed. The first alternative was to place the pipe on plinths for the entire route. The second alternative was to place a section of the pipe on plinths and the rest will remain underground. These two options will result in a smaller developmental footprint; however the pipe will have to consist of stainless steel, which is a more costly option. Another reason for the alternatives not being feasible is the fact that it is not practical to send construction teams by foot onto the hill to construct the plinths and place the pipeline above ground by hand. The latter is also not preferred by the George Municipality Operational Team.

The preferred Alternative A will be burying the entire route of the pipeline, while Alternative B refers to using plinths to rest the pipe on the ground or on supports anchored on the ground.

<u>Construction methodology of Alternative A:</u>

- Clearing the route of vegetation (if endangered plants are present, these to be protected or removed and relocated).
- Removing the topsoil removed and stockpile this to prevent contamination.
- Excavating a trench to required depth. The excavation can be either, all or a combination of the following, hand excavation, back-actor, track excavator, rock fracturing or blasting.
- The material removed from the trench, which cannot be used in the construction will then be removed from site and used of elsewhere or disposed of at authorised site. The suitable material to backfill the trench will be stockpiled on site, to backfill the trench,
- A layer of bedding sand will be placed and compacted in the bottom of the trench.
- The pipe segments will be installed onto the sand.
- The pipe will then be covered with some more bedding material (sand) and compacted. This layer is to protect the pipe.
- The trench will then be backfilled and compacted in layers.

<u>Construction methodology of Alternative B:</u>

- Clearing the route of vegetation (if endangered plants are present, these to be protected or removed and relocated).
- Removing the topsoil from the support footing footprint and stockpile this to prevent contamination.
- Excavate to footing founding level and dispose of at approved site
- Place precast pipe support / or cast in situ concrete plinths / pipe supports.
- Deliver pipe segments to site and install
- Apply / install protection
- Construct thrust blocks

6. Heritage Resources

6.1.	Was a specialist study conducted?	**YES**	NO
6.2.	Provide the name and/or company who conducted the specialist study.		
Dr. Peter Nilsen			
6.3.	Explain how areas that contain sensitive heritage resources have influenced the proposed development.		
	The development footprint is substantially disturbed and previously developed, and no colonial or pre-colonial heritage resources of significance were identified in the study area. If present on or in surface sediments between the WWTW and Spekie Gericke Drive, then Stone Age implements are expected to be of low significance and Not Conservation Worthy. No caves or rock shelters occur in the development footprint. Neither the Provincial Heritage Site nor other heritage resources in the surroundings will be impacted by the proposed activity. Because there is no significant heritage resources associated with the development footprint, it does not meaningfully contribute to the already altered cultural landscape of the area. For the same reason there will be negligible to no cumulative impact on the heritage value of the area. The specialist found that the study area's palaeontological sensitivity is INSIGNIFICANT/ZERO and LOW. Due to the INSIGNIFICANT/ZERO/LOW palaeontological sensitivity of the study area, a professional palaeontologist was not consulted for this project. In accordance with the SAHRIS PalaeoSensitivity map, it is recommended that a protocol for finds of potential fossil material (and buried artefacts), the Fossil Finds Procedure (FFP), is included in the Environmental Management Program (EMPr) for the construction phase of the project.		

7. Historical and Cultural Aspects

Explain whether there are any culturally or historically significant elements as defined in Section 2 of the NHRA that will be affected and how has this influenced the proposed development.
The development footprint is substantially disturbed and previously developed, and no colonial or pre-colonial heritage resources of significance were identified in the study area. If present on or in surface sediments between the WWTW and Spekie Gericke Drive, then Stone Age implements are expected to be of low significance and Not Conservation Worthy. No caves or rock shelters occur in the development footprint. Neither the Provincial Heritage Site nor other heritage resources in the surroundings will be impacted by the proposed activity. Because there is no significant heritage resources associated with the development footprint, it does not meaningfully contribute to the already altered cultural landscape of the area. For the same reason there will be negligible to no cumulative impact on the heritage value of the area. Due to the sub-terranean nature of most of the proposed activity, there is no vertical component and hence no visual impact on the aesthetic value of the affected area. The proposed new pump station on Erf 116 will be built within an existing disturbance and will have a negligible visual impact as it will be partially screened by existing vegetation and developments. Nevertheless, on heritage grounds, due to the entire absence of heritage resources or themes in and around Erf 116, the proposed pump station will have negligible to no impact on the visual or aesthetic heritage value of the area. The positive socio-economic impact, including short-, medium- and long-term jobs as well as the growing need for maintaining and upgrading the bulk services – including sewer – infrastructure of Herold's Bay outweigh the negligible to zero negative impacts this project may have on heritage resources. Because of the above, and because there is no reason to believe that significant heritage resources will be impacted by the proposed activity, it is recommended that the proposed activity be approved in full, and that a Heritage Impact Assessment is not warranted for the project. The DFFE screening tool map and table for the archaeological and cultural heritage theme sensitivity indicates that the proposed development footprint falls within an area of VERY HIGH sensitivity. The VERY HIGH sensitivity is attributed because the study area is within 2 km of a Grade II heritage site and

within 100 m of an ungraded heritage site. The reverse is correct. The study area is within 100 m of the Grade II Provincial Heritage Site (PHS) of Herold's Bay Cave and within 2 km of Stone Age and Colonial period archaeological resources identified to the south, east and north-east. Nevertheless, the study area is already transformed and developed, and the proposed activity will not have any impact on the above-mentioned Grade II heritage site or heritage resources within 2 km that were reported in previous studies. Consequently, while the general surroundings, like most coastal settings, is highly sensitive from an archaeological and cultural heritage perspective, the proposed development footprint area is of LOW sensitivity.

In addition to the Stone Age rock shelter with Middle Stone Age deposits - the PHS of Herold's Bay Cave - some 50 m south of Spekie Gericke Drive, previous heritage-related studies for properties in the surroundings have identified a mixture of colonial and pre-colonial / Stone Age heritage resources. The eastern, shoreline section of the development footprint, from the top of Spekie Gericke Drive to the pump station on Erf RE/95 is already transformed and developed. Stone Age and pastoralist shell middens commonly occur in such settings. In locations with spatial, topographic and sedimentary environments like that between the Herold's Bay WWTW and the top of Spekie Gericke Drive, archaeological resources are either absent or consist of isolated, temporally mixed Stone Age implements that lack associated cultural or organic remains and that are of low significance or Not Conservation Worthy.

It is anticipated that the most likely archaeological resources to occur would be in the area between the Herold's Bay WWTW and the top of Spekie Gericke Drive. If present, these are likely to include isolated Stone Age implements, or at best, low to medium density scatters of the same materials. Due to low densities, temporal mixing, the complete absence of associated cultural and organic remains, and in this case previously disturbed context, such finds are of low to no archaeological value and hence attributed Grade IIIC or Not Conservation Worthy status.

As mentioned above, however, the proposed development footprint is already transformed and developed with sewer, water, storm water and transport infrastructure, and consequently, the study area is not expected to be sensitive from an archaeological and cultural heritage standpoint.

8. Socio/Economic Aspects

8.1.	Describe the existing social and economic characteristics of the community in the vicinity of the proposed site.
	The proposed site is located within George Municipality. As of the 2022 census, the population of George LM is **294,929**, up significantly from earlier estimates. The rapid growth reflects a sharp increase in households: there are approximately **85,931 households**, with an average household size of **3.4 persons** per household. **(Source: Local Spatial Development Framework, Herold's Bay 2015).** Herold's Bay originated as a holiday village for visitors, which over decades has slowly expanded in size to include a relatively large group of retired residents later also. In more recent years this growth has however increased dramatically together with the enormous national and international interest in the Southern Cape region in general. It is however considered pertinent that the unique character of Herold's Bay Lower as well as the overall rural character and atmosphere of Herold's Bay Upper be retained and access to the coastline respected. **<u>Herold's Bay Upper</u>** A large portion of this area presently consists of agricultural land, though some are being used for grazing purposes. Former cultivation of agricultural land has been ceased. An exception is the Denneseerus Nursery, producing foliage and greenery for the local flower market. Apart from the Down to Earth Restaurant / Weddings and Functions Venue, Dutton's Cove restaurant, Herold's Bay Eco Resort and a number of Guesthouse, economic activities within the extent of the residential suburbs are limited.

	The Oubaai Golf Resort & Spa hotel is also located in this area. The resort consists of an eighteen-hole golf course, hotel, conference centre, 3 up-market restaurants and guestrooms and suites. The resort is a prime destination for golf holidays in South Africa. **Herold's Bay Lower** An estate agency is located at the entrance to the village. Two stationary vendor caravans are in the car parking area along the beachfront. Several residential properties are rented out during the year. The Herold's Bay caravan park with its 42 caravan sites, which is regarded as one of the most popular camping sites during peak season periods, is also located at the entrance to Herold's Bay. The Herold's Bay Hotel with its stylish restaurant, bar, pool, sundeck and bedroom apartments and studios are also located in this part of Herold's Bay.
8.2.	Explain the socio-economic value/contribution of the proposed development.

The estimate for Preliminary and General costs was made at 25% of the works cost estimate and a 10% allowance was made for contingencies and escalation. Due to this being a preliminary design, the accuracy of the estimate is placed at +-70%, and the anticipated envelope of costs is presented as well.

Total Preliminary Cost Estimate: R51 687 267.50

Although the project will be designed as a whole, the actual implementation may need to be done in stages to suit construction access periods and project budget allocation. It is therefore proposed that the project be split into work packages which can be implemented as standalone projects or concurrently depending on budget availability and peak seasons in Herold's Bay.

- **Creation of employment opportunities:** The direct employment opportunities associated with the operational phase of this project are relatively limited. However, most employment will be in the construction phase.
- **Benefits associated with the socio-economic contributions:** The upgrades will increase the pumping capacity and resilience of the sewerage network which will benefit Herold's Bay.

8.3.	Explain what social initiatives will be implemented by applicant to address the needs of the community and to uplift the area.

Due to the rapid expansion of the George Municipal area, the age of existing infrastructure and planned developments; the George Municipality has identified the need for the upgrade of the sewer infrastructure, Herold's Bay Pump Station 1, and the construction of Herold's Bay Pump Station 4 to relief the increased sewage gravity flows from the area.

The project will make use of local labour as much as is practical for unskilled labour. A lot of the works are specialised and therefore will be done by specialists.

The Municipality is implementing the project completely to improve the water and sanitation services provided to the community and to prevent spillage and surcharge into the ocean.

8.4.	Explain whether the proposed development will impact on people's health and well-being (e.g. in terms of noise, odours, visual character and sense of place etc) and how has this influenced the proposed development.

PS1

Impacts during the construction phase will be temporary and include noise and dust impacts due to proximity and number of houses to the site. This can however be mitigated by implementing the EMPr. No operational impacts.

Part 2 of the National Environmental Management: Integrated Coastal Management Act. 2008
13(1) "Subject to this Act and any other applicable legislation, any natural person in the Republic—

a) has a right of reasonable access to coastal public property; and
b) is entitled to use and enjoy coastal public properly, provided such use—
    i. does not adversely affect the rights of members of the public to use and enjoy the coastal public properly;

ii. does not hinder the State in the performance of its duty to protect the environment; and
iii. does not cause an adverse effect.

(2) This section does not prevent prohibitions or restrictions on access to or the use of any part of coastal public property—

a) which is or forms part of a protected area;
b) to protect the environment, including biodiversity;
c) in the interests of the whole community;
d) in the interests of national security; or
e) in the national interest.

Part 2 of the National Environmental Management: Integrated Coastal Management Act. 2008

20. (1) A municipality in whose area coastal access land falls, must—

(d) maintain that land so as to ensure that the public has access to the relevant coastal public property;
(e) where appropriate and within its available resources, provide facilities that promote access to coastal public property, including parking areas, toilets, boardwalks and other amenities, taking into account the needs of physically disabled persons;
(f) ensure that the provision and use of coastal access land and associated infrastructure do not cause adverse effects to the environment;

In accordance with the abovementioned Act, the George Municipality proposes to temporarily close a section of the Herold's Bay beach, if required, for the upgrade of Pump Station 1.

PS4
Impacts during the construction phase will be temporary and include noise and dust impacts and traffic congestion due to proximity and number of houses to the site and the fact that Skimmelkrans Drive is the main road used to get to Herold's Bay beach. This can however be mitigated by implementing the EMPr. No operational impacts.

Pipeline Upgrades
Impacts during the construction phase will be temporary and include noise, dust, traffic and visual impacts due to proximity and number of houses to some of the sites. This can however be mitigated by implementing the EMPr. No operational impacts.

The proposed development, once completed, will have a positive impact on people's health and well-being by increasing the resilience of the sewerage infrastructure.

SECTION H: ALTERNATIVES, METHODOLOGY AND ASSESSMENT OF ALTERNATIVES

1. Details of the alternatives identified and considered

1.1.	Property and site alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred property and site site alternative.

The existing and preferred site spans across multiple properties: Remainder of Farm 236, Portion 37 of Farm 236, Portion 35 of Farm 236, Portion 10 of Farm 236, Portion 36 of Farm 236, Erf 116, Erf 237, Erf 113, Remainder of Farm 95.

The existing Pump Station 1 is located on Remainder 95 and as the proposal is for the upgrading of an existing facility, PS1 may have to shift within this property as previously mentioned or move to Erf 114. The alternative position will be within the existing car park area and therefore do not require environmental approval.

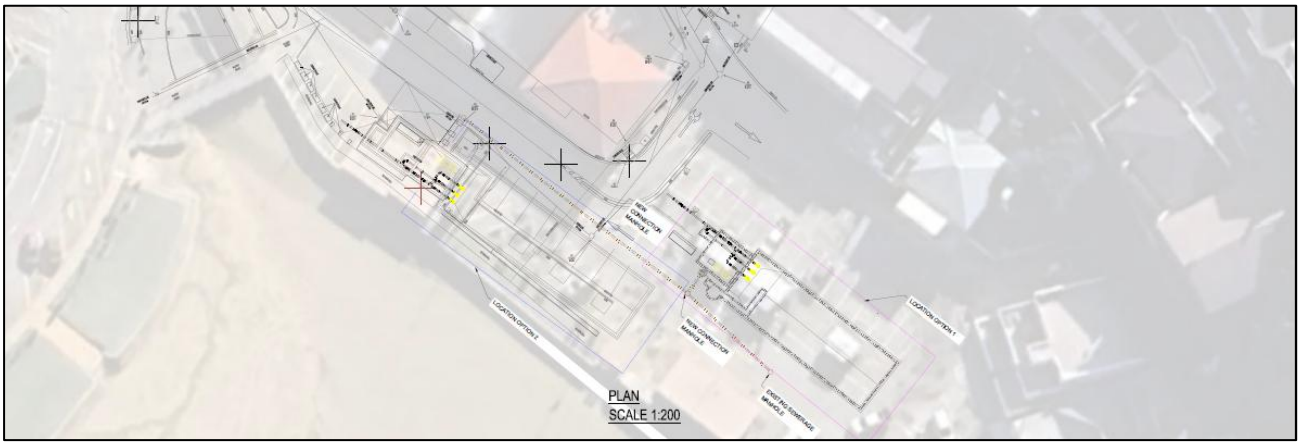


Figure 32: possible alternative position of PS1 and the emergency storage tank

Erf 116 and a portion of Farm 236 is the preferred site for PS4. Alternatives were investigated but not feasible due to engineering and financial restraints.

The existing pipeline crosses several properties: Remainder of Farm 236, Portion 37 of Farm 236, Portion 35 of Farm 236, Portion 10 of Farm 236, Portion 36 of Farm 236, Erf 116, Erf 237, Erf 113, Remainder of Farm 95. Since the proposal is to install the new pipeline parallel to the existing pipeline, the preferred installation site will have the least amount of negative impact on the environment.

Provide a description of any other property and site alternatives investigated.

Erf 114 (the car park next to PS1) may be an alternative location for PS1. Alternative options were investigated for the PS4 during the planning phase; the options were however not feasible. Due to space and property ownership.

Provide a motivation for the preferred property and site alternative including the outcome of the site selectin matrix.

PS1 is an existing pump station and will be upgraded. Erf 114 is being looked into by the George Municipality as an alternative location for PS1.

Alternative routes were investigated for the installation of the rising main between PS4 and the WWTW, however it was a longer route.

According to the Engineers, the proposed site for PS4 is the only available space to implement the proposed upgrades to the existing sewerage infrastructure, it has the correct elevation and topography, is not densely vegetated and the closest available property to existing electricity and stormwater infrastructure

Provide a full description of the process followed to reach the preferred alternative within the site.

Please refer to the above answered questions.

Provide a detailed motivation if no property and site alternatives were considered.

Not applicable

List the positive and negative impacts that the property and site alternatives will have on the environment.

The new Pump Station 4 will be located on Erf 116.

Positive:	Negative:
• Good use of open space • Protect municipal infrastructure	• Loss of protected trees

1.2.	Activity alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred activity alternative.

The preferred activity is to upgrade PS1, construct PS4 and install the new buried rising main to upgrade Herold's Bay's bulk sewerage capacity as a whole.

Provide a description of any other activity alternatives investigated.

It was considered to place a section of the new rising main on plinths between PS4 and the WWTW, this is however not a feasible option due to engineering and financial restraints. The buried pipeline is also preferred by the Terrestrial biodiversity and Animal specialist.

Provide a motivation for the preferred activity alternative.

The sewerage capacity of Herold's Bay needs to be increased to match current and future expansion, as such PS4 and a new rising main are proposed as well as upgrades to the existing PS1 with the addition of an emergency storage tank to mitigate potential spills during loadshedding and part failures.

Provide a detailed motivation if no activity alternatives exist.

Not applicable

List the positive and negative impacts that the activity alternatives will have on the environment.

<u>Above-ground pipelines</u>

Advantages:

- Less excavation required
- Marginally smaller footprint
- Possibly shorter construction period
- Easy visual inspection

Disadvantages:

- Pipeline will be exposed to
  - the elements, including solar radiation, winds, rain and sea spray.
  - fire (during bushfire events)
  - increased likelihood of vandalism
- Permanent visual impact
- Create a permanent barrier
- Follows the natural ground level.

<u>Below ground pipelines</u>

Advantages:

- Infrastructure protected from:
  - elements (rain, solar radiation, heat, wind and sea spay)
  - fires
- Low permanent visual impact
- Does not cause permanent obstruction to animal or human movement.
- Less prone to vandalism

Disadvantages:

- Larger construction footprint (trench excavation, material storage, and working space)

1.3.	Design or layout alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts

Provide a description of the preferred design or layout alternative.

The perferred layout depicts the construction of PS4, the upgrade of PS1, the installation of the rising main between PS1 and PS4 and PS4 and the WWTW. The existing rising main between PS1 and PS4 will also be utilised to convey sewage to the emergency storage tank at PS 1 during failure or load shedding or any other mechanical failure. The existing rising main between PS4 and the WWTW will be retained

as a backup in the event of an issue with the new rising main. Please note that the rising main between PS4 and the WWTW may deviate from the layout below within a 10m corridor.

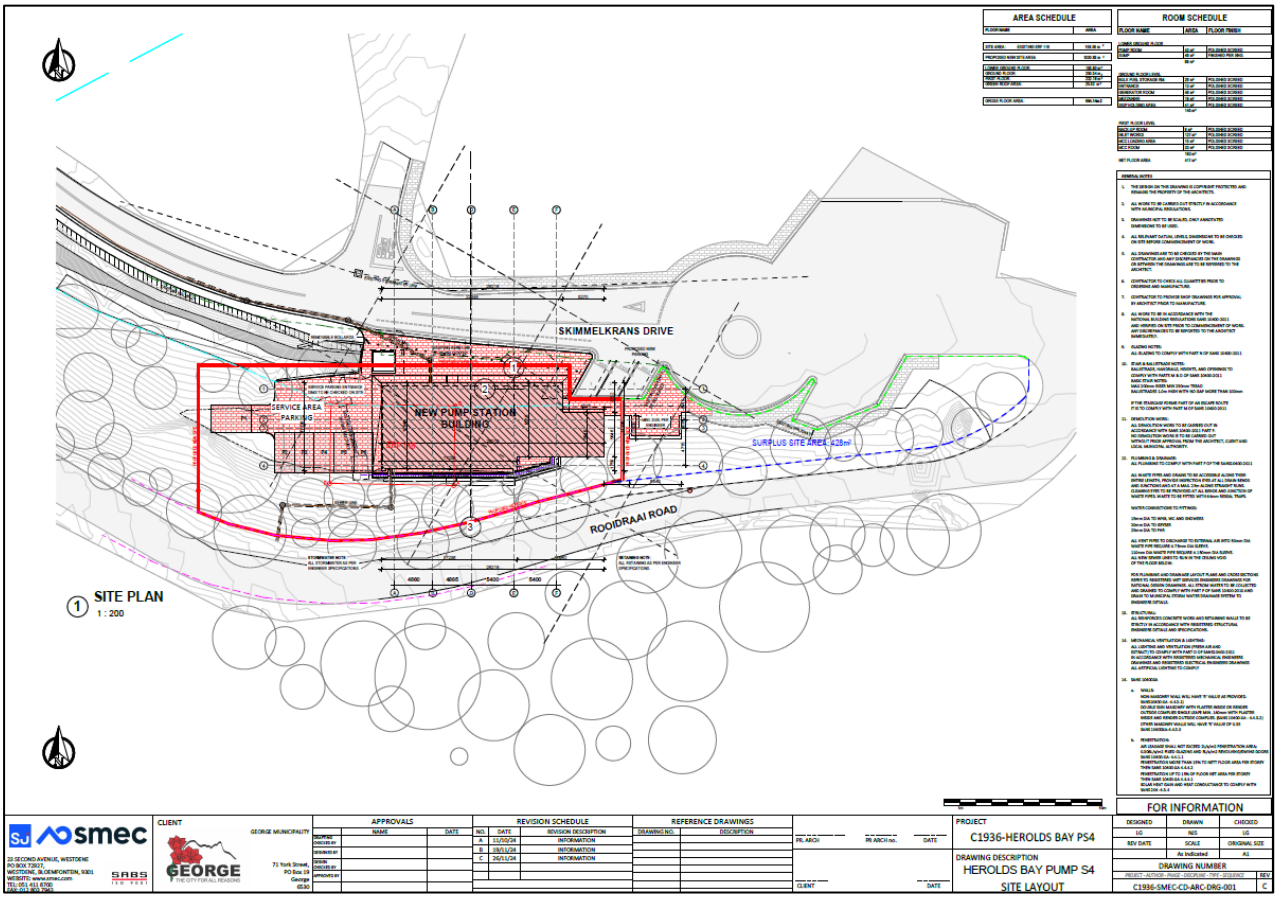


Figure 33: Preferred PS4 design

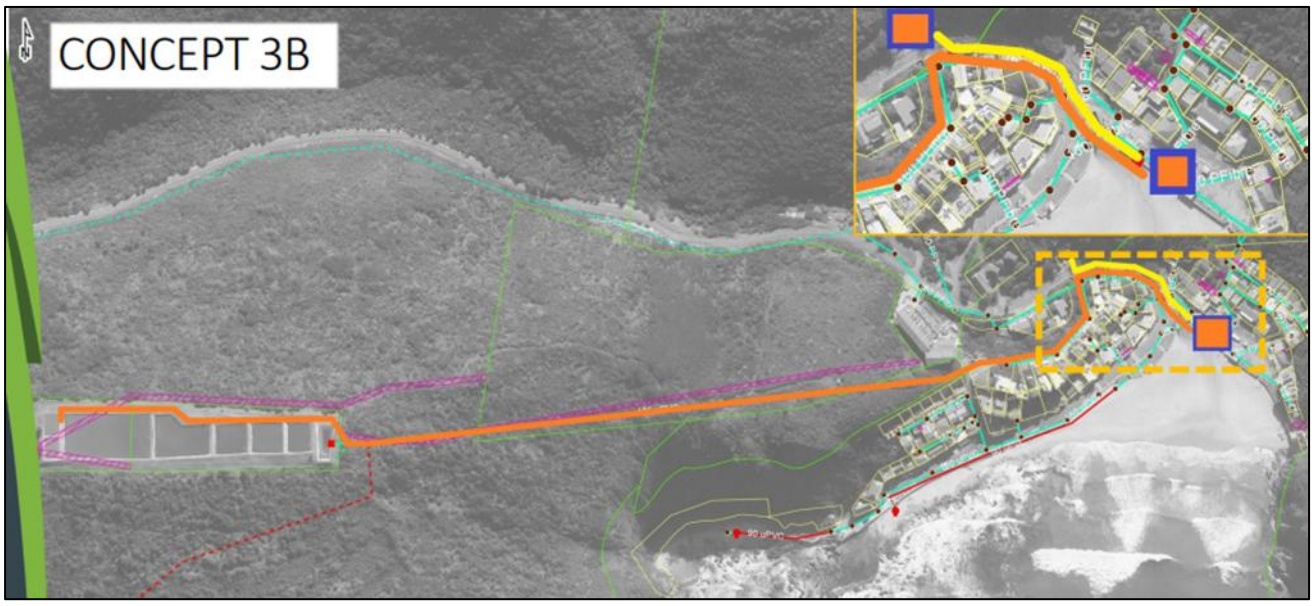


Figure 34: Preferred Pipeline route layout

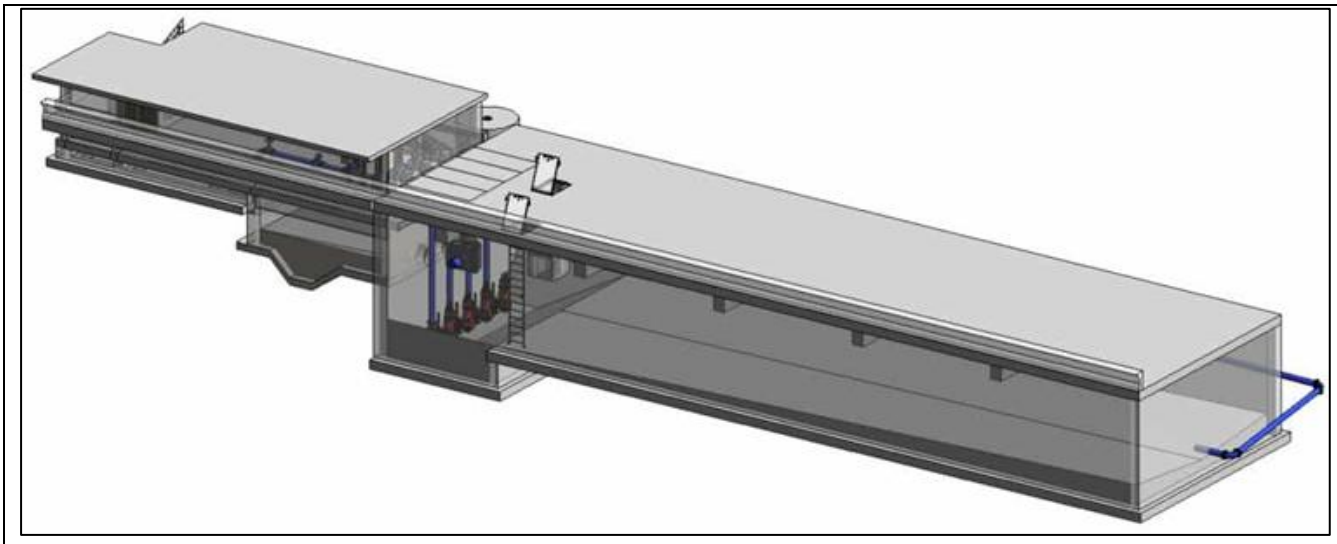


Figure 35: Preferred emergency storage tank design for PS1

Provide a description of any other design or layout alternatives investigated.

CONCEPT 1 – CONCEPTUAL LAYOUT

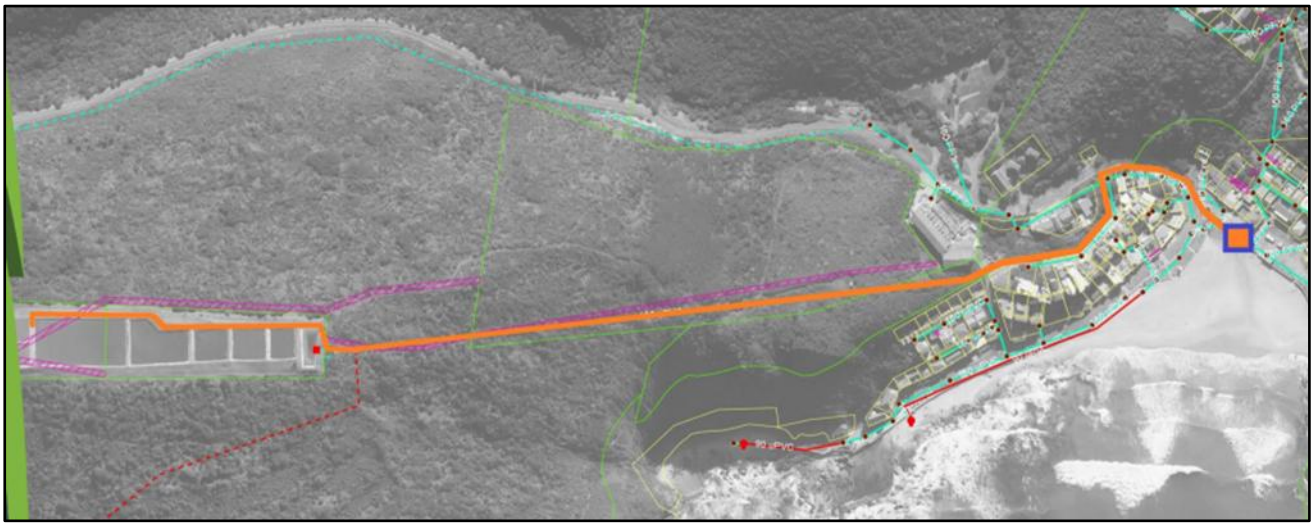


Figure 36: Concept 1 layout

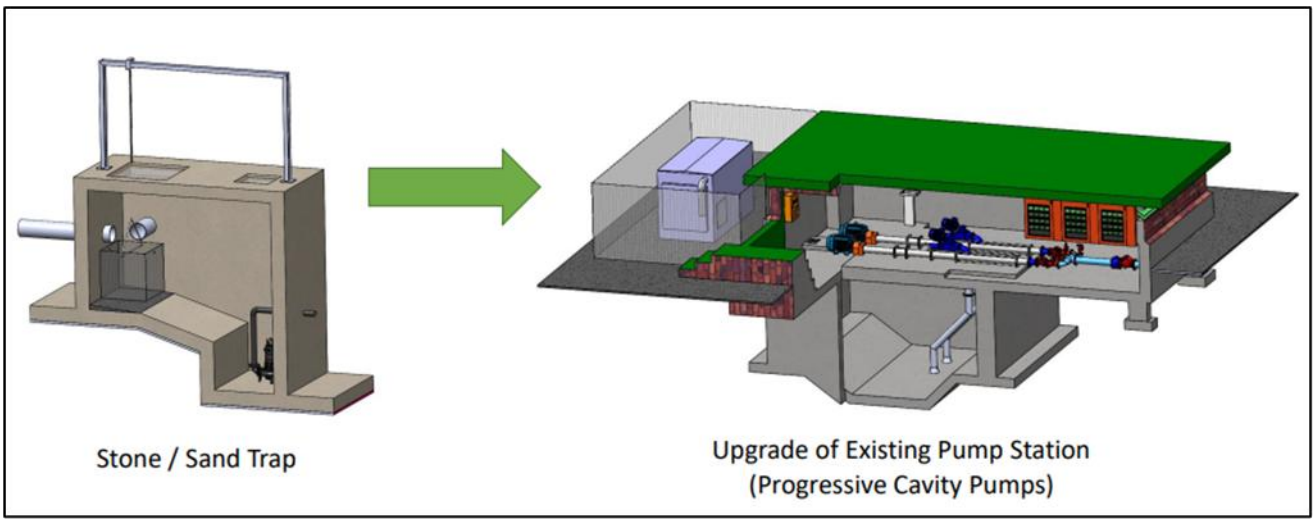


Figure 37: Concept 1 design (PS1)

1. Upgrade and refurbish Herolds Bay Pump Station 1 to cater for a capacity of 32ℓ/s, including an additional stone and sand trap.
2. Construct new Herolds Bay WWTW rising main from existing Herolds Bay Pump Station 1, approximately 1375m.

CONCEPT 2 – CONCEPTUAL LAYOUT

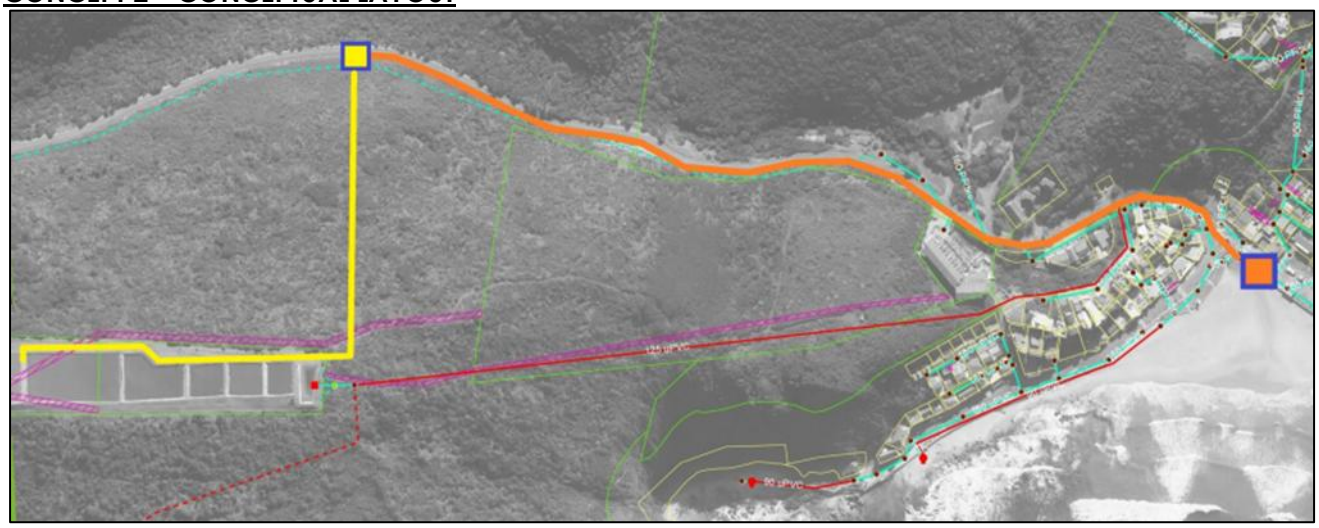


Figure 38: Concept 2 layout

1. Upgrade and refurbish Herold's Bay Pump Station 1 with a capacity of 32ℓ/s.
2. Upgrade the Herold's Bay rising main to follow the R404 (access road to Herold's Bay), approximately 955m in length.
3. Construct new Herold's Bay WWTW Pump Station No. 4 adjacent to the R404 with a capacity of 52ℓ/s.
4. Construct new Herold's Bay WWTW rising main from new Inlet Pump Station, approximately 685m.

CONCEPT 3A - CONCEPTUAL LAYOUT

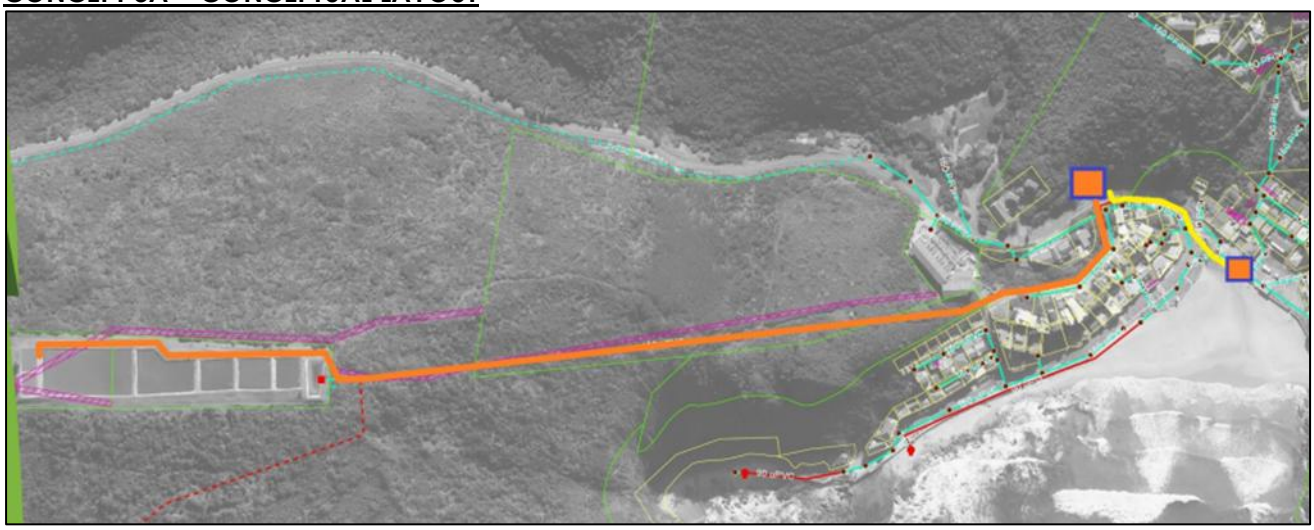


Figure 39: Concept 3A layout

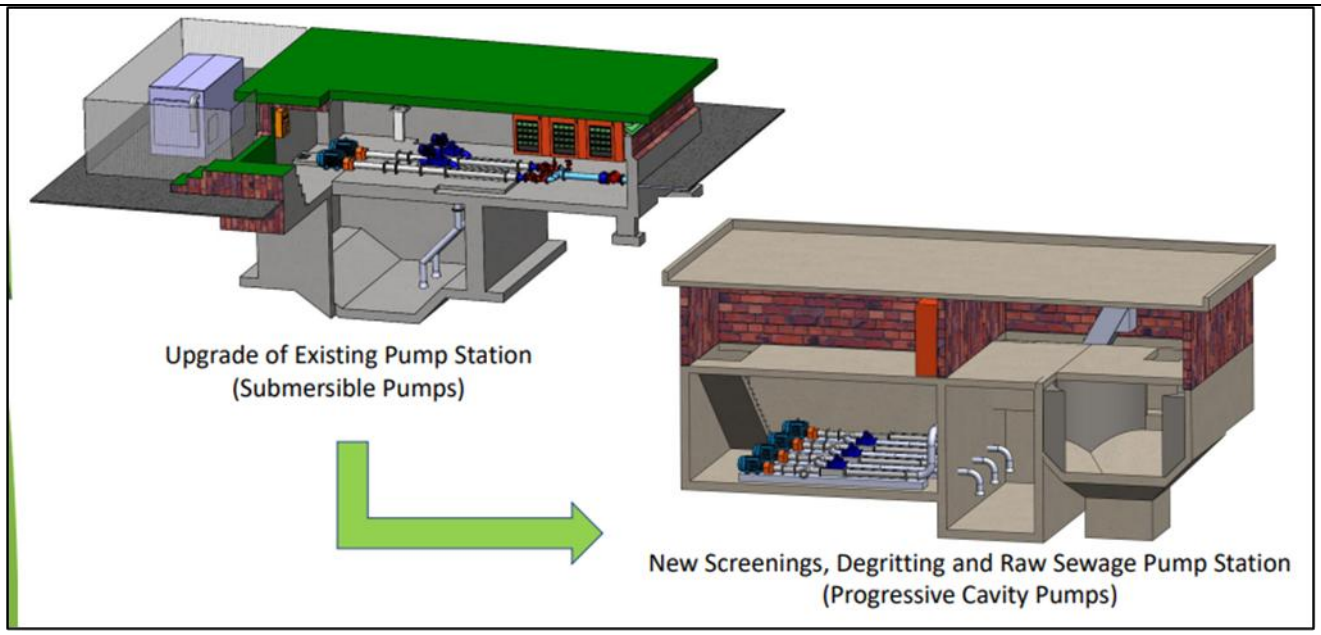


Figure 40: Concept 3A design (PS1)

1. Construct new Herold's Bay Pump Station 4 next to Skimmelkrans Drive
2. Construct new rising main from Pump Station 4 to the WWTW, approximately 1,230m in length, with a capacity of 52ℓ/s.
3. Construct new rising main from Herold's Bay Pump Station 1 to Herold's Bay Pump Station 4, approximately 185m in length with a capacity of 32ℓ/s.
4. Upgrade and refurbish Herold's Bay Pump Station 1 with a capacity of 32ℓ/s

CONCEPT 3B – PREFERRED LAYOUT

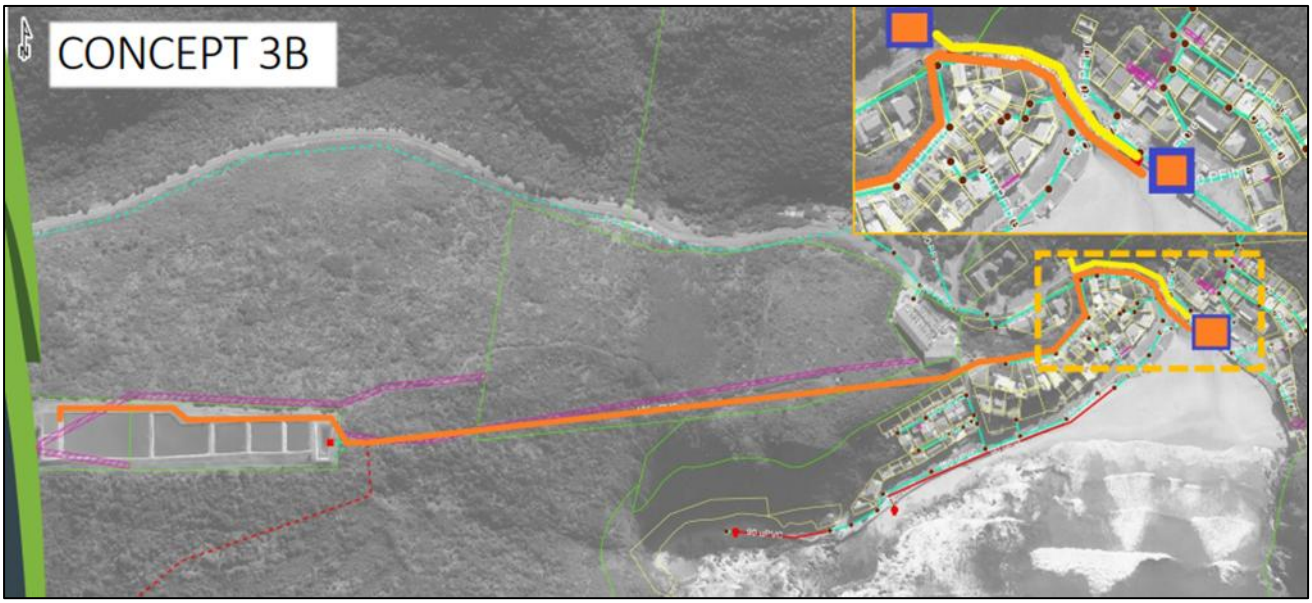


Figure 41: Preferred layout

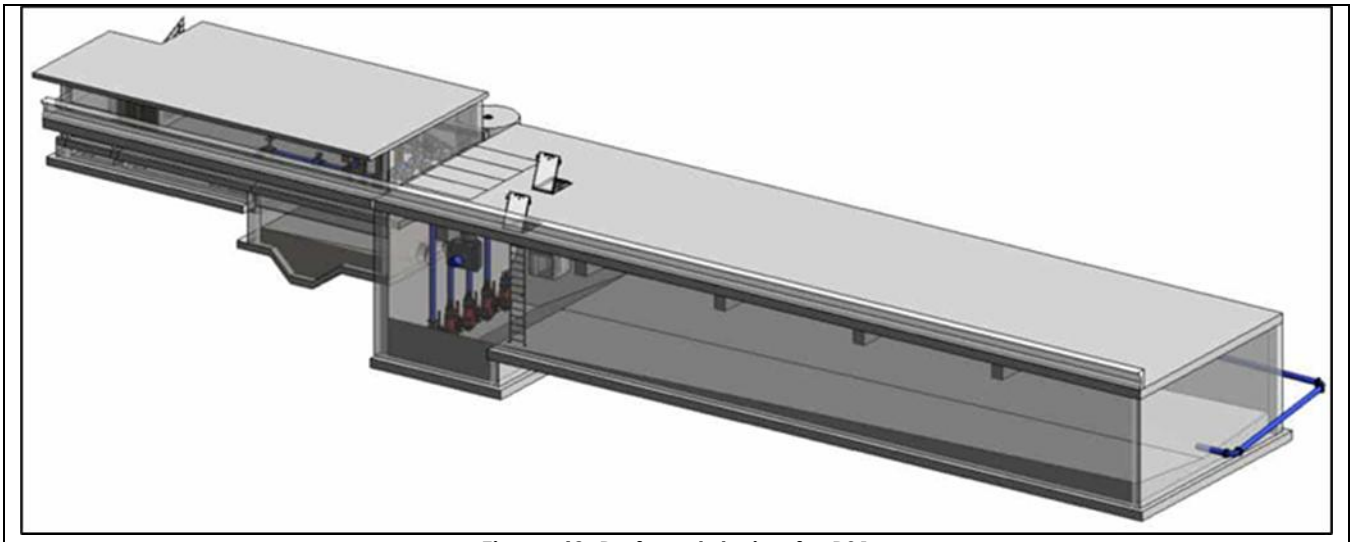


Figure 42: Preferred design for PS1

1. Construct new Pump station (PS4) next to Skimmelkrans Drive with an ultimate capacity of 52 L/s.
2. Construct new rising main between PS1 to PS4, approximately 185m in length with a capacity of 32ℓ/s.
3. Construct new rising main from PS4 to the WWTW, approximately approx. 1,470m in length, with a capacity of 52ℓ/s.
4. Upgrade PS1 to an ultimate capacity of 32l/s and with emergency storage

Provide a motivation for the preferred design or layout alternative.

The preferred design is to upgrade PS1 to :

- Upgrade the existing pump station's civil infrastructure to handle 32L/s (ultimate design flow) and the mechanical operating capacity from 5 L/s to 32 L/s. The average flow under normal circumstances will be 10l/s.
- Refurbish the entire pump station building and equipment, including all mechanical, electrical and electronic equipment. All structures are to be stormproof as far 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/assist/standby.
- Replace the odour control unit.
- Provide a new emergency storage tank.
- Provide an emergency generator supply, integrated from PS4, with existing supply as a backup
- 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.

The new rising main will start at PS1 and be installed adjacent to the existing pipeline and will be approx. 175m - 200m in length. The new pipeline route will follow the alignment of the existing pipeline with an offset of 2m.
The new pumping main will leave PS4 and follow Speckie Gericke Drive up to the intersection of Gus Meyer Avenue (0-220m). From there, it will follow the existing pipeline and servitude up the ridge to the WWTW (220m - 1,470m). Although the existing pipeline runs within the servitude, the width of the servitude is insufficient to accommodate the second pipeline. Accordingly, an additional servitude will have to be applied for. The extent of the additional servitude is 4m on the northern side of the existing servitude.

PS1 will pump to PS4, where the sewage will be screened and degritted, and pumped to WWTW. PS4 will have some emergency storage and house a generator to power both the PS1 and PS4.

The preferred pipeline route will follow the existing pipeline route.

This design will reduce malodorous activity on the beach front, reduce the risk of spillages onto the beach, and efficient removal of sewage from the beach front. The screening and degritting of sewage from PS4, will reduce the wear and tear on the high lift pumps.

Provide a detailed motivation if no design or layout alternatives exist.

N/A

List the positive and negative impacts that the design alternatives will have on the environment.

Table 5: Alternatives advantages and disadvantages

Advantages	Disadvantages
Concept 1	
No construction of new Pump Station 4, therefor Erf 116 would not be used.	All sewage overflows to beach front, limited emergency storage
	Vegetation disturbance
	Greater visual impact on the beachfront.
Concept 2	
Larges site available for PS4	Longer pipeline route – bigger vegetation disturbance
Increased sewage capacity	Two high pressure pumpstations
	Pipeline route along a new route– increased vegetation disturbance (not previously disturbed)
	Malodourous activities still at beach front with associated maintenance.
Concept 3A	
Increased sewage capacity	Vegetation disturbance (only along existing pipeline route)
Increased functionality and durability of sewage network	Malodourous activities at beach front
Uses existing structures (PS1 and existing rising mains)	Generator at beach front
	Grater visual impact on beach front
Preferred Concept 3B	
Increased sewage capacity	Vegetation disturbance
Increased functionality and durability of sewage network	Limited emergency storage – increased risk of spillage to beach
	Large pumpstation at beach front

1.4.	Technology alternatives (e.g., to reduce resource demand and increase resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred technology alternative:

Refer to the design alternative, the various designs are also regarded as different forms of technology.

Provide a description of any other technology alternatives investigated.

Not Applicable, refer to designs alternatives

Provide a motivation for the preferred technology alternative.

The preferred technology of the proposed upgrades was carefully selected by the applicant in consultation with the Engineers to match the specific demands of Herold's Bay while taking the physical constraints of the area into account.

Provide a detailed motivation if no alternatives exist.
Not Applicable, refer to designs alternatives
List the positive and negative impacts that the technology alternatives will have on the environment.
Not Applicable, refer to designs alternatives

1.5.	Operational alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred operational alternative.
Not Applicable
Provide a description of any other operational alternatives investigated.
Not Applicable
Provide a motivation for the preferred operational alternative.
Not Applicable
Provide a detailed motivation if no alternatives exist.
Not Applicable
List the positive and negative impacts that the operational alternatives will have on the environment.
Not Applicable

1.6.	The option of not implementing the activity (the 'No-Go' Option).

Provide an explanation as to why the 'No-Go' Option is not preferred.
Sewerage infrastructure must be maintained and periodically upgraded to ensure functionality and prevent breakdowns. If it is not upgraded and properly maintained sewerage will spill into the water course and ocean, waterborne diseases (cholera, shigella, hepatitis and dysentery) could be spread due to dysfunctional maintenance, drinkable water could be contaminated, and the sewerage system of Herold's Bay could break down completely resulting in reduction in attractiveness of the bay to tourists (blue flag beach).

1.7.	Provide and explanation as to whether any other alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist.

N/A

1.8.	Provide a concluding statement indicating the preferred alternatives, including the preferred location of the activity.

Taking the findings of the specialists into account, the impacts associated with Alternatives A and B are the same, as such the deciding factor for the Preferred Alternative A extends from Engineering input that Alternative A is the preferred alternative.

2. "No-Go" areas

Explain what "no-go" area(s) have been identified during identification of the alternatives and provide the co-ordinates of the "no-go" area(s).
The goal of the No-Go area for this proposal will be to limit the movement within the natural vegetation to the absolute minimum. The contractor will therefore be offered a reasonable working corridor of 10m to ensure labourer safety however all areas outside of the working footprint will be considered the No-Go area.

3. Methodology to determine the significance ratings of the potential environmental impacts and risks associated with the alternatives.

Describe the methodology to be used in determining and ranking the nature, significance, consequences, extent, duration of the potential environmental impacts and risks associated with the proposed activity or development and alternatives, the degree to which the impact or risk can be reversed and the degree to which the impact and risk may cause irreplaceable loss of resources.
The assessment criteria utilised in this environmental impact assessment is based on, and adapted from, the *Guideline on Impact Significance, Integrated Environmental Management Information Series 5* (Department of Environmental Affairs and Tourism (DEAT), 2002) and the *Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations* (DEAT, 2006). **Determination of Extent (Scale):**

Site specific	On site or within 100 m of the site boundary, but not beyond the property boundaries.

Local	The impacted area includes the whole or a measurable portion of the site and property, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g., neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to the construction phase.
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than 8 months after the completion of the construction phase.
Medium term	The impact will last up to the end of the construction phase, where after it will be entirely negated in a period shorter than 3 years after the completion of construction activities.
Long term	The impact will continue for the entire operational lifetime of the development but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.
Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.
Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No	The impact will be mitigated to the point where it is regarded to be insubstantial.

significance	
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures
Barely Reversible	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	The impact is irreversible, and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	The impact is reversible with implementation of minor mitigation measures
Can be partly mitigated	The impact is partly reversible but more intense mitigation measures
Can be barely mitigated	The impact is unlikely to be reversed even with intense mitigation measures
Not able to mitigate	The impact is irreversible, and no mitigation measures exist

Determination of Loss of Resources:

No loss of resource	The impact will not result in the loss of any resources
Marginal loss of resource	The impact will result in marginal loss of resources
Significant loss of resources	The impact will result in significant loss of resources
Complete loss of resources	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects
High	The impact would result in significant cumulative effects

Determination of Consequence significance:

Negligible	The impact would result in negligible to no consequences
Low	The impact would result in insignificant consequences
Medium	The impact would result in minor consequences
High	The impact would result in significant consequences

Impact Assessment Methodology used by the Aquatic Specialist

A desktop assessment was conducted to contextualise the watercourse in terms of its local and regional setting, and conservation planning. An understanding of the biophysical attributes and conservation and water resource management plans of the area assists in the assessment of the importance and sensitivity of the watercourse, the setting of management objectives and the assessment of the significance of anticipated impacts. The following data sources and GIS spatial information were consulted to inform the desktop assessment:

- National Freshwater Ecosystem Priority Area (NFEPA) atlas (Nel at al., 2011);
- Western Cape Biodiversity Spatial Plan (WCBSP, 2017);
- 1:50 000 Topographical Maps (CD:NGI, 2020); and
- Recent and historical satellite imagery (Google Earth).

Classification of the watercourse is important as this determines the PES and EIS assessment methodologies that can be applied. The watercourse was categorised into discrete hydrogeomorphic units (HGMs) based on their geomorphic characteristics, source of water and pattern of water flow through the watercourse. These HGMs were then classified according to Ollis et al. (2013).

The PES of the watercourse was assessed using the Index of Habitat Integrity (IHI; Kleynhans, 1996). The IHI was regarded as the most appropriate method for assessing riverine habitats as it is not dependent on flow in the watercourse and, therefore, produces results that are directly comparable across perennial and non-perennial systems. The IHI was developed as a rapid assessment of the severity of impacts on criteria affecting habitat integrity within a river reach. Instream (water abstraction; flow modification; bed modification; channel modification; physico-chemical modification; inundation; alien macrophytes; rubbish dumping) and riparian (vegetation removal, invasive vegetation, bank erosion, channel modification, water abstraction, inundation, flow modification, physico-chemistry) criteria are assessed as part of the index. Each of the criteria are given a score (from 0 to 25, corresponding to no and very high impact, respectively – Table 6) based on their degree of modification, along with a confidence rating based on the level of confidence in the score.

Weighting scores are used to assess the extent of modification for each criterion (x):

$$Weighted\ Score = \frac{IHI_X}{25} \times Weight_X$$

Where:

- IHI = rating score for the criteria (Table 6);
- 25 = maximum possible score for a criterion; and
- Weight = Weighting score for the criteria (Table 7).

The estimated impacts of all criteria calculated this way are summed, expressed as a percentage and subtracted from 100 to arrive at an assessment of habitat integrity for the instream and riparian components, respectively. An IHI class indicating the present ecological state of the river reach is then determined based on the resulting score (ranging from Natural to Critically Modified – Table 8).

Table 6: Descriptive classes for the assessment of habitat modifications (Kleynhans, 1996)

Impact Class	Description	Score
None	No discernible impact, or the modification is located in a way that has no impact on habitat quality, diversity, size and variability.	0
Small	The modification is limited to very few localities and the impact on habitat quality, diversity, size and variability are also very small.	1-5
Moderate	The modifications are present at a small number of localities and the impact on habitat quality, diversity, size and variability is limited.	6-10
Large	The modification is generally present with a clearly detrimental impact on habitat quality, diversity, size and variability. Large areas are, however, not influenced.	11-15
Serious	The modification is frequently present and the habitat quality, diversity, size and variability in almost the whole of the defined area are affected. Only small areas are not affected.	16-20
Critical	The modification is present overall with a high intensity. The habitat quality, diversity, size and variability in almost the whole of the defined section are influenced detrimentally.	21-25

Table 7: Criteria and weights used for the assessment of instream and riparian zone habitat integrity

Instream Criteria	Weight	Riparian Zone Criteria	Weight
Water abstraction	14	Indigenous vegetation removal	13
Flow modification	13	Exotic vegetation encroachment	12
Bed modification	13	Bank erosion	14
Channel modification	13	Channel modification	12
Water quality	14	Water abstraction	13
Inundation	10	Inundation	11
Exotic macrophytes	9	Flow modification	12
Exotic fauna	8	Water quality	13
Solid waste disposal	6		
TOTAL	**100**		**100**

Table 8: Index of habitat integrity (IHI) classes and descriptions

Integrity Class	Description	IHI Score (%)
A	Unmodified, natural.	> 90
B	Largely natural with few modifications. The flow regime has been only slightly modified and pollution is limited to sediment. A small change in natural habitats may have taken place. However, the ecosystem functions are essentially unchanged.	80 – 90
C	Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.	60 – 79
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	40 – 59
E	Seriously modified. The loss of natural habitat, biota and basic ecosystem functions is extensive.	20 – 39
F	Critically / Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.	0 - 19

The ecological importance and sensitivity (EIS) of the watercourse was assessed using a method developed by Kleynhans (1999). In summary, several biological and aquatic habitat determinants are assigned a score ranging from 1 (low importance or sensitivity) to 4 (high importance or sensitivity). These determinants include the following:

- Biodiversity support:
    - Presence of Red Data species;
    - Presence of unique instream and riparian biota;
    - Use of the ecosystem for migration, breeding or feeding.
- Importance in the larger landscape:
    - Protection status of the watercourse;
    - Protection status of the vegetation type;
    - Regional context regarding ecological integrity;
    - Size and rarity of the wetland types present;
    - Diversity of habitat types within the wetland.
- Sensitivity of the watercourse:
    - Sensitivity of watercourse to changes in flooding regime;
    - Sensitivity of watercourse to changes in low flow regime, and
    - Sensitivity to water quality changes.

The median value of the scores for all determinants is used to assign an EIS category according to Table 9.

Table 9: Ecological importance and sensitivity categories. Interpretation of average scores for biotic and habitat determinants.

Ecological Importance and Sensitivity Category (EIS)	Range of Median	Recommended Ecological Management Class
Very high: Quaternaries/delineations that are considered to be unique on a national or even international level based on unique biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually very sensitive to flow modifications and have no or only a small capacity for use.	>3 and <=4	A
High: Quaternaries/delineations that are considered to be unique on a national scale due to biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) may be sensitive to flow modifications but in some cases, may have a substantial capacity for use.	>2 and <=3	B
Moderate: Quaternaries/delineations that are considered to be unique on a provincial or local scale due to biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually not very sensitive to flow modifications and often have a substantial capacity for use	>1 and <=2	C
Low/marginal: Quaternaries/delineations that are not unique at any scale. These rivers (in terms of biota and habitat) are generally not very sensitive to flow modifications and usually have a substantial capacity for use.	>0 and <=1	D

Impact Assessment Methodology used by the Botanical Specialist

Each issue that is identified consists of components that on their own or in combination with each other give rise to potential impacts, either positive or negative, from the project onto the environment or from the environment onto the project. In the EIA the significance of the potential impacts is considered before and after identified mitigation is implemented, for direct, indirect, and cumulative impacts, in the short and long term.

A description of the nature of the impact, any specific legal requirements and the stage (construction/decommissioning or operation) were given. The following criteria was used to evaluate the significance of each issue that was identified:

Table 10: Geographical extent of impact

Rating	Extent	Description
1	Site	Impacted area is only at the site – the actual extent of the activity.
2	Local	Impacted area is limited to the site and its immediate surrounding area
3	Regional	Impacted area extends to the surrounding area, the immediate and the neighbouring properties.
4	Provincial	Impact considered of provincial importance
5	National	Impact considered of national importance – will affect entire country.

Table 11: Duration of Impact

Rating	Duration	Description
1	Short term	0–3 years, or length of construction period
2	Medium term	3–10 years
3	Long term	>10 years, or entire operational life of project.
4	Permanent – mitigated	Mitigation measures of natural process will reduce impact – impact will remain after operational life of project.
5	Permanent – no mitigation	No mitigation measures of natural process will reduce the impact after implementation – impact will remain after operational life of project.

Table 12: Intensity of Impact

Rating	Intensity	Description
1	Negligible	Change is slight, often not noticeable, natural functioning of environment not affected.
2	Low	Natural functioning of environment is minimally affected. Natural processes can be reversed to their original state.
3	Medium	Environment remarkably altered, still functions, if in modified way. Negative impacts cannot be fully reversed.
4	High	Natural functions and processes disturbed – potentially ceasing to function temporarily.
5	Very high	Natural functions and processes permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.

Table 13: Potential for irreplaceable loss of resources

Rating	Potential for irreplaceable loss	Description
1	Low	No irreplaceable natural resources will be impacted.
3	Medium	Natural resources can be replaced, with effort.
5	High	There is no potential for replacing a particular vulnerable resource that will be impacted.

Table 14: Probability of Impact

Rating	Probability	Description
1	Improbable	Under normal conditions, no impacts expected.
2	Low	The probability of the impact to occur is low due to its design or historic experience.
3	Medium	There is a distinct probability of the impact occurring.
4	High	It is most likely that the impact will occur.
5	Definite	The impact will occur regardless of any prevention measures.

Table 15: Confidence in level of knowledge or information

Rating	Confidence	Description
	Low	Judgement based on intuition, not knowledge/information.
	Medium	Common sense and general knowledge inform decision.
	High	Scientific/proven information informs decision.

Table 16: Significance of issues (based on parameters)

Rating	Significance	Description
1-14	Very low	No action required.
15-29	Low	Impacts are within the acceptable range.
30-44	Medium-low	Impacts are within the acceptable range but should be mitigated to lower significance levels wherever possible.
45-59	Medium-high	Impacts are important and require attention; mitigation is required to reduce the negative impacts to acceptable levels.
60-80	High	Impacts are of great importance, mitigation is crucial.
81-100	Very high	Impacts are unacceptable.

Impact Assessment Methodology used by the Terrestrial Faunal and Avifaunal Specialist

The assessment criteria for this impact assessment were based on, and adapted from, the Guideline on Impact Significance, Integrated Environmental Management Information Series 5, Department of Environmental Affairs and Tourism (DEAT, 2002) and the Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations (DEAT, 2006).

Table 17: Determination of Consequence significance

Negligible	The impact would result in negligible to no consequences
Low	The impact would result in insignificant consequences
Medium	The impact would result in minor consequences
High	The impact would result in significant consequences

Table 18: Determination of Cumulative Impact

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects
High	The impact would result in significant cumulative effects

Table 19: Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Table 20: Determination of Significance (with mitigation)

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Impact Assessment Methodology used by the Geotechnical Specialist

The following methodology was adopted in order to realise the aims of this study:

- A review of available geological and geotechnical records including aerial photography, topographical mapping, site plans, previous geotechnical reports and experience of the area
- A general site walk-over
- Geotechnical site investigation, including trial holes and rotary core boreholes
- Laboratory testing of soil samples and rock core samples to establish material design parameters

Impact Assessment Methodology used by the Geohydrological Specialist

A standardised and internationally recognised methodology has been developed. This methodology will be applied in this study to assess the significance of the potential environmental impacts of the proposed development.

For each predicted impact, certain criteria are applied to establish the likely significance of the impact, firstly in the case of no mitigation being applied and then with the most effective mitigation measure(s) in place.

These criteria include the intensity (size or degree scale), which also includes the type of impact, being either a positive or negative impact; the duration (temporal scale); and the extent (spatial scale). For each predicted impact, the specialist applies professional judgement in ascribing a numerical rating for each of these criteria respectively as per Table 21, Table 22 and Table 23 below. These numerical ratings are used in an equation whereby the consequence of the impact can be calculated. Consequence is calculated as follows:

Consequence = type x (intensity + duration + extent)

Table 21: Definition of Intensity ratings.

Rating	Criteria	
	Negative impacts (Type of impact = -1)	Positive impacts (Type of impact = +1)
7	Irreparable damage to biophysical and / or social systems. Irreplaceable loss of species.	Noticeable, on-going benefits to which have improved the quality and extent of biophysical and / or social systems, including formal protection.
6	Irreparable damage to biophysical and / or social systems and the contravention of legislated standards.	Great improvement to ecosystem processes and services.
5	Very serious impacts and irreparable damage to components of biophysical and / or social systems.	On-going and widespread positive benefits to biophysical and / or social systems.
4	On-going damage to biophysical and / or social system components and species.	Average to intense positive benefits for biophysical and / or social systems.
3	Damage to biophysical and / or social system components and species.	Average, on-going positive benefits for biophysical and / or social systems.
2	Minor damage to biophysical and / or social system components and species. Likely to recover over time. Ecosystem processes not affected.	Low positive impacts on biophysical and / or social systems.
1	Negligible damage to individual components of biophysical and / or social systems.	Some low-level benefits to degraded biophysical and / or social systems.

Table 22: Definition of Duration ratings.

Rating	Criteria
7	**Permanent:** The impact will remain long after the life of the project
6	**Beyond project life**: The impact will remain for some time after the life of the project
5	**Project Life:** The impact will cease after the operational life span of the project
4	**Long term**: 6-15 years
3	**Medium term:** 1-5 years
2	**Short term:** Less than 1 year
1	**Immediate**: Less than 1 month

Table 23: Definition of Extent ratings.

Rating	Criteria
7	**International:** The effect will occur across international borders
6	**National:** Will affect the entire country
5	**Province/ Region:** Will affect the entire province or region
4	**Municipal Area:** Will affect the whole municipal area
3	**Local:** Extending across the site and to nearby settlements
2	**Limited:** Limited to the site and its immediate surroundings
1	**Very limited:** Limited to specific isolated parts of the site

Depending on the numerical result, the impact's consequence would be defined as either extremely, highly, moderately or slightly detrimental; or neutral; or slightly, moderately, highly or extremely beneficial. These categories are provided in Table 46.

Table 24: Application of Consequence ratings

Range		Significance rating
-21	-18	Extremely detrimental
-17	-14	Highly detrimental
-13	-10	Moderately detrimental
-9	-6	Slightly detrimental
-5	5	Negligible
6	9	Slightly beneficial
10	13	Moderately beneficial
14	17	Highly beneficial
18	21	Extremely beneficial

To calculate the significance of an impact, the probability (or likelihood) of that impact occurring is also taken into account. The most suitable numerical rating for probability is selected from Table 25 below and applied with the consequence as per the equation below:

Significance = consequence x probability

Table 25: Definition of Probability ratings.

Rating	Criteria
7	**Certain/ Definite:** There are sound scientific reasons to expect that the impact will definitely occur
6	**Almost certain/Highly probable:** It is most likely that the impact will occur
5	**Likely:** The impact may occur
4	**Probable:** Has occurred here or elsewhere and could therefore occur
3	**Unlikely:** Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
2	**Rare/ improbable:** Conceivable, but only in extreme circumstances and/ or has not happened during lifetime of the project but has happened elsewhere. The possibility of the impact manifesting is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	**Highly unlikely/None:** Expected never to happen.

Depending on the numerical result, the impact would fall into a significance category as negligible, minor, moderate or major, and the type would be either positive or negative. These categories are provided in Table 26. Despite attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, environmental assessment processes can never escape the subjectivity inherent in attempting to define significance. The determination of the significance of an impact depends on both the context (spatial scale and temporal duration) and intensity of that impact. Since the rationalisation of context and intensity will ultimately be prejudiced by the observer, there can be no wholly objective measure by which to judge the components of significance, let alone how they are integrated into a single comparable measure.

Table 26: Application of Significance ratings

Range		Significance rating
-147	-109	Major - negative
-108	-73	Moderate - negative
-72	-36	Minor - negative
-35	-1	Negligible - negative
0	0	Neutral
1	35	Negligible - positive
36	72	Minor - positive
73	108	Moderate - positive
109	147	Major - positive

4. Assessment of each impact and risk identified for each alternative

Note: The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. The EAP may decide to include this section as Appendix J to this BAR.

Development/Construction Phase Impacts

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT OF CONSTRUCTION ACTIVITIES ON HABITAT AND WATER QUALITY.			
Potential impact and risk:	**POLLUTION OF WATERCOURSES THROUGH LEAKAGE OF FUELS, OILS, AND OTHER POLLUTANTS FROM VEHICLES AND CONSTRUCTION MACHINERY, OR FROM WASHING OF EQUIPMENT AND VEHICLES, THE PRESENCE OF CONSTRUCTION WORKERS ON SITE WILL REQUIRE THE NEED FOR APPROPRIATE ABLUTION FACILITIES. POOR MANAGEMENT OF THESE FACILITIES COULD POTENTIALLY LEAD TO SEWAGE SPILLS OR LEAKS WHICH COULD CONTAMINATE WATERCOURSES, STORAGE OF CONSTRUCTION MATERIALS OR THE TEMPORARY LAY-DOWN OF EQUIPMENT WITHIN AN AREA THAT DRAINS IN THE DIRECTION OF THE WATERCOURSE, DUMPING OF EXCAVATED MATERIAL INTO THE WATERCOURSE, POOR MANAGEMENT OF WASTE GENERATED DURING CONSTRUCTION ACTIVITIES, INCREASED PEDESTRIAN AND VEHICULAR TRAFFIC IN CLOSE PROXIMITY TO WATERCOURSES; AND MIXING OF CONCRETE OR CEMENT IN OR IN CLOSE PROXIMITY TO WATERCOURSES.**		
Nature of impact:	Negative	Negative	**No Impact**
Extent and duration of impact:	• Short term • Limited extent	• Short term • Limited extent	
Consequence of impact or risk:	Low - Impacts would result in low consequences.	Low - Impacts would result in low consequences.	
Probability of occurrence:	Likely	Likely	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	Low	Low	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Minor (-)**	**Minor (-)**	**No Impact**
Degree to which the impact can be avoided:	High	High	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	None identified.	None identified.	
Cumulative impact post mitigation:	None identified.	None identified.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Negligible**	**Negligible**	**No Impact**

Mitigation Measures:

- 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; (This will be not possible to achieve due to the location of the sites)
- 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;
- The area(s) chosen for the stockpiling of imported building materials should be demarcated, and notices put up declaring what must be stockpiled where.
- Chemical toilets should be provided on-site at 1 toilet per 10 persons;
- Waste from chemical toilets must be disposed of regularly (at least once a week) in a responsible manner by a registered waste contractor;
- 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;
- 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.;
- 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.

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT OF CONSTRUCTING NEW RISING MAIN ACROSS THE ESTUARINE ZONE ON HABITAT AND WATER QUALITY.			
Potential impact and risk:	**THE NEW RISING MAIN WILL CROSS THE ESTUARINE ZONE ALONGSIDE THE EXISTING RISING MAIN. THE PIPELINE WILL BE ELEVATED ABOVE THE ESTUARINE ZONE AND NO EXCAVATION OF THE BED WILL BE REQUIRED. THE BANKS HAVE ALREADY BEEN TRANSFORMED AND ARE CANALISED BY A COMBINATION OF CONCRETE RETAINING WALL AND GABION STRUCTURES.**		
Nature of impact:	Negative	Negative	**No Impact**
Extent and duration of impact:	• Short term • Limited extent	• Short term • Limited extent	
Consequence of impact or risk:	Low - Impacts would result in low consequences.	Low - Impacts would result in low consequences.	
Probability of occurrence:	Probably	Probably	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	Low	Low	
Significance rating of impact prior to mitigation	**Minor (-)**	**Minor (-)**	**No Impact**

(e.g. Low, Medium, Medium-High, High, or Very-High)			
Degree to which the impact can be avoided:	Low	Low	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	• UV resistant material must be used for the section of pipeline crossing the estuary to ensure long-term lifespan. • A steel bridge will be constructed to support the pipeline and provide protection against storm surges and flooding. • 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.		
Residual impacts:	None identified.	None identified.	
Cumulative impact post mitigation:	None identified.	None identified.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Negligible**	**Negligible**	**No Impact**

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT OF CONSTRUCTION OF THE RISING MAIN ALONG SKIMMELKRANS LANE ON HABITAT AND WATER QUALITY			
Potential impact and risk:	**SURFACE RUNOFF THROUGH EXCAVATED SECTION OF THE ROAD SURFACE COULD LEAD TO INPUT OF SEDIMENT AND OTHER CONSTRUCTION MATERIALS INTO THE WATERCOURSE.**		
Nature of impact:	Negative	Negative	**No Impact**
Extent and duration of impact:	• Short term • Limited extent	• Short term • Limited extent	
Consequence of impact or risk:	Low - Impacts would result in low consequences.	Low - Impacts would result in low consequences.	
Probability of occurrence:	Probably	Probably	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	Low	Low	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Minor (-)**	**Minor (-)**	**No Impact**
Degree to which the impact can be avoided:	High	High	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	

Proposed mitigation:	See below		
Residual impacts:	None identified.	None identified.	
Cumulative impact post mitigation:	None identified.	None identified.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Negligible**	**Negligible**	**No Impact**

Mitigation Measures:

- No dumping of waste materials in the watercourse (Alternative A and B);
- Works should preferably be scheduled for the dry season to reduce the likelihood of flooding and or stormwater flows through construction areas (Alternative A and B); (This will not be possible)
- 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 (Alternative A);
- Any diversion of surface runoff must not cause erosion to the bed and banks of the watercourse Alternative A);
- A construction schedule must be clearly defined and broken down into phases, to avoid multiple sites being exposed simultaneously. The completion date for each phase of development must be indicated and all excavation and final/temporary road resurfacing operations must be completed before moving onto the next phase (Alternative A);
- No construction materials to be stockpiled in the watercourse (Alternative B);
- All waste materials must be removed from the watercourse (Alternative B);
- UV resistant material should be used for the exposed section of pipeline to ensure long-term lifespan (Alternative B);
- Areas where instream access is required must be confined to clearly demarcated areas to prevent unnecessary disturbance of instream and riparian habitat outside of these areas (Alternative B)

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
TERRESTRIAL FAUNAL AND AVIFAUNAL SPECIES			
Potential impact and risk:	**DESTRUCTION OF HABITAT, DIRECT MORTALITY OF FAUNA, VIBRATION, NOISE**		
Nature of impact:	Negative	Negative	A high incidence of alien and invasive vegetation over a small portion of the site.
Extent and duration of impact:	These impacts will be site specific and restricted to the proposed project footprint, albeit over a slightly larger area than Alternative B. These impacts will also be temporary and will cease at the end of the construction phase.	These impacts will be site specific and restricted to the proposed project footprint. These impacts will also be temporary and will cease at the end of the construction phase.	A high incidence of alien and invasive vegetation is restricted to a small portion of the project footprint, and a small part to the north of the site. This impact may be managed over a relatively short

			period by human actions.
Consequence of impact or risk:	Low - Impacts would result in insignificant consequences.	Low - Impacts would result in insignificant consequences.	This small area of alien and invasive vegetation may result in insignificant consequences over a short Period (consumption of fresh water and degradation of the natural vegetation).
Probability of occurrence:	It is probable that these impacts will occur due to a slightly larger footprint and vegetation clearing by machinery, but the project footprint will still be of a spatially limited nature and the impacts of a very short duration.	It is improbable that these impacts will occur due to circumstances and design (a spatially limited project footprint and a very short duration of the impact).	Probable - There is a possibility that the impact will occur to the extent that provisions must therefore be made (i.e., clearing of alien and invasive vegetation).
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	Alien and invasive vegetation may cause a consumption of fresh water and degradation of the natural vegetation.
Degree to which the impact can be reversed:	Partly Reversible	Completely Reversible	Completely Reversible
Indirect impacts:	None identified.	None identified.	None identified.
Cumulative impact prior to mitigation:	Low	Low	Low
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium (-)**	**Low (-)**	**Low (-)**
Degree to which the impact can be avoided:	N/A	N/A	N/A
Degree to which the impact can be managed:	N/A	N/A	High
Degree to which the impact can be mitigated:	High	High	N/A
Proposed mitigation:	Destruction of habitat should be limited to the smallest project footprint possible (i.e., minimisation mitigation). The 10m-12m working area footprint should be rehabilitated and allowed to regenerate naturally. In addition, every effort should be made to save and	Destruction of habitat should be limited to the smallest project footprint possible (i.e., minimisation mitigation). This footprint should be rehabilitated and allowed to regenerate naturally. In addition, every effort should be made to save and relocate any mammal,	Alien and invasive vegetation should be cleared by hand and all regrowth and seed germination be monitored any new recruitment should be removed.

	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. Vibration and noise through machinery, vehicles and people are unavoidable during the construction and no mitigation measures are suggested.	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. Vibration and noise through machinery, vehicles and people are unavoidable during the construction and no mitigation measures are suggested.	
Residual impacts:	None identified.	None identified.	None identified.
Cumulative impact post mitigation:	None identified.	None identified.	None identified.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)** The impact will be mitigated to the point where it is of limited importance.	**No significance** The impact will be mitigated to the point where it is regarded to be insubstantial.	**No significance** The impact will be mitigated to the point where it is regarded to be insubstantial.

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT ON FLORA AND SCC AND PROTECTED TREE SPECIES			
Potential impact and risk:	**LOSS OF INDIGENOUS FLORA, SCC AND PROTECTED TREE SPECIES**		
Nature of impact:	Negative A 570 m long strip of degraded granite fynbos and a 110 m strip of good quality coastal thicket. Earthworks (trenching) will be required. A 10-12 m wide strip will be disturbed during the construction phase, of which a 3 m wide strip will remain for a maintenance road.	Negative 570 m strip of degraded granite fynbos and a 110 m strip of good quality coastal thicket.	No Impact
Extent and duration of impact:	• Development footprint extent	• Development footprint extent	

	• Medium term duration	• Medium term duration	
Consequence of impact or risk:	Medium	Medium	
Probability of occurrence:	High	High	
Degree to which the impact may cause irreplaceable loss of resources:	Medium	Medium	
Degree to which the impact can be reversed:	Medium-high	Medium-high	No impact
Indirect impacts:	None identified	None identified	
Cumulative impact prior to mitigation:	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the linear nature of the project and the potential for rehabilitation.	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the linear nature of the project and the potential for rehabilitation.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-low (-)**	**Medium-low (-)**	**No Impact**
Degree to which the impact can be avoided:	Medium	Medium	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below	See below	
Residual impacts:	Minimal	Minimal	
Cumulative impact post mitigation:	There should be no cumulative impact if rehabilitation is successful.	There should be no cumulative impact if rehabilitation is successful.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**

Mitigation Measures:

- 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 fisheries and Environment. It is recommended that the protected trees be marked prior to the start of construction activities.
- 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.

Alternative:	Preferred alternative A	Alternative B	No-Go Alternative
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT ON TERRESTRIAL BIODIVERSITY			
Potential impact and risk:	**DISTURBANCE OF VEGETATION, IMPACT ON BIODIVERSITY NETWORK, INCREASED OPPORTUNITY FOR ALIEN INFESTATION, EROSION ON THE STEEPER SLOPES DUE TO POOR REHABILITATION EFFORTS**		
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	• Construction footprint and immediate surroundings • Short to medium term duration	• Construction footprint and immediate surroundings • Short to medium term duration	
Consequence of impact or risk:	Medium	Medium	
Probability of occurrence:	High	High	
Degree to which the impact may cause irreplaceable loss of resources:	Medium	Medium	
Degree to which the impact can be reversed:	Medium	Medium-high	No impact
Indirect impacts:	Non identified	Non identified	
Cumulative impact prior to mitigation:	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the linear nature of the project and the potential for rehabilitation.	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the linear nature of the project and the potential for rehabilitation.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-low (-)**	**Medium-low (-)**	**No Impact**
Degree to which the impact can be avoided:	Cannot be avoided	Cannot be avoided	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	Minimal	Minimal	
Cumulative impact post mitigation:	There should be no cumulative impact if rehabilitation is successful.	There should be no cumulative impact if rehabilitation is successful.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- During the construction phase, demarcate/fence off the construction footprint. Restrict all construction activities, such as stockpiling, parking and cement mixing, to already disturbed areas away from natural vegetation. The contractor(s) must be made aware of the sensitive surroundings and the presence of SCC and protected trees. The thicket and fynbos outside the footprint must be declared a 'no-go' area and not be disturbed in any way.
- 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.
- Avoid trenching in the steeper thicket areas. Install the pipelines above ground by using plinths, etc. The applicant has subsequently stated that plinths will not be viable due to financial and engineering constraints.
- 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.

Please note that the proposal has changed since the ground water impact assessment was undertaken, there will now not be any underground fuel storage for the facility, as such all mitigation measures relating to the Underground Storage Tank (UST) will be excluded from the EMPr.

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT ON GROUNDWATER			
Potential impact and risk:	**SPILLAGES OF DIESEL, PETROL, OIL, PAINTS, CLEARS AND OTHER HARMFUL CHEMICALS. THESE SUBSTANCES MAY POTENTIALLY PERCOLATE INTO THE GROUNDWATER AND ENTER THE SURROUNDING ENVIRONMENT.**		
Nature of impact:	Negative		No Impact
Extent and duration of impact:	• Construction footprint and immediate surroundings • Short to medium term duration		
Consequence of impact or risk:	• Slightly detrimental without mitigation • Negligible with mitigation		
Probability of occurrence:	Probable		
Degree to which the impact may cause irreplaceable loss of resources:	Medium		
Degree to which the impact can be reversed:	Medium-high		No impact
Indirect impacts:	Non identified		
Cumulative impact prior to mitigation:	Since the impact is negligible negative with mitigation, cumulative impacts to groundwater with other projects are not anticipated.		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Minor (-)**		**No Impact**
Degree to which the impact can be avoided:	Cannot be avoided		
Degree to which the impact can be managed:	High		
Degree to which the impact can be mitigated:	High		
Proposed mitigation:	See below		
Residual impacts:	Minimal		
Cumulative impact post mitigation:	There should be no cumulative impact.		
Significance rating of impact after mitigation	**Negligible (-)**		**No Impact**

(e.g. Low, Medium, Medium-High, High, or Very-High)		

Mitigation measures to reduce residual risk or enhance opportunities:

- Install the UST according to applicable national SANS standards.
- Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies.
- Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.
- Cover stockpiles of building materials like cement, sand and other powders.
- Regularly inspect stockpiles for spillages and store away from waterways or drainage areas.
- Collect any wastewater generated from site activities during construction in settlement tanks then screen, discharge the clean water, and dispose of remaining sludge according to environmental regulations.

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT ON CAPITAL EXPENDITURE DUE TO CONSTRUCTION COSTS			
Potential impact and risk:	**IT IS ANTICIPATED THAT CONSTRUCTION RELATED COSTS WILL BE IN THE REGION OF R50 MILLION TO R68 MILLION**		
Nature of impact:	Positive		No Impact
Extent and duration of impact:	• Local • Short – long term		
Consequence of impact or risk:	Capital influx for businesses involved and knock on effect as the businesses that will supply services and materials for the development will benefit from the capital influx and job creation.		
Probability of occurrence:	Definite		
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource		
Degree to which the impact can be reversed:			No impact
Indirect impacts:	Growth for business involved in the development and general influx of capital into the construction sector support industries		
Cumulative impact prior to mitigation:			
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low-medium (+)**		**No Impact**
Degree to which the impact can be avoided:			
Degree to which the impact can be managed:	Can be managed by encouraging proponent to support local business		
Degree to which the impact can be mitigated:	Support of local businesses can be encouraged but not guaranteed.		
Proposed mitigation:	Local business should be supported as far as possible		
Residual impacts:	Certain services or materials may need to be sourced from outside of the George Municipal area		
Cumulative impact post mitigation:			
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium (+)**		**No Impact**

Alternative:	Preferred alternative A	Alternative B	No-Go Alternative
PLANNING, DESIGN AND DEVELOPMENT PHASE			
IMPACT GENERATED BY CONSTRUCTION ACTIVITIES			
Potential impact and risk:	**CONSTRUCTION RELATED NOISE AND TRAFFIC CONGESTION**		
Nature of impact:	Negative		No Impact
Extent and duration of impact:	• Local • Temporary		
Consequence of impact or risk:	Negligible • Frustrations and disruptions experienced by surrounding landowners • Detract from sense of place (peacefulness)		
Probability of occurrence:	Definite		
Degree to which the impact may cause irreplaceable loss of resources:	No loss of resource		
Degree to which the impact can be reversed:	High		No impact
Indirect impacts:	None identified		
Cumulative impact prior to mitigation:	• Residents not being able to commute to or from their houses during construction hours • Nuisance from construction noise at inappropriate hours		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium (-)**		**No Impact**
Degree to which the impact can be avoided:	Not avoidable		
Degree to which the impact can be managed:	Medium		
Degree to which the impact can be mitigated:	Medium		
Proposed mitigation:	• Restricting construction activities to weekdays from 8am to 5pm • Only working during off seasons to limit traffic disturbances and congestion • Implementing a stop and go system in Skimmelkrans Drive		
Residual impacts:	Non-identified		
Cumulative impact post mitigation:	• Better traffic flow • Less noise disturbance		
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**		**No Impact**

Operational Phase Impacts

Alternative:	Preferred alternative A	Alternative B	No-Go Alternative
OPERATIONAL PHASE			
IMPACT ON WATER QUALITY			
Potential impact and risk:	**LEAKS CAUSED BY DAMAGE TO THE PIPELINE**	**VANDALISM OR DAMAGE DURING EXTREME FLOODING EVENTS RESULTING IN DISCHARGE OF UNTREATED SEWAGE INTO THE WATERCOURSE**	
Nature of impact:	Negative	Negative	**No Impact**
Extent and duration of impact:	Brief duration with very limited extent.	Brief duration with limited extent.	
Consequence of impact or risk:	Low	Low	
Probability of occurrence:	Unlikely	Likely	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	Loss/damage to biodiversity	Loss/damage to biodiversity	
Cumulative impact prior to mitigation:	Pollution to surrounding environment	Pollution to surrounding environment	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Negligible**	**Minor (-)**	**No Impact**
Degree to which the impact can be avoided:	High	High	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	No mitigation required.	The pipeline must be routinely inspected following extreme weather events, with the aim of responding rapidly to damaged infrastructure.	
Residual impacts:	None identified.	None identified.	
Cumulative impact post mitigation:	None identified.	None identified.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Negligible**	**Minor (-)**	**No Impact**

Alternative:	Preferred alternative A	Alternative B	No-Go Alternative
OPERATIONAL PHASE			
TERRESTRIAL FAUNAL AND AVIFAUNAL SPECIES			
Potential impact and risk:	**THE PERMANENT ACCESS ROAD MAY LEAD TO VEHICLES AND FOOT TRAFFIC INTO PARTS OF THE SITE WHICH HAVE PREVIOUSLY BEEN INACCESSIBLE. THIS MAY CAUSE COLLISION OF FAUNA WITH VEHICLES, ILLEGAL WASTE DUMPING, ILLEGAL HUNTING, AND THE POTENTIAL OF A FIRE RISK THROUGH OPEN FIRES.**	**THE TEMPORARY ACCESS ROAD AND / OR NEW RISING MAIN FOOTPRINT MAY LEAD TO VEHICLES AND FOOT TRAFFIC INTO PARTS OF THE SITE WHICH HAVE PREVIOUSLY BEEN INACCESSIBLE. THIS MAY CAUSE COLLISION OF FAUNA WITH VEHICLES, ILLEGAL WASTE DUMPING, ILLEGAL HUNTING, AND THE POTENTIAL OF A FIRE RISK THROUGH OPEN FIRES.**	
Nature of impact:	Negative	Negative	**No Impact**
Extent and duration of impact:	These impacts will be site specific but will continue for the entire operational lifetime of the development unless managed / mitigated by direct human action.	These impacts will be site specific and will persist over a short term through mitigation and through natural processes.	
Consequence of impact or risk:	Medium	Medium	
Probability of occurrence:	Probable - There is a possibility that the impact will occur to the extent that provisions must therefore be made.	Probable - There is a possibility that the impact will occur to the extent that provisions must therefore be made.	
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss of resource	Marginal loss of resource	
Degree to which the impact can be reversed:	Completely Reversible	Completely Reversible	
Indirect impacts:	Vehicles and foot traffic into parts of the site which have previously been inaccessible, collision of fauna with vehicles, illegal waste dumping, illegal hunting, and the potential of a fire risk through open fires.	Vehicles and foot traffic into parts of the site which have previously been inaccessible, collision of fauna with vehicles, illegal waste dumping, illegal hunting, and the potential of a fire risk through open fires.	
Cumulative impact prior to mitigation:	Negligible	Negligible	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-High (-)**	**Medium-High (-)**	**No Impact**
Degree to which the impact can be avoided:	N/A	N/A	
Degree to which the impact can be managed:	N/A	N/A	
Degree to which the impact can be mitigated:	High	High	

Proposed mitigation:	Access control of the permanent access road.	Access control of the permanent access road and / or new rising main footprint.	
Residual impacts:	None identified.	None identified.	
Cumulative impact post mitigation:	None identified.	None identified.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**No significance**	**No significance**	**No Impact**

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
OPERATIONAL PHASE			
IMPACT ON TERRESTRIAL BIODIVERSITY			
Potential impact and risk:	**INCREASED ALIEN INFESTATION**		
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	• Construction footprint and immediate surroundings • Short to medium term duration	• Construction footprint and immediate surroundings • Short to medium term duration	
Consequence of impact or risk:	Decrease in biodiversity	Decrease in biodiversity	
Probability of occurrence:	High	High	
Degree to which the impact may cause irreplaceable loss of resources:	Medium-Low	Medium-low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	Decrease in biodiversity, Increased alien infestation.	Decrease in biodiversity, Increased alien infestation.	
Cumulative impact prior to mitigation:	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the already degraded state of the site, the linear nature of the project and the potential for rehabilitation. There should be no cumulative impact if rehabilitation is successful.		
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-low (-)**	**Medium-low (-)**	**No Impact**
Degree to which the impact can be avoided:	Cannot be avoided	Cannot be avoided	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	The residual impact will be minimal.		
Cumulative impact post mitigation:	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the already degraded state of the site, the linear nature of the		

	project and the potential for rehabilitation. There should be no cumulative impact if rehabilitation is successful.		
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- Remove topsoil and/or seed-bearing 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.
- 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. 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.
- 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.
- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction.

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
OPERATIONAL PHASE			
IMPACT ON TERRESTRIAL BIODIVERSITY			
Potential impact and risk:	**ALIEN INFESTATION AND RESULTING DISPLACEMENT OF INDIGENOUS FLORA**		
Nature of impact:	Negative	Negative	No Impact
Extent and duration of impact:	• Construction footprint and immediate surroundings • Medium term duration	• Construction footprint and immediate surroundings • Medium term duration	
Consequence of impact or risk:	Decrease in biodiversity	Decrease in biodiversity	
Probability of occurrence:	High	High	
Degree to which the impact may cause irreplaceable loss of resources:	Medium	Medium	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	Decrease in biodiversity, Increased alien infestation.	Decrease in biodiversity, Increased alien infestation.	
Cumulative impact prior to mitigation:	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the already degraded state of the site, the linear nature of the project and the potential for rehabilitation. There should be no cumulative impact if rehabilitation is successful.		
Significance rating of impact prior to mitigation	**Medium-low (-)**	**Medium-low (-)**	**No Impact**

(e.g. Low, Medium, Medium-High, High, or Very-High)			
Degree to which the impact can be avoided:	Medium	Medium	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	The residual impact will be minimal.		
Cumulative impact post mitigation:	The continued erosion of Garden Route Granite Fynbos and the biodiversity network as a result of construction activities. In this instance, the loss of biodiversity and resultant cumulative impact is considered small (acceptable) due to the already degraded state of the site, the linear nature of the project and the potential for rehabilitation. There should be no cumulative impact if rehabilitation is successful.		
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- Search and rescue succulents and bulbs from the construction footprint for replanting in the disturbed areas after construction. Topsoil, cuttings and seed-bearing 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.

Please note that the proposal has changed since the ground water impact assessment was undertaken, there will now not be any underground fuel storage for the facility, as such all mitigation measures relating to the Underground Storage Tank (UST) will be excluded from the EMPr.

Alternative:	**Preferred alternative A**	**Alternative B**	**No-Go Alternative**
OPERATIONAL PHASE			
IMPACT ON GROUNDWATER			
Potential impact and risk:	**SPILLAGES OF DIESEL, OIL AND OTHER HARMFUL CHEMICALS. LEAKAGE FROM UNDERGROUND DIESEL STORAGE TANK (UST) AND ASSOCIATED PIPEWORK. THESE SUBSTANCES MAY POTENTIALLY PERCOLATE INTO THE GROUNDWATER AND ENTER THE SURROUNDING ENVIRONMENT.**		
Nature of impact:	Negative		No Impact
Extent and duration of impact:	• Construction footprint and immediate surroundings • Short to medium term duration		
Consequence of impact or risk:	Slightly detrimental without mitigation Negligible with mitigation		
Probability of occurrence:	Probable: Has occurred here or elsewhere and could therefore occur		
Degree to which the impact may cause irreplaceable loss of resources:	Medium		
Degree to which the impact can be reversed:	Medium		

Indirect impacts:	Non identified	
Cumulative impact prior to mitigation:	Since the impact is negligible negative with mitigation, cumulative impacts to groundwater with other projects are not anticipated.	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Minor (-)**	**No Impact**
Degree to which the impact can be avoided:	High	
Degree to which the impact can be managed:	High	
Degree to which the impact can be mitigated:	High	
Proposed mitigation:	See below	
Residual impacts:	Non identified	
Cumulative impact post mitigation:	Since the impact is negligible negative with mitigation, cumulative impacts to groundwater with other projects are not anticipated.	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Negligible (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- All areas where potential spillages may occur are to be paved and cemented.
- Maintain operation of the fuelling station as per national standards.
- Set up a comprehensive monitoring system, such as observation boreholes, to detect any leakages/groundwater chemistry changes on-site.
- Install shallow aquifer piezometers in close proximity to the UST to be monitored regularly for any leakages.
- 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.

SECTION I: FINDINGS, IMPACT MANAGEMENT AND MITIGATION MEASURES

1.	Provide a summary of the findings and impact management measures identified by all Specialist and an indication of how these findings and recommendations have influenced the proposed development.

Table 27 below summarises the potential Impacts associated with the proposed upgrades to the Existing PS1 and construction of new rising main and PS4, post mitigation. Please refer to the Section I (2) for the proposed mitigation measures to ensure the corresponding rating post mitigation.

Table 27: Summary of Impacts Post Mitigation

Impact	Preferred Alternative A	Alternative B	No-Go Alternative
Construction Phase			
Pollution of watercourses, sewage spills or leaks, dumping of excavated material into the watercourse, increased pedestrian and vehicular traffic, mixing of concrete or cement in or in close proximity to watercourses	**Negligible**	**Negligible**	**No Impact**
Impact of constructing new rising main across the estuarine zone on habitat and water quality.	**Negligible**	**Negligible**	**No Impact**
Surface runoff through excavated section of the road surface could lead to input of sediment and other	**Negligible**	**Negligible**	**No Impact**

construction materials into the watercourse, access to the watercourse in order to fasten the pipeline to either of the existing structures			
Destruction of habitat, direct mortality of Fauna, Vibration, Noise	**Low (-)**	**No Significance**	**No Impact**
Loss of indigenous flora, SCC and protected trees	**Low (-)**	**Low (-)**	**No Impact**
Disturbance of vegetation, Impact on biodiversity network, increased opportunity for alien infestation, erosion on the steeper slopes due to poor rehabilitation efforts.	**Low (-)**	**Low (-)**	**No Impact**
Spillage of diesel, petrol, oil, paints, clears and other harmful chemicals.	**Negligible (-)**	**Negligible (-)**	**No Impact**
Capital Expenditure	**Medium (+)**	**Medium (+)**	**No Impact**
Construction related activities	**Low (-)**	**Low (-)**	**No Impact**
Operational Phase			
Impact on water quality caused by leaks or damage to rising main due to vandalism, flood events or storm surges.	**Negligible**	**Minor (-)**	**No Impact**
The access road may lead to vehicles and foot traffic into parts of the site which have previously been inaccessible. This may cause collision of Fauna with vehicles, illegal waste dumping, illegal hunting and the potential of a fire risk through open fires.	**No Significance**	**No Significance**	**No Impact**
Increased alien infestation	**Low (-)**	**Low (-)**	**No Impact**
Alien infestation and resulting displacement of indigenous flora	**Low (-)**	**Low (-)**	**No Impact**
Spillage of diesel, petrol, oil, paints, clears and other harmful chemicals. Leakage from underground storage tank (UST) and associated pipework. These substances may potentially percolate into the groundwater and enter the surrounding environment.	**Negligible**	**Negligible**	**No Impact**

Botanical Assessment, Appendix G1:

The affected vegetation has been identified as Garden Route Granite Fynbos and Groot Brak Dune Strandveld. Both are currently listed as Critically Endangered. Given the linear nature of the project and the somewhat degraded state of the granite fynbos, the impact on terrestrial biodiversity is of medium-low concern. The proposed pipelines also pass through terrestrial CBA's and a degraded ESA, which form part of an extensive coastal biodiversity corridor. One can expect a temporary impact on the functionality of the biodiversity network. Areas disturbed during the construction phase can be rehabilitated and should recover fully. Nearly all the recorded plant species are common and widespread in the region, with only two SCC recorded. With regards to protected tree species, several *Pittosporum viridiflorum* and *Sideroxylon inerme* trees were recorded in the immediate vicinity of the pipeline routes. They can potentially be avoided.

It is therefore recommended that the project (as currently presented) be approved, but subject to the proposed mitigation measures.

The following mitigation measures are required to ensure that the impact on terrestrial biodiversity and plant species is minimal:

- During the construction phase, demarcate/fence off the construction footprint. Restrict all construction activities, such as stockpiling, parking and cement mixing, to already disturbed areas away from natural vegetation. The contractor(s) must be made aware of the sensitive surroundings and the presence of SCC and protected trees. The thicket and fynbos outside the footprint must be declared a 'no-go' area and not be disturbed in any way.
- 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.
- 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.
- It was previously recommended that the pipelines be installed above ground in the steeper thicket areas by using plinths in order to avoid trenching. However, the applicant has subsequently stated that plinths are no longer viable due to financial and engineering constraints.
- 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. 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.
- 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.
- 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 fisheries and Environment. It is recommended that the protected trees be marked prior to the start of construction activities.
- 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.
- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. (this will only be the responsibility of the contractor during the defailts and Liability period, after which this is the responsibility of the Municipal Parks Directorate)

Aquatic Assessment, Appendix G2:

While Alternative A is located in close proximity to the watercourse, the pipeline will be buried beneath the road surface. The pipeline will not be located in the riparian zone of the watercourse, and, assuming the road is above the 100-year floodline, the pipeline is located outside of the regulated area of the watercourse. Nevertheless, risks associated with construction and operational phase activities have been assessed. Alternative B will fall within the alignment of the bed and banks of the watercourse and will therefore be located within the regulated area. The risk of the pipeline crossing the estuarine zone was not assessed as an estuary is not defined as a watercourse and therefore Section 21 c and i water uses (as defined by the NWA) are not applicable. All other risks/impacts were assessed given the proximity of the watercourse to the proposed rising main alignment options. Risks for both Alternatives are considered to be Low and would ordinarily qualify for a General Authorisation. Bulk and main sewage pipelines are however excluded from a General Authorisation when these

pipelines are located within the regulated area of a watercourse. Alternative B would therefore most likely require a WULA.

The following recommendations are made:

- 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;
- The area(s) chosen for the stockpiling of imported building materials should be demarcated, and notices put up declaring what must be stockpiled where.
- Chemical toilets should be provided on-site at 1 toilet per 10 persons, per gender;
- Waste from chemical toilets must be disposed of regularly (at least once a week) in a responsible manner by a registered waste contractor;
- 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;
- 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.;
- 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.
- UV resistant material must be used for the section of pipeline crossing the estuary to ensure long-term lifespan.
- A steel bridge will be constructed to support the pipeline and provide protection against storm surges and flooding. (or similar engineering measures to protect the pipe)
- 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;
- Works should preferably be scheduled for the dry season to reduce the likelihood of flooding and or stormwater flows through construction areas; (this will not be possible due to limited construction time to accommodate the festive season and long weekends)
- 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;
- Any diversion of surface runoff must not cause erosion to the bed and banks of the watercourse;
- A construction schedule must be clearly defined and broken down into phases, to avoid multiple sites being exposed simultaneously. The completion date for each phase of development must be indicated and all excavation and final/temporary road resurfacing operations must be completed before moving onto the next phase;
- No construction materials to be stockpiled in the watercourse;
- All waste materials must be removed from the watercourse;
- Areas where instream access is required must be confined to clearly demarcated areas to prevent unnecessary disturbance of instream and riparian habitat outside of these areas.

- The pipeline must be routinely inspected following extreme weather events, with the aim of responding rapidly to damaged infrastructure.

Terrestrial Biodiversity and Animal Species Compliance Statement, Appendix G3:

The central section of the project footprint harbours the most intact habitats, intersecting intact Fynbos and Forest/Woodland habitats, with the western section of the intersecting the existing WWTW and the eastern section largely located within the existing residential area. Collectively, only a small part (<1 hectare) of the proposed footprint overlaps with intact natural habitats.

Faunal and avifaunal diversity and abundances appears high over the study area landscape and is largely comprised of relatively common species of "Least Concern" (IUCN, 2021), albeit one avifaunal SCC, the Knysna Warbler (*Bradypterus sylvaticus*) is present in the thick and tangled vegetation Fynbos vegetation which offers a dense understory.

The presence of one avifaunal SCC, the Knysna Warbler (*Bradypterus sylvaticus*), was confirmed on the site, with three further avifaunal SCC likely also occurring within the study area landscape given suitable habitat characteristics.

Although all the natural habitats on the site offer suitable habitat for the confirmed or possibly occurring avifaunal SCC, the project footprint itself is of a very small spatial extent, intersecting <1 hectare of natural habitat. In addition, it is highly likely that all avifaunal species will remain in areas adjacent to the project footprint and will return when the disturbances from construction have ceased. This renders habitats over the project footprint as of a "Very low" SEI, allowing for development activities of medium to high impact without restoration activities being required.

Only minor current impacts are evident within the study area landscape. Planned development activities for the study area will be restricted to the construction phase. During the operational phase, a temporary or permanent access road will be constructed which may bring novel impacts into the landscape.

The project footprint under both alternatives will be of a limited spatial extent and impacts will be of a localised and relatively short term, ending at the construction phase. Even so, Alternative A will result in a wider affected area to be rehabilitated at the end of the construction phase. To this end, impacts from Alternative A will be of a slightly higher significance to the receiving environment compared to Alternative B.

At the onset of the operational phase, Alternative B will comprise a temporary access road and / or new rising main footprint, while Alternative A will comprise a permanently cleared access road. Given that these open areas may result in novel indirect impacts in parts of the site, which was previously inaccessible, access control of the project footprint may be required to manage these indirect impacts.

Should the "No-Go" alternative be selected, the status quo will be maintained and the presence of alien and invasive vegetation over a small part of the site may continue to abstract fresh water from the environment and degrade the surrounding habitat structure over the long term (Section 11). This impact is, however, completely reversible through clearing this alien and invasive vegetation. Taken together therefore, the project footprint under both development alternatives (Alternatives A and B) will generally be of a similar spatial layout and will be of a limited spatial extent. To this end, direct impacts will be of a localised and very short nature (less than a year) and will cease at the end of the construction phase. Although the significance of Alternative A (the preferred alternative) to the receiving environment will be slightly higher compared to Alternative B (given different construction methods, a wider temporary footprint, and the establishment of a permanent access road), this alternative takes into account the engineering constraints of the project along with the need to balance environmental outcomes with the need for upgrading infrastructure from a municipal perspective.

To this end, development under the preferred Alternative A will be acceptable from a faunal perspective as direct impacts on the receiving environment will result in only minor to insignificant loss or deterioration of faunal biodiversity in the receiving environment over the short term, and indirect

impacts may be effectively managed over the long term. To this end, the development layout under Alternative 2 is supported from a faunal biodiversity perspective.

Anticipated project impacts:

- Destruction of habitat,
- Direct mortality of fauna, and
- Vibration and noise (from machinery and people).

During the operational phase, the new rising main, screening and de-gritting pump stations will have been constructed and in operation. Because noise and vibration from the pump stations (PS1 and PS2) will be of a low degree, direct impacts during the operational phase will be of an inconsequential nature to the faunal and avifaunal biodiversity in the surrounding landscape. Should a temporary or permanent access road be constructed, however, this may bring novel indirect impacts into this landscape including:

- Vehicles and foot traffic into parts of the site which have previously been inaccessible,
- Collision of fauna with vehicles,
- Illegal waste dumping,
- Illegal hunting
- The potential of a fire risk through open fires.

Impact management actions and mitigation measures:

- The new rising main be placed below-ground so as not to impede faunal movement within the study area landscape
- Topsoil should be removed, the rising main installed, and the topsoil levelled over the rising main so as to rehabilitate this area
- Project footprint be kept at the absolute minimum
- 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
- The access road to be constructed should be access controlled so as not to allow novel indirect impacts into this previously undisturbed part of the landscape
- Alien and invasive vegetation should be cleared by hand and all regrowth and seed germination be monitored any new recruitment be removed
- Vibration and noise through machinery, vehicles and people are unavoidable during the construction and no mitigation measures are suggested.

Groundwater Impact Assessment, Appendix G4:

The site is underlain by the Maalgaten Granite which forms part of the George Pluton and the Cape Granite Suite. To the immediate south of the site, the Skaapkop Formation of the Kaaimans Group is observed. The site is underlain by a low-yielding, intergranular and fractured aquifer, which suggests groundwater presence in both the shallow, unconsolidated rock as well as in deeper, fractured rock.

The boreholes intersected sandy colluvium followed by completely weathered colluvium consisting of granite schist which gradually grades into highly weathered schistose granite with both boreholes being terminated in moderately weathered schistose granite. BH1 was drilled to a depth of 8.67 mbgl, whilst BH was drilled to a depth of 8.20 mbgl.

No boreholes were identified during the hydrocensus or from various DWS databases within a reasonable distance of the site (1 km radius and maximum 3 km) or within the defined Groundwater Response Unit. It is thus assumed that groundwater use within the area is very limited to non-existent. Based on the national scale electrical conductivity map of South Africa, groundwater within the area typically exhibits a poor water quality ranging between 370- to 520 mS/m.

The aquifer vulnerability of the site is classified as "least" according to the DRASTIC method, which is consistent with the Aquifer System Management Index and Groundwater Quality Management index of "low". The lack of or absence of fractures present in the deeper bedrock may attribute to the low aquifer vulnerability. However, the intergranular aquifer which comprises the shallow, unconsolidated material, are likely to be more vulnerable and would require a higher degree of protection.

Identified sources of contamination include spillages of toxic and harmful chemicals and leakages from the UST and associated pipework. The underlying aquifer, which includes the identified shallow aquifer as well as the deeper aquifer, represents both a pathway for contaminants as well as being a receptor. Evidence is seen of a fluctuation saturated level which may be an indication of groundwater-surface water interaction. Potential contaminants may enter the shallow aquifer and percolate into the adjacent stream. The aforementioned pathway is identified is the main area of concern.

The receptors of potential contaminants are thus mostly the shallow aquifer and to a lesser extent the deeper aquifer. No groundwater users were identified as receptors. Further potential receptors include the adjacent stream and surrounding environment. Potential contamination will be limited to the site proximity with the furthest extent being the coastal plain, situated approximately 150 m south-east of the site, should contaminants enter the stream. With this in mind, the risk assigned to the construction and operational phase of the proposed UST is classified as minor - negative. Special note should be taken of the identified shallow aquifer which may place the UST in close proximity or within the water table. The shallow water table will, however, enable early leak detection through installed piezometers. It is thus imperative that stringent mitigation measures are implemented to decrease the risk to the indicated negligible – negative. To prevent any contamination of the groundwater, regular monitoring thereof is strongly recommended.

The following recommendations are made:
Please note that the proposal has changed since the ground water impact assessment was undertaken, there will now not be any underground fuel storage for the facility, as such all mitigation measures relating to the Underground Storage Tank (UST) will be excluded from the EMPr.

- It is recommended that the monitoring network be installed prior to the installation of the UST and relevant mitigation. This will serve as monitoring of both the construction and operational phase.
- 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.
- 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.
- Shallow piezometers are to be installed in close proximity of the UST. Minimum installation depth of 3.50 mbgl.
- A rapid response plan must be developed should any hydrocarbon spillages or leakages be detected.
- It is recommended a geohydrologist be appointed to manage and supervise the drilling and should be responsible for the design and construction. No drilling should be undertaken without, at the very least, the consultation of a geohydrologist.

Should the above monitoring network be in place and mitigation measures be considered, as outlined herein, the risk assigned to potential impacts of contamination during both the construction and operational phase is negligible - negative.

The following mitigation measures are recommended:
- Install the UST according to applicable national SANS standards.
- Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies.

- Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.
- Cover stockpiles of building materials like cement, sand and other powders.
- Regularly inspect stockpiles for spillages and store away from waterways or drainage areas.
- 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.
- All areas where potential spillages may occur are to be paved and cemented.
- Maintain operation of the fuelling station as per national standards.
- Set up a comprehensive monitoring system, such as observation boreholes, to detect any leakages/groundwater chemistry changes on-site.
- Install shallow aquifer piezometers in close proximity to the UST to be monitored regularly for any leakages.
- 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.

Based on the above evaluation, ground conditions are favourable and consistent. No further investigations are recommended.

Heritage Statement, Appendix G5:

No colonial or pre-colonial heritage resources of significance were identified in the study area. If present on or in surface sediments between the WWTW and Speckie Gericke Drive, then Stone Age implements are expected to be of low significance and Not Conservation Worthy. No caves or rock shelters occur in the development footprint. There will be negligible to no cumulative impact on the heritage value of the area.

Due to the sub-terranean nature of most of the proposed activity, there is no vertical component and hence no visual impact on the aesthetic value of the affected area. The proposed new pump station on Erf 116 will be built within an existing disturbance and will have a negligible visual impact as it will be partially screened by existing vegetation and developments. Nevertheless, on heritage grounds, due to the entire absence of heritage resources or themes in and around Erf 116, the proposed pump station will have negligible to no impact on the visual or aesthetic heritage value of the area.
The positive socio-economic impact, including short-, medium- and long-term jobs as well as the growing need for maintaining and upgrading the bulk services – including sewer – infrastructure of Herold's Bay outweigh the negligible to zero negative impacts this project may have on heritage resources.

There is no reason to believe that significant heritage resources will be impacted by the proposed activity, it is recommended that the proposed activity be approved in full, and that a Heritage Impact Assessment is not warranted for the project.

It is recommended that Heritage Western Cape consider and/or require that the following be included in the Environmental Authorisation / Environmental Management Program, if the project is approved:

- Although not requiring further Palaeontological investigation, in accordance with the SAHRIS PalaeoSensitivity Map, the Fossil Finds Procedure (FFP – see links above), should be included in the Environmental Authorisation / Environmental Management Program (EMPr) for the construction phase of the project,
- Due to the disturbed and developed nature of the development footprint, as well as the findings of this and previous archaeological studies, archaeological monitoring is NOT recommended, but,
- If any human remains or significant archaeological materials are exposed during mining activities, then the find should be protected from further disturbance and work in the immediate area should be halted and Heritage Western Cape must be notified immediately. These heritage resources are protected by Section 36(3)(a) and Section 35(4) of the NHRA (Act

25 of 1999) respectively and may not be damaged or disturbed in any way without a permit from the heritage authorities. Any work in mitigation, if deemed appropriate, should be commissioned and completed before construction continues in the affected area and will be at the expense of the developer.

2.	List the impact management measures that were identified by all Specialist that will be included in the EMPr

Recommended mitigation measures by avifaunal species and terrestrial faunal specialist:

- Destruction of habitat should be limited to the smallest project footprint possible.
- The 10m-12m working area footprint should be rehabilitated and allowed to regenerate naturally.
- 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. 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.
- Vibration and noise through machinery, vehicles and people are unavoidable during the construction and no mitigation measures are suggested.
- The access road should be access controlled so as not to allow novel indirect impacts into this previously undisturbed part of the landscape.
- Access control should also be applied to the new rising main footprint.
- Alien and invasive vegetation should be cleared by hand
- All regrowth and seed germination to be monitored and any new recruitment be removed

Recommended mitigation measures by Botanical specialist:

- During the construction phase, demarcate/fence off the construction footprint.
- Restrict all construction activities, such as stockpiling, parking and cement mixing, to already disturbed areas away from natural vegetation.
- The contractor(s) must be made aware of the sensitive surroundings and the presence of SCC and protected trees.
- The thicket and fynbos outside the footprint must be declared a 'no-go' area and not be disturbed in any way.
- 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.
- 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.
- 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. 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.
- 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 short- to medium-term maintenance requirement.
- During the staking out of the construction footprint take cognisance of the presence of SCC and protected trees. Try and avoid these as far as practically possible. Removal of the latter requires a permit from the Department of Forestry Fisheries and Environment. It is recommended that the protected trees be marked prior to the start of construction activities.
- 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. Geophytes 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.

Recommended mitigation measures by Heritage specialist:

- In accordance with the SAHRIS PalaeoSensitivity Map, the Fossil Finds Procedure, should be included in the Environmental Authorisation / Environmental Management Program (EMPr) for the construction phase of the project.
- If any human remains or significant archaeological materials are exposed during mining activities, then the find should be protected from further disturbance and work in the immediate area should be halted and Heritage Western Cape must be notified immediately. These heritage resources are protected by Section 36(3)(a) and Section 35(4) of the NHRA (Act 25 of 1999) respectively and may not be damaged or disturbed in any way without a permit from the heritage authorities. Any work in mitigation, if deemed appropriate, should be commissioned and completed before construction continues in the affected area and will be at the expense of the developer.

Recommended mitigation measures by Groundwater specialist:

- Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies.
- Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.
- Cover stockpiles of building materials like cement, sand and other powders.
- Regularly inspect stockpiles for spillages and store away from waterways or drainage areas.
- 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.
- All areas where potential spillages may occur are to be paved and cemented.

Recommended mitigation measures by Freshwater specialist:

- 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 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;
- The area(s) chosen for the stockpiling of imported building materials should be demarcated, and notices put up declaring what must be stockpiled where.
- Chemical toilets should be provided on-site at 1 toilet per 10 persons;
- Waste from chemical toilets must be disposed of regularly (at least once a week) in a responsible manner by a registered waste contractor;
- 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;
- 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.;
- 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.

- UV resistant material must be used for the section of pipeline crossing the estuary to ensure long-term lifespan.
- Engineering appropriate measure to protect the pipe will be undertaken.
- 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;
- Areas where instream access is required must be confined to clearly demarcated areas to prevent unnecessary disturbance of instream and riparian habitat outside of these areas.
- The pipeline must be routinely inspected following extreme weather events, with the aim of responding rapidly to damaged infrastructure.

3.	List the specialist investigations and the impact management measures that will **not** be implemented and provide an explanation as to why these measures will not be implemented.

Botanical Impact Assessment mitigation measures that will not be included in the EMPr:

Mitigation measure to be excluded	Reason for exclusion
Avoid trenching in the steeper thicket areas. Install the pipelines above ground by using plinths, etc.	The applicant has subsequently stated that plinths will not be viable due to financial and engineering constraints.
Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction.	The contractor involvement will only be 12 months.

Freshwater Impact Assessment mitigation measures that will not be included in the EMPr:

Mitigation measure to be excluded	Reason for exclusion
Works should preferably be scheduled for the dry season to reduce the likelihood of flooding and or stormwater flows through construction areas (Alternative A and B);	This is difficult, as it constantly rains, and the construction will be limited during the summer months due to influx of tourists.
A construction schedule must be clearly defined and broken down into phases, to avoid multiple sites being exposed simultaneously. The completion date for each phase of development must be indicated and all excavation and final/temporary road resurfacing operations must be completed before moving onto the next phase (Alternative A);	The upgrade of the pump stations and the pipelines may be upgraded simultaneously and will be production based.
No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed within 30m of the banks of the watercourse;	This is not possible to achieve due to the location of the site. The applicant wishes to change it to "No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed within the banks of the watercourse"

Groundwater Impact Assessment mitigation measures that will not be included in the EMPr:

Mitigation measure to be excluded	Reason for exclusion
Maintain operation of the fuelling station as per national standards.	A fuelling station is not part of the proposal.

Install the UST according to applicable national SANS standards.	The proposal has changed since the ground water impact assessment was undertaken, there will now not be any underground fuel storage for the facility.
Set up a comprehensive monitoring system, such as observation boreholes, to detect any leakages/groundwater chemistry changes on-site.	
Install shallow aquifer piezometers in close proximity to the UST to be monitored regularly for any leakages.	
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.	
It is recommended that the monitoring network be installed prior to the installation of the UST and relevant mitigation. This will serve as monitoring of both the construction and operational phase.	
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.	
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.	
Shallow piezometers are to be installed in close proximity of the UST. Minimum installation depth of 3.50 mbgl.	
A rapid response plan must be developed should any hydrocarbon spillages or leakages be detected.	
It is recommended a geohydrologist be appointed to manage and supervise the drilling and should be responsible for the design and construction. No drilling should be undertaken without, at the very least, the consultation of a geohydrologist.	

4.	Explain how the proposed development will impact the surrounding communities.

During the construction phase the surrounding community will be temporarily inconvenienced by the construction noise and visual impacts and the traffic congestion that will take place however these impacts are temporary in nature. Labourers from the George Area will be used as labour during the construction phase, therefor providing them with an income.

5.	Explain how the risk of climate change may influence the proposed activity or development and how has the potential impacts of climate change been considered and addressed.

The upgrade of Pump Station 1 will be protected as far as possible against any future storm surges and against increased sea levels since all the pumps will be submersible, therefor any seawater that might ingress into the facility will just be pumped up to the WWTW.

6.	Explain whether there are any conflicting recommendations between the specialists. If so, explain how these have been addressed and resolved.

The Botanical specialist previously recommended placing the pipeline on plinths, but due to the engineering and financial restraints this is not possible.

7.	Explain how the findings and recommendations of the different specialist studies have been integrated to inform the most appropriate mitigation measures that should be implemented to manage the potential impacts of the proposed activity or development.

The recommendation of the specialists has been incorporated into the EMPr except for those mentioned in Section I 3, and compliance will be monitored by the appointed ECO during the construction phase.

8.	Explain how the mitigation hierarchy has been applied to arrive at the best practicable environmental option.

Table 28: Mitigation hierarchy

MITIGATION HIERARCHY		
1	AVOID IMPACTS	As the proposal is to upgrade an existing pumpstation and the construction of a new pump station the impacts cannot be avoided at this location. No-go areas will be prescribed.
2	MINIMISE IMPACTS	The recommended mitigation measures of the specialists reports in addition to the compressive mitigation measures contained in the EMPr will minimise the impact of the development.
3	RECTIFY	The disturbances created by the construction phase will be rehabilitated in accordance with the EMPr.
4	OFFSET	Not necessary as no residual impacts not addressed by the previous steps of the mitigation hierarchy

SECTION J: GENERAL

1. Environmental Impact Statement

1.1.	Provide a summary of the key findings of the EIA.

Botanical Assessment, Appendix G1:

The affected vegetation has been identified as Garden Route Granite Fynbos and Groot Brak Dune Strandveld. Both are currently listed as Critically Endangered. Given the linear nature of the project and the somewhat degraded state of the granite fynbos, the impact on terrestrial biodiversity is of medium-low concern. The proposed pipelines also pass through terrestrial CBA's and a degraded ESA, which form part of an extensive coastal biodiversity corridor. One can expect a temporary impact on the functionality of the biodiversity network. Areas disturbed during the construction phase can be rehabilitated and should recover fully. Nearly all the recorded plant species are common and widespread in the region, with only two SCC recorded. With regards to protected tree species, several *Pittosporum viridiflorum* and *Sideroxylon inerme* trees were recorded in the immediate vicinity of the pipeline routes. They can potentially be avoided.

It is therefore recommended that the project (as currently presented) be approved, but subject to the proposed mitigation measures.

Aquatic Assessment, Appendix G2:

The results of the report indicate the following:
Herolds Bay is situated in quaternary catchment K30B of the Breede-Olifants Water Management Area and the catchment area falls within the South-Eastern Coastal Belt. The Mean Annual Precipitation is relatively high, ranging between 500-800 mm and is a-seasonal, occurring throughout the year. Soils in the catchment area are relatively shallow consisting of a diagnostic pedocutanic duplex soil and are highly erodible.

The study site is located within sub-quaternary catchment which has not been classified as a FEPA, therefore it is not considered as being a priority for maintaining freshwater biodiversity at a national scale.

The watercourse running immediately to the north of Skimmelkrans Drive is classified as an Ecological Support Area (ESA2), therefore it is considered as degraded areas that are not important in terms of meeting biodiversity targets but do play an important role in providing supporting ecological functions. A section of the rising main stretching from the end of Speckie Gericke Crescent to the WWTW is indicated to cross a Critical Biodiversity Area (CBA1) wetland. CBA1 wetlands are in a natural or near-natural state and are essential for meeting biodiversity targets. Development should avoid these areas where possible or result only in low, biodiversity sensitive impacts.

Present Ecological State (PES) of instream habitat of the watercourse is classified as Moderately Modified. The riparian habitat is relatively intact, comprising predominantly of indigenous vegetation. The PES of riparian habitat is Largely Natural to Moderately Modified and overall, the PES (taking instream and riparian habitat into consideration) is Moderately Modified.

The watercourse adjacent to the new pumpstation and rising main is a non-perennial watercourse which has been moderately modified from reference conditions, largely due to urbanisation along the lower most reaches. Given its small size and non-perennial characteristics, the EIS is low. At its lower most extent, the watercourse grades into a small temporarily closed estuary which periodically opens to the sea through the main Herold's Bay beach.

Activities associated with the construction and operational phase of the pumpstation and rising main can be realistically mitigated to a negligible to minor level of impact. Of the two alternatives, Alternative A is recommended as, due to the pipeline being buried beneath the road surface, impacts and risks associated with the operational phase of the pipeline are lower. Risks for both Alternatives are considered to be Low and would ordinarily qualify for a General Authorisation. Bulk and main sewage pipelines are however excluded from a General Authorisation when these pipelines are located within the regulated area of a watercourse. Consultation with BOCMA is recommended to determine whether authorisation is required for Alternative A as a floodline assessment was not available at the time of compiling this report.

Terrestrial Biodiversity and Animal Species Compliance Statement, Appendix G3:
The results of the report indicate the following:

Taken together therefore, the project footprint under both development alternatives will generally be of a similar spatial layout and will be of a limited spatial extent. To this end, direct impacts will be of a localised and very short nature (less than a year) and will cease at the end of the construction phase. Although the significance of Alternative A (the preferred alternative) to the receiving environment will be slightly higher compared to Alternative B (given different construction methods, a wider temporary footprint and the establishment of a permanent access road), this alternative takes into account the engineering constraints of the project along with the need to balance environmental outcomes with the need for upgrading infrastructure from a municipal perspective.

To this end, development under the preferred Alternative A will be acceptable from a faunal perspective as direct impacts on the receiving environment will result in only minor to insignificant loss or deterioration of faunal biodiversity in the receiving environment over the short term, and indirect impacts may be effectively managed over the long term. To this end, the development layout under Alternative A is supported from a faunal biodiversity perspective.

Groundwater Assessment, Appendix G4:
The site is underlain by the Maalgaten Granite which forms part of the George Pluton and the Cape Granite Suite. To the immediate south of the site, the Skaapkop Formation of the Kaaimans Group is observed. The site is underlain by a low-yielding, intergranular and fractured aquifer, which suggests groundwater presence in both the shallow, unconsolidated rock as well as in deeper, fractured rock.

The aquifer vulnerability of the site is classified as "least" according to the DRASTIC method, which is consistent with the Aquifer System Management Index and Groundwater Quality Management index

of "low". The lack of or absence of fractures present in the deeper bedrock may attribute to the low aquifer vulnerability. However, the intergranular aquifer which comprises the shallow, unconsolidated material, are likely to be more vulnerable and would require a higher degree of protection.

Identified sources of contamination include spillages of toxic and harmful chemicals and leakages from the UST and associated pipework. Potential contaminants may enter the shallow aquifer and percolate into the adjacent stream. The receptors of potential contaminants are thus mostly the shallow aquifer and to a lesser extent the deeper aquifer. No groundwater users were identified as receptors. Further potential receptors include the adjacent stream and surrounding environment. Potential contamination will be limited to the site proximity with the furthest extent being the coastal plain.

The shallow water table will enable early leak detection through installed piezometers. It is thus imperative that stringent mitigation measures are implemented to decrease the risk to the indicated negligible – negative.

Heritage Assessment, Appendix G5:
The HIA identified no colonial or pre-colonial heritage resources of significance and no caves or rock shelters. There will be negligible to no cumulative impact on the heritage value of the area.

Neither the Provincial Heritage Site nor other heritage resources in the surroundings will be impacted by the proposed activity.

1.2.	Provide a map that that superimposes the preferred activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. (Attach map to this BAR as Appendix B2)
	N/A
1.3.	Provide a summary of the positive and negative impacts and risks that the proposed activity or development and alternatives will have on the environment and community.

Preferred Alternative A

Positive

- Temporary job opportunities during the construction phase
- Increased pumping capacity for the sewerage network
- Reduced chance of spillages due to pumpstation having an increased capacity
- Bigger storage capacity in case of emergencies
- Functioning back-up generator
- To accommodate future population growth
- Does not cause permanent obstruction to animal or human movement
- Less prone to vandalism
- Infrastructure protected from elements (rain, solar radiation, heat, wind spay and fires)

Negatives

- Temporary noise and construction related inconveniences.
- Temporary closure of Spekie Gericke Drive (Working days 08:00 – 17:00)
- Traffic congestion from the "Stop and Go" in Skimmelkrans Lane
- Temporary disturbance and impacts to the natural environment
- Larger construction footprint
- More costly to perform leak detection and repair leaks

Alternative B

Positives

- Temporary job opportunities during the construction phase
- Increased pumping capacity for the sewerage network
- Reduced chance of spillages due to pumpstation having an increased capacity
- Bigger storage capacity in case of emergencies
- Functioning back-up generator
- To accommodate future population growth
- Smaller construction footprint

- Easy visual inspection and pipe repair

Negatives

- Temporary noise and construction related inconveniences.
- Temporary closure of Spekie Gericke Drive (Working days 08:00 – 17:00)
- Traffic congestion from the "Stop and Go" in Skimmelkrans Drive
- Temporary disturbance and impacts to the natural environment
- Impediment of faunal movement
- Increased budget requirements.
- Not feasible due to engineering restraints
- Not feasible due to geographical restraints
- Pipeline will be exposed to the elements, including solar radiation, winds, rain, sea spray and fire
- Increased likelihood of vandalism

2. Recommendation of the Environmental Assessment Practitioner ("EAP")

2.1.	Provide Impact management outcomes (based on the assessment and where applicable, specialist assessments) for the proposed activity or development for inclusion in the EMPr

In order to obtain/reach the impact management objects the corresponding mitigation measures prescribed in the BAR and EMPr must be implemented. Potential impacts were assessed and mitigation measures to minimise the negative impacts were explored in greater depth Section G of this BAR. Within the Environmental Management Programme (attached as Appendix H) the Environmental Impact Management has been separated into 3 sections, Pre-construction Phase, Construction Phase and Post Construction Rehabilitation Phase

IMPACT MANAGEMENT OBJECTIVES	IMPACT MANAGEMENT OUTCOMES
PRE-CONSTRUCTION PHASE	
Identify and demarcate no-go areas, working areas and site facilities	Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance
To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.
Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site	Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. Site facilities are appropriately located on site. Construction workers receive environmental awareness training before commencing work on site
CONSTRUCTION PHASE	
Prevent pollution of watercourses	No change in watercourse quality
Limit surface runoff and input of sediment and construction material into the watercourse	No erosion to the bed and banks of the watercourse and no change in water quality
Limit the impact on terrestrial biodiversity	Terrestrial biodiversity is only temporarily impacted within the footprint and reasonable working corridor

Reduce the loss of indigenous flora and SCC	Indigenous flora and SCC are searched and rescued from the footprint and used for rehabilitation
To prevent/limit soil erosion	Sedimentation is limited and erosion is prevented
Limit habitat destruction and direct mortality of fauna	No fauna mortality or loss of natural habitats as a results of construction activities.
Prevent spillage of diesel, oil and other harmful chemicals	Groundwater is not contaminated within the sites.
To limit noise generated by construction activities	No avoidable noise impacts emanate from the site during the construction phase
Limit inconvenience to residence (traffic congestion)	Residents are able to commute to and from their houses.
To create employment opportunities with potential for skills transfer, for members of the local community	The George Municipality labourers benefits from the employment opportunities created during the construction phase.
POST CONSTRUCTION REHABILITATION PHASE	
Prevent leaks or damage to rising main	No leaks are detected during routine inspection
To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner	The site is neat and tidy, and all exposed surfaces are suitably covered/ stabilised. There is no construction-related waste or pollution remaining on site.
Prevent alien vegetation establishment on the site	Only indigenous vegetation species establish on the disturbed areas
Prevent displacement of indigenous flora	Indigenous flora remains on site after construction
Prevent spillage of diesel, oil and other harmful chemicals	Groundwater is not contaminated within the sites.
Prevent leakage from underground storage tank and associated pipework.	Wastewater is contained within the underground storage tank.
Limit vehicle and foot traffic on access road	Only authorized vehicles and people allowed on access road
Prevent fire risk	No fires on site

2.2.	Provide a description of any aspects that were conditional to the findings of the assessment either by the EAP or specialist that must be included as conditions of the authorisation.

The EMPr must be implemented, this is however a standard condition of Environmental Authorisation.

All mitigation measures from the specialists have been incorporated into the EMPr and as such are conditional to the environmental authorisation.

2.3.	Provide a reasoned opinion as to whether the proposed activity or development should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be included in the authorisation.

The preferred Alternative A should be authorised.

As seen in the body of this Basic Assessment Report, the negative impacts associated with the construction phase can be mitigated to that of a low to no significance. The proposal is to upgrade an existing pump station and the construction of a new pump station and rising main to divert approx. 80% of the sewerage flow from PS1 to PS4. This will decrease the risk of sewerage leaking into the ocean and to improve the overall operation of the system. The increase in flow will also accommodate future population growth of Herold's Bay.

Proposed Conditions of Authorisation:

- The EMPr must be implemented.
- An ECO must be appointed to monitor compliance with the EMPr monthly.

2.4.	Provide a description of any assumptions, uncertainties and gaps in knowledge that relate to the assessment and mitigation measures proposed.

It is assumed that the proposed mitigation measures as listed in this report and the EMPr (Appendix H) will be implemented and adhered to as the significance of impacts ratings are conditional on implementation of the mitigation measures.

The following limitations and assumptions apply to the Aquatic Assessment study:

- With ecology being dynamic and complex, there is the likelihood that some aspects (some of which may be important) may have been overlooked. Similarly, sampling by its nature, means that generally not all aspects of ecosystems can be assessed and identified;
- This assessment is based on the findings of a visual assessment of the site combined with available desktop resources. This study was not informed by detailed hydraulic, hydrological, faunal or floral assessments;
- The PES and EIS assessments undertaken are largely qualitative assessment tools and thus the results are open to professional opinion and interpretation. An effort has been made to substantiate all claims where applicable and necessary.

The following limitations and assumptions apply to the Botanical Assessment study:

- Fieldwork was carried out in the winter season, considered to be a suitable time for many flowering species in the Southern Cape. However, plants that only flower at other times of the year (e.g. spring), such as certain bulbs (Iridaceae and Orchidaceae), may have been missed. The overall confidence in the completeness and accuracy of the botanical findings is however considered to be good.
- Sections of the proposed pipeline route was inaccessible due to very dense and impenetrable vegetation. This is ascribed to senescence and the exclusion of fire from the area. However, good views of the route were obtained from the side. Notwithstanding the above limitations, the specialist is of the opinion that the survey and findings are adequate to aid decision making.

The following limitations and assumptions apply to the Terrestrial Faunal and Avifaunal Species Impact Assessment:

Weather conditions during the surveying period were relatively optimal for detecting a representative sample of the terrestrial faunal and avifaunal species diversity across the study area. Even so, not all species could be observed (especially cryptic species), and it is further possible that the surveying period did not correspond to the activity period or activity season of some species. Coupled to this, the thick and impenetrable nature of the Forest/Woodland and Fynbos vegetation in the study area hampered sampling efforts as not all areas could be accessed.

Although the observed faunal composition of the study area therefore only partly reflects the species richness of, and faunal abundances within the study area landscape, the inclusion and consideration of SCC was further based on a thorough desktop assessment for the included faunal groups (mammals and avifauna), meaning that all possibly occurring SCC were considered in the current assessment.

The following limitations and assumptions apply to the Geotechnical Investigation:

This report is based on limited data obtained from limited, widely spaced investigation points and is not likely to reveal the detail of conditions that will become evident during construction. Further, the nature of geotechnical engineering is such that variations in what is reported here may occur elsewhere over the site. It is imperative that a Competent Person inspects all excavations to ensure that conditions at variance with those predicted do not occur, and to undertake an interpretation of this report as ground conditions are exposed during development of the site.

This report has been prepared for the exclusive use of the client, with specific application to the proposed project. Changes in design loads or the development in general may require a review of the recommendations made in this report.

The following limitations and assumptions apply to the Groundwater Impact Assessment:

	• The hydrocensus; o There is a potential that groundwater users are located within the one kilometre radius of the site; ▪ Not all groundwater users display the relevant signage to indicate groundwater use; ▪ It is thus safe to assume that the amount of groundwater users is in fact greater than are currently represented in this report, although being unlikely due to the geographical setting of Herold's Bay and unfavourable geological conditions for groundwater development. • No deep geology logs below the geotechnical borehole depths; • No aquifer parameters.
2.5.	The period for which the EA is required, the date the activity will be concluded and when the post construction monitoring requirements should be finalised.
SMEC South Africa was appointed for a Multi-Year Professional Services Contract (Tender No. T/ING/010/2020), which includes the upgrade of Municipal Infrastructure by the George Municipality (GM). Construction expenditure is anticipation to commence in the second half of the 2025/2026 financial year. 3 years are need to complete construction and rehabilitation of the sites but is subject to funding. The validity period of the EA should therefore be at least 10 years to allow for any delays that may arise before or during implementation.	

3. Water

Since the Western Cape is a water scarce area explain what measures will be implemented to avoid the use of potable water during the development and operational phase and what measures will be implemented to reduce your water demand, save water and measures to reuse or recycle water.
Water will only be required during the construction phase for compacting and concrete works. Once operational the facility will use water for the degritting and screening operations.

4. Waste

Explain what measures have been taken to reduce, reuse or recycle waste.
Only packaging waste will be generated by materials brought to site. An integrated waste management system must be adopted on site in accordance with the EMPr. Unrecyclable items will be taken to the George landfill. During the construction phase of the proposed development, construction waste will be generated. This includes, but is not limited to cement bags, electric cells and batteries, disposable containers and wrappings and common waste. Construction waste will also include metal, wooden insulator crates, left-over cables and paper. During the operational phase no waste should be produced. It should be noted, that should the reuse, repair, recycle approach be followed others would be limited waste associated with the faulty components during the construction period.

5. Energy Efficiency

8.1.	Explain what design measures have been taken to ensure that the development proposal will be energy efficient.
The new generator at PS4 will will be used during loadshedding and as back-up electricity supply to both Pump Stations to ensure both are operating at all times.	

SECTION K: DECLARATIONS

DECLARATION OF THE APPLICANT

Note: Duplicate this section where there is more than one Applicant.

I **Johannes Franciscus Koegelenberg**, ID number **7906085048081** ~~in my personal capacity or~~ duly authorised thereto hereby declare/affirm that all the information submitted or to be submitted as part of this application form is true and correct, and that:

- I am fully aware of my responsibilities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), the Environmental Impact Assessment ("EIA") Regulations, and any relevant Specific Environmental Management Act and that failure to comply with these requirements may constitute an offence in terms of relevant environmental legislation;
- I am aware of my general duty of care in terms of Section 28 of the NEMA;

- I am aware that it is an offence in terms of Section 24F of the NEMA should I commence with a listed activity prior to obtaining an Environmental Authorisation;

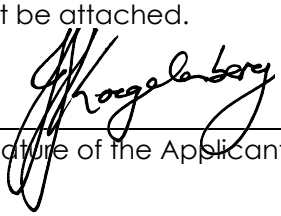
- I appointed the Environmental Assessment Practitioner ("EAP") (if not exempted from this requirement) which:
  - meets all the requirements in terms of Regulation 13 of the NEMA EIA Regulations; or
  - meets all the requirements other than the requirement to be independent in terms of Regulation 13 of the NEMA EIA Regulations, but a review EAP has been appointed who does meet all the requirements of Regulation 13 of the NEMA EIA Regulations;

- I will provide the EAP and any specialist, where applicable, and the Competent Authority with access to all information at my disposal that is relevant to the application;

- I will be responsible for the costs incurred in complying with the NEMA EIA Regulations and other environmental legislation including but not limited to –
  - costs incurred for the appointment of the EAP or any legitimately person contracted by the EAP;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the NEMA EIA Regulations;
  - Legitimate costs in respect of specialist(s) reviews; and
  - the provision of security to ensure compliance with applicable management and mitigation measures;

- I am responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority, hereby indemnify, the government of the Republic, the Competent Authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which I or the EAP is responsible in terms of the NEMA EIA Regulations and any Specific Environmental Management Act.

Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.



2026/01/28

Signature of the Applicant: Date:

George Municipality

Name of company (if applicable):

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I **Michael Jon Bennett**, EAP Registration number **2021/3163**. as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this BAR and any other documents/reports submitted in support of this BAR;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

Signature of the EAP: Date: 29 January 2026

Sharples Environmental Services cc

Name of company (if applicable):