

THE PROPOSED POSTMASBURG WASTE WATER TREATMENT WORKS AND SEWER PIPELINE POSTMASBURG, NORTHERN CAPE



D:E&NC reference number: NC/EIA/20/ZFM/TSA/POS1/2014

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TSANTSABANE MUNICIPALITY

PROPOSED POSTMASBURG WWTW AND SEWER LINE

Postmasburg, Northern Cape

D:E&NC Ref No.: NC/EIA/20/ZFM/TSA/POS1/2014

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ACRONYMS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DENC	Department of Environment and Nature Conservation
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act
OESA	Other Ecological Support Area
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
WULA	Water Use Licence Application

1. INTRODUCTION

1.1 BACKGROUND

Consideration is being given to the construction of a new Waste Water Treatment Works and sewer line in Postmasburg, Northern Cape. The total area of the new Waste Water Treatment Works will be approximately 10 ha.

The applicant is Tsantsabane Municipality who will undertake the activity should it be approved. EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA).

This Scoping Report, which will be submitted to the Department of Environment and Nature Conservation (DE&NC) for consideration, forms part of the EIA process.

The purpose of this Draft Environmental Scoping Report is to describe the proposed project, the process followed to date, to present alternatives and to list issues identified for further study and comment by specialists.

Should the EIA process be authorised by DE&NC, the Specialist Studies (noted in Section 8) will be undertaken and the significant issues (noted in Section 6) will be investigated and assessed during the next phase of this application.

1.2 DESCRIPTION OF THE PROPOSED ACTIVITY

It is proposed that a new Waste Water Treatment Works be constructed on Farm Olynfontein No.475 Portion 3, Postmasburg to accommodate the growing population of Postmasburg and the growing costs of operating the existing waste water treatment works.

Currently, all wastewater in Postmasburg drains to the Postmasburg Pump Station No.1, which is located to the south of Postmasburg within the Groenwater Spruit. The logical extension would be to extend the existing main sewer downstream to a point where it would daylight and then construct a new wastewater treatment plant there. Calculations have however indicated that the current main sewer, which is only a 300mm diameter pipe, would not be adequate to convey the existing and future flows.

Given the planned developments in Postmasburg, a flow of 100 litres per second was calculated as being the future Average Dry Weather Flow for Postmasburg. This equates to a wastewater treatment plant with a minimum design capacity of 8 640m³/day. A decision was taken to allow for a percentage of future growth and expansion and a figure of 10 000m³/day was arrived at as the Average Dry Weather Flow and the minimum required size for a new wastewater treatment plant for the future flows expected to be generated at Postmasburg.

It is proposed that the new wastewater treatment plant will utilize the modified Ludzack-Ettinger process which is a biological nutrient removal process for the removal of carbonaceous and nitrogen based soluble nutrients. This plant utilizes only aerobic processes and as such minimizes the risks for generating offensive odours. The gradient of the site also allows the raw wastewater to be pumped once after which flow through the treatment plant can take place under gravity.

It is suggested that the treatment plant be designed in such a manner that modules capable of treating 5000m³/day each are constructed. The plant will have a common inlet works providing facilities for screenings removal, grit removal and flow measurement of a size capable of dealing with current and future peak flows of up to 250 litres per second which equates to a maximum daily flow of 21 600m³ / day.

It should be noted that this flow is not the design capacity of the plant, but the ultimate peak flow which could reasonably be expected during occurrences of high rainfall and as such, only the inlet works is to be designed for this capacity and not the process units within the treatment plant. Postmasburg is located in an arid region, but is subject to heavy thunder showers in summer which can cause flash floods. In addition, the natural water table in the area is quite shallow and the fact that the town's main sewer runs inside a watercourse lends itself to large volumes of water ingress during flood occurrences.

To convey these flows, a new main outfall sewer of at least 600mm diameter is required. Such a sewer will run at 80% capacity for a flow of 100 liters per second providing some space for future runoff. It is planned that this new sewer will be extended from the current position of Postmasburg Pump Station No.1 in a southerly direction following the run of the Groenwater Spruit to a point approximately 1 300m downstream of the town where the pipe will daylight at a gradient of 1 in 200.

The proposed sewer line will cross the following erven in Postmasburg: Erf 1, Erf 123, Erf 125, Erf 126, Erf 127, Erf 764, Erf 779, Erf 1504.



Figure 1: Locality Plan.

2. NEED AND DESIRABILITY

In terms of the National Environmental Management Act, as amended, EIA 2010 regulations the Scoping/EIA report must provide a description of the need and desirability of the proposed activity. The consideration of “need and desirability” in EIA decision-making requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest.

While the concept of need and desirability relates to the *type* of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which *need* refers to *time* and *desirability* to *place* – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to *wise use of land* – i.e. the question of what is the most sustainable use of land.

2.1 NEED

Postmasburg falls within the jurisdiction of the Tsantsabane Municipality and within the ZF Mgcawu District Municipality in the Northern Cape Province. The town is located in a valley through which the Groenwater Spruit is the major watercourse. The town of Postmasburg has a population of approximately 42 000 persons and has over the last 3 years maintained a growth rate of 2.5% per annum. This is primarily due to a major increase in mining activities with the two mining houses KUMBA and ASSMANG being the primary economic drivers.

The existing Postmasburg WWTP was constructed in the early 1980's with a capacity of 2400m³/day. For political reasons, the treatment plant was constructed on a high point south of the town's CBD. This decision necessitated that all sewage draining from the town must be pumped to the wastewater treatment plant. Subsequently, Postmasburg was initially equipped with 3 sewage pump stations and later on a 4th booster pump station was constructed.

In 2006, the civil works at the treatment plant was doubled in preparation of the coming expansion of mining activities, but the works was never equipped mechanically due to a shortage of funding. In 2009, the Kolomela Mine development commenced and KUMBA started a housing project of 885 housing units in Postmasburg as well as development of required bulk infrastructure. In 2010 the existing Postmasburg Wastewater Treatment Plant was assessed to make proposals to get the plant operational again as it was in a very poor state. A refurbishment project was undertaken and concurrently to this, the mechanical and electrical installation was done on the new portion of the works expanding the plant capacity to 4800m³/day. The plant was recommissioned on 1st September 2011 and has been operating successfully since.

Since middle 2012, the new houses of Kumba were occupied in phases and ASSMANG commenced development of 450 stands to relocate their employees from Beeshoek to Postmasburg to facilitate expansion of the Beeshoek Mine. The first 250 of these new houses have been occupied since mid-2013. All these houses of both KUMBA and ASSMANG have increased the flow of wastewater to the existing Postmasburg WWTP gradually until a point was reached where the treatment plant was exceeding its design capacity on a daily basis.

In addition to these recently constructed housing units, several private developers have in the past year applied for land to develop further housing projects as KUMBA have indicated that they plan to expand their operations at Kolomela Mine and have an immediate need for another 1 300 housing units. In

addition to the above, the municipality are also in a planning process to develop a 3 500 unit mixed housing development. All these planned developments now require that the existing wastewater treatment plant either be upgraded to accommodate these envisaged flows, or as an alternative, that a new wastewater treatment plant be considered.

2.2 DESIRABILITY

The following factors determine the desirability of the area for the proposed Zypherfontein dam.

2.2.1 Location and Accessibility

The proposed location of the Waste Water Treatment Works site is considered ideally suited for the construction of the WWTW.

From an engineering point of view, the proposed site location is preferred since the flow of wastewater to the WWTW can be undertaken under gravity, avoiding the increased costs involved with pumping the wastewater. It is planned that this new sewer will be extended from the current position of Postmasburg Pump Station No.1 in a southerly direction following the run of the Groenwaterspruit to a point approximately 1 300m downstream of the town where the pipe will daylight at a gradient of 1 in 200. At this point, the Groenwater Spruit's gradient is steeper than the gradient of the pipe allowing the pipe to daylight above the envisaged 1 in 50 year floodline of the Groenwater Spruit. This represents an ideal position for the proposed new wastewater treatment plant.

The current electricity costs to pump all wastewater to the existing plant costs the Tsantsabane Municipality in excess of R5 million per annum and a decision was taken to look at the possibility of constructing a new wastewater treatment works on a site where gravity flow to the plant was possible and also where future expansion was not limited by spatial constraints.

The preferred site alternative meets these requirements.

2.2.2 Compatibility with the Surrounding Area

The proposed WWTW site is located on Farm Olynfontein No.475 Portion 3 just south of the town. The land is mostly undeveloped and is close enough to the town to avoid further costs due to extra pipelines and pump stations, but still far enough to avoid any potential nuisances and/or negative impacts on the residential areas of Postmasburg.

As discussed above, the site is not limited by spatial constraints due to future expansion.

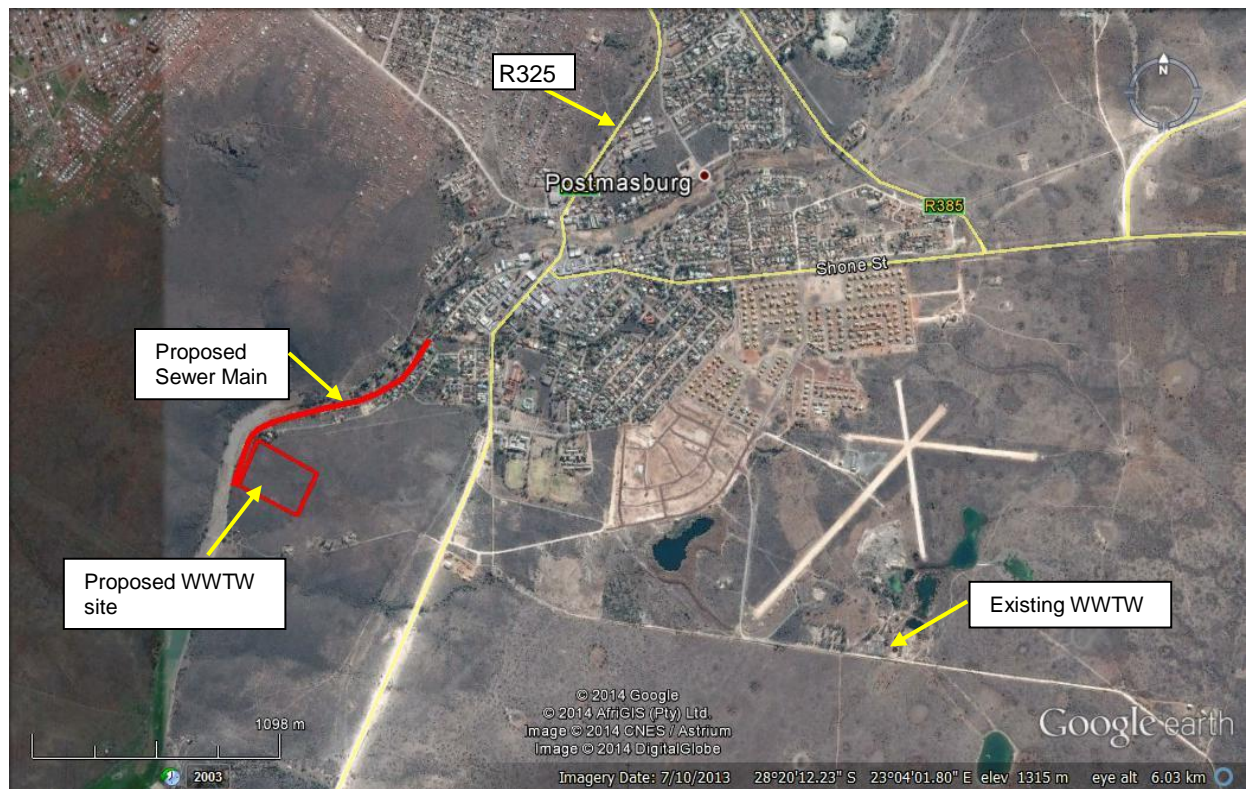


Figure 2: Aerial image of the surrounding landscape.

3. LEGAL REQUIREMENTS

The current assessment is being undertaken in terms of the National Environmental Management Act (Act 107 of 1998, NEMA), to be read with section 24 (5): NEMA EIA Regulations 2010. However, the provisions of various other Acts must also be considered within this EIA.

The legislation that is relevant to this study is briefly outlined below.

3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Northern Cape to the Department of Environment and Nature Conservation (DE&NC).

On the 18 June 2010 the Minister of Water and Environmental Affairs promulgated regulations in terms of Chapter 5 of the NEMA, namely the EIA Regulations 2010 (GN No. R. 543, R. 544 (Listing Notice 1), R. 545 (Listing Notice 2), R. 546 (Listing Notice 3) and R. 547 in Government Gazette No. 33306 of 18 June 2010). These regulations came into effect on the 2 August 2010. Listing Notice 1 and 3 are for a Basic Assessment and Listing Notice 2 for a full Environmental Impact Assessment.

According to the regulations of Section 24(5) of NEMA, authorisation is required for the following listed activities for the proposed Postmasburg Waste Water Treatment Works and sewer line:

Government Notice R544 (Listing Notice 1) listed activities:

11 The construction of:

- (i) canals
- (ii) channels
- (iii) bridges
- (iv) dams**
- (v) weirs
- (vi) bulk storm water outlet structures
- (vii) marinas
- (viii) jetties exceeding 50 square meters in size
- (ix) slipways exceeding 50 square meters in size
- (x) buildings exceeding 50 square meters in size or;
- (xi) infrastructure or structures covering 50 square meters or more;**

where such construction occurs within 32 meters of a watercourse, measured from the edge of a watercourse.

- 18** The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from a watercourse.
- 19** The **construction** of facilities or infrastructure exceeding 1000 meters in length for the bulk transportation of water, sewage or storm water –
- (i) With internal diameter of 0.36 meters or more; or
 - (ii) With a peak throughput of 120 liters per second or more,
- Excluding where:
- a. Such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or
 - b. Where such construction will occur within urban areas but further than 32 meters from a watercourse, measured from the edge of the watercourse.
- 23** The transformation of undeveloped, vacant or derelict land to –
- (i) Residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or
 - (ii) Residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;
- Except where such transformation takes place
- (i) For linear activities; and
 - (ii) For purposes of agricultural/afforestation, in which case Activity 16 of Notice No. R. 545 applies.
- 55a** The construction of facilities for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15 000 cubic metres.

Government Notice R545 (Listing notice 2) listed activities:

- 5** The **construction** of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.

Government Notice R546 (Listing notice 3) listed activities:

- 13** The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:
- (1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management:

Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;

- (2) the undertaking of a linear activity falling below the thresholds mentioned in Listing 1 in terms of GN R.544 of 2010.

14 The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:

- (1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;
- (2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;
- (3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010.

An Application Form has been submitted to DE&NC. On acknowledgment from DE&NC (**Appendix 1**), this Scoping Process is being undertaken to identify potential issues.

The principles of environmental management as set out in section 2 of NEMA have been taken into account. The principles pertinent to this activity include:

- People and their needs will be placed at the forefront while serving their physical, psychological, developmental, cultural and social interests. The activity seeks to provide additional employment and economic development opportunities, which are a local and national need – *the proposed activity is expected to have a beneficial impact on people, especially developmental and social benefits, as well providing additional employment and economic development opportunities.*
- Development will be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. The impact that the activity will potentially have on these will be considered, and mitigation measures will be put in place - *potential impacts have been identified and considered, and any further potential impacts will be identified during the public participation process. Mitigation measures will be included in the EMP.*
- Where waste cannot be avoided, it will be minimised and remedied through the implementation and adherence of the Environmental Management Programme (EMP) – *this will be included in the EIR.*
- The use of non-renewable natural resources will be responsible and equitable.
- The negative impacts on the environment and on people's environmental rights will be anticipated, investigated and prevented, and where they cannot be prevented, will be minimised and remedied.
- The interests, needs and values of all interested and affected parties will be taken into account in any decisions through the Public Participation Process.
- The social, economic and environmental impacts of the activity will be considered, assessed and evaluated, including the disadvantages and benefits.
- The effects of decisions on all aspects of the environment and all people in the environment will be taken into account, by pursuing what is considered the best practicable environmental option.

3.3 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will require a Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is found to be adequate, a separate HIA is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- any development or other activity which will change the character of a site exceeding 5 000 m² in extent;
- the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

3.4 EIA GUIDELINE AND INFORMATION DOCUMENT SERIES

The following are the latest guidelines and information Documents that have been consulted:

- Department of Environmental Affairs and Development Planning's (DEA&DP) *Environmental Impact Assessment Guideline and Information Document Series (Dated: March 2013)*:
 - ✓ *Guideline on Transitional Arrangements*
 - ✓ *Generic Terms of Reference for EAPs and Project Schedules*
 - ✓ *Guideline on Alternatives*
 - ✓ *Guideline on Public Participation*
 - ✓ *Guideline on Exemption Applications*
 - ✓ *Guideline on Appeals*
 - ✓ *Guideline on Need and Desirability*
- Department of Environmental Affairs and tourism (DEAT) *Integrated Environmental Management Information Series*

3.5 NATIONAL WATER ACT

Besides the provisions of NEMA for this EIA process, the proposed Waste Water Treatment Works also requires authorizations under the National Water Act (Act N0. 36 of 1998). The Department of Water Affairs, who administer that Act, will be a leading role-player in the EIA.

As required by the Department of Water Affairs, a Water Use Licence Application (WULA) will be compiled and submitted.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA, which includes the Protected Areas Act, the Air Quality Act, the Integrated Coastal Management Act and the Waste Act. Chapter 4 of NEMBA deals with threatened and protected ecosystems and species and related threatened processes and restricted activities. The need to protect listed ecosystems is addressed (*Section 54*).

4. ALTERNATIVES

Various alternatives have been considered during the Scoping phase and these are described below.

4.1 SITE AND ACTIVITY ALTERNATIVES FOR THE PROPOSED WASTE WATER TREATMENT WORKS

After much investigation, only two viable alternatives have been considered. The two alternatives are as follows:

- The construction a new WWTW on Farm Olynfontein No.475 Portion 3 (Alternative 1 – preferred alternative)
- Upgrading of the existing Postmasburg WWTW (Alternative 2)

These are indicated in Figure 3 below.

Alternative 1 (Preferred alternative):

This is the option of construction a new Waste Water Treatment Works on Farm Olynfontein No.475 Portion 3, and a new main sewer line from the existing Postmasburg pump station.

Technically and financially (in terms of future Operation and Maintenance costs) this is the preferred option. The reason for this is that the chosen site allows the total sewage load of the town (with the exception of Boichoko) to flow to the wastewater treatment plant under gravity.

This also has the advantage that the municipality will be able to eliminate 4 of their 6 wastewater pump stations. This will firstly generate an annual saving of about R5 million per annum just on the cost of electricity. Secondly it will eliminate 4 operational points which require constant electrical and mechanical maintenance.

Thirdly, it will reduce the risks associated with sewage spills which currently occur on a weekly basis, as these pump stations are operating at their design limits due to the unprecedented growth experienced by Postmasburg. With a number of residential developments being planned in Postmasburg, these developments will put additional strain on the pump stations increasing the risk for spills.

Alternative 2:

The only other viable option is to extend the capacity of the existing wastewater treatment plant (4.8MI/day) by doubling its capacity to 9.8MI/day. This will cost approximately the same as the construction of the new proposed WWTW (Alternative 1). The reason for this being that the current plant's inlet works has reached its design capacity which means that the entire plant must be duplicated to achieve the required treatment capacity.

There is sufficient space at the current site to do this, however, it would entail substantial blasting as the site is basically a calcrete koppie.

This alternative is also not preferred as it will continue to require that all sewage generated in the town of Postmasburg be pumped. This will require that at least 4 of the six pump stations be upgraded to increase their capacity by at least 50%. Given that Postmasburg Pump station No.1 has a sump of 11m in depth, this will entail major construction works on a very constricted site at great cost.

If the lifecycle cost of a pump is considered over 20 years, 85% of the cost is for energy (electricity), 10% for the initial capital investment and 5% for maintenance. The continued use of the pump stations will also require continued electrical and mechanical maintenance.

This alternative is also not preferred as the existing site has no more space for the safe disposal of the treated effluent. The current naturally occurring pans which are used to evaporate the treated effluent have been overflowing since May 2014. This overflowing treated effluent is now flowing onto the roads and stormwater system of the Airfield residential suburb. Although the water is of good quality, the continuous flooding of the roads and streets of Airfield will eventually lead to their premature failure. This issue can only be addressed by constructing a pipeline from the existing works to the Groenwaterspruit at an additional cost of R12 million, as this water needs to be disposed of and the future flows cannot be accommodated at the pans any more.

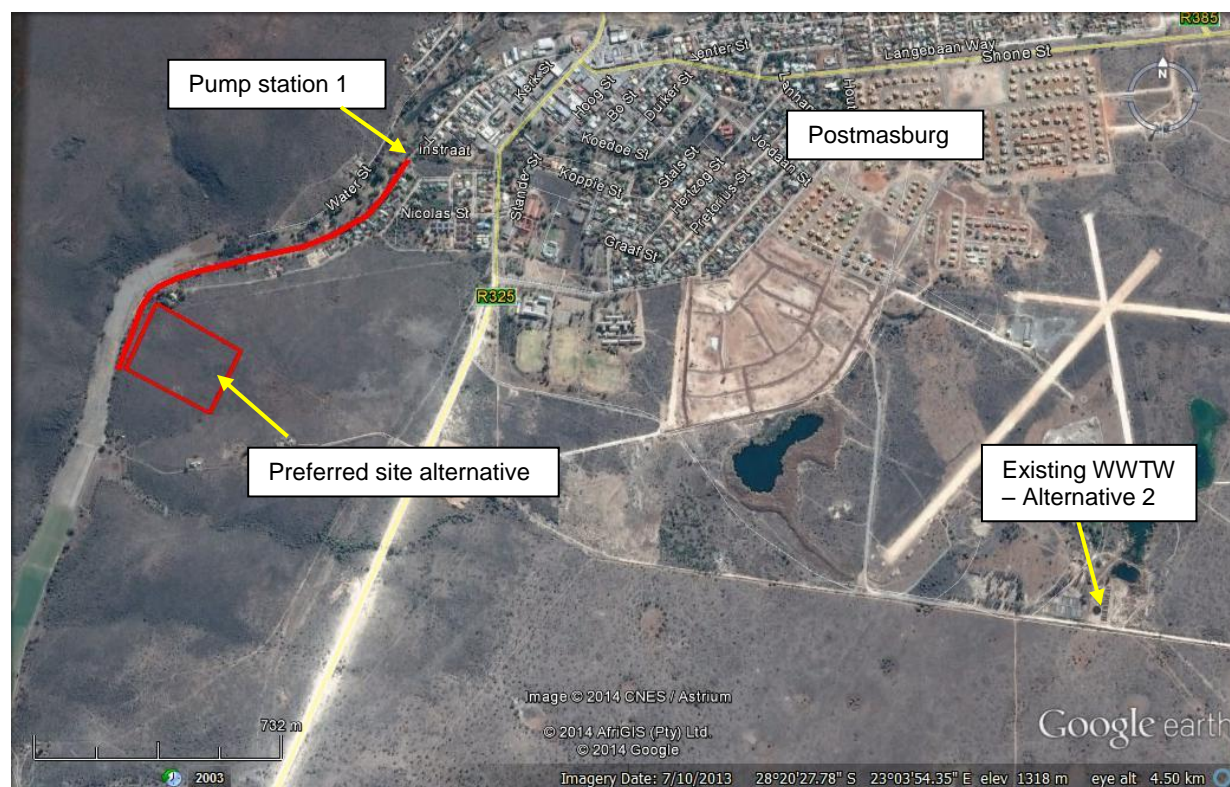


Figure 3: Aerial image showing the various alternatives that were considered and investigated

4.2 NO-GO ALTERNATIVE

This is the option of not developing the proposed Waste Water Treatment Works. Although this might result in no potential negative environmental impacts, the direct and indirect socio-economic benefits of not constructing the WWTW will not be realised. As described in *Section 2.1*, future expansion and development of the town of Postmasburg, and as a result, mining operations in the area, will be limited in future.

5. SITE DESCRIPTION

5.1 LOCATION

The site of the proposed Waste Water Treatment Works is located on Portion 3 of Farm Olynfontein No. 475, Postmasburg in the Northern Cape. The proposed new sewer line will cross the following erven:

- Erf 1,
- Erf 123,
- Erf 125,
- Erf 126,
- Erf 127,
- Erf 764,
- Erf 779 and
- Erf 1504.

The proposed WWTW will be located approximately 350m south-west of the nearest residential area in Postmasburg.

The site coordinates for the WWTW are: S 28° 20' 23.41", E23° 03' 04.92".

The proposed sewer line starts at the existing Postmasburg pump station located at: S 28° 20' 03.78", E23° 03' 29.53".

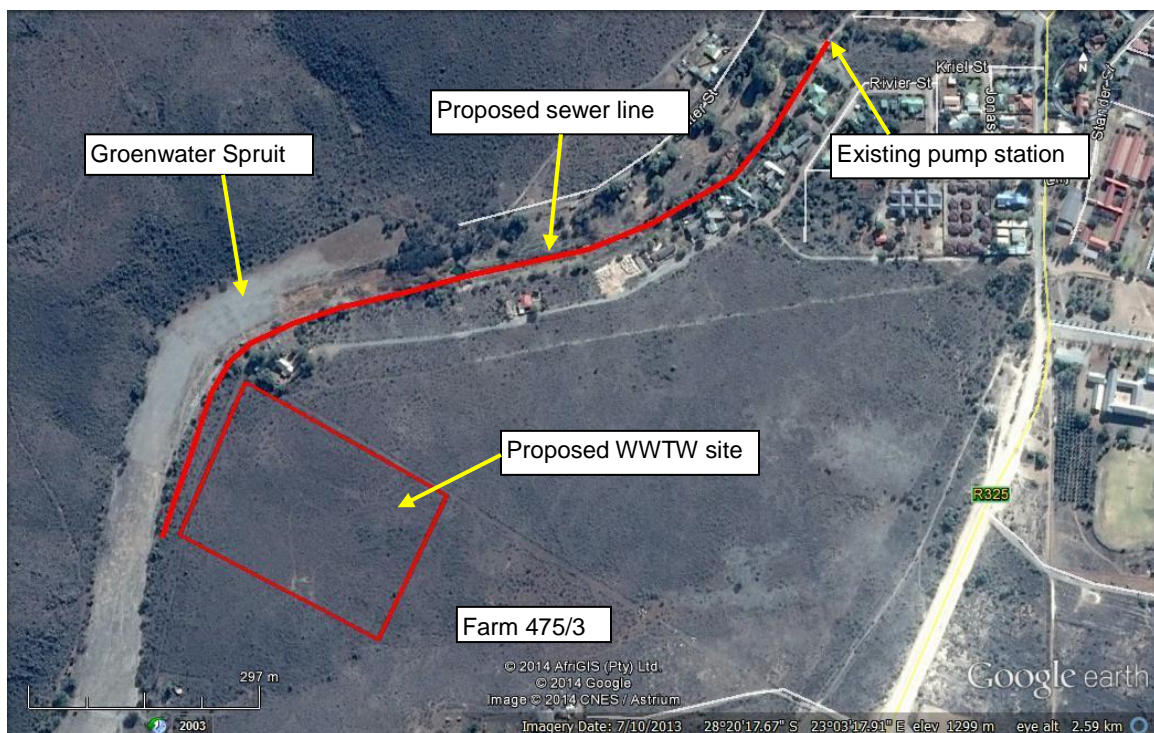


Figure 4: Aerial image of the site.



Figure 5: General view of the proposed WWTW site, looking south east

5.2 VEGETATION

The site of the WWTW is undeveloped and generally near natural. The site of the WWTW is covered relatively densely in Black Thorn/ Swaarthaak (*Acacia mellifera*), which in places has become impregnable.

The sewer line route along the Groenwater Spruit consists typically of *Acacia erioloba*, *Grewia flava*, *Ziziphus mucronata*, *Tarchonanthus camphoratus* and alien *Prosopis* trees (*Prosopis glandulosa*)

From the vegetation map (SANBI BGIS), the vegetation that occurs on the properties is Kuruman Thornveld and Postmasburg Thornveld.

None of these vegetation types are classified in terms of Section 52 (1)(a) of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA).

According to the National list of ecosystems that are threatened and in need of protection (GN. 1002 of 9 Dec. 2011), these vegetation types are classified as:

- Kuruman Thornveld - Least threatened.
- Postmasburg Thornveld - Least threatened.

Kuruman Thornveld is described as very well developed, closed shrub layer and well-developed open tree stratum consisting of *Acacia erioloba* on flat rocky plains and some sloping hills.

Postmasburg Thornveld is described as an open, shrubby thornveld characterized by a dense shrub layer, often lacking a tree layer, with a sparse grass layer. Shrubs are normally low with a karroid affinity.

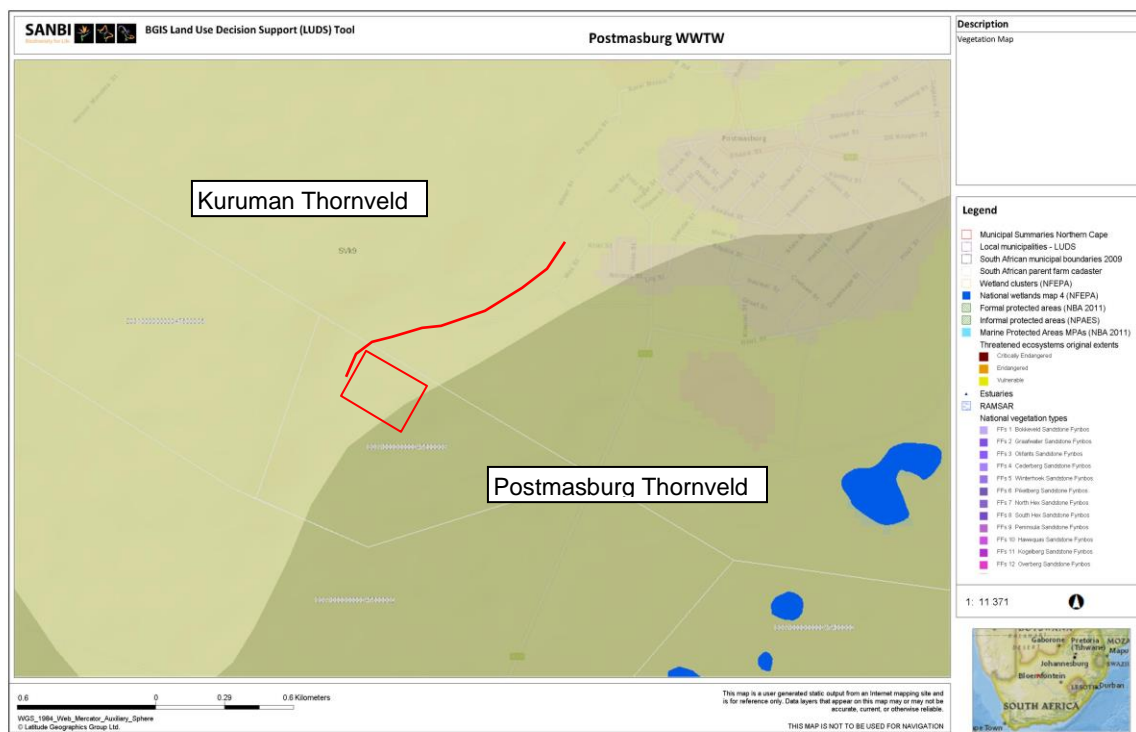


Figure 6: SANBI Vegetation map of the area. The proposed site is indicated by the red polygon and the proposed sewer line by the red line.

5.3 FRESHWATER

The town of Postmasburg is located within a valley, of which the non-perennial Groenwater Spruit is the major watercourse. The proposed WWTW is located on the eastern bank of the Groenwater Spruit.

The topography of the area slopes gradually towards the Groenwater Spruit which is an episodic river fed by numerous small tributaries. Flow only takes place after heavy rainfall events and it is then short lived.

These events only occur every couple of years and for this reason the fertile soils of the Groenwater Spruit river bed is used for the cultivation of lucerne and for other agricultural purposes.

During the 2004 National Spatial Biodiversity Assessment, the Groenwater Spruit system has been classified as largely natural and not threatened, which places a special emphasis on the management and protection of this river system. However, the Groenwater Spruit in the vicinity of the study area has been impacted and disturbed by agricultural and other purposes.

5.4 CLIMATE

The Postmasburg area is typically a semi-desert area characterised by hot summers and cold dry winters. Rains occur in the summer and autumn, and frost is frequent in the winter.

The area receives approximately 330mm of rain per year with 80% rainfall between November and April.

It receives the lowest rainfall in July and the highest (81mm average) in February. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Postmasburg range from 17°C in June and July to 30°C in January. The region is the coldest during June and July when the temperature drops to 1°C on average during the night.

5.5 SOCIO-ECONOMIC CONTEXT

According to the Tsantsabane Local Municipality IDP Review 2014-2015, the Tsantsabane Municipality is characterized by a mixture of land uses of which agriculture and mining is dominant land use within the rural areas. The residential areas vary from the relatively large town of Postmasburg to small scattered rural communities. Some of these communities are the remains of railway stations.

The population figures in terms of census 2011 is 35093 compare to 31014 in 2001 (the current estimated population is approximately 42 000). The male population has increased with 24% while the female population has increased with only 2.7% since 2001. This increase can be relatively influenced by job migration and other factors.

According to the stats the unemployment figure has drastically reduced from 4466 in 2001 to 3795 in 2011 which shows a decrease of -15%. Employment has increase with 69% in 2011, which translates in more people working in 2011 than 2001. If the jobs are permanent then it attributes to higher level of skills.

Tsantsabane is characterized by a mixture of land uses of which agriculture and mining is dominant within the rural areas. Although diamonds have been mined here since 1892, the most important mineral currently mined is manganese. The residential areas vary between relatively large town (Postmasburg) to small scattered rural communities – some the remains of railway stations.

5.6 HERITAGE FEATURES

A Heritage Scan has been conducted on the proposed site.

According to the scan thirty four stone implements were encountered during the baseline study, but none of these were found in the proposed sewer pipeline alongside the Groenwater Spruit.

A few isolated banded ironstone flakes and chunks were found on the rocky slopes and small outcrops alongside the proposed route, while the majority of the finds were encountered in the small strip of land cleared alongside the fence line including a very diffuse scatter.

Only eight implements were found in the proposed footprint area for the sewerage treatment works on top the kopje above the proposed pipeline route, overlooking the Groenwater Spruit. These include several retouched and utilized flakes chunks and two cores including one MSA disc core.

No visible graves or typical surface grave markers were found in the pipeline route or associated infrastructure

There are no other old buildings, structures or features older than 60 years that will be impacted by proposed construction activities.

The HIA has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to proposed construction activities commencing.

The receiving environment is not considered to be a sensitive, vulnerable or threatened archaeological landscape.

6. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

Environmental issues were raised through informal discussions with the project team, specialists and authorities. All issues raised will be assessed in the specialist reports and will form part of the Environmental Impact Report. Additional issues raised during the public participation will be listed in the Final Scoping Report.

The following potential issues have been identified:

6.1 BIODIVERSITY

6.1.1 Botanical

A botanical impact assessment will be conducted to determine if there is any sensitive or endangered vegetation on the proposed site. Due to the size of the development (approximately 10ha), there will be a loss of vegetation during the construction phase of the project.

A Biodiversity scoping assessment will be conducted, which will describe and assess the botanical sensitivity of the area. The terms of reference for this study required a baseline analysis of the flora of the property, including the broad ecological characteristics of the site.

The botanical assessment will include the following:

- The significance of the potential impact of the proposed project, alternatives and related activities – with and without mitigation – on biodiversity pattern and process at the site, landscape and regional scales.
- Recommended actions that should be taken to prevent or, if prevention is not feasible, to mitigate impacts.

6.2.2 Fauna

Mammal and bird species was not regarded as the proposed activity is not expected to have any significant, permanent impact on these species.

However, fauna will be assessed as part of the Biodiversity assessment, and no further faunal assessments are deemed necessary.

6.2 FRESHWATER

Due to the size and nature of the development and the location of the proposed Waste Water Treatment Works and sewer line in close proximity to the Groenwater Spruit, a freshwater impact assessment will be conducted.

The terms of reference for the Freshwater assessment are as follows:

- Literature review and assessment of existing information
- Site Assessment of the proposed activities and impact on the associated freshwater systems. This will include an assessment of the freshwater ecological condition, using river health indices such as in-stream and riparian habitat integrity, aquatic macro-invertebrates and riparian vegetation to determine set back lines and geomorphological condition of the streams, which will

then determine the overall Ecostatus of the streams and provide data that will inform the Water Use Licence Application of the project. This will include both the stream to be impacted by the dam development and the pump station establishment.

- Describe ecological characteristics of freshwater systems and compile report based on the data and information collected in the previous two tasks, describe ecological characteristics of the freshwater systems, comment on the conservation value and importance of the freshwater systems and delineate the outer boundary of the riparian zones/riverine corridors.
- Evaluate the freshwater issues on the site and propose mitigation measures and measures for the rehabilitation of the site as well as setback lines for future development.
- Compilation of the documentation for submission of the water use authorisation application (WULA) to the Department of Water Affairs (if deemed necessary).

6.3 HERITAGE

The possible impact on heritage resources has been identified as a possible environmental impact as a result of the construction of the Waste Water Treatment Works and sewer line.

A Heritage Impact Assessment will be conducted on the site.

The terms of reference for the heritage and archaeological study are as follows:

- To determine whether there are likely to be any important archaeological sites or remains that might be impacted by the proposed development;
- To identify and map archaeological sites/remains that might be impacted by the proposed development;
- To assess the sensitivity and conservation significance of archaeological sites/remains in the inundation area;
- To assess the status and significance of any impacts resulting from the proposed development, and
- To identify measures to protect any valuable archaeological sites/remains that may exist within the estimated inundation area.

6.4 GEOHYDROLOGICAL

The primary objective of this study is to complete a geo-hydrological impact assessment of what impacts the proposed developments and disposal of the treated effluent may have.

The groundwater risk characterization is determined by problem identification, receptor characterization, an exposure assessment and a toxicity assessment.

The study involved the following key tasks:

Task 1: Data Collation. This involves obtaining all relevant data to the project (i.e. data from the National Groundwater Archive (NGA), Water Quality Management System and Water Information Management System), geological maps and geo-hydrological maps. This includes reviewing relevant reports and studies pertaining to the Waste Water Treatment Works and study area.

Task 2: Hydrocensus and Site Visit. This involves a site visit and completing a hydrocensus surrounding the treatment works, pipeline and outflow point (i.e. visiting all boreholes on the property and

measuring yields and water quality (pH, EC, TDS and ORP). This includes an evaluation of the water quality of the discharged treated effluent and an evaluation of potential contamination sources, pathways and receptors.

Task 3: Data Analysis. All collected data obtained will be analysed using geo-hydrological methods and the groundwater risks were evaluated in relation to the proposed developments.

All the results and findings from the study will be presented in detail within the report.

6.5 VISUAL IMPACT

The potential impact on the sense of place of the proposed Waste Water Treatment Works and sewer line will also be considered. However, due to the nature of the activity, the surrounding land-uses and the proximity of any significant settlements to the site, and that the sense of place is not expected to be significantly altered by the proposed Waste Water Treatment Works, no further studies are suggested.

6.6 OTHER ISSUES IDENTIFIED

Any further issues raised during the public participation process or by the Competent Authority not mentioned in this section, will be dealt with during the EIA phase.

7. DETAILS OF THE PUBLIC PARTICIPATION PROCESS

Interested and Affected Parties (I&APs) have been and will be identified throughout the process. Landowners adjacent to the proposed site, relevant organs of state, organizations, ward councillors and the Local and District Municipality were added to this database. A complete list of organisations and individual groups identified to date is shown in **Appendix 2A**.

Public Participation will be conducted for this proposed WWTW in accordance with the requirements outlined in Regulation 54 and 55 and 56 of the NEMA EIA Regulations. The issues and concerns raised during the scoping phase will be dealt with in the EIA phase of this application.

As such each subsection of Regulation 54 contained in Chapter 6 of the NEMA EIA Regulations will be addressed separately to thereby demonstrate that all potential Interested and Affected Parties (I&AP's) were notified of the proposed development.

R54 (2) (a):

R54 (2) (a) (i): A poster will be displayed on the property fence near the farm entrance of the proposed site. Posters will also be placed at conspicuous sites in Postmasburg, including at the Spar shopping centres, post office in Postmasburg and at the Tsantsabane Municipality offices (please refer to **Appendix 2D**)

The posters contained all details as prescribed by R56 (3) (a) & (b) and the size of the on-site poster was 60cm by 42cm as prescribed by section 56 (4) (a).

R54 (2) (a) (ii): N/A. There is no alternative site.

R54 (2) b):

R54 (2) (b) (i): An initial notification letter was sent to the landowner/s (please refer to **Appendix 2C** for proof of notification letters sent).

R54 (2) (b) (iii): Initial notification letters will be delivered to landowners and occupiers adjacent to the site (please refer to **Appendix 9C** for proof of notification letters sent).

R54 (2) (b) (iv): An initial notification letter was sent to the municipal Ward councillor at the Tsantsabane Municipality, for the ward in which the site is situated (please refer to **Appendix 2C** for proof of notification letters sent).

R54 (2) (b) (v): An initial notification letter was sent to the Municipal Manager of Tsantsabane Municipality as the municipality is the Applicant

R54 (2) (b) (vi): Initial notification letter (please refer to **Appendix 2C** for proof of notification letters sent) will be sent to the following organs of state having jurisdiction in respect of any aspect of the activity:

- Department of Water Affairs
- Department of Agriculture and Land Reform
- Department of Roads and Public Works
- Department of Agriculture, Forestry and Fisheries

- Department of Environment and Nature Conservation: Waste Management

R54 (2) (c) (i): An advertisement was placed in the local newspaper, Kalahari Bulletin, on 30 October 2014 (please refer to **Appendix 2B** for proof of advertisement).

R54 (2) (d): N/A

R54 (7):

R54 (7) (a): All relevant facts in respect of the application were made available to potential I&AP's.

R54 (7) (b): I&AP's were given more than a 40-day registration and comment period on the proposed application during the first round of public participation for the Draft Scoping Report.

R55 (1) (a), (b), (c) and R56(2): A register of interested and affected parties was opened, maintained and is available to any person requesting access to the register in writing (please refer to **Appendix 2A** for the list of Interested and Affected Parties).

Please find attached in **Appendix 2:**

- Proof of Notice boards, advertisements and notices that were sent out
- List of potential interested and affected parties
- Summary of issues raised by interested and affected parties

8. PLAN OF STUDY FOR THE EIA

8.1 TASKS TO BE UNDERTAKEN

Due to the nature of the proposed Postmasburg Waste Water Treatment Works there are a number of activities that will still need to be undertaken during the next phase of the project. The proposed process is as described as follows (This follows from a Scoping process to be accepted by the DE&NC):

The Draft Scoping Report is being advertised for a 40-day comment period starting from the 30th October 2014 to 10th December 2014. Comments received during the Public Participation Process will be incorporated into the Final Scoping Report. The Final Scoping Report will be made available for comment for a further 21 days to all registered I&APs.

The following is a list of tasks to be performed as part of the EIA Process. Should the process be modified significantly, changes will be copied to DEA&DP.

EIA PROCESS	
TASK	TIMEFRAMES
Submit Final Scoping Report (FSR) and Plan of Study for EIA.	February 2015
Receive approval for the FSR and the Plan of Study for EIA.	March 2015
Undertake specialist studies.	March 2015
Compile the Draft Environmental Impact Report (EIR) for public comment based on specialist information.	April 2015
Advertise Draft EIR, for public comment.	April 2015
Receive responses to the Draft EIR.	May 2015
Preparation of a FINAL EIR for submission to DE&NC.	June 2015

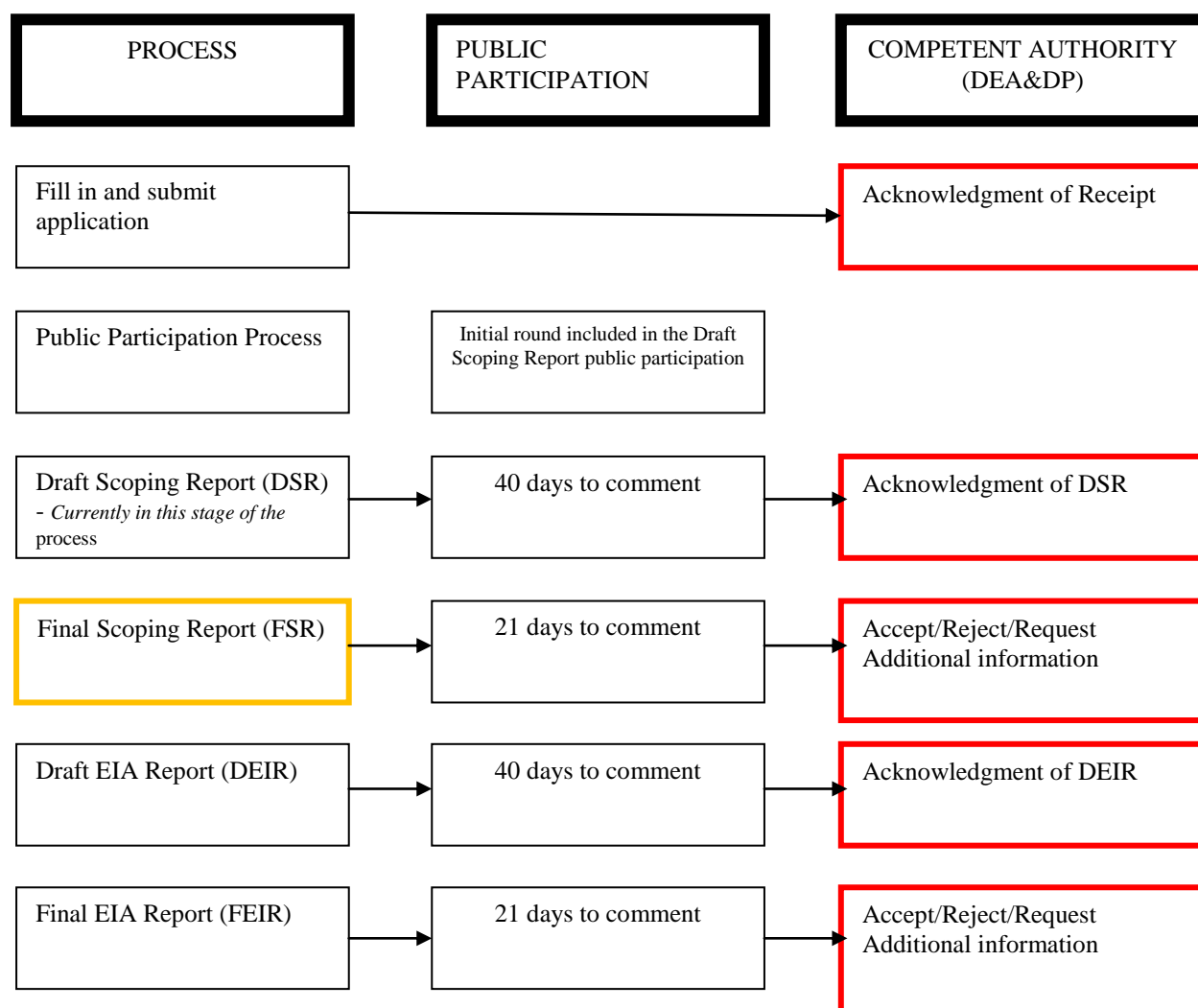


Figure 7. Summary of the EIA process and public participation process. The red indicates the stages where the competent authority will be consulted during the process.

8.2 PUBLIC PARTICIPATION AND INTERESTED AND AFFECTED PARTIES

Please refer to Figure 6 to see where the public participation process is present in the environmental impact assessment. The Interested and Affected Parties will have a chance to view and comment on all the reports that are submitted. The figures also indicated what timeframes are applicable to what stage in the process. If required, meetings with key stakeholders will be held.

At the end of the comment period, the EIR will be revised in response to feedback received from I&APs. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR). The Final EIR will then be submitted to DE&NC for consideration and decision-making.

Correspondence with I&APs will be via post, fax, telephone, email and newspaper advertisements.

Should it be required, this process may be adapted depending on input received during the on-going process and as a result of public input. DE&NC will be informed of any changes in the process.

8.3 CRITERIA FOR SPECIALIST ASSESSMENT OF IMPACTS

As a result of the environmental issues and potential impacts identified in *Section 6*, the need for the following specialist studies has been identified:

- Biodiversity Assessment
- Freshwater Assessment
- Heritage Impact Assessment
- Geo-hydrological Assessment

The impacts of the proposed activity on the various components of the receiving environment will be evaluated in terms of duration (time scale), extent (spatial scale), magnitude and significance as outlined in Table 1. These impacts could either be positive or negative.

The magnitude of an impact is a judgment value that rests with the individual assessor while the determination of significance rests on a combination of the criteria for duration, extent and magnitude. Significance thus is also a judgment value made by the individual assessor.

Table 1: Criteria used for evaluating impacts

Criteria	Category
Nature of impact	This is an evaluation of the effect that the construction, operation and maintenance of a proposed dam would have on the affected environment. This description should include what is to be affected and how.
Duration (Predict whether the lifetime of the Impact will be temporary (less than 1 year) short term (0 to 5 years); medium term (5 to 15 years); long term (more than 15 years, with the Impact ceasing after full implementation of all development components with mitigations); or permanent.	Temporary: < 1 year (not including construction) Short-term: 1 – 5 years Medium term: 5 – 15 years Long-term: >15 years (Impact will stop after the operational or running life of the activity, either due to natural course or by human interference) Permanent: Impact will be where mitigation or moderation by natural course or by human interference will not occur in a particular means or in a particular time period that the impact can be considered temporary
Extent (Describe whether the impact occurs on a scale limited to the site area; limited to broader area; or on a wider scale)	Site Specific: Expanding only as far as the activity itself (<i>onsite</i>) Small: restricted to the site's immediate environment within 1 km of the site (<i>limited</i>) Medium: Within 5 km of the site (<i>local</i>) Large: Beyond 5 km of the site (<i>regional</i>)
Intensity (Describe whether the magnitude (scale/size) of the Impact is high; medium; low; or negligible. The specialist study must attempt to quantify the magnitude of impacts, with the rationale used explained)	Very low: Affects the environment in such a way that natural and/or social functions/processes are not affected Low: Natural and/or social functions/processes are slightly altered Medium: Natural and/or social functions/processes are notably altered in a modified way High: Natural and/or social functions/processes are severely altered and may temporarily or permanently cease

Probability of occurrence Describe the probability of the Impact actually occurring as definite (Impact will occur regardless of mitigations)	Improbable: Not at all likely Probable: Distinctive possibility Highly probable: Most likely to happen Definite: Impact will occur regardless of any prevention measures
Status of the Impact Describe whether the Impact is positive, negative (or neutral).	Positive: The activity will have a social/ economical/ environmental benefit Neutral: The activity will have no affect Negative: The activity will be socially/ economically/ environmentally harmful
Degree of Confidence in predictions State the degree of confidence in predictions based on availability of information and specialist knowledge	Unsure/Low: Little confidence regarding information available (<40%) Probable/Med: Moderate confidence regarding information available (40-80%) Definite/High: Great confidence regarding information available (>80%)
Significance (The impact on each component is determined by a combination of the above criteria and defined as follows) The significance of impacts shall be assessed <u>with and without mitigations</u> . The significance of identified impacts on components of the affected biophysical or socio-economic environment (and, where relevant, with respect to potential legal requirement/s) shall be described as follows:	No change: A potential concern which was found to have no impact when evaluated Very low: Impacts will be site specific and temporary with no mitigation necessary. Low: The impacts will have a minor influence on the proposed development and/or environment. These impacts require some thought to adjustment of the project design where achievable, or alternative mitigation measures Moderate: Impacts will be experienced in the local and surrounding areas for the life span of the development and may result in long term changes. The impact can be lessened or improved by an amendment in the project design or implementation of effective mitigation measures. High: Impacts have a high magnitude and will be experienced regionally for at least the life span of the development, or will be irreversible. The impacts could have the no-go proposition on portions of the development in spite of any mitigation measures that could be implemented.

In addition to determining the individual impacts against the various criteria, the element of mitigation, where relevant, will also be brought into the assessment. In such instances the impact will be assessed with a statement on the mitigation measure that could/should be applied. An indication of the certainty of a mitigation measure considered, achieving the end result to the extent indicated, is given on a scale of 1-5 (1 being totally uncertain and 5 being absolutely certain), taking into consideration uncertainties, assumptions and gaps in knowledge.

Table 2: The stated assessment and information will be determined for each individual issue or related groups of issues and presented in descriptive format in the following table example or a close replica thereof.

Impact Statement:		
Mitigation:		
Ratings	Duration	
	Extent	
	Intensity	
	Probability of impact	
	Status of Impact (Positive/negative)	
	Degree of confidence	

Significances	Significance without Mitigation	
	Significance <u>WITH</u> Mitigation	
Indication of the certainty of a mitigation measure considered, achieving the end result to the extent indicated, is given on a scale of 1-5 (1 being totally uncertain and 5 being absolutely certain), taking into consideration uncertainties, assumptions and gaps in knowledge		
Legal Requirements (Identify and list the specific legislation and permit requirements which are relevant to this development):		

9. CONCLUSION AND RECOMMENDATIONS

A scoping exercise is being undertaken to present the proposed activities to the I&APs and to identify environmental issues discussed in this report and concerns raised as a result of the proposed development alternatives to date. The issues and concerns were raised by I&APs, authorities, the project team as well as specialist input, based on baseline studies undertaken.

This Draft Scoping Report, being undertaken in terms of NEMA, summarises the process undertaken, the alternatives presented and the issues and concerns raised.

As a result of the above, the need for the following specialist studies, have been identified:

- Biodiversity Assessment
- Freshwater Assessment
- Geo-hydrological Assessment
- Heritage Impact Assessment

Any further issues raised as a result of the Public Participation Process will be dealt with during the EIA phase.

The significance of the impacts associated with the alternatives proposed will be assessed in these specialist studies, as part of the EIA. Once the specialist studies have been completed, they will be summarised in an Environmental Impact Report (EIR), which integrates the findings of the assessment phase of the EIA.

Based on the significance of the issues raised during the ongoing Public Participation Process and Scoping Phase, it is evident that an Environmental Impact Assessment (EIA) is required. ***It is therefore recommended that authorisation for the commencement of an EIA for the proposed development is granted.*** Should the EIA process be authorised, the significant issues raised in the process to date will be addressed and the specialist studies noted in this report, will be undertaken.

10. DETAILS AND EXPERTISE OF THE EAP

This Draft Scoping Report was prepared by Clinton Geyser who has a MSc. Degree in Environmental Management. He has been working as an Environmental Assessment Practitioner since 2009 and is currently employed at EnviroAfrica CC. The whole process and report was supervised by Bernard de Witt who has more than 20 years experience in environmental management and environmental impact assessments.

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