BASIC ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A NEW CONCRETE RESERVOIR IN LENASIA SOUTH WITHIN CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.

DRAFT BASIC ASSESSMENT REPORT

February 2019

COMPILED BY:
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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.

4. A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.

5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.

6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**

10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.

11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:	
File Reference Number:	
Application Number:	
Date Received:	

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Not Applicable

Is a closure plan applicable for this application and has it been included in this report? **No**

if not, state reasons for not including the closure plan.

There are currently no plans to decommission

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? **No**

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? **Yes**

Refer to Appendix E9 – IAP Register

If no, state reasons for not attaching the list.

Not Applicable

Have State Departments including the competent authority commented? **N/A**

If no, why?

This information will be available after DBAR has been reviewed

PROJECT DETAILS

Title	:	BASIC ASSESSMENT FOR PROPOSED DEVELOPMENT OF A NEW CONCRETE RESERVOIR IN LENASIA SOUTH WITHIN CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.
Report compiled by	:	Company Name: Envirolution Consulting Contact person: Mr Thabang Sekele Postal Address: P.O.Box 1898, Sunninghill, 2157 Telephone Number: 0861 44 44 99 Fax Number: 0861 62 62 22 Email: thabang@envirolution.co.za
Applicant	:	Johannesburg Water SOC Ltd
Report Status	:	Draft Basic Assessment Report for Public Review
Review period		**The 30-day period for review is from** **06 February 2018 to 11 March 2018**

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- Appendix E6 - Comments and Responses Report
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PUBLIC REVIEW OF THE DRAFT BASIC ASSESSMENT REPORT

The Draft Basic Assessment Report (BAR) has been prepared by Envirolution Consulting (Pty) Ltd in order to assess the potential environmental impacts associated with the proposed development of a new concrete reservoir. The report is made available for public review for 30-day review period.

In order to obtain further information, register on the project database or submit your written comment to:

Environmental Assessment Practitioner

Name:	Thabang Sekele
Physical Address:	Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
Postal Address:	PO Box 1898, Sunninghill, 2157
Telephone Number:	(0861) 44 44 99
Fax Number:	(0861) 62 62 22
E-mail:	thabang@envirolution.co.za

The due date for comments on the Draft Basic Assessment Report is xx XXXX 2018

EXECUTIVE SUMMARY

Johannesburg Water SOC Ltd proposes to develop and operate a new concrete reservoir located in Lenasia South within the City of Johannesburg Metropolitan Municipality, Gauteng Province. The proposed concrete reservoir site is situated approximately 35km south west of the Johannesburg central business district where it is adjacent to the north western boundary of an existing Lenasia HL reservoir. The proposed reservoir will have a capacity of 15 mega litres and the associated development footprint will be approximately one (1) hectare in extent. This includes the concrete reservoir and the surrounding servitude yard.

Additional capacity is needed at the Lenasia HL reservoir in order to supply adequate water to Lenasia South Ext.1 and 4, Migson Manor (Lenasia South Ext.7), Zakariyya Park and additional areas of Vlakfontein Proper, Finetown, Hospital Hill and Lehae. The demand of these areas supplied by the existing Lenasia HL reservoir is higher than the supply to the reservoir resulting in insufficient head at the reservoir.

The purpose of this basic assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potential environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

Public participation has been conducted in line with the NEMA requirements; engagement through public meetings, site notices, newspaper advert and email correspondence with authorities and interested and affected members from the community.

While it is generally presumed that construction activities are damaging to the environment, the results of the assessment showed that project area is classified as an Ecological Support Area, as well as a CBA – Important Area in the southern section, based on the Gauteng Conservation Plan. The floral diversity was adversely affected by a fire event prior to the site survey. One provincially protected orchid species was identified approximately eight meters outside of the study area. The vegetation within the study is considered primary and highly sensitive.

The faunal diversity on the site was found to be moderate. There was suitable habitat present at the study area, including rocky outcrops, termite mounds, and grassland for the occurrence of more species and potentially species of conservation concern such as *Mystromys albicaudatus* and *Otomys auratus*. The survey was short and with additional sampling methods, it is expected that more species may be found. Overall and ecologically, the site exhibits no fatal flaw.

There are no insurmountable environmental or social constraints that prevent the establishment of the proposed reservoir; therefore, it is recommended that the proposed development be considered for approval subject to the application of the suggested mitigation measures.

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

1.1 Project Title

Proposed Development of a New Concrete Reservoir In Lenasia South within City of Johannesburg Metropolitan Municipality, Gauteng Province.

1.2 Project Background

Envirolution Consulting was appointed by **Nyeleti Consulting** on behalf of **Johannesburg Water SOC Ltd** to undertake a Basic Assessment process for the proposed development of a new 15 mega litre concrete reservoir on **Portion 352 of the farm Lenasia** within City of Johannesburg Metropolitan Municipality, Gauteng Province (refer to Figure 1). The proposed site is located approximately 35 kilometres south west of the Johannesburg central business district. The proposed development total footprint of the site is approximately one (1) hectare in extent. This includes the concrete reservoir and the surrounding servitude yard. The new proposed reservoir is located on the north western side of the existing Lenasia High Level (HL) reservoir.

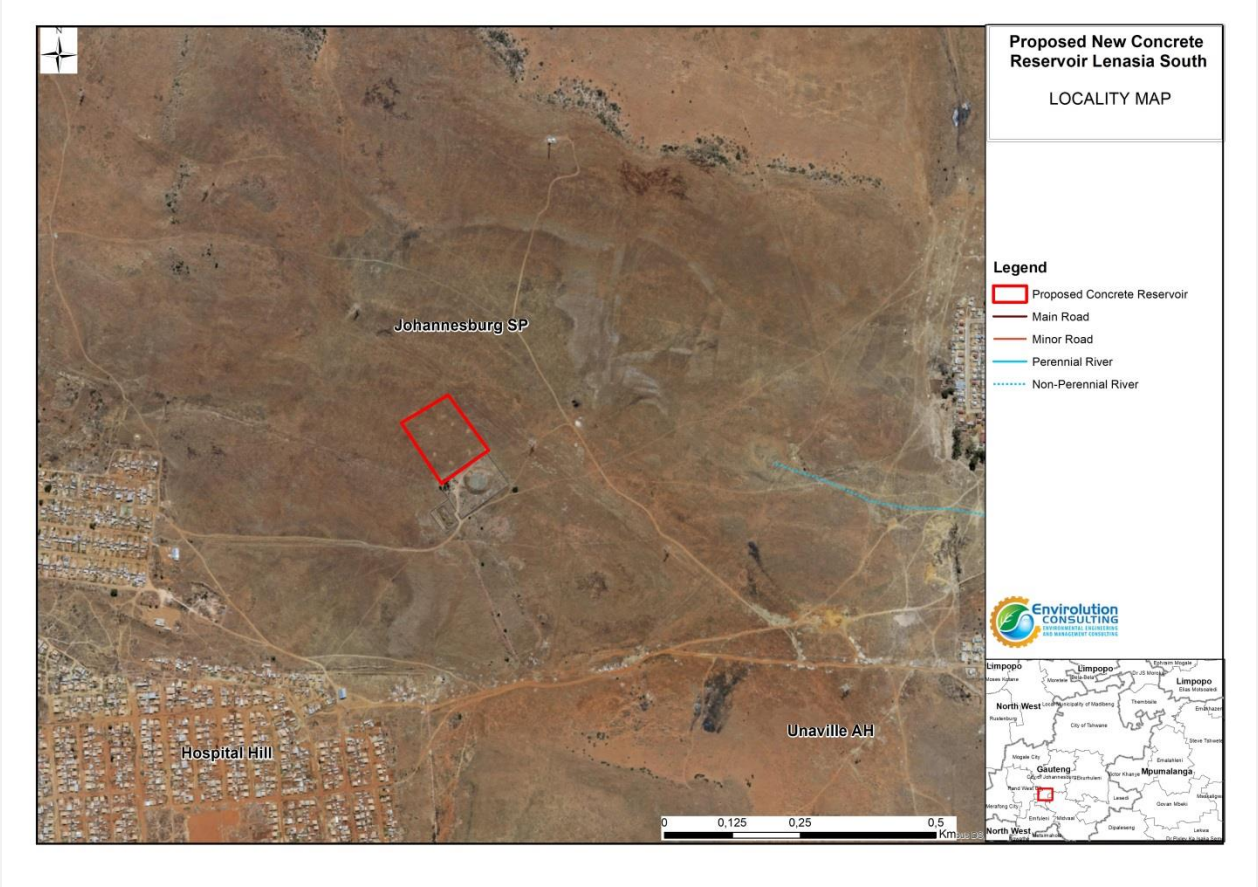


Figure 1: Locality map showing the proposed developable area for the proposed development (refer to **Appendix A** for maps).

Additional capacity is needed at the Lenasia HL reservoir in order to supply adequate water to Lenasia South ext.1 and 4, Migson Manor (Lenasia South ext.7), Zakariyya Park and additional areas of Vlakfontein Proper, Finetown, Hospital Hill and Lehae. The demand of these areas supplied by the existing Lenasia HL reservoir is higher than the supply to the reservoir resulting in insufficient head at the reservoir.

1.3 Requirement for a Basic Assessment Process

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GNR 982 to R983 (as amended 07 April 2017 (GNR 326), a Basic Assessment process is required for the proposed project. **Table 1** contains the listed activities in terms of the EIA Regulations and includes a description of those project activities which relate to the applicable listed activities.

Table 1: Listed Activities Applicable applied for to be authorised.

Listed activities	Description of project activity that triggers listed activity
GR 985 Listing Notice 1, Activity 27 The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The proposed development will require the clearance of approximately one (1) hectare of indigenous vegetation.
GR 985 Listing Notice 3, Activity 2 (c) (iv) The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres. (c) In Gauteng iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan.	The proposed development entails the construction of a new concrete reservoir of more than 250 cubic metres in Gauteng on a site identified as Ecological Support Area in the Gauteng Conservation Plan.
GR 985 Listing Notice 3, Activity 12 (c) (ii) The clearance of an area of 300 square metres or more of indigenous vegetation. (c) In Gauteng ii. Sites identified as Critical Biodiversity Areas (CBAs) or	The proposed development will require the clearance of more than 300 square metres of indigenous vegetation classified as Ecological Support Area and Important Area according to the Gauteng Conservation Plan Version 3.3.

Ecological Support Areas (ESAs) in the Gauteng Conservation Plan.	

The above listed activities have triggered the need for a Basic Assessment process, these activities may not commence without an environmental authorisation from the Gauteng Department of Agriculture and Rural Development (GDARD). The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts associated with the proposed project are taken into consideration.
- Public Participation Process is conducted i.e. to afford any Interested and or Affected parties (I&AP) sufficient opportunity to provide comments.
- Sufficient information is provided to decision makers in order to ensure an informed decision making.

The nature and extent of the proposed project are explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

1.4 Details of Environmental Assessment Practitioner and Expertise to conduct the Basic Assessment

Envirolution Consulting (Pty) Ltd was contracted by appointed by Nyeleti Consulting on behalf of Johannesburg Water SOC Ltd as the independent environmental consultants to undertake the Environmental Basic Assessment Process for the proposed project. Envirolution is not a subsidiary or affiliated with Johannesburg Water SOC Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools. Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix I** for CV's):

Mr Thabang Sekele forms part of the project team and acts as the Project Manager for all phases of the project. Thabang holds a Bachelor's degree in Environmental Management from the University of South Africa. Thabang's key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which include integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; environmental auditing and compliance reporting; the

identification of environmental management solution and mitigation/risk minimising measures; environmental auditing, monitoring and reporting compliance. Thabang is currently an Environmental Consultant at Envirolution Consulting (Pty) Ltd.

Mr Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

1.4.1. Specialists

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialists to conduct specialist impact assessments with regards to the proposed development:

Specialist Studies Undertaken	Specialist
Terrestrial Biodiversity Assessment	Peter Kimberg (Pr.Sci.Nat Biological and Aquatic Science) and Kimberley Anne Perry (Cand. Sci. Nat. Zoology), Lorainmari den Boogert (Pr.Sci.Nat Botanical and Ecological Science).
Heritage Impact Assessment	Johnny van Schalkwyk (D Litt et Phil)

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	✔	Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	NO✔

If yes, describe the legislation and the Competent Authority administering such legislation

Not applicable.

If yes, have you applied for the authorisation(s)?

YES	NO

If yes, have you received approval(s)? (attach in appropriate appendix)	YES	NO

Not applicable.

2. APPLICABLE LEGISLATION, POLICIES AND / OR GUIDELINES

Table 2: List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	National		
National Environmental Management Act (Act No. 107 of 1998)	» NEMA requires, inter alia, that: ∗ Development must be socially, environmentally, and economically sustainable." ∗ Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied." ∗ A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions." » EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. » In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Rural Development	» In terms of sections 24(2) and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations 2014 of GN R983 and R985; a Basic Assessment process is required to be undertaken for the proposed project.
National Environmental Management Act (Act No. 107 of 1998)	» A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts.	» National Department of Environmental Affairs » Gauteng Department of Agriculture	» While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	» In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.	and Rural Development	proposed project has found application in the EIA Phase. » The implementation of mitigation measures are included as part of the EMPr and will continue to apply throughout the life cycle of the project.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	» The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. » In terms of the regulations published in terms of this Act (GN 921 of November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. » Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unlit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and (e) Pollution of the environment and harm to health are prevented.	» National Department of Environmental Affairs (hazardous waste) » Gauteng Department of Agriculture and Resource Development (general waste)	» In terms of GNR921, no waste license is required for the project » Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the applicable EMPr, as well as in accordance with the relevant Norms and Standards.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	» S18, S19 and S20 of the Act allow certain areas to be declared and managed as “priority areas”. » Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.	» National Department of Environmental Affairs » Local Municipality	» Reporting in terms of compliance to GNR831 will be required. » While no permitting or licensing requirements arise from this legislation, this Act will find application during the

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
			construction phase of the project. The Air Emissions Authority (AEL) may require the compilation of a dust management plan.
National Water Act (Act No. 36 of 1998)	» Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. » In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.	» National Department of Water Affairs » Gauteng Department of Agriculture and Resource Development	» the proposed development requires a Water Use License as per the following regulations: • Section 21(c): impeding or diverting the flow of water in a watercourse and; • Section 21 (i): altering the bed, banks, course or characteristics of a watercourse. » Requirements set by S19 will apply throughout the life-cycle of the project.
Petroleum Products Amendment Act, 2003 (Act No 58, 2003)	» Section 2A (1) (d), states that no one is allowed to retail prescribed petroleum products unless that person has a valid retail licence.	» National Department of Energy	» the proposed development requires a Retail License » The developer will engage with the Department of Energy in regards to obtaining a retail license.
Environment Conservation Act (Act No. 73 of 1989)	» National Noise Control Regulations (GN R154 dated 10 January 1992)	» National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development » Local Authorities	There is no requirement for a noise permit in terms of the legislation.
National Heritage Resources Act (Act No. 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including: » The construction of a road, powerline, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000	» South African Heritage Resources Agency	» The proposed development exceeds5 000 m2 in extent » Heritage Assessment has been undertaken as part of this Basic Assessment. » Due to the density of the urban development in the region, it is very unlikely that any sites or features dating to the pre-colonial

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	m^2 in extent » The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. » Stand-alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.		history of the region would still exist in the study area. However, isolated objects such as Stone Age artefacts might be exposed in areas close to stream beds. » Some smaller, informal burial sites occur in the larger region, but would not be impacted on by the proposed development. » Should heritage features, archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
National Environment Management Protected Areas Act, 2003 (Act No. 57 of 2003).	» Wetlands and other critical Biodiversity areas are regulated under the NEM:BA. Activities that fall within the parameters of these areas require specialist assessment to determine the impacts and the residual effects of mitigation measures	» National Department of Environmental Affairs	» Ecologist specialists were appointed to determine any critical biodiversity areas.
Conservation of Agricultural Resources Act (Act No 43 of 1983).	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories: » Category 1 plants: are prohibited and must be controlled. » Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a	» Department of Agriculture, Forestry and Fisheries (DAFF)	» An alien species management plan to be included in the requirements of the EMPr.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	permit and that steps are taken to prevent their spread. » Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.		
Provincial			
The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011)	» The plan has classified areas within the province on the basis of its contribution to reach the conservation targets within the province. Critical Biodiversity Areas (CBAs) contain irreplaceable, important and protected areas (terms used in C-Plan 2) and are areas needed to reach the conservation targets of the Province. In addition 'Ecological Support Areas' (ESAs), mainly around riparian areas and other movement corridors were also classified to ensure sustainability in the long term. Landscape features associated with ESAs is essential for the maintenance and generation of biodiversity in sensitive areas and requires sensitive management where incorporated into C-Plan 3.	» Gauteng Department of Agriculture and Rural Development	On the study site, the sections associated with the watercourse are classified while the rest of the areas remain unclassified. The areas associated with the watercourse are classified as Ecological Support Areas
Promotion of Access to Information Act, 2000 (Act No 2 of 2000):	▪ Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making. »	DEA » GDARD	No permitting is required the act finds applicability during the public participation process phase of the basic assessment process.

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

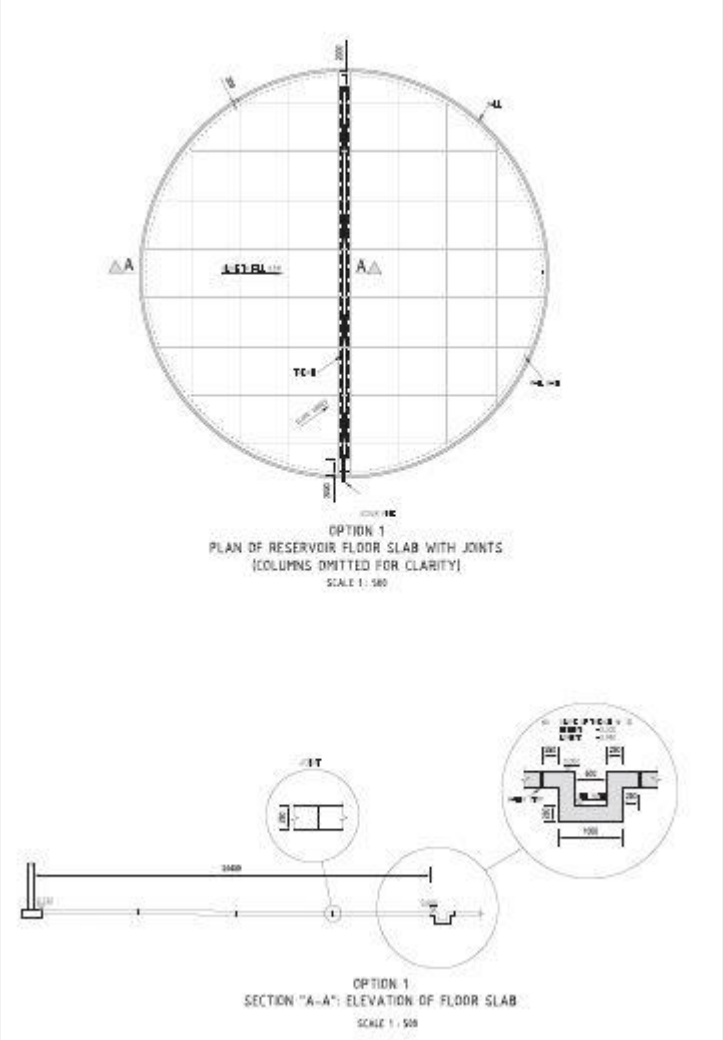
Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

Provide a description of the alternatives considered

Table 3: Description of the alternatives considered

Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
Proposed Development	The proposed development of new concrete reservoir on Portion 352 of the farm Lenasia within City of Johannesburg Metropolitan Municipality, Gauteng Province. The proposed development total footprint of the site is approximately one (1) hectare in extent (concrete reservoir and associated yard area combined). The proposed development entailed evaluating three (3) different options for the floor slab of the new Lenasia HL reservoir. The first option is to construct a conventional floor with joints in it at 6.0m centre to centre grid. The second alternative is to construct the reinforced slab without joints (**of which is the preferred option**). The third alternative is to construct a post tensioned floor slab also without joints.

Proposed Floor Slab Option 1: Conventional Floor Slab with Joints	**Floor Slab Option 1: Conventional Floor Slab with Joints**  **Figure 2:** Floor Slab Option 1 Conventional Floor Slab with Joints (refer to **Appendix C** for full layout design). This option is for the conventional 250mm thick reinforced concrete floor slab with joints at 6.0m centre to centre forming a grid. The floor slopes at minimum 0.5% to a central drainage channel as described above for maintenance purposes. Floor joints consist of water stop, joint filler, sealant as well as a bandage. The in situ concrete channel also has joints matching slab joints at 6.0m centre to centre.
Floor Slab Option 2: Joint less RC Floor Slab	**Floor Slab Option 2: Jointless RC Floor Slab - (Preferred)**

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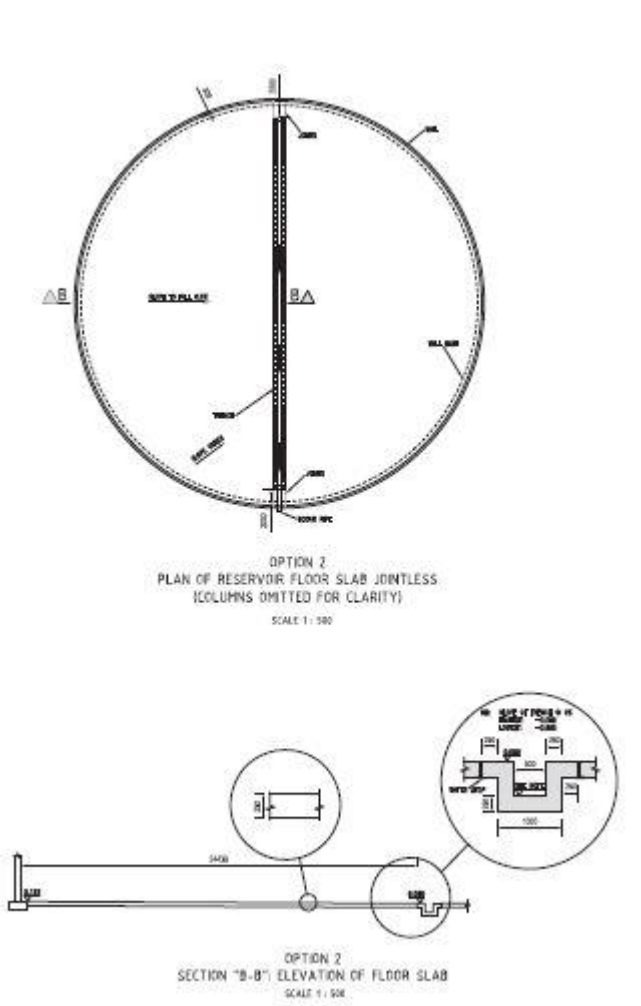

Figure 3: Floor Slab Option 2 Joint less RC Floor Slab (refer to Appendix C for full layout design).

Constructing jointless floors are in line with international trends. Joints for this option will be limited to the trench perimeter only. This will limit the leakage and the maintenance needed on the floor slab. The floor will have a thickness of 250mm and will be heavily reinforced and designed to BS 8007 for 0.2mm crack width. No joints are specified for the channel.
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<td>Option 3: Post Tensioned Floor Slab</td>
<td>Floor Slab Option 3: Post Tensioned Floor Slab</td>
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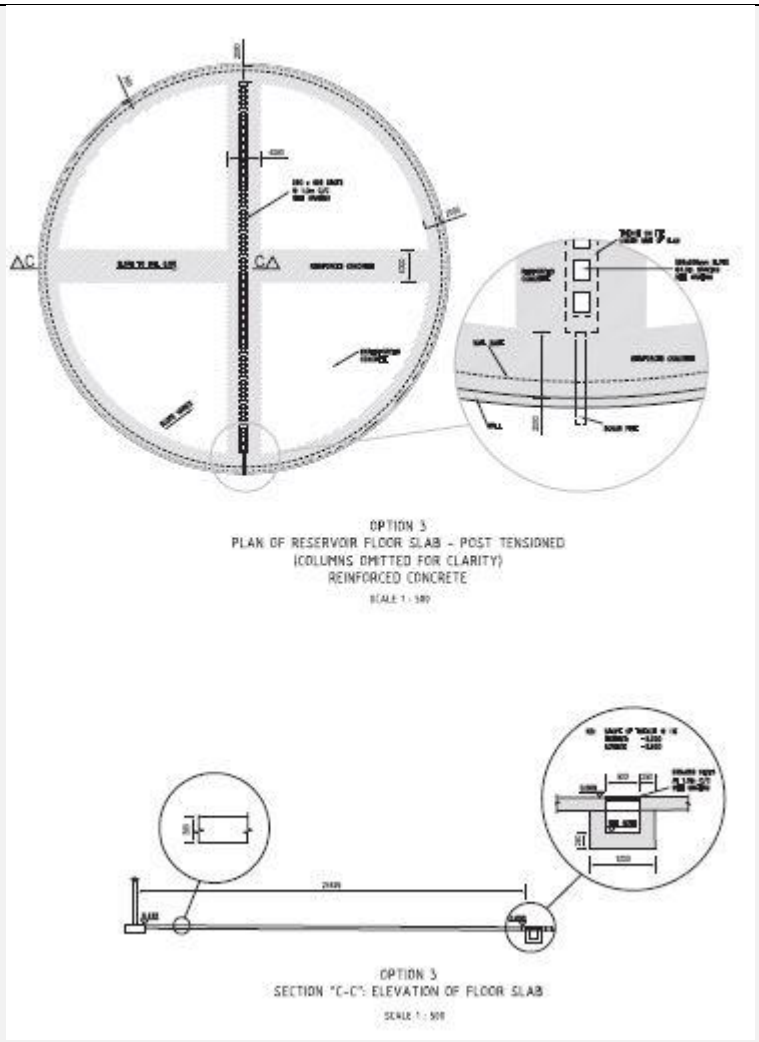


Figure 4: Floor Slab Option 3 Post Tensioned Floor Slab (refer to **Appendix C** for full layout design).

The floor slab will have a thickness of 200mm and will have a band of reinforced concrete 2.0m wide along its perimeter and 4.0m wide along the center, as indicated in the drawing. The remainder concrete inside this band shall be unreinforced. The floor will be post tensioned to 1.0MPa residual compression to BS 8007 using a bonded post tensioning system.

No Go Option	The 'do nothing alternative' is the option of not constructing the reservoir on site. This alternative would result in no additional environmental impacts on the site or its surrounding area. This option would result in the additional capacity as needed at the Lenasia HL reservoir in order to supply adequate water to Lenasia South ext.1 and 4, Migson Manor (Lenasia South ext.7), Zakariyya Park and additional areas of Vlakfontein Proper, Finetown, Hospital Hill and Lehae not to be realised. Ultimately this would have a negative result of not delivering a vital service delivery of water provision. This option is thus undesired.

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

N/A

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

	the activity:
Proposed activity (Proposed new concrete reservoir)	± 10 000 m²
Alternatives:	
Design Layout Option 1	± 10 000 m²
Design Layout Option 2 - **Preferred**	± 10 000 m²
Design Layout Option 3	± 10 000 m²
	Ha/ m²

or, for linear activities:

	Length of the activity:
Proposed activity	
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	
	m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity (Proposed new concrete reservoir)	± 10 000 m²
Alternatives:	
Design Layout Option 1	
Design Layout Option 2 - **Preferred**	± 10 000 m²
Design Layout Option 3	± 10 000 m²
	Ha/m²

5. SITE ACCESS

(All Design Layout Alternatives)

Does ready access to the site exist, or is access directly from an existing road?	YES✔	NO
If NO, what is the distance over which a new access road will be built		

Describe the type of access road planned:

Access to the site is available via Lenasia South township and existing dirt roads.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Figure 5: Overview of existing access roads to the site.

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated | 0 | Number of times (only complete when applicable)

6. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;

- A3 size for activities with development footprint of > 5 hectares to 20 hectares;
- A2 size for activities with development footprint of >20 hectares to 50 hectares);
- A1 size for activities with development footprint of >50 hectares);

- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
  - sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

The **design layout plan** for the proposed development are enclosed within **Appendix C**

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities 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 locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

The **Locality Map** for the proposed development is enclosed within **Appendix A**

7. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix**.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

Reference is made to **Appendix B – Site Photographs** included as part of this application

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.

Reference is made to **Appendix C – Facility Illustration** included as part of this application

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.

1. Indicate on a plan(s) the different environments identified
2. Complete Section B for each of the above areas identified
3. Attach to this form in a chronological order
4. Each copy of Section B must clearly indicate the corresponding sections of the route at the top of
5. the next page.

Section B has been duplicated for sections of the route	**0**	times

Instructions for completion of Section B for location/route alternatives

1. For each location/route alternative identified the entire Section B needs to be completed
2. Each alterative location/route needs to be clearly indicated at the top of the next page
3. Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives	**0**	tim es	(complete only when appropriate)

It is worth noting that all three (3) Floor Slab Options (alternatives) that are investigated occur within the same receiving environment and therefore will be described together as the characteristics will be similar irrespective of the respective Floor Slab Option selected. It is for this reason that this section will not be duplicated.

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route		(complete only when appropriate for above)
Section B – Location/route Alternative No.		(complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description: (Including Physical Address and Farm name, portion etc.)	The proposed development of new concrete reservoir on Portion 352 of the farm Lenasia within City of Johannesburg Metropolitan Municipality, Gauteng Province. The proposed development total footprint of the site is approximately one (1) hectare in extent.

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Proposed Activity:	**Latitude (S):**	**Longitude (E):**
Centre point of the activity (Floor Slab Option 1)	26°22'30.96"S	27°51'50.51"E
Centre point of the activity (Floor Slab Option 2)	26°22'30.96"S	27°51'50.51"E
Centre point of the activity (Floor Slab Option 3)	26°22'30.96"S	27°51'50.51"E

In the case of linear activities:

Proposed Activity:	Latitude (S):	Longitude (E):
Starting point of the activity		
Middle point of the activity		
End point of the activity		

Alternative 1	Latitude (S):	Longitude (E):
▪ Starting point of the activity		
▪ Middle point of the activity		
▪ End point of the activity		

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached **N/A**

The 21 digit Surveyor General code of each cadastral land parcel

Note: All three Floor Slab Options investigated are located on the same property and thus will have identical property details.

All three Floor Slab Options :

21 digit Surveyor General code –

T0IQ00000000035200000 – Farm Lenasia 352 IQ, Remaining Extent

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Note: All three (3) Floor Slab Options investigated are located on the same property/site and thus will have identical gradient details.

Proposed Activity

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

4. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Note: All three (3) Floor Slab Options investigated are located on the same property/site and thus will have identical landscape details.

Proposed Activity (All three Floor Slab Options)

Ridgeline	Plateau	Side slope of hill/ridge ✔	Valley	Plain	Undulating plain/low hills	River front

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

Note: All three (3) Floor Slab Options investigated are located on the same property/site and thus will have identical groundwater, soil and geological stability details.

	All three Floor Slab Options:	
Shallow water table (less than 1.5m deep)	YES	NO ✔
Dolomite, sinkhole or doline areas	YES	NO ✔
Seasonally wet soils (often close to water bodies)	YES	NO ✔
Unstable rocky slopes or steep slopes with loose soil	YES	NO ✔
Dispersive soils (soils that dissolve in water)	YES	NO ✔
Soils with high clay content (clay fraction more than 40%)	YES	NO ✔
Any other unstable soil or geological feature	YES	NO ✔

An area sensitive to erosion	YES✔	NO

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s) YES | NO ✔

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

c) are any caves located within a 300m radius of the site(s) YES | NO✔

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

d) are any sinkholes located within a 300m radius of the site(s) YES | NO✔

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

Geology and soils

The site is located on the side slope of a localised hill, with a gentle slope to the south-west. Drainage takes place by means of sheetwash towards the south-west. According to the published 1:250 000 scale Geological Series, Sheet 2626 (West Rand) of the area, the site is underlain by ferruginous quartzite, shale and hornfels of the Timeball Hill Formation, Pretoria Group, Transvaal Supergroup. Refer to Figure 2 for the relevant portion of the geological map.

According to the geological map the transition between the Timeball Hill Formation and the chert, dolomite and chert breccia of the Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup is situated approximately 1,3km to the north of the site.

The Malmani Subgroup consists of chert-bearing, alternating with chert-free dolomite formations. These rocks have a notorious reputation for the development of karst subsurface landscape, associated with a highly irregular and voided bedrock profile, as well as heterogenic soil conditions. The Eccles Formation may be closest to the site and is known to be predominantly chert-bearing. The soil cover often comprises highly erodible soils, which can readily erode by downward percolating water to create leached or voided zones, which may result in the formation of sinkholes and subsidences.

The Timeball Hill Formation is younger than the Malmani Subgroup and therefore occurs on top, which implies

that dolomite and chert may be present with depth at the proposed reservoir site.

According to Weinert's climatic N-value the site falls in an area classified as N<5, indicating a relatively humid climate. The predominant weathering mode is chemical decomposition, opposed to mechanical disintegration that dominates in more arid regions.

Foundation Conditions

Although the materials occurring at the site are fairly consistent, the foundation conditions are variable. It is also apparent that the DPSH refusal depths of <1,5m are all in the west half of the reservoir site. The required allowable bearing capacity for a reservoir perimeter wall less than 10m high normally does not exceed 150kPa, while the allowable bearing capacity below the floor does not exceed 100kPa.

Although the residual silty shale is mostly stiff to very stiff below 2,5m depth, there are frequent water spillages which migrate into the soil at a reservoir and may cause softening of such soil with resulting differential settlement.

6. AGRICULTURE

(All three Floor Slab Options)

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

YES	NO✔

Please note: The Department may request specialist input/studies in respect of the above.

7. GROUNDCOVER

(All three Floor Slab Options)

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

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition % = 90 ✔	**Natural veld with scattered aliens % = 5✔**	Natural veld with heavy alien infestation % =0	Veld dominated by alien species % = 0	Landscaped (vegetation) % =
Sport field % =0	Cultivated land %=0	Paved surface (hard landscaping) % =	Building or other structure % =	**Bare soil % =10 ✔**

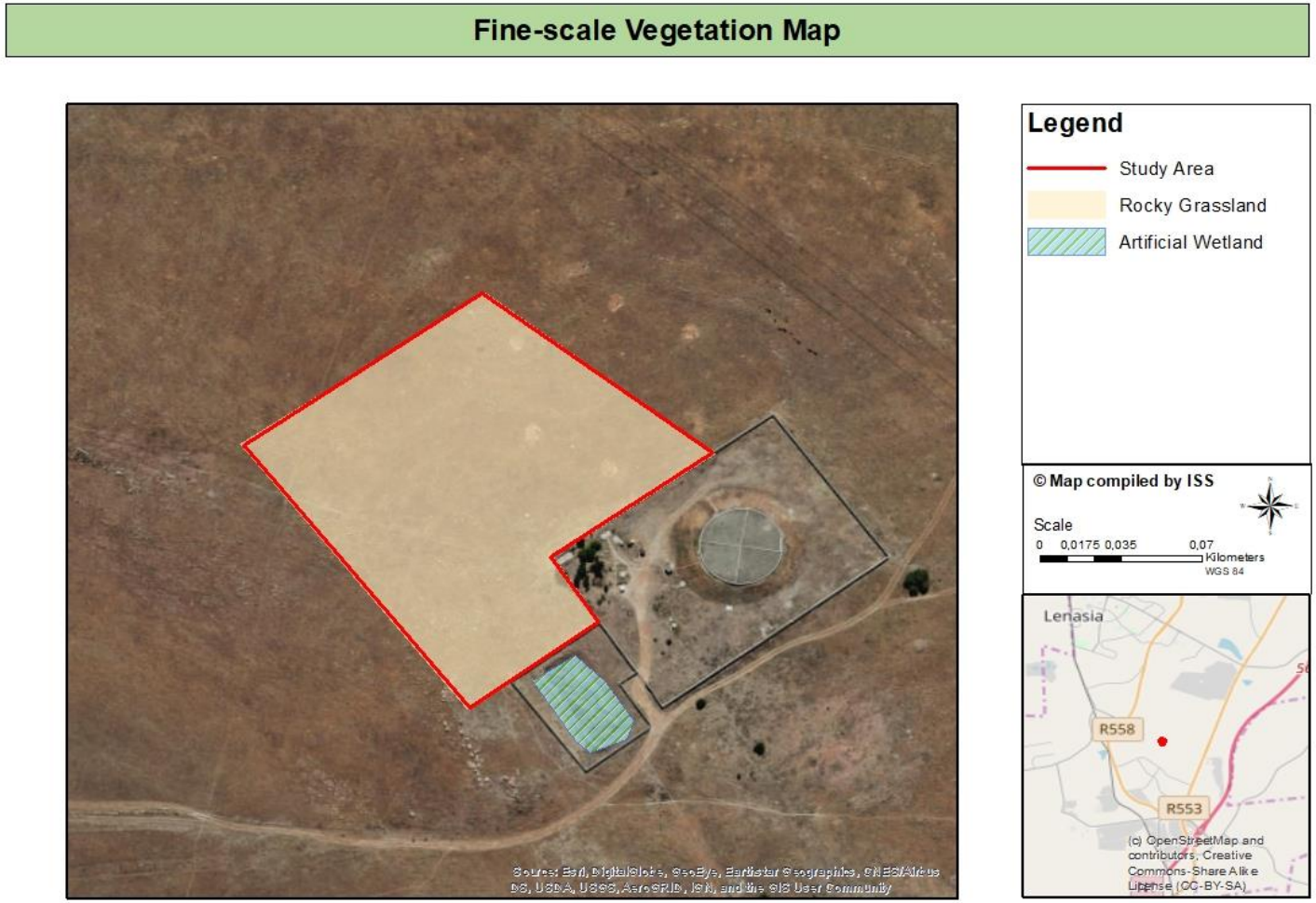


Figure 6: Fine scale vegetation sensitivity map

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there *any rare or endangered flora or fauna species* (including red list species) present on the site	YES✔	NO

If YES, specify and explain:

Vegetation Assessment

One vegetation community was identified within the study area namely:

- ***Rocky grassland***

Surrounding land use includes the existing reservoir as well as what seems to be a constructed wetland with *Phragmites australis* (Common Reed) being the dominant species. Although Mucina and Rutherford (2006) delineated the study area within the savannah biome during the site visit it was clear that the study area resembles the grassland biome. It is thought that therefore the study area can contain species form the Carltonville Dolomomite Grassland (Gh 15) and the Soweto Highveld Grassland (Gm 8). Prior to the site visit a fire event occurred. Most species observed within the study area were emergent after the fire event. The grass layer was removed and the amount of grass species which were identified was limited.

Vegetative cover was low due to the fire event. A total of 43 species were observed in the rocky grassland community during the site visit the majority of which were forbs and shrubs. One provincially protected species was observed namely the Orchid *Eulophia hians var. hians*. Three, individuals of *E. hians var. hians* were observed roughly eight meters outside of the study area (-26.375654°, 27.862895°).

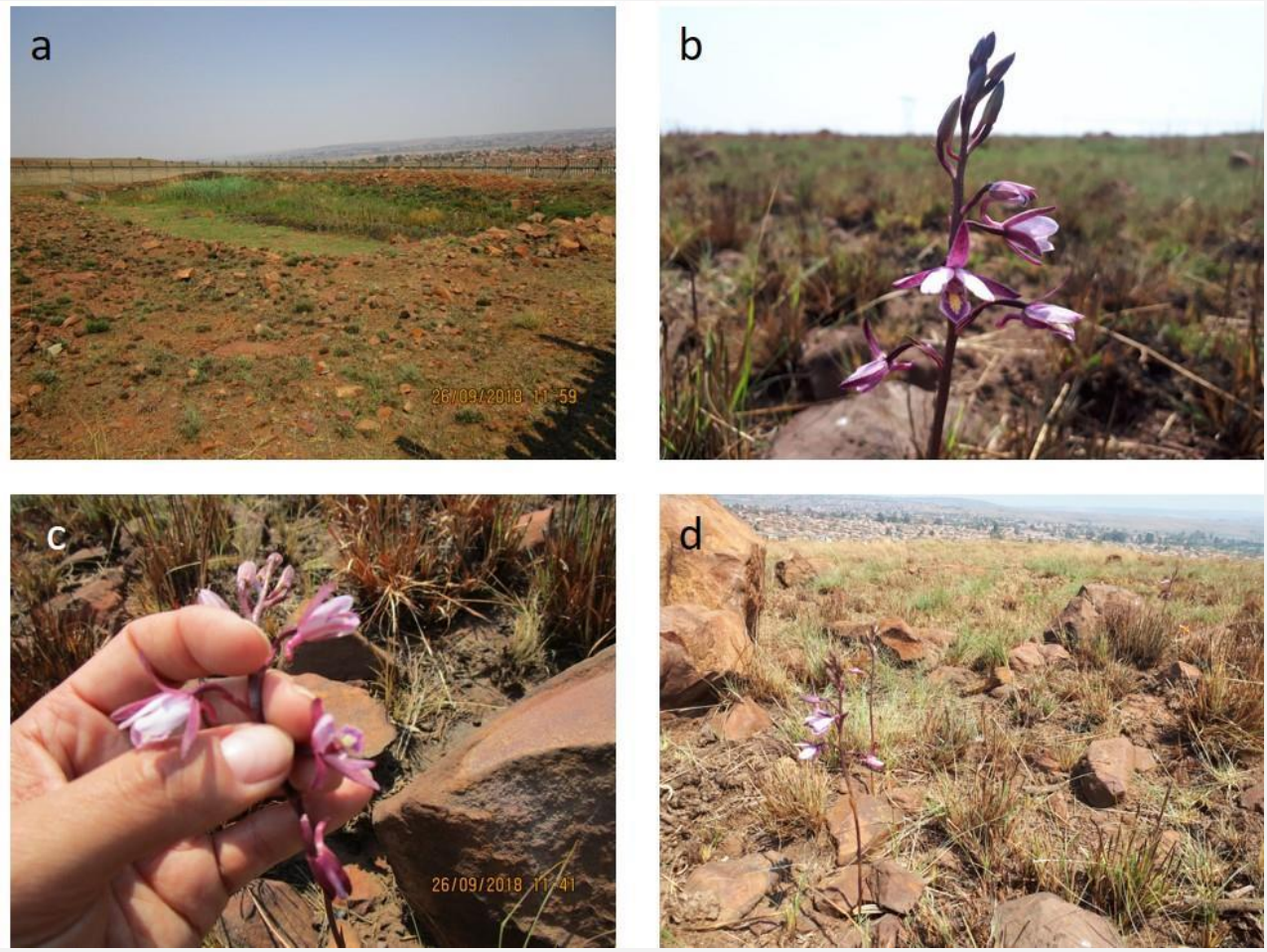


Figure 7: a,) Artificial wetland affected by the fire event b,c,d) The orchid species *Eulophia hians var. hians* situated amongst the rocky outcrops.

Important note: The scour pond/retention dam is Designed to capture access water deriving from the reservoir overflow release pipe in the aim of avoiding erosion due to the release of water. The overflow pipe will drain water to a concrete chamber, which in turn drains to the scour pond/retention dam on site. This periodic release of water has created and maintains an ecologically isolated artificial wetland. This constructed feature is common practice for a large number of existing reservoirs. The scour pond is created partly as an erosion protection mechanism for the existing Lenasia HL reservoir.

Avifauna Assessment

A total of 4 bird species were recorded in the project area during the September 2018 survey (Table 4). No bird Species of Conservation Concern (SCC) were recorded during the survey (Table 6). The recorded bird species are all common and abundant.

Table 4: Bird species recorded in the project area during the August 2018 field surveys

SPECIES NAME	COMMON NAME	IUCN (2017)	BIRDLIFE SA (2017)
Streptopelia capicola	Turtle-dove, Cape	LC	Unlisted
Euplectes progne	Widow, Long-tailed	LC	Unlisted
Anthus cinnamomeus	Pipit, African	LC	Unlisted
Ploceus velatus	Masked-weaver, Southern	LC	Unlisted

Mammals

No mammal SCC were recorded during the survey. The low mammal diversity was attributed to the transformed nature of the surrounding area, as well as the relatively high human density in the areas surrounding the proposed Lenasia South Reservoir. It should however be noted that no intensive mammal sampling was conducted as this was beyond the scope of this assessment. It is very likely that intensive sampling, Sherman trapping, camera trapping etc., will increase the number of mammals recorded.

Herpetofauna

A total of five (5) herpetofauna species were observed on the site during the September 2018 survey (Figure 8). No herpetofauna SCC were recorded during the survey (Table 5).

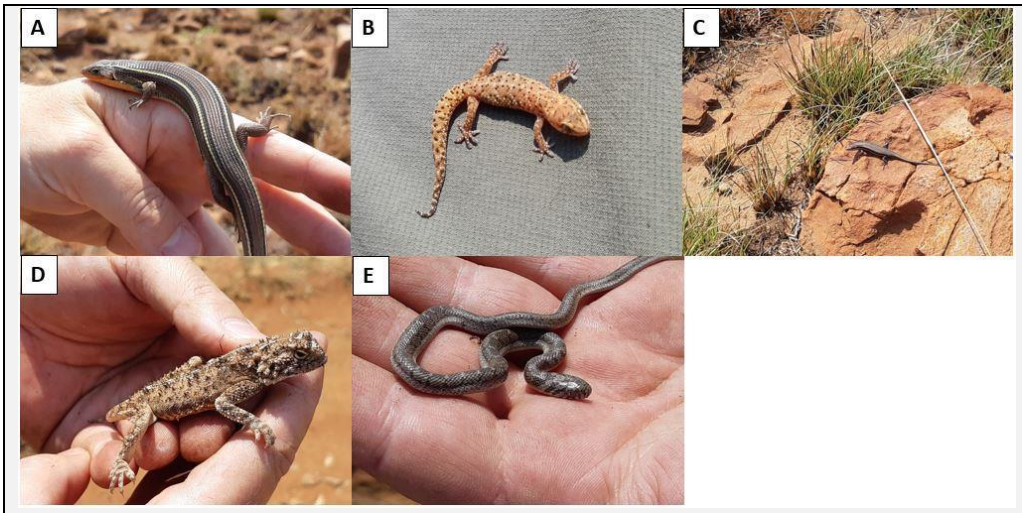


Figure 8: Images of the herpetofaunal species recorded during the September 2018 survey.

Table 5: Herpetofauna species observed during the September 2018 survey.

SPECIES	COMMON NAME	IUCN (2018)	SANBI (2016)
Trachylepis striata	Striped skink	LC	LC
Agama aculeata	Ground agama	LC	LC
Gerrhosaurus flavigularis	Yellow-throated plated lizard	LC	LC
Dasypeltis scabra	Rhombic egg eater	LC	LC
Pachydactylus affinis	Transvaal thick-toed gecko	LC	LC

Are there <u>any *rare or endangered flora or fauna species*</u> (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) <u>radius of the site.</u>	YES	NO

If YES, specify and explain:

(see above)

Are there any special or sensitive habitats or other natural features present on the site?	YES✔	NO

If YES, specify and explain:

Vegetation

The study area occurs within the Gauteng Shale Mountain Bushveld (Mucina and Rutherford, 2006) (Figure 9). The Gauteng Shale Mountain Bushveld occurs on low, broken ridges and with high surface rock cover. Vegetation in this unit is short, semi-open thicket dominated by a variety of woody species such as *Senegalia caffra*, *Searsia leptodictya*, and *Cussonia spicata*. The conservation status of this vegetation unit is vulnerable (Mucina and Rutherford, 2006). This vegetation unit is also not listed as a threatened or protected ecosystem in GN 1002 (GG 34809 of 9 December 2011) published under the NEM:BA.

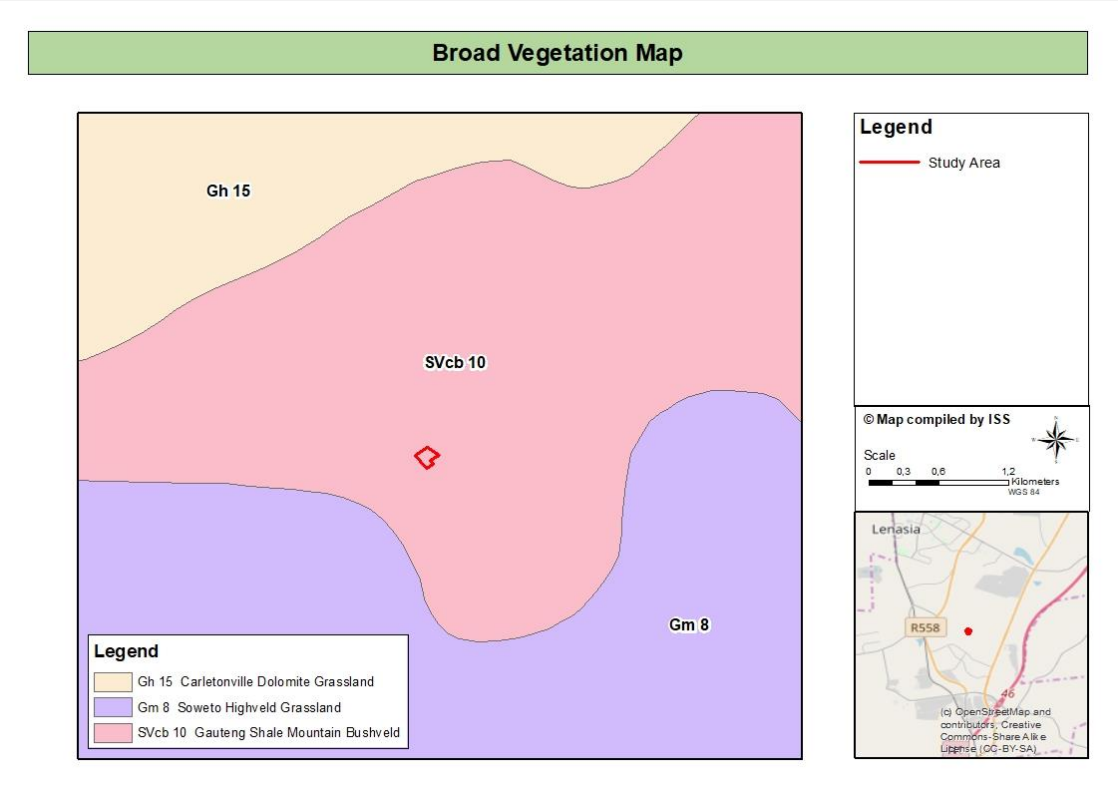


Figure 9: Lenasia South reservoir project area showing the vegetation type based on the Vegetation of South Africa, Lesotho & Swaziland (SANBI, 2006).

Sensitivity Analysis

As per Table 6 below, the result of the sensitivity assessment indicated that the Rocky grassland communities were assigned a high sensitivity and the artificial wetland community were assigned a low sensitivity. Additionally, a 500 m buffer surrounding the proposed study area was included to show that no wetlands were situated within this vicinity of the study area.

Table 6: Preliminary sensitivity scoring of vegetation communities within the project area

SITE	CONSERVATION STATUS OF REGIONAL VEGETATION UNIT	LISTED ECOSYSTEM OR STATE OF VEGETATION	LEVEL OF LEGISLATIVE PROTECTION	SUITABLE HABITAT FOR PLANTS OF CONSERVATION	ECOLOGICAL FUNCTION	ECOLOGICAL IMPORTANCE	TOTAL SCORE OUT OF MAX OF 18
Rocky grassland	0	3	2	3	3	2	13 **High**
Artificial Wetland	0*	0	3	0	3	0	6 **Low**

Was a specialist consulted to assist with completing this section	**YES✔**	NO

If yes complete specialist details

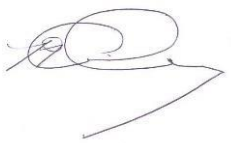
1.) Biodiversity Specialist

Name of the specialist:	Peter Kimberg		
Qualification(s) of the specialist:	B.Sc. 1999 - 2001 University of Johannesburg (UJ) B.Sc. Honours 2002 University of Johannesburg (UJ) M.Sc. Rhodes University		
Postal address:			
Postal code:			
Telephone:		Cell:	27 82 417 9191
E-mail:	peter@iggdrasilscientific.com	Fax:	

Are any further specialist studies recommended by the specialist?	YES	NO✔
If YES, specify:	N/A	
If YES, is such a report(s) attached?	YES	NO

If YES list the specialist reports attached below

N/A

Signature of specialist:		Date:	**30.09.2018**

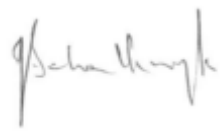
Please note; if more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

2.) Heritage Specialist

Name of the specialist:	J van Schalkwyk

Qualification(s) of the specialist:	J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 30 years. Based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 60 papers, many in scientifically accredited journals.		
Postal address:	62 Coetzer Avenue, Monument Park, 0181		
Postal code:	2194		
Telephone:		Cell:	076 790 6777
E-mail:	jvschalkwyk@mweb.co.za	Fax:	

Are any further specialist studies recommended by the specialist?	YES	NO ✔
If YES, specify:	**N/A**	
If YES, is such a report(s) attached?	YES	NO
If YES list the specialist reports attached below		
N/A		

Signature of specialist:		Date:	**30.09.2018**

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

Proposed Activity:

1. Vacant land✔	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge✔
6. Dam or reservoir ✔	7. Agriculture	8. Low density residential	9. Medium to high density residential ✔	10. Informal residential✔
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	25. Major road (4 lanes or more)[N]
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	35 Other land uses (describe):

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

Site

NORTH

	8 34	**6 8 34**	**6 8 34**	**8 13 4**	**10**
	8 34	**2 8 34**	**13**	**13**	**10**
WEST	**8**	**2 8**		**10**	**10**
	13	**2**	**1**	**10**	**10**
	13	**13**	**1**	**10**	**10**

EAST

SOUTH

Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached	YES✔	NO

If yes indicate the type of reports below

- Terrestrial Biodiversity Assessment Associated with Lenasia South Reservoir
- Heritage Impact Assessment

The above specialists reports are attached within **Appendix G** of this report

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The City of Johannesburg Local Municipality is situated in Gauteng province and covers an area of 1645km². The City of Johannesburg Local Municipality is divided into seven regions, designated alphabetically from A to G. The proposed development is located within **Region G**.

Population

The City of Johannesburg has a population of approximately 4.4 million people made up primarily of a young population aged between 30 and 39 years. The total population translates into roughly 1.4 million households with an average household size of 3 persons. At a regional level, Region D is the most densely populated region in the City with 24.4% followed by Regions **G (16.7%)**, F (13.4%), A (12.6%), E (11.8%), C (11.6%) and B (9.4%) respectively.

In terms of gender, 50.2% of the population is male and 49.8% is female. Majority of the population are black (76.4%), followed by 12.3% white, 5.6% coloured, 4.9% indian, and 0.8% other. The predominant languages within the City are Zulu (23.1%), followed by English (19.8%) and Sotho (9.5%).

Lenasia South is the southern part of Lenasia, which was founded in 1958 as an Indian township. The name Lenasia is possibly an amalgamation of the words Lenz and Asia. Lenz possibly originates from a Captain Lenz who owned the original piece of land on which Lenasia is located. (GPS coordinates: 26.3967 S, 27.8642 E)

Economic Profile of local Municipality

The City of Johannesburg's economy is driven primarily by four economic sectors which are: (a) finance and business services, (b) community services, (c) manufacturing, and (d) trade. These four economic sectors collectively account for more than 82% of economic activity within the City. These sectors also account for the highest levels of formal and informal employment. This state of affairs suggests that the City of Johannesburg's economy is highly concentrated; making it vulnerable to sudden external shocks such as the recession experienced during 2008/09. Every opportunity should therefore be explored to diversify the economy into other sectors in which the City enjoys a comparative advantage.

Level of Unemployment

The City has a high unemployment level of 25%. Of the 1 228 666 economically active youth (15–35 years), 31.5% are unemployed. Regional analysis shows that Region D had the highest level of unemployment (42.7%) followed by Regions **G (28.1%)**, F (26.2%) and A (15.7%). Regions E, B and C have the lowest rates of unemployment at 2.3%, 9.2% and 11.7% respectively. Youth unemployment remains a major challenge both nationally and for the City. Low education levels and slow formal sector growth are two of the major causes of youth unemployment. The vast majority of the youthful population in Johannesburg has only a matric certificate preventing access to the labour market (CoJ IDP 2012/2016).

Education

In terms of education within the City of Johannesburg Local Municipality, of those 20 years and older 3.4% have completed primary school, 32.4% have some secondary education, 34.9% have completed matric, 19.2% have some

form of higher education, and 2.9% of those aged 20 years and older have no form of schooling.

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as-

(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site-

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO ✔

If YES, explain:

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

A Heritage Assessment has been undertaken as part of this Basic Assessment (refer to **Appendix G**).

The findings are as summarised below:

Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development:

- As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development. No impacts are expected on any cultural-historical aspects during the operation of the proposed development as no such features occur on site.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Will any building or structure older than 60 years be affected in any way?	YES	NO ✔
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO ✔
If yes, please attached the comments from SAHRA in the appropriate Appendix		

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER MUST CONDUCT PUBLIC PARTICIPATION PROCESS IN ACCORDANCE WITH THE REQUIREMENT OF THE EIA REGULATIONS, 2014.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	YES✔	NO

If yes, has any comments been received from the local authority?	YES	NO✔

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

This is the Draft Report which will be submitted to the City of Johannesburg Metropolitan Municipality for comment. If any issues and comments are received, these will be collated and responded to. These responses will be incorporated into the Final BAR.

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

The draft BAR will be circulated to the local authorities where it will be subject to 30 days public review. All comments received during the review period will be incorporated into the Final BAR. At this stage no comment can be recorded as the Draft BAR is only now being circulated to the local authorities.

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	YES	NO✔

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

No comments on the proposed development have been received to date.

For details please refer to the comments and response report attached to this report within **Appendix E**.

If "NO" briefly explain why no comments have been received

See above.

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should

have been addressed may cause the competent authority to withdraw any authorization it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices to I&APs

Appendix 3 – Proof of newspaper advertisements

Appendix 4 –Authority Consultation

Appendix 5 – Minutes of any public and/or stakeholder meetings – **this is anticipated during the Draft BAR review period**

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report - **Comments are anticipated during the Draft BAR review period**

Appendix 8 –Comments from I&APs on amendments to the BA Report N/A

Appendix 9 – Copy of the register of I&APs

Appendix E10 - Comments from I&APs on the application

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives **0** times (Complete only when appropriate)

Section D Alternative No. _____ (complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES✔	NO
If yes, what estimated quantity will be produced per month?	Could not be determined at this stage	

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

Some construction rubble/ solid waste will arise from construction activities. This solid waste will be temporarily stored on site in designated waste skips or stockpiles and then reused where possible for backfill. Surplus material will be removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr.

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

General waste removed from site will be disposed of at a suitably licensed disposal facility. The nearest licensed landfill site is the General waste removed from site will be disposed of at a suitably licensed disposal facility. The nearest licensed landfill site is the Goudkopies Landfill site. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase

Will the activity produce solid waste during its operational phase?	YES	NO ✔
If yes, what estimated quantity will be produced per month?	Unknown at this stage m^3	

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

Over time minimal silt will form at the bottom of the reservoir, this waste in immaterial.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?	YES ✔	NO

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

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

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

If yes, inform the competent authority and request a change to an application for scoping and EIA.

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

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

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

During Construction, wastes must be separated at source into recyclable and non-recyclable materials and distributed for recycling where applicable. During the construction phase, construction waste rubble should be re-used as fill material, erosion protection and gabion construction where applicable. The re-use of construction waste materials will minimize the amount of waste that will need to be disposed of at registered municipal waste facilities. In addition, there will be extensive earthworks, but import and export of material will be minimised by balancing cut and fill requirements as far as possible.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	NO ✔
If yes, what estimated quantity will be produced per month?	N/A m3	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	YES	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	NO ✔
If yes, what estimated quantity will be produced per month?	N/A m3	

If yes describe the nature of the effluent and how it will be disposed.

N/A

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

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

If yes, provide the particulars of the facility:

Facility name:	N/A		
Contact person:	N/A		
Postal address:	N/A		
Postal code:	N/A		
Telephone:	N/A	Cell:	
E-mail:	N/A	Fax:	

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

N/A

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal	YES	NO

sewage system?	✔	
If yes, what estimated quantity will be produced per month?	Unknown at this stage	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	YES ✔	NO

Will the activity produce any effluent that will be treated and/or disposed of onsite?	YES ✔	NO

If yes describe how it will be treated and disposed of.

Chemical toilets are going to be used during construction stage and the sewage waste will be collected by the Contractor on for treatment at an authorised treatment facility.

Emissions into the atmosphere

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

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

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

The activity itself will not contribute directly to emissions released into the atmosphere except possible short-term dust emissions during the construction phase. Emissions generated will be in the form of dust, carbon dioxide and other vehicle emissions generated by diesel powered machinery and trucks during the construction process i.e. tip trucks, TLB's, excavators and dust from the movement of the construction vehicles. These emissions will be composed primarily of carbon monoxide (CO) and will be of a low concentration.

No atmospheric emissions are expected during operation phase.

2. WATER USE

Indicate the source(s) of water that will be used for the activity

Municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity process itself will not use water
✔					

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate
the volume that will be extracted per month: N/A

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?	YES	NO ✔

If yes, list the permits required

N/A

If yes, have you applied for the water use permit(s)?	YES	NO ✔
If yes, have you received approval(s)? (attached in appropriate appendix)	YES	NO

N/A

3. POWER SUPPLY

Please indicate the source of power supply e.g. Municipality / Eskom / Renewable energy source

The proposed development will be supplied with electricity by the local municipality.

If power supply is not available, where will power be sourced from?

Please see above.

4. ENERGY EFFICIENCY

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

Different energy saving measures will be considered in the detail design phase of the project.

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

None supplied at this stage.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4) (b) (i).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summaries the issues raised by interested and affected parties.

No comments on the proposed development have been received to date. For details please refer to the comments and response report attached to this report within **Appendix E** of the report.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Please refer to Appendix E.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilized in the rating of significance of impacts

The purpose of impact assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potential environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

The potential impacts of the proposed development were identified through a site visit, the Environmental Assessment Practitioners experience and expertise in the field and specialist study reports. In the Basic Assessment Report, the potential impacts are broadly identified and outlined. An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to reduce the impacts. In general, it is recognized that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks are taken into account during the pre-construction phase of the development.

In accordance with the requirements from the EIA Regulations 2014 GN 982, Regulation 19 (3) and as set out in Appendix 1, the following impacts of the issues identified through the basic assessment phase were assessed in terms of the following methodology. All impacts are assessed according to the following criteria.

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
  - The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate with
  - a score of 1 being site specific,
  - 2 = local (site + immediate surrounds),

- 3 = regional (the impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns) ,
- 4 = national and
- a score of 5 being international (where the impact has international ramifications that extend beyond the boundaries of South Africa).

- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.

- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:
S= (E+D+M) P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance** weightings for each potential impact are as follows:

- < **30 points**: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30-60 points**: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **>60 points**: High (i.e. Impact is significant, mitigation is critical to reduce impact or risk. Resulting impact could influence the decision depending on the possible mitigation. An impact which could influence the decision about whether or not to proceed with the project.).

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the **CONSTRUCTION and OPERATION PHASE** for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

This section contains the assessment of potentially significant positive and negative environmental impacts associated with the proposed project. Specific emphasis was placed on any relevant significant environmental, social and economic impacts identified from the specialist study and professional judgement of the EAP (Envirolution Consulting Pty Ltd). The objectives of the specialist study and further investigation by Envirolution of each of the potential environmental impacts identified was to determine their significance and to promote mitigation measures to reduce the impacts to an acceptable level where required.

All potential environmental impacts have been addressed in this section, according to the adopted methodology for assessing impacts as described in Section 2.

2.1 IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Table 10: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that is likely to occur as a result of the **CONSTRUCTION PHASE AND OPERATIONAL PHASE** of all of the proposed reservoir (All three (3) Floor Slab Options).

It is worth noting that all three Design Layout Options that are proposed occur within the same receiving environment and therefore will be assessed together as the impacts will be similar irrespective of which design layout selected during the construction phase and operation phase. The design layout options will have no significant environmental impact bearing no matter which design is selected. It is for this reason that the section will not be duplicated.

a) Destruction and fragmentation of natural vegetation

Floral diversity was adversely affected by a fire event prior to the site survey. One provincially protected orchid species was identified approximately eight meters outside of the study area. The vegetation within the study are is considered primary and highly sensitive:

Destruction of natural vegetation
Nature: Loss of vegetation and plants of conservation concern due to the proposed construction activities. The following factors can contribute to the loss of vegetation: **The sources of this impact include:** • Construction vehicles causing compaction and damaging vegetation • Construction personnel harvesting /damaging plants • Dumping of construction material or excavated soils • Alteration in natural fire regimes and subsequent loss of non-marginal and marginal vegetation. • Increase in invasive species due to disturbance.

- Likely to be more significant during the construction phase vs the operation phase

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Highly Probable (4)	Probable (3)
Duration	Long term (4)	Short (1)
Extent	Regional (3)	Footprint (1)
Magnitude	High (8)	Low (6)
Significance	**88 (High)**	**30 (Low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Very Improbable (1)
Duration	Medium term (3)	Short (1)
Extent	Limited to Local Area (1)	Limited to Local Area (1)
Magnitude	Low (6)	Low (6)
Significance	**42 (medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	High	Low
Can impacts be mitigated?	Yes	
NO GO Option		

Mitigation:

Construction phase:

- An independent Ecological Control Officer (ECO) should be appointed to oversee construction.
- Keep the development footprint as small as possible.
- A 30 m buffer must be kept for the one provincially protected species was observed namely the *Orchid Eulophia hians var. hians.*
- A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs.
- Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.
- No open fires are permitted within naturally vegetated areas.
- Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.
- A vegetation rehabilitation plan should be implemented. Grassland can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the

next 2 weeks.

- Grass species, typical of the Rocck Grassland can be sown in prepared soils. Revegetation should take place successively in order to re-establish vegetation as soon as possible after construction in a specific area.
- Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.
- Limit clearing of indigenous vegetation to active construction sites only
- Where topsoils need to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation
- Never mix topsoils with subsoils or other spoil materials.
- Maintain site demarcations in position until the cessation of construction work.
- After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.

Operational/Maintenance phase:

- After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.
- Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
- Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.
- Introduce adequate sedimentation control measures at watercourse crossings and when excavation or disturbance within moist grasslands takes place.
- Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the ECO.

Cumulative impacts: Overall cumulative impacts as a result of the proposed project are considered to be low. Cumulative impacts may include the combined impact of various similar developments in the area. Cumulative impacts may include the cumulative loss of floral species diversity within the larger region.

Residual Risks: Residual risks include the permanent loss of and altered floral species diversity within the vicinity of the proposed infrastructure and surrounds as a result of ineffective or lack of rehabilitation activities where disturbance has occurred.

b) Impact on Mammals & Hepertofauna species

Destruction of natural and sensitive mammals & Hepertofauna species
Nature: Due to the nature of construction of such a development, much of the existing natural habitat will be destroyed concrete reservoir footprint.

ACTIVITY: The source of this impact includes the compaction of soil, the removal of vegetation. This leads to certain species becoming proportionally rarer within local context.

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Definite (5)	Probable (3)
Duration	Long term (4)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**60 (Medium)**	**27 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Definite (5)	Probable (3)
Duration	Medium-term (3)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**55 (Medium)**	**27 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	High	Low
Can impacts be mitigated?	Yes	

Mitigation:

Construction/operational

- Education of the construction/maintenance staff about the value of wildlife and environmental sensitivity.
- Restrict access to the suitable and sensitive habitats of faunal species.
- Restrict construction/maintenance activities to the smallest possible area of development site.
- The contractor must ensure that no animals are disturbed, trapped, hunted or killed during the construction/operational phase. Conservation-orientated clauses should be built into contracts for construction/maintenance personnel, complete with penalty clauses for non-compliance.

Cumulative impacts: Construction and operational activities may result in cumulative impact to the natural habitat on the study site and even beyond. It is very imperative that effective protective measures should be put into place and monitored, especially sensitive areas. A rehabilitation plan should be put into action should any degradation be observed on natural areas.

Residual Risks: Impacts on the natural and sensitive habitat are likely to be permanent unless rehabilitated.

c) Exposure to erosion

Nature: The removal of surface vegetation will expose the soils, which in rainy events would wash down into rocky grasslands causing sedimentation. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance vehicles could disturb rehabilitated areas which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and

plants of conservation concern. The sources of this impact include:

Activity:

- Access roads, especially on slopes, channels rainfall and causes erosion;
- Lack of rehabilitation or failed rehabilitation;
- Maintenance vehicles disturbing rehabilitated areas;
- Spillages of construction material and harmful chemicals; and
- Failure of rehabilitation of the construction footprint.

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly Probable (4)	Highly Probable (4)
Duration	Medium-term (3)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	High (8)	Low (4)
Significance	**52 (medium)**	**21 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Probable (3)
Duration	Medium term (3)	Medium term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate(6)	Moderate(6)
Significance	**33 (medium)**	**14 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

Construction:

- Do not allow erosion to develop on a large scale before taking action.
- Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas.
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).
- Runoff from roads must be managed to avoid erosion and pollution problems.
- Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated (erosion management plan required)
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The rocky grassland can be removed as sods and re-established after construction is completed.

- Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.
- After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level.

Operational/Maintenance:

- Do not disturbed soil unnecessary during maintenance. Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
- Monitor rehabilitation and ensure that rehabilitated areas do not erode.
- If monitoring finds that indigenous vegetation from the surrounding grasslands are not colonising the site, implement a re-vegetation plan to ensure that grass species that naturally occur in the Rand Highveld Grassland, are sowed in order to re-establish indigenous plant cover.
- Monitor rehabilitation and delay the re-introduction of livestock (where applicable) to all rehabilitated areas until an acceptable level of re-vegetation has been reached.
- Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.

Cumulative impacts: Erosion of the development footprint upslope from the moist grasslands and riparian areas could increase sedimentation in already degraded watercourses. However, this could be mitigated. Possible erosion of areas lower than the access roads, possible contamination of wetlands and/or groundwater reserves due to hydrocarbon or other spillage and an increase of modified areas (together with surrounding developments) that will affect flora population dynamics and runoff patterns.

Residual Risks: A risk that heavy rain and flooding could erode the base of reservoir, or the subsequent removal or destruction of the vegetation by other land uses do remain.

d) Potential increase in invasive vegetation

Nature: The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation along the route are unsuccessful or is not enforced, exotic and invasive vegetation may invade the area.

Activity:

- Removal of vegetation without proper rehabilitation or failure of rehabilitation;
- Removal of vegetation within the rocky grassland

	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Long-term (4)	Short-term (2)
Extent	Local Area (2)	Site bound (1)
Magnitude	High (8)	Low (4)
Significance	**56 (medium)**	**21 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Long term (4)	Short term (2)
Extent	Limited to Local Area (2)	Limited to the Site (1)
Magnitude	Low (4)	Minor (2)
Significance	**30 (medium)**	**10 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

Construction:

- Alien invasive species, in particular category 1b species that were identified within the study area, should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
- Manual removal is preferred to chemical control, particularly in the moist grassland.
- Only suitably trained contractors (e.g. certified by the South African green Industries Council (SAGIC)) with knowledge of the species in question should be employed.
- All alien seedlings and saplings must be removed as they become evident for the duration of construction.
- All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.
- If filling material is to be used, this should be sourced from areas free of invasive species.

Operational/Maintenance:

- Implement an alien invasive plant monitoring and management plan whereby the spread of alien and invasive plant species into the areas disturbed by the construction are regularly removed and re-infestation monitored.

Cumulative impacts: A number of invasive species are present within the area that the proposed development is

situated in. Therefore, if mitigation measures to limit and prevent the spread of alien species are not implemented, the cumulative impact could lead to remaining natural vegetation transformed by alien plant species.
Residual Risks: Re-infestation in areas initially cleared.

e) Heritage and Cultural Impacts

Nature: Loss and disturbance of heritage sites due to the development.		
Activity: Excavation activities during construction and maintenance.		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Probable (3)
Duration	Permanent(5)	Permanent(5)
Extent	Limited to Local Area (1)	Limited to Local Area (1)
Magnitude	Minor (1)	Minor (1)
Significance	**21 (Low)**	**21 (Low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Probable (3)
Duration	Permanent(5)	Permanent(5)
Extent	Limited to Local Area (1)	Limited to Local Area (1)
Magnitude	Minor (1)	Minor (1)
Significance	**21 (Low)**	**21 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	High	High
Can impacts be mitigated?	Yes	

Mitigation:

Construction/operational

- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act

(Act No. 25 of 1999), Section 51. (1).

Cumulative impacts: None

Residual Risks: The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.

f) Visual Impact

Nature: Observers in the study area will experience the visual impact relating to the construction phase in varying degrees depending on their exposure to the project and their sensitivities. The distance from the source of impact is considered the greatest factor aggravating or mitigating the intensity of impact. During the initial stages of construction, activities will be limited to the ground level and the natural vegetation cover is expected to screen some of the impacts. Viewers within 500 m of the source of impact have the greatest risk of intrusions on their views, however this will be a limited number of observers.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Probable (3)
Duration	Short term (2)	Very short duration(1)
Extent	Limited to Local Area (2)	Limited to Site (1)
Magnitude	Low (4)	Minor (2)
Significance	**24 (Low)**	**12 (Low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly Probable (4)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Medium (6)	Low (4)
Significance	**20 (Low)**	**18 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

Construction

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- Keep dust levels down by regularly wetting dirt roads and exposed soil areas
- Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site.
- Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed soil surfaces. Monitor the rehabilitated areas for at least 6 months to ensure a sufficient vegetation cover is established that will prevent erosion from occurring.

- Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints.
- Enhance screening of the construction camps by erecting a temporary fence with a 3m high shade cloth to limit the intrusive nature of such a site.

Operational

- Avoid obtrusive lighting of the development. Obtrusive lighting, otherwise known as light pollution, can range from glare to light spillage that causes a nuisance to surrounding viewers.
- Regular maintenance of structure footprint must be conducted to avoid visual unattractiveness.

Cumulative impacts: A medium risk of cumulative impacts can be expected due to the presence of an existing reservoir in the study area. The new reservoir will slightly increase the visual intrusion.

Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced and therefore visual intrusion will remain an impact for the lifetime of the project, unless underground cabling is considered.

g) Waste Management Impact

Nature: Pollution due to inappropriate management of generated waste on site

Activity: The development may generate waste which may result in unsightliness and potential pollution.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Highly probable (4)	Probable (2)
Duration	Medium-term (5)	Very short-term (1)
Extent	Limited to the Local Area (2)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**52 (Medium)**	**12 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
No significant impacts are expected on Pollution emanating from waste generation during operation of the proposed development. It is expected that waste will be collected on a weekly basis by the Local Municipality.		
Probability	Improbable (2)	Improbable (2)
Duration	Very short-term (1)	Very short-term (1)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Minor (2)	Minor (2)
Significance	**8 (low)**	**8 (low)**
Status (positive or negative)	Negative	Negative (Negligible)
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	

Mitigation:

Construction / Operational

- Regular litter picking and general waste bins must be readily available for litter disposal and general housekeeping.
- All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste skips / bins.
- All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates obtained and retained on file.
- Separate waste skips/ bins for the different waste streams must be available on site.
- The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. This will be managed through the site specific EMPr and monitored by the ECO.
- No waste (hazardous or general) will be disposed of in the wetland and around the construction footprint.
- All hazardous material must be carefully stored and then disposed of offsite at the licensed hazardous landfill site
- All excess material and rubble must be removed from the site so not to restrict the rehabilitation process.
- Adequate chemical toilet facilities must be provided for all staff members as standard construction practice. Monitor the sewerage facilities for spillages, and handle any spillages as hazardous waste;
- Chemical toilets must be placed within the construction camp and not in close proximity to the river/wetlands. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
- General waste must not at any time be mixed with hazardous waste.
- No burning of refuse or vegetation is permitted on site.
- Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of an approved at dumping site as approved by the Municipality.
- A comprehensive employee induction programme, covering waste management protocols. This must be addressed in the construction EMPr as the best practice.
- The Contractor shall provide sanitation facilities in the form of chemical toilets, at all camps, offices, workshops and construction sites for staff and visitors. No other form of sanitation will be permitted unless a connection with a local sewer main is possible. The provision of this facility will comply with current legislation. A minimum of one toilet per 11 people or within 100 meters of the work site in order to prevent any breach of sanitary bylaws or offence to public decency.
- All staff are to use the toilets at all times rather than informal defecation in the environment.
- Any sewerage spillages must be regarded as hazardous and cleaned up immediately using appropriate PPE
- Provided designated eating and smoking areas.
- Screening for unsightly works.

Cumulative impacts

None expected

Residual Risks: None anticipated

h) Impact on the Social Economic Environment

Nature: Employment Opportunities and Local Procurement

Activity: This aspect refers to the extent to which employment opportunities emerging from the proposed project match the job skills of the unemployed in the area, as well as to the creation of new job opportunities.
The total number of job opportunities over the entire construction period.
The majority of employment opportunities created by the construction activities would thus involve unskilled and semi-skilled labour (e.g. bricklayers, plasterers, painters, electricians, plumbers, carpenters and sheet metal workers and so forth) with some skilled (site supervision) and highly skilled categories (engineers, quantity surveyors etc.).

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Extent	Local (3)	Regional (5)
Duration	Medium Term (3)	Medium Term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	**Medium (30+)**	**Medium (56+)**
Status (positive or negative)	Positive	Positive
Reversibility	Moderate: Impact can be reversed	Moderate: Impact can be reversed
Irreplaceable loss of resources?	Low	Low
Can impacts be enhanced?	Yes	Yes

Enhancement:

- Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process.
- The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area.
- The communication strategy should ensure that unrealistic employment expectations are not created.
- It is recommended that local individuals applying for work should submit their Curriculum Vitae (CV's) through local community structures. Some proof of residence should be attached
- The development of skills and the creation of opportunities to obtain experience through the build-up phase are of critical importance to ensure that the medium and lower skilled positions can be filled from local individuals.
- To ensure a positive impact among locals within the medium and lower skilled categories would require some training programmes to start once the project has received a positive environmental authorisation and/or continue with on-site training for the duration of the construction phase, even if only focused on a limited number of individuals
- Training of contract workers and/or community members should focus on construction related skills to equip trainees/beneficiaries with the necessary portable skills to find employment at other similar employment sectors in future.

Cumulative impacts:

- Possible improved skills among some locals that were involved with the construction of other related infrastructure projects in the Lenasia South area.

Residual Risks:

- Skilled and experienced individuals who would be able to find employment opportunities in similar industries.

NO GO OPTION

This is the option of not undertaking the proposed development of a new 15ML concrete reservoir. This option will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. The 'do nothing alternative' is the option of not constructing the reservoir on site. This alternative would result in no additional environmental impacts on the site or its surrounding area. This option would result in the additional capacity that is needed at the Lenasia HL reservoir in order to supply adequate water to Lenasia South ext.1 and 4, Migson Manor (Lenasia South ext.7), Zakariyya Park and additional areas of Vlakfontein Proper, Finetown, Hospital Hill and Lehae not to be realised. Ultimately this would have a negative result of not delivering a vital service delivery of water provision.

The No go option would compromise the city's IDP objectives by not assisting the Local Municipality in achieving the performance areas as identified by the Local Municipality, as municipalities have the primary responsibility to provide for the availability of essential services by means of provision of water services for the city. This responsibility is embodied in legislation as well as policy statements. With this said the No Go option is therefore not preferred.

Table 14: Potential impacts should the development not be Approved **"No-Go" Alternative**

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Destruction and fragmentation of natural vegetation	Negligible	There are no mitigation measures	Negligible	No risk
Loss of floral Species of Conservation Concern.	None	There are no mitigation measures	Negligible	No risk
Impact on Mammals & Hepertofauna species	N – Very High	There are no mitigation measures	N – Low	Very Low risk
Exposure to erosion	Negligible	There are no mitigation measures	Negligible	No risk
Potential increase in invasive vegetation	Negligible	There are no mitigation measures	Negligible	No risk
Heritage and Cultural Impacts	Negligible	There are no mitigation measure	Negligible	
Visual Impact	Negligible	There are no mitigation measures	Negligible	No risk
Waste Management Impact	Negligible	There are no mitigation measures	Negligible	No risk
Impact on the Social Economic Environment	Negligible	There are no mitigation measures	Negligible	No risk

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

- Terrestrial Biodiversity Assessment Report
- Heritage Impact Assessment Report

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

The information provided by the client forms the basis of the planning and design layouts discussed.

3. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), +significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposed and Alternative Designs

Potential impacts:	**Significance rating of impacts(positive, negative or neutral):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
It is not foreseen that the proposed development would reach a decommissioning and closure phase in the near future. Impacts associated with the decommissioning phase are therefore not assessed. Decommissioning procedures will adhere to the prevailing legislation when the time comes for decommissioning.				

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Not Applicable

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

- Post decommissioning management cost will not be determined at this stage as this phase of the development is not contemplated.
- Rehabilitation management costs are not available it this stage of the project.

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative impacts can result from an effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. The anticipated cumulative impacts of this development includes the following:

Destruction and fragmentation of natural vegetation

- Overall cumulative impacts as a result of the proposed project are considered to be low. Cumulative impacts may include the combined impact of various similar developments in the area. Cumulative impacts may include the cumulative loss of floral species diversity within the larger region.
- Residual risks include the permanent loss of and altered floral species diversity within the vicinity of the proposed infrastructure and surrounds as a result of ineffective or lack of rehabilitation activities where disturbance has occurred.

Loss of floral Species of Conservation Concern.

- An identified *Orchid Eulophia hians var. hians* species is known to occur in the larger region. Transformation and further loss of habitat within the area may result in such species facing extinction.
- Should floral SCC be impacted or destroyed during the development process, loss of such species within the study area is likely to be permanent.

Impact on Mammals & Hepertofauna species

- Construction and operational activities may result in cumulative impacts to the natural habitat on the study site and even beyond. It is very imperative that effective protective measures should be put into place and monitored, especially sensitive areas. A rehabilitation plan should be put into action should any degradation be observed on natural areas.
- Impacts on the natural and sensitive habitat are likely to be permanent unless rehabilitated.

Exposure to erosion

- Erosion of the development footprint upslope from the moist grasslands and riparian areas could increase sedimentation in already degraded watercourses. However, this could be mitigated. Possible erosion of areas lower than the access roads, possible contamination of wetlands and/or groundwater reserves due to hydrocarbon or other spillage and an increase of modified areas (together with surrounding developments) that will affect flora population dynamics and runoff patterns.
- A risk that heavy rain and flooding could erode the base of the reservoir, or the subsequent removal or destruction of the vegetation by other land uses does remain.

Potential increase in invasive vegetation

- A number of invasive species are present within the area that the proposed development is situated in. Therefore, if mitigation measures to limit and prevent the spread of alien species are not implemented, the cumulative impact could lead to remaining natural vegetation transformed by alien plant species.

Heritage and Cultural Impacts

- None

Visual Impact

- A medium risk of cumulative impacts can be expected due to the presence of an existing reservoir in the study area. The new reservoir will slightly increase the visual intrusion.

Generally, the cumulative impacts for the development are rated as **Low** and with mitigations.

5. IMPACT SUMMARY OF THE PROPOSAL AND ALTERNATIVE

A summary of the impact assessments is presented in **Table 15 and 16;** the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (I.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

< 30	**Low significance**
30 to -60	**Moderate significance**
>60	**High significance**

Table 15: Impact Summary table **:** Construction Phase

Environmental Aspect	Construction	
	Without Mitigation	With Mitigation
Destruction and fragmentation of natural vegetation	Moderate	Low
Loss of floral Species of Conservation Concern.	High	Moderate
Impact on Mammals & Hepertofauna species	Moderate	Low
Exposure to erosion	Moderate	Low
Potential increase in invasive vegetation	Moderate	Low
Heritage and Cultural Impacts	Low	Low
Visual Impact	Low	Low
Waste Management Impact	Moderate	Low
Impact on the Social Economic Environment	Moderate	Moderate

Table 16 : Impact Summary table: Operation Phase

Environmental Aspect	Operation	
	Without Mitigation	With Mitigation
Destruction and fragmentation of natural vegetation	Moderate	Low
Loss of floral Species of Conservation Concern.	Moderate	Low
Impact on Mammals & Hepertofauna species	Moderate	Low
Exposure to erosion	Moderate	Low
Potential increase in invasive vegetation	Moderate	Low
Heritage and Cultural Impacts	Low	Low

Visual Impact	Low	Low
Waste Management Impact	Moderate	Low
Impact on the Social Economic Environment	Moderate	Moderate

For alternative:

During construction and operation phases of the development, it is noted that the impacts of ALL the reservoir slab options are similar.

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The recorded impacts before mitigation were mostly of Medium significance without mitigation of which the impacts can be reduced to mostly Low significance.

The environmental cost of this proposed development are expected to occur at local and site level and are considered acceptable provided that the mitigation measures as outlined in this Basic Assessment Report and EMPr are implemented. It must be noted that the implementation of any of the proposed reservoir Floor Slab Options presents no fatal environmental flaws and from an environmental point of view, any of the proposed reservoir Floor Slab Options can be implemented for development provided that recommended mitigation measures are implemented.

From an engineering point of view, the options investigated for implementation are as follows:

The first option is to construct a conventional floor with joints in it at 6.0m center to center grid (Floor Slab Option 1). The second alternative is to construct the reinforced slab without joints (Floor Slab Option 2). By limiting joints in the slab, probability of leakage as well as maintenance is reduced significantly. The third alternative is to construct a post tensioned floor slab also without joints (Floor Slab Option 3).

It was concluded that the reservoir floor must be constructed with a channel running down the centre to facilitate ease of cleaning the reservoir. Thus, from an engineering perspective, **Floor Slab Option 2** (jointless slab) is most preferred and thus is endorsed.

From an environmental perspective the implementation of any of the options/alternatives investigated is recommended as they have identical environmental impacts both during construction and operation. Having said that and also taking the engineering perspective into consideration, it is further recommended that **Floor Slab Option 2** (jointless slab) is be implemented. This recommendation is on acceptance of the proposed mitigation measures to minimise the anticipated environmental impacts.

6. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and

mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

The following conclusions were drawn from the specialist studies undertaken within this Basic Assessment for all three (3) reservoir Floor Slab Options alternatives:

Terrestrial Biodiversity Assessment:

- The project area is classified as an Ecological Support Area, as well as a CBA – Important Area in the southern section, based on the Gauteng Conservation Plan;
- Faunal diversity on the site was found to be moderate. There was suitable habitat present at the study area, including rocky outcrops, termite mounds, and grassland for the occurrence of more species and potentially species of conservation concern such as *Mystromys albicaudatus* and *Otomys auratus*. The survey was short and with additional sampling methods, it is expected that more species may be found;
- Floral diversity was adversely affected by a fire event prior to the site survey. One provincially protected orchid species was identified approximately eight meters outside of the study area. The vegetation within the study are is considered primary and highly sensitive;
- The significance of loss of terrestrial habitat was rated as moderate. The faunal assessment indicated that the habitat found at the study area was largely intact;
- The significance of the loss of CBA – Important Area habitat was rated as low. However, the area which is classified as CBA – Important Area surrounding the proposed Lenasia South Reservoir has been increasingly developed, placing a high importance on conserving the remaining CBA and ESA areas in this location;
- The significance of the loss of Ecological Support Area habitat is rated as high. Although the development footprint (approximately 1 hectare) is small, the area is primarily an Ecological Support Area which links with Important Areas in the vicinity of the study area;
- Despite being classified as occurring in the Savannah Biome on a desktop level, the site visit confirmed that the area is situated in a pristine grassland. Grasslands, particularly in the Gauteng Province, are one of the most threatened habitat types with very little formally conserved in South Africa.

Loss of terrestrial habitat

The significance of this impact was rated as moderate prior to mitigation due to:
• The presence of plant species of conservation concern; and
• The presence of intact terrestrial habitat for both flora and fauna species located within the study area.

Loss of Important Area Habitat

The significance of the loss of CBA - Important Area habitat was rated as medium and post mitigation the significance was rated as low. This was attributed to the small size of the project footprint, as well as the small size of the area classified as an Important Area. The site is situated in the southern section of the study area and may possibly be avoided during construction activities.

Loss of Ecological Support Area Habitat

The significance of the loss of Ecological Support habitat was rated as high both prior and post mitigation. The area occurs primarily in an Ecological Support Area, which links to CBA areas to the north of the study area, and to the south. The CBA areas to the south are already being transformed by residential areas, which highlights the importance of the Ecological Support Areas in this location.

Degradation of grasslands and subsequent loss of plant diversity including protected plant species

During the construction activities removal of indigenous plant species will occur. The Eulophia hians var. hians which occurs outside of the footprint area is protected according to the Transvaal Nature Conservation Ordinance No. 12 of 1983.

Increase in alien and invasive plant species

During the construction phase of the project vegetation clearing will occur. This will alter the natural competition present within the ecosystem currently and allow a window of opportunity for invasive species to colonise the disturbed areas.

Heritage Impact Assessment:

During the physical survey, no sites, features or objects of cultural significance were identified. As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development. From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the proposed mitigations.

Overall, the significance levels of the majority of identified negative environmental impacts can generally be reduced to acceptable levels by implementing the recommended mitigation measures. With reference to the information available at this planning approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable with the implementation of the of practical and appropriate mitigation measures as detailed in this report and contained in the Environmental Management Programme in **Appendix H.**

No-go (compulsory)

This is the option of not undertaking the proposed development of a new 15ML concrete reservoir. This option will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. The 'do nothing alternative' is the option of not constructing the reservoir on site. This alternative would result in no additional environmental impacts on the site or its surrounding area. This option would result in the additional capacity that is needed at the Lenasia HL reservoir in order to supply adequate water to Lenasia South ext.1 and 4, Migson Manor (Lenasia South ext.7), Zakariyya Park and additional areas of Vlakfontein Proper, Finetown, Hospital Hill and Lehae not to be realised.

Ultimately this would have a negative result of not delivering a vital service delivery of water provision.

The No go option would compromise the city's IDP objectives by not assisting the Local Municipality in achieving the performance areas as identified by the Local Municipality, as municipalities have the primary responsibility to provide for the availability of essential services by means of provision of water services for the city. This responsibility is embodied in legislation as well as policy statements. With this said the No Go option is therefore not preferred.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

Provincial Spatial Development Framework (PSDF)

The Gauteng PSDF is a provincial and strategic planning policy that responds to and complies with in particular the National Development Plan vision 2030 and the National Spatial Development perspective (NSDP). This framework promotes a developmental state in accordance to the principals of global sustainability as is stated by among others, the South African constitution and enabling legislation. The Gauteng PSDF is based on six growth and development pillars, each of which has its onset of drivers with long term-programmes. Pillar 1 highlights the job creation. The proposed development will create job opportunities during the construction phase. These employment opportunities will target local community members that are usually excluded from mainstream economic and formal employment. Therefore, the development is in line with the Gauteng PSDF.

Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).

The project will not compromise the IDP objectives but would rather assist the Local Municipality in achieving the performance areas as identified by the Local Municipality, as municipalities have the primary responsibility to provide for the availability of essential services by means of provision of waste and environmental management services; for the city. This responsibility is embodied in legislation as well as policy statements.

In terms of Chapter 5 of the Local Government: Municipal System Act, 2000, Act 32 of 2000, the Integrated Development Plan (IDP) is required to have a Spatial Development Framework (SDF) as one of its core components. The intention of the SDF is to guide spatial development in response to the challenges and opportunities of the municipality, in order to achieve the desired spatial form. The SDF must in terms of the Local Government Municipal Planning and Performance Management Regulations, 2001 set out a capital investment framework for the municipality's development programmes.

City of Joburg has a responsibility to guide spatial development through its urban planning instruments, infrastructure investments and service delivery programmes that are critical to achieving inclusive economic growth in South Africa.

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).	YES ✔	NO

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

There are no insurmountable environmental or social constraints that prevent the establishment of the proposed development of a new concrete reservoir in Lenasia South within City of Johannesburg Metropolitan Municipality, Gauteng Province. Therefore, it is recommended that the proposed **reservoir Floor Slab Option 2 (Jointless slab)** of the proposed development be considered for approval subject to the following general recommendations:

- The EMPr should be a legal binding document and an extension of the Environmental authorisation once issued by GDARD.
- The appointed contractor should be contractually bound to comply with the conditions of the EMPr.
- An independent ECO should be present during construction to monitor the implementation of the EMPr and the environmental authorization once issued and compiles monthly audit reports for submission to the relevant authorities.
- Compliance with the mitigation measures outlined in this BA report and EMPr.
- All relevant legislation and requirement of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
- In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of section 30 of NEMA.
- Compliance with all legal requirements in relation to environmental management and conditions of the authorization issued by GDARD.
- Construction noise on site must not exceed 85DB as required by the Health and Safety Act.
- The site after construction must be rehabilitated to a state that conforms to the principles of sustainable development.

From an environmental perspective the implementation of any of the options/alternatives investigated is recommended as they have identical environmental impacts both during construction and operation. Having said that and also taking the engineering perspective into consideration, it is further recommended that **Floor Slab Option 2** (jointless slab) is be implemented for construction. This recommendation is on acceptance of the proposed mitigation measures to minimise the anticipated environmental impacts.

9. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT *(as per notice 792 of 2012, or the updated version of this guideline)*

The proposed development of the new concrete reservoir in Lenasia South will assist the City of Johannesburg

Metropolitan Municipality in improving the city's water services provision by improving the efficiency of water supply of the surrounding area and catering for future water supply needs.

The project will not compromise the IDP objectives but would rather assist the Local Municipality in achieving the performance areas as identified by the Local Municipality, as municipalities have the primary responsibility to provide for the availability of essential services by means of provision of water services for the city. This responsibility is embodied in legislation as well as policy statements.

In terms of Chapter 5 of the Local Government: Municipal System Act, 2000, Act 32 of 2000, the Integrated Development Plan (IDP) is required to have a Spatial Development Framework (SDF) as one of its core components. The intention of the SDF is to guide spatial development in response to the challenges and opportunities of the municipality, in order to achieve the desired spatial form. The SDF must in terms of the Local Government Municipal Planning and Performance Management Regulations, 2001 set out a capital investment framework for the municipality's development programmes.

City of Johannesburg Metropolitan Municipality has a responsibility to guide spatial development through its urban planning instruments, infrastructure investments and service delivery programmes that are critical to achieving inclusive economic growth in South Africa.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (Consider when the activity is expected to be concluded)

Duration and Validity: The environmental authorization is required for a period of 10 years from the date of issue. Should a longer period be required, the applicant/EAP will be required to provide a detailed motivation on what the period of validity should be.

11. THE PERIOD ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

(must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached	YES

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information (N/A)

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Other information

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.