

BACKGROUND INFORMATION DOCUMENT FOR ENVIRONMENTAL IMPACT ASSESSMENT PROCESS - APRIL 2023

FOR TWO PROPOSED RENEWABLE ENERGY GENERATION PROJECTS LOCATED
WITHIN THE THABAZIMBI LOCAL MUNICIPALITY, WATERBERG DISTRICT
MUNICIPALITY, LIMPOPO PROVINCE:

- ZELPY 1 SOLAR PARK BY ERIDANUS ENERGY (PTY) LTD
- ZELPY 2 SOLAR PARK BY HOROLOGIUM ENERGY (PTY) LTD

Eridanus Energy (Pty) Ltd (Reg. No: 2022/367345/07) and Horologium Energy (Pty) Ltd (Reg. No. 2022/847618/07) are proposing the establishment of two renewable energy generation facilities (Photovoltaic Power Plants) with associated infrastructure and structures on **Portion 1 (Remaining Extent) of the Farm GOVERNEMENTS PLAATS 417 KQ**, located within the Thabazimbi Local Municipality, Waterberg District Municipality, Limpopo Province.

The project sites are located between 5 – 11 km North of Northam and ±11 km North-East of the Eskom Spitskop Main Transmission Substation.

The proposed renewable energy generation facilities will consist of **two Photovoltaic (PV) Power Plants** with the following **Maximum Export Capacities** and **development areas (footprints)**:

Project name	Maximum Export Capacity	Maximum Footprint	Project sites / Properties
Zelpy 1 Solar Park	190 MW	390 ha	Remaining Extent of Portion 1 of the Farm GOVERNEMENTS PLAATS 417 KQ
Zelpy 2 Solar Park	170 MW	350 ha	Remaining Extent of Portion 1 of the Farm GOVERNEMENTS PLAATS 417 KQ

The characteristics, technology and extent of the initiative are defined more in detail in this document.

PURPOSE OF THIS DOCUMENT

The main purposes of this background information document are:

- To provide information about the proposed projects
- To explain the Environmental Impact Assessment (EIA) process
- To provide an opportunity for participation in the Environmental Impact Assessment (EIA) process

This document also indicates how you can receive information, or raise issues, which may be of concern and/or interest for interested and/or affected parties (I&APs).

The sharing of information forms the basis of the public participation process and offers you the opportunity to become actively involved in the project from the outset.

Public participation plays an important role in the undertaking of an Environmental Impact Assessment (EIA) process, as input from I&APs ensures all potential issues are considered within the process.

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PROJECT SITE AND KEY FEATURES OF THE PROPOSED PROJECT

In view of the growing electricity demand and to use renewable energy resources, **Eridanus Energy (Pty) Ltd** and **Horologium Energy (Pty) Ltd** are assessing the feasibility of energy generation facilities, consisting of the **construction, operation, and maintenance of two Photovoltaic (PV) Power Plants**.

The project site is **Remaining Extent of Portion 1 of the Farm GOEVERNEMENTS PLAATS 417 KQ (1115 ha in extent)**, located within the Thabazimbi Local Municipality, Waterberg District Municipality, Limpopo Province.

The project sites are located between 5 – 11 km North of Northam. The **Eskom Spitskop Main Transmission Substation (MTS)** is located 11 km South-West of the project site.

The **developed areas (footprints)** required for the proposed projects will be:

- **up to 390 hectares** for the Zelpy 1 Solar Park, and
- **up to 350 hectares** for the Zelpy 2 Solar Park respectively.

The final size and location of the project footprint will be assessed following the outcomes of the Public Participation Process and of the recommendations and conclusions of the Specialist Studies to be conducted during the Environmental Impact Assessment (EIA) process.

Below are the **Surveyor-general 21-digit site codes (LPI codes)** of the project site:

Portion 1 (Remaining Extent) of the Farm GOEVERNEMENTS PLAATS 417 KQ (1115.2046 ha)

T	0	K	Q	0	0	0	0	0	0	0	0	0	0	4	1	7	0	0	0	0	1
1		2			3				4				5								

Please see attached a **Locality Map** indicating the location of the project sites, preliminary development areas (footprints) and Powerline Study Corridors for EIA (**Annexure A**).

Access to the development areas will be from the **regional road R510** from Northam to Thabazimbi, adjacent to the western boundary of the property or from the D56 Koedoeskop/Middeldrift road bordering the property on the south.

The proposed development (the Photovoltaic (PV) Power Plants and connection infrastructure) consists of the installation of the following equipment:

- Photovoltaic modules (mono-crystalline, poly-crystalline or bi-facial modules).
- Mounting systems for the PV arrays (single-axis horizontal trackers or fixed structures) and related foundations.
- Internal cabling and string boxes.
- DC/AC inverters.
- Medium voltage stations, hosting LV/MV power transformers.
- Control buildings, workshops & warehouses.

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- On-site high-voltage substation (one per project) with 22kV/132kV step-up transformers, and a 132 kV busbar (switching station) with metering and protection devices.
- One 132 kV power line (double circuit) (one per project), from the on-site substation & switching station up to the **Eskom Phoko 1 Distribution Substation (Connection Alternative 1)**, powerlines 4.1 km and 1.5 km long respectively) or up to the **Eskom Spitskop Transmission Substation (Connection Alternative 2)**, powerlines 10.8 km and 14.7 km long respectively).
- **For the Zelpy 1 Solar Park:** one **Battery Energy Storage System**, with a Maximum Export Capacity **up to 190 MW** and up to 6-hour storage capacity (up to 1140 MWh).
- **For the Zelpy 2 Solar Park:** one **Battery Energy Storage System**, with a Maximum Export Capacity **up to 170 MW** and up to 6-hour storage capacity (up to 1020 MWh).
- Electrical system and UPS (Uninterruptible Power Supply) devices, lighting system and grounding system.
- Access roads from the regional road R510 or the Koedoeskop/Middeldrift road.
- Internal roads.
- Fencing of the site, alarm and video-surveillance system.
- Water access point, water supply pipelines, water treatment facilities.

During the construction phase, the site may be provided with additional:

- water access point, water supply pipelines, water treatment facilities;
- prefabricated buildings, workshops; and
- warehouses that will be removed at the end of construction.

The connection may also entail interventions on the Eskom grid, according to Eskom's connection requirements/solution.

The following properties/farms fall within the **Powerline Study Corridors** and may be crossed by the proposed 132kV powerlines, depending on the final alignment and on the connection solution approved by Eskom:

Powerline Study Corridor, Alternative 1, 4 km long, from the Zelpy 1 and 2 Solar Parks up to the **Eskom “Phoko 1” Distribution Substation**:

- RE of Portion 1, Portions 7 and 10 of the Farm GOVERNEMENTS PLAATS 417 KQ;
- RE of Portion 6, RE of Portion 10, RE of Portion 11, Portion 14 and Portion 12 of the Farm KAALVLAKTE 416 KQ;
- Remainder of the Farm ELANDSFONTEIN 386 KQ.

Powerline Study Corridor, Alternative 2, 15 km long, from the Zelpy 1 and 2 Solar Parks up to the **Eskom “Spitskop” Transmission Substation**:

- RE of Portion 1 of the Farm GOVERNEMENTS PLAATS 417 KQ;
- RE of Portion 6, RE of Portion 10, RE of Portion 11, Portion 12 and Portion 14 of the Farm KAALVLAKTE 416 KQ;
- Portion 2, Portion 3, Portion 5 and Portion 51 of the Farm LEEUWKOPJE 415 KQ;
- Remainder and Portion 173 of the Farm WILDEBEESTLAAGTE 411 KQ.

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THE NEED FOR SOLAR GENERATION FACILITIES

South Africa currently relies principally on fossil fuels (coal and oil) for the generation of electricity. At the present date, Eskom generates approximately 90% of the electricity used in South Africa. On the other hand, South Africa has a largely unexploited potential in renewable energy resources such as solar, wind, biomass and hydro to produce electricity as opposed to other energy types (liquid fuel or coal).

South Africa's electricity supply still heavily relies upon coal power plants, whereas the current number of renewable energy power plants is still limited. In the last few years, the demand for electricity in South Africa has been growing at a rate approximately 3% per annum.

These factors, if coupled with the rapid advancement in community development, have determined the growing consciousness of the significance of environmental impacts, climate change and the need for sustainable development. The use of renewable energy technologies is a sustainable way in which to meet future energy requirements.

The development of clean, green and renewable energy has been qualified as a priority by the Government of South Africa with a target for 2013 of 10 000 GWh, as planned in the Integrated Resource Plan 1 (IRP1) and with the Kyoto Protocol. Subsequently the Department of Energy of South Africa (DoE) decided to undertake a detailed process to determine South Africa's 20-year electricity plan, called **Integrated Resources Plan 2010-2030 (IRP 2010)**. The IRP1 (2009) and the IRP 2010 (2011, updated in March 2014 and in October 2019) outline the Government's vision, policy and strategy in matter of the use of energy resources and the current status of energy policies in South Africa.

To achieve this goal, the DoE announced a Renewable Energy IPP (Independent Power Producers) Procurement Programme.

The **Renewable Energy IPP Procurement Programme (REIPPPP)**, issued on 3rd of August 2011, envisaged the commissioning of 3725 MW of renewable projects (1450 MW with solar photovoltaic technology) capable of beginning commercial operation before the end of 2017. This goal has not been fully fulfilled.

On 2014, the Department of Energy announced the intention to procure an additional 3 600 MW of renewable energy projects by 2020 (DOE Media Statement of 12 December 2014). In the **IRP 2019**, issued by the Department of Energy (now **Department of Mineral Resources and Energy (DMRE)**) under Notice No. 1360 dated 18 October 2019 in Government Gazette 42784, pursuant to the Electricity Regulation Act, provision has been made to procure an additional **6000 MW of solar PV** and 14400 MW of wind **between 2022 and 2030**.

The purpose of the proposed Solar Photovoltaic Plants is to add new capacity for the generation of renewable electric energy to the national electricity supply in compliance with the REIPP Procurement Programme in order to meet the "sustainable growth" of the Limpopo Province. The use of solar radiation for power generation is considered as a non-consumptive use and a renewable natural resource which does not produce greenhouse gas emissions. The generation of renewable energy will contribute to the growth of South Africa's electricity market, which has been primarily dominated up to this date by coal-based power generation.

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The proposed solar parks will assist the Eskom grid to meet the high energy demand related to the mining and industrial activities conducted in the Northam and Thabazimbi areas. Furthermore, being renewable energy projects, which don't generate greenhouse gases, they will assist to compensate the greenhouse gas emissions arising from these mining and industrial activities.

The purpose of the proposed **Zelpy 1 and 2 Solar Parks** is to add new capacity for the generation of electrical energy to the national electricity supply, in compliance with the Minister of Energy's Determinations and to meet the "electricity consumptions' growth" of the Limpopo Province.

Eridanus Energy (Pty) Ltd and Horologium Energy (Pty) Ltd intend to participate with their Solar Parks to the **Round 7 of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)**, to be launched by the **Department of Mineral Resources and Energy ("DMRE")**.

FUNCTIONING OF A PHOTOVOLTAIC (PV) POWER PLANT

Solar energy facilities such as those using PV technology use the energy from the sun to generate electricity through a process known as Photovoltaic Effect, which consists in the generation of electrons by photons of sunlight to create electrical energy.

Each of the five PV plants will mainly consist of the following components and equipment:

- **Photovoltaic cells and photovoltaic modules:** PV cells are made in silicone and act as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic module. The facility will use **mono/polycrystalline photovoltaic (PV) modules** or **bi-facial modules** with high efficiency.
- **Support structures:** PV modules will be assembled on steel or aluminium frames. The preferred technical solutions for the proposed solar parks entail PV modules mounted on **single-axis horizontal trackers** (alternative option 1) or on **fixed mounting systems** (alternative option 2), or a combination of both. As depicted in Figures 1 and 2, each tracker is composed by several PV arrays North-South oriented and linked by a horizontal axis, driven by a motor. The horizontal axis allows the rotation of the PV arrays toward the West and East direction, to follow the daily sun path. In the case of fixed mounting systems, as depicted in Figures 3 and 4: each mounting frame hosts PV modules along parallel rows of PV modules placed side by side, with the position of the panels northwards and an optimized tilt angle (between 20° and 30°). The rows of PV modules are mounted horizontally one on top of the other, with an overall mounting structure height up to 4.5 meters above ground level.
- **Strings and string boxes:** the PV modules are connected in series to form PV strings, so that the string voltage fits into the voltage range of the DC/AC inverters. PV strings are devised to be connected to DC-connection boxes (string boxes) with a parallel connection solution (PV sub-field). String Boxes monitor the currents in photovoltaic

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modules and can promptly diagnose faults. String boxes are also designed with a general circuit breaker to disconnect the photovoltaic sub-fields from the DC/AC inverters.

- **Medium-voltage stations:** each medium-voltage station is designed to host one or more DC/AC inverters, and one or more medium-voltage power transformers. The DC/AC inverters are deemed to convert the direct current (DC) to alternating current (AC) at low voltage; subsequently the AC will pass through a medium-voltage power transformer to step-up the voltage up to 22 kV or 33 kV.
- **Medium voltage receiving station:** the energy from the medium voltage stations will be collected into one medium voltage receiving stations, linking in parallel all the PV fields of the PV generator.
- **One on-site high-voltage substation and 132 kV switching station (one per project):** from the medium-voltage receiving station, the electrical energy will be delivered to one small on-site high-voltage substation with two or more high-voltage power transformers (one as spare), stepping up the voltage to the voltage of the Eskom grid (132 kV). Furthermore, the on-site high-voltage substation will be equipped with a control building and one busbar with metering and protection devices (also called “switching station”).
- **One 132 kV power line (double circuit) (one per project),** from the on-site substation & switching station up to the **Eskom Phoko 1 Distribution Substation (Connection Alternative 1,** powerlines 4.1 km and 1.5 km long respectively) or up to the **Eskom Spitskop Transmission Substation (Connection Alternative 2,** powerlines 10.8 km and 14.7 km long respectively).
- **For the Zelpy 1 Solar Park:** one **Battery Energy Storage System,** with a Maximum Export Capacity **up to 190 MW** and up to 6-hour storage capacity (up to 1140 MWh), with a footprint up to 15 ha within the PV plant footprint / development area.
- **For the Zelpy 2 Solar Park:** one **Battery Energy Storage System,** with a Maximum Export Capacity **up to 170 MW** and up to 6-hour storage capacity (up to 1020 MWh), with a footprint up to 15 ha within the PV plant footprint / development area.
- **Control buildings,** within the on-site substation and switching station.
- **Workshop and warehouses,** next to the on-site substation.

Other key features of the project are to ensure a high level of reliability, operational and maintenance safety, low water consumption. The expected operational life of a PV plant is deemed to be between 30 up to 40 years. The construction and the commissioning of the two PV plants are expected to last approximately **18 to 24 months.**

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Figure 1 Simulation views of the PV arrays mounted on horizontal 1-axis tracker

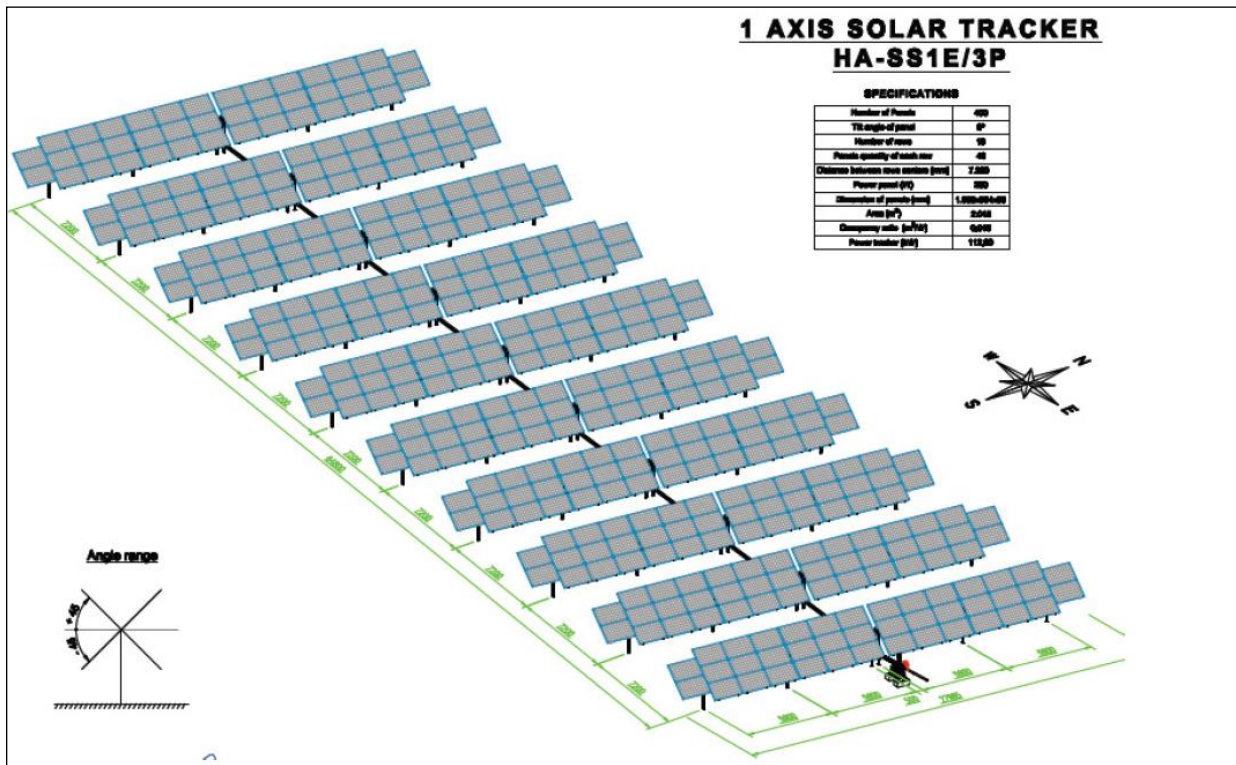


Figure 2 Frontal views of the PV arrays mounted on horizontal 1-axis tracker



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Figure 3 Lateral views of PV arrays mounted on fixed mounting systems

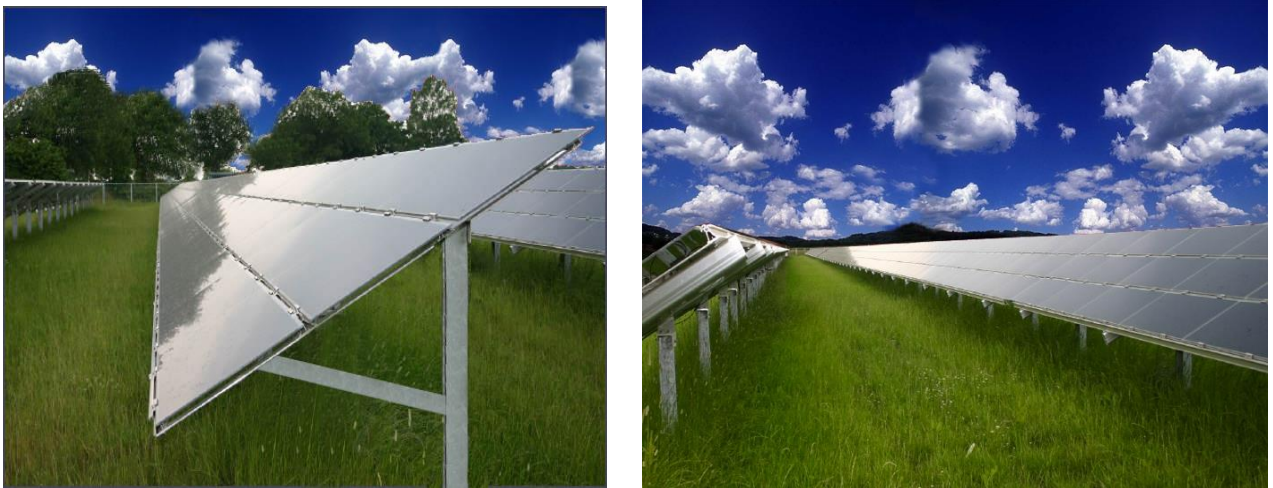


Figure 4 Frontal view of PV arrays mounted on fixed mounting systems



Figure 5 Example of a Battery Energy Storage System (BESS)



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ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

In order to undertake the construction of the proposed PV plants, **Eridanus Energy (Pty) Ltd** and **Horologium Energy (Pty) Ltd** must receive each its own environmental authorization from the **National Department of Forestry and Fisheries and Environment (DFFE)**, under the terms of the EIA Regulations 2014, as amended and published in terms of Section 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

The environmental authorization shall be granted in consultation with the **Limpopo Department of Economic Development, Environment and Tourism. (LEDET)**.

The Environmental Impact Assessment (EIA) process permits the identification and assessment of potential environmental impacts resulting from the proposed project.

Eridanus Energy (Pty) Ltd and **Horologium Energy (Pty) Ltd** will undertake the required Environmental Impact Assessment (EIA) process and appointed **AGES Limpopo (Pty) Ltd** as Environmental Assessment Practitioner (EAP) to identify and assess potential environmental impacts, proposing appropriate mitigation and management measures as part of an Environmental Management Programme. This process also gives the opportunity to liaise with interested and affected parties through a public participation process.

Therefore, during the entire Environmental Impact Assessment (EIA) process, I&AP's will be actively and constantly involved.

The main environmental studies will be the following:

- Draft Scoping Report
- Final Scoping Report
- Draft EIA Report
- Final EIA Report
- Draft Environmental Management Programme

POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECTS

A series of preliminary significant environmental issues and potential environmental impacts are currently being investigated and evaluated in terms of the severity, duration, extent, frequency and probability during the construction and the operational phases. The methods to be used are internationally recognised and based on facts, experience, and expert opinions.

The following preliminary issues and potential impacts are being evaluated during the Environmental Impact Assessment (EIA) process:

- Impacts on avifauna
- Impacts on vegetation and fauna
- Impacts on aquatic biodiversity
- Impacts on the agricultural potential of the soils
- Geological, soil and erosion impacts
- Impacts on archaeological and palaeontological resources
- Visual impact
- Social and economic impacts

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During the Scoping Phase, specialists will identify the abovementioned potential environmental issues and impacts for further investigation within the subsequent EIA Phase.

Specialist studies will be conducted to identify all potentially significant impacts. These impacts will be all analysed singularly and cumulatively to exclude the risk of fatal flaws and potential threats, if any, as well as to recommend adequate and effective mitigation measures.

The Scoping Report will highlight areas that should be avoided to limit potential impacts and will recommend the most favourable alternatives for the PV plant and the associated infrastructure and structures for further investigation in the EIA Report. The public participation process will provide valuable information in the identification of further issues which may require further and specific investigation and analysis during the EIA process. AGES Limpopo will give responses to all comments and queries received from I&APs and will carefully consider and evaluate all issues raised with the aim of assessing all potential impacts.

PUBLIC PARTICIPATION PROCESS

It is important that all relevant I&APs are identified and involved in the public participation process from the beginning of the project. The public participation process gives the chance to become actively involved through constant sharing of information related to the project.

The main purposes of the public participation process are to ensure that:

- all relevant information in respect of the application is made available to I&APs for their evaluation and review;
- reasonable opportunity is given to I&AP's to comment and to submit queries related to the proposed project; and
- a review period is provided for interested and affected parties to comment on findings of the Draft Scoping Report and Draft EIA Report.

The public participation process includes the following phases:

- phase 1: advertising of the EIA process (regional and local press);
- phase 2: registration of I&APs and key stakeholders on the database (on-going);
- phase 3: consultation with and transfer of information to I&APs through consultation, public meetings, focus group meetings and key stakeholder workshops;
- phase 4: registration of all comments, issues and concerns raised by I&APs within an issue's registry, which will form an integral part of Scoping and EIA Reports; and
- phase 5: invitation of I&APs to comment the Draft Scoping and EIA Reports within the stipulated 30-day review period.

The public involvement within the phases of an EIA process includes:

1. Notification of Environmental Impact Assessment process

- a) Advertising in local and/or regional newspapers
- b) Inform I&APs and stakeholders through site notices, background information documents and letters

2. Draft Scoping Report

- a) Draft Scoping Report sent to I&APs and stakeholders
- b) Application form submission to DFFE
- c) Draft Scoping Report submission to DFFE
- d) Collection of comments from DFFE, I&APs and stakeholders

3. Final Scoping Report

- a) Final Scoping Report submitted to DFFE
- b) Approval of Final Scoping Report by DFFE

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- 4. Draft EIA Report and Draft Environmental Management Programme**
 - a) Draft EIA Report and Draft Environmental Management Programme (EMPr) sent to I&APs and stakeholders
 - b) Draft EIA Report and Draft EMPr submitted to DFFE
 - c) Collection of comments from DFFE, I&APs and stakeholders
- 5. Final EIA Report and Draft Environmental Management Programme**
 - a) Final EIA Report and EMPr submitted to DFFE.
- 6. Decision Making**
 - a) Acknowledge receipt of Final EIA Report and Draft EMPr
 - b) Granting or Refusal of Environmental Authorization
 - c) Notification of decision
 - d) Information of stakeholders & I&APs of decision in writing.

RIGHTS AND RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations of 2014, as amended, please take note of your rights and responsibilities as an I&AP.

To participate in this EIA process as an I&AP, you must be registered on the project database. Please observe that all comments regarding the proposed projects must be submitted within the stipulated timeframes.

Finally, please be advised that as I&AP you are required to disclose any direct business, financial, personal or other interest which that you may have in the approval or rejection of the application for the proposed project.

PRELIMINARY TIME SCHEDULE

Project notification period	April 2023 – May 2023
Submission of Draft Scoping Report	May 2023
Submission of Final Scoping Report	July 2023
Submission of Draft EIA Report and Draft EMPr	August 2023
Submission of Final EIA Report and Draft EMPr	October 2023

WHO TO CONTACT

AGES Limpopo (Pty) Ltd

Ms. Hiadee von Well

Tel: 015 2911577

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Physical Address: 120 Marshall Street, Polokwane 0699 – South Africa

Postal Address: P.O. Box 2526, Polokwane 0700 – South Africa

E-mail: hvonwell@ages-group.com

Please contact Ms. von Well at the above indicated numbers and addresses.

Please complete the enclosed response form and return it to the above indicated numbers and addresses.

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**RESPONSE FORM
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CONTACT DETAILS:

Title:

First Name:.....

Surname:.....

E-mail:

Cell:

Telephone:

Fax:

Organization (if applicable):

Capacity (e.g. Chairperson, member, etc):

Physical Address:.....

Town: **Code:**

Postal Address:.....

Town: **Code:**

YOUR INTEREST IN THE MATTER:

1. What is your main area of interest with regards to the proposed project?
.....
.....

2. Are there any concerns you would like to raise, at this stage, regarding the proposed project?
.....
.....

3. Are there any additional role-players whom we should involve in the process?
If **“yes”**, please provide us with their contact details (Name, address & telephone numbers):
.....
.....

**THANK YOU FOR YOUR TIME
Please add more pages if necessary**

