Scoping report:
AS-R-2013-11-01

Scoping report as part of the Environmental Impact Assessment Process for the proposed Separation Plant on portion 6 of the farm Langeberg 188, Saldanha Bay Local Municipality

November 2013

Document version 2.0 – Final for public review

Compiled by: C Smith
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Scoping Report as part of the Environmental Impact Assessment Process for the proposed Separation Plant on portion 6 of the farm Langeberg 188, Saldanha Bay Local Municipality

November 2013

Prepared for:

Frontier Separation (Pty) Ltd

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Executive Summary

Background

Africa Geo-Environmental Services (AGES) was appointed by Frontier Separation (Pty) Ltd to facilitate the EIA process for the proposed Separation Plant development on portion 6 of the farm Langeberg 188, Saldanha Bay Local Municipality, Western Cape Province. The site proposed for development is located approximately 6 km south-east of Vredenburg, 9 km north-east of Saldanha and 10 km north of Langebaan within a proposed Industrial Corridor.

This Scoping Report forms part of the Environmental Impact Assessment process to be completed in accordance with the EIA Regulations as part of National Environmental Management Act (NEMA) (Act 107 of 1998) and the National Environmental Management: Waste Act (NEMWA) (Act 59 of 2008). Activities associated with the proposed separation plant are listed according to the 2010 Regulations (GNR 544, 545 and 546). The National Environmental Management Air Quality Act (Act 39 of 2004) with the listed activities as contemplated in section 21(3)(a) and (b) of the NEMAQA and read with GN 964 of 23 November 2012 (previously GN 248 of 31 March 2010) triggers activities for the proposed plant and the applicant needs to attain an atmospheric emission licence before production may start. An air quality specialist consultant will be appointed to facilitate this process.

Project Description

Bulk mixed rare earth salts from a rare earth mine site is proposed to be transported by road to the Saldanha Bay Separation Plant (SSP) for further processing. The proposed Separation Plant will incorporate the following processes: hydrochloric acid leaching and clarification, solvent extraction, precipitation, filtration/dewatering, drying/calcining; and product packaging. The SSP is intended to produce 20,000 tonnes per annum of highly purified rare earth oxides (REO) or their equivalents.

The currently saleable rare earth elements (REEs) will be separated either as rare earth oxides (REOs) or carbonates with a purity equal to or greater than 99%. The currently non-saleable or non-profitable elements will be precipitated as carbonates and then temporarily stored in a waste settling pond for 6 months prior to further disposal or possible future sales.

Major unit operations for the separation plant include the following:

- concentrates receiving;

- hydrochloric acid leaching and clarification;
- solvent extraction;
- precipitation;
- filtration/dewatering;
- drying/calcining; and
- product packaging.

The different components are discussed in more detail in Section 4.

Environmental Scoping Report Requirements

For ease of reference a summary of the legal requirements for a Scoping Report according to GNR 543 of 2010 is provided below.

Legal and Regulatory Requirement	Cross-reference
A Scoping Report must contain all information that is necessary for a proper understanding of the nature of issues identified during scoping and must include all the requirements as contemplated in regulation 28(1) of GNR 543, and must include –	
(a) details of – (i) the EAP who compiled the report; and (ii) the expertise of the EAP to carry out an scoping procedure.	Refer to section 1.4
(b) a description of the proposed activity.	Refer to section 4
(c) a description of any feasible and reasonable alternatives that have been identified.	Refer to section 6
(d) a description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is (i) a linear activity, a description of the route of the activity; or (ii) an ocean-based activity, the coordinates where the activity is to be undertaken.	Refer to section 1
(e) a description of the environment that may be affected by the activity and the manner in which activity may be affected by the environment.	Refer to section 5
(f) an identification of all legislation and guidelines that have been considered in the preparation of the scoping report.	Refer to section 3 and Appendix F
(g) a description of environmental issues and potential impacts including cumulative impacts, that have been identified.	Refer to section 7

Legal and Regulatory Requirement	Cross-reference
(h) details of the public participation process conducted in terms of regulation 27 (a), including – (i) the steps that were taken to notify potentially interested and affected parties of the application; (ii) proof of notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given; (iii) a list of all persons or organisation that were identified and registered in terms of regulation 55 as interested and affected parties in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues.	Refer to section 2.1.2 and Appendix A Comments and Response report
(i) a description of the need and desirability of the proposed activity.	Refer to section 4.6
(j) a description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that me be affected by the activity.	Refer to section 6
(k) copies of any representations, and comments received in connection with the application or the scoping report from interested and affected parties.	Refer to Appendix A
(l) copies of the minutes of an meetings held by the EAP with interested and affected parties and other role players which record the views of the participants.	Refer to section Appendix A
(m) any response by the EAP to those representations and comments and views.	Refer to section Appendix A Comments and Response Report
(n) a plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include – (i) a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken; (ii) an indication of the stages at which the competent authority will be consulted; (iii) a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and (iv) particulars of the public participation process that will be conducted during the environmental impact assessment process.	Refer to Appendix D

Legal and Regulatory Requirement	Cross-reference
(o) any specific information required by the competent authority.	For information regarding the HIV/AIDS, STI and TB Operational Plan refer to Section 5.10.4 below, as well as Section 3.2.11.3 of the Plan of Study for EIA attached as Appendix D. Refer to Appendix F for proof of Service Agreements
(p) any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not applicable

Environmental Impact Assessment and Public Participation Process

Specific comments or concerns that were raised during the stakeholder engagement process include the following:

- Biodiversity impacts
  - Negative impacts on naturally occurring fauna and flora
  - Rehabilitation of disturbed areas according to best practice
- Palaeontology and archaeology
  - Need for palaeontological and archaeological surface surveys prior to any earth moving activities
  - Availability of previously conducted archaeological and palaeontological reports
  - Provision for monitoring of subsurface activity
  - Rescuing of fossil material during excavations
- Air Quality Impacts
  - Air Pollution originating from the plant
  - The requirement for an Atmospheric Emissions Licence
  - Dust Pollution
- Soil pollution
- Noise Pollution
- Traffic Impacts
  - Increased heavy traffic impacting on the existing road infrastructure during the construction and operational phases

- Groundwater and surface water pollution and management
  - Impact on water users in the area
  - Pollution/contamination of groundwater resources
  - Lowering of the groundwater table due to abstraction of water
  - Poor storm water management that could lead to pollution of Saldanha Bay
- Visual Impact
- Material handling and storage
  - Usage and storage of hazardous chemicals
  - Management and disposal of solid and liquid waste
  - Processing and storage of Rare Earths
- Socio-Economic Impacts
  - Economic upliftment relating to local job creation and employment
  - Land use impacts
  - Impacts on farming of livestock, grain and bee keeping.
  - Safety and Security
  - Supply of building material
- Health Impacts
- Economic impacts related to:
  - Rare Earth supply and exporting
  - Rare Earth wastes and recovery of these wastes if possible
  - Separation of Rare Earths and resulting products
  - Beneficiation of South Africa's natural resources, including establishing downstream electronics industries in South Africa
- Waste impacts
  - Handling and testing of sludge
  - Lining of waste settling dams/evaporation ponds
  - Capacity of waste disposal facility
  - Storage of hazardous waste
  - Disposal of hazardous waste
  - Disposal of unused products
  - Storage of raw materials

Through the synthesis of issues raised by interested and affected parties during the scoping process, the above mentioned issues are to be investigated during the EIA Phase through the following specialist studies:

- Air Quality Impact Assessment (Airshed Planning Professionals);
- Surface and Groundwater Impact Assessment (AGES Hydrogeology Unit);
- Stormwater Management (Rede Engineering and Management Solutions);
- Archaeological Impact Assessment (AGES);
- Health Impact Assessment (Envirosim);
- Social Impact Assessment (Equispectives Research & Consulting Services);
- Economic Impact Assessment (Urban Econ);
- Noise Assessment (Acusolv);
- Visual Impact Assessment (New World Associates);
- Heritage Impact Assessment (New World Associates);
- Ecological Assessment (Nick Helme);
- Palaeontological Impact Assessment (John Pether);
- Risk Assessment (ISHECON); and
- Traffic Impact Assessment (ITS).

Environmental Impact Assessment

An Environmental Impact Assessment (EIA) is an essential planning tool for any development. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

Scoping is the process of identifying the significant issues, alternatives and decision points that should be addressed in the EIA process. The aim of the Scoping Process is to support informed decision-making by providing information on the potential environmental effects of development prior decision-making. The overall aim of the Scoping Phase is to identify the environmental issues and impacts associated with the proposed development that require further investigation

The Site

Geology – Calcrete is found to a depth of 8 metres on site. Sand and clay with an expected thickness of 40 to 50 m follows. The sand and clay layers may contain gravel fine and very fine sands alternated with clay lenses. A sandy layer consisting of black sand that may be peat is expected to be below the sand and clay layer before the Vredenburg Granite is to be found at an expected depth of 50 to 60 m.

Climate –The area receives a Mean Annual Precipitation (MAP) of 325 mm/annum. The site is located in Evaporation Zone 23B which has an S-Pan Mean Annual Evaporation (MAE) of 1460 mm/a. Saldanha has a Mediterranean climate with highest temperatures occurring from December to March and the lowest between June and August. Average temperatures range from a minimum of 7ºC to a maximum of 18ºC in winter, while in summer the average minimum temperature is 15°C up to a maximum of 28ºC on average.

Topography and Drainage – The contours of the area indicate the flat topographic setting of the study area which slopes very gently to the south. No drainage lines occur on or adjacent to the site.

Natural Vegetation (Flora) – The entire study area has been previously cultivated and has a low botanical conservation value at a regional scale. This is due to the disturbed nature of the soils in this area, the low plant diversity, and the lack of any plant Species of Conservation Concern (SCC).

Animal Life (Fauna) – The cultivated nature of the primary development area, and the associated loss of natural vegetation and habitat, means that the faunal diversity is much reduced in this area relative to intact, natural veld.

Wetlands – No evidence of permanent or seasonal wetlands could be found on site.

Ground and surface water – The Saldanha region is located in Water Management area number 19 (the Berg). The entire Saldanha region and the Separation Plant Site are located in quaternary drainage region G10M.The Separation Plant site is located on the Langebaan Road Aquifer System (LRAS).

Water level depths on the site currently vary between 2.7 and 4.1 m below ground level. The water from all the samples taken from seven monitoring boreholes drilled on site is in Class 1 level according to the micro determinants. All samples show elevated levels of Electrical Conductivity (EC), Total Dissolved Solids (TDS), Sodium, Magnesium, Chloride which is above Class 2 level. All the samples also show elevated Calsium and Sulphate levels elevated to Class 2 water.

The average TDS level is 7410 mg/l which render the water from all the boreholes unsafe for domestic and animal use. The water is unpalatable and unusable for all farming activities.

Palaeontology – The project site is underlain by calcareous aeolianites and calcretes of

the Langebaan Formation. Fossils have been found in these strata that are of profound scientific value. Deep excavations may encounter fossiliferous marine deposits of the Uyekraal Formation and mitigation measures will be recommended during the EIA phase to limit impacts on palaeontological resources.

Sites of archaeological and cultural interest – No archaeological sites could be identified during a site survey due to the disturbed nature of the area.

Socio-economic Environment – The Saldanha Bay Local Municipality (SBLM) has a population of 99 193 and more than half of the population of the municipality belongs to the Coloured population. Afrikaans is the dominant home language on provincial, district as well as local level, followed by IsiXhosa and English. In the municipality 66.7% of the population is of economically active age. About half of the people of economically active age on provincial, district and local level are employed.

Alternatives

The identification of alternatives is an important component of the EIA process.

Site Alternatives

Prior to the EIA application a Preliminary Environmental Assessment was undertaken in order to assess two different site alternatives. The study identified two possible sites for the proposed plant within the Saldanha Local Municipality:

- Portion 6 of the farm Langeberg 188 (Alternative Site 1)
- Portion 0 of the Farm Uyekraal 189 (Alternative Site 2)

These two sites were visited by an Archaeologist and an Ecologist to assist with determining the best site option for the proposed plant. Various sites of heritage significance were found on Alternative Site 2 and two plant Species of Conservation Concern were also recorded in the study area. There is also a possibility that one or two other such species may be present in the area. Alternative Site 2 partly falls within a Critical Biodiversity Area, and is also largely surrounded by Critical Biodiversity Areas. In contrast no heritage sites or plant species of Conservation Concern were identified on Alternative Site 1 (Portion 6 of Langeberg).

Alternative Site 1 is also located closer to the existing railway lines in the area compared to Alternative Site 2. A railway siding is being considered for the Industrial Area and therefore rail transport is seen as an alternative future transport method for the mixed rare earth salt from the Zandkopsdrift mine to Saldanha.

When taking into consideration the ecological and heritage significance of the two alternative sites, as well as access to rail infrastructure, Alternative Site 1 is considered to be the preferred alternative. This alternative site on Portion 6 of the farm Langeberg 188 was therefore taken further into the EIA process as the preferred alternative site.

Technology / Service Alternatives

Various technology or service alternatives are in the process of being assessed. These relate to the following aspects:

1. Process water treatment alternatives;
2. Brine Disposal Alternatives;
3. Mixed Rare Earth Carbonate Waste Disposal Alternatives; and
4. Boiler Fuel Alternatives.

1. Process water treatment alternatives:
    - Alternative 1: Full bleed of process brine (no process waste water recycling);
    - Alternative 2: Reverse osmosis combined with thermal treatment with moderate process brine bleed (i.e., moderate water recycling); and
    - Alternative 3: Reverse osmosis combined with thermal treatment of the full process waste water (i.e. maximum water recycling).
2. Brine Disposal Alternatives:
    - disposal to one or more of the existing local waste water treatment works;
    - constructing evaporation ponds to generate salt for responsible disposal;
    - evaporating and crystallising to generate salt for responsible disposal; or
    - sea disposal of the effluent (Regional Marine Outfall Project).
3. Mixed Rare Earth Salts Waste Disposal Alternatives:
    - sold if a market can be found or;
    - disposed of to the tailings storage facility at the Zandkopsdrift mine site; or

- alternatively disposed of at an appropriately licensed waste disposal facility.

4. Boiler Fuel Alternatives

    - Coal and Liquid Petroleum Gas (LPG) is currently being considered as fuel alternatives for the proposed boiler system

Some of the alternatives may be rejected because of a lack of feasibility (e.g. for technical or financial reasons). These alternatives will be considered and discussed in the EIA report, and the reasons for non-feasibility will be explained.

All alternatives will be assessed against the *No Go Alternative*.

Conclusions & Recommendations

This Scoping Process has followed the correct and appropriate standards and procedure for the EIA application, as set out in the NEMA, as amended, and the EIA Regulations of 2010. The Scoping Study includes a description of the various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment of the EIA process.

Impact significance will be assessed in the EIA phase with the assistance of the various specialist studies using the criteria listed in section □.

Public participation during the Impact Assessment Phase of the EIA will revolve around a review of the findings of the EIA and inputs into the Environmental Management Plan (EMP). The findings will be presented in a Draft Environmental Impact Assessment Report, Specialist Studies and EMP. AGES recommends that the project proceed into the EIA phase of the environmental process. The EIA report will address the comments or concerns identified in the Scoping Report, at a level required to provide the public and the decision making authorities with sufficient information to deliver a final decision.

The anticipated way forward on the next phase of the EIA process is explained in Section 8.1.

LIST OF ABBREVIATIONS

Abbreviation	Description
BPEO	Best Practicable Environmental Option
DM	District Municipality
DWA	Department of Water Affairs
EC	Electrical Conductivity
ECA	Environmental Conservation Act (Act 73 of 1989)
EI	Environmental Impact
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
GDP	Gross Domestic Product
GDP-R	Gross Domestic Products per Region
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
LM	Local Municipality
LRAS	Langebaan Road Aquifer System
LSA	Later Stone Age
MAMSL	Meters Above Mean Sea Level
MAP	Mean Annual Precipitation
MSA	Middle Stone Age
NAAQS	National Ambient Air Quality Standards
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NFA	National Forest Act
NWA	National Water Act (Act 36 of 1998)
PGWC	Provincial Government of the Western Cape
PPB	One part per billion
REEs	Rare Earth Elements
REO	Rare Earth Oxides
SBLM	Saldanha Bay Local Municipality
SCC	Species of Conservation Concern
SSP	Saldanha Bay Separation Plant
TDS	Total Dissolved Solids

WCDM	West Coast District Municipality
DEADP	Western Cape Department of Environmental Affairs and Development Planning

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1 INTRODUCTION

Africa Geo-Environmental Services Gauteng (Pty) Ltd (AGES) was appointed by Frontier Separation (Pty) Ltd to facilitate the EIA process for the proposed Separation plant development on portion 6 of the farm Langeberg 188, Saldanha Bay Local Municipality, Western Cape Province.

Bulk mixed rare earth salts from a rare earth mine site is proposed to be transported by road to the Saldanha Separation Plant (SSP) for further processing. The proposed Separation Plant will incorporate the following processes: hydrochloric acid leaching and clarification, solvent extraction, precipitation, filtration/dewatering, drying/calcining; and product packaging. The SSP is intended to produce 20,000 tonnes per annum of highly purified rare earth oxides (REO) or their equivalents.

The currently saleable rare earth elements (REEs) will be separated either as rare earth oxides (REOs) or carbonates with a purity equal to or greater than 99%. The currently non-saleable or non-profitable elements will be precipitated as carbonates and then temporarily stored in a waste settling pond for 6 months prior to further disposal or possible future sales.

1.1 Regional Setting

The site is located approximately 6 km south-east of Vredenburg, 9 km north-east of Saldanha and 10 km north of Langebaan within a proposed Industrial Corridor. Refer to Figure 1 to Figure 3 for locality maps.

The general coordinates for the site are:

Latitude: -32˚57’9.62” S

Longitude 18˚4’14.6” E

1.2 Magisterial District and Municipality

The site falls within the jurisdiction of the Saldanha Bay Local Municipality and the West Coast District Municipality (WCDM) within the Western Cape Province.

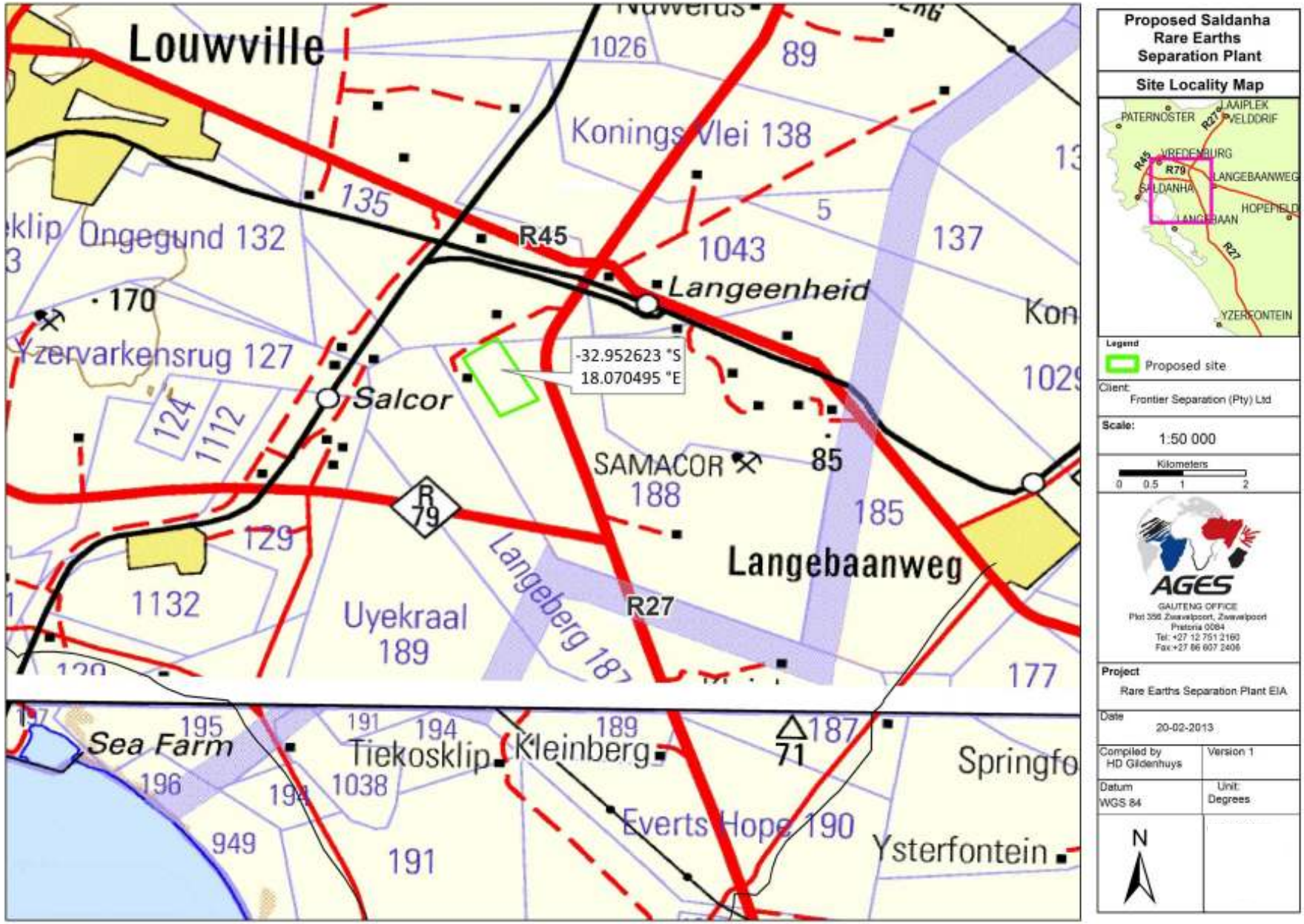


Figure 1 Regional Locality Map

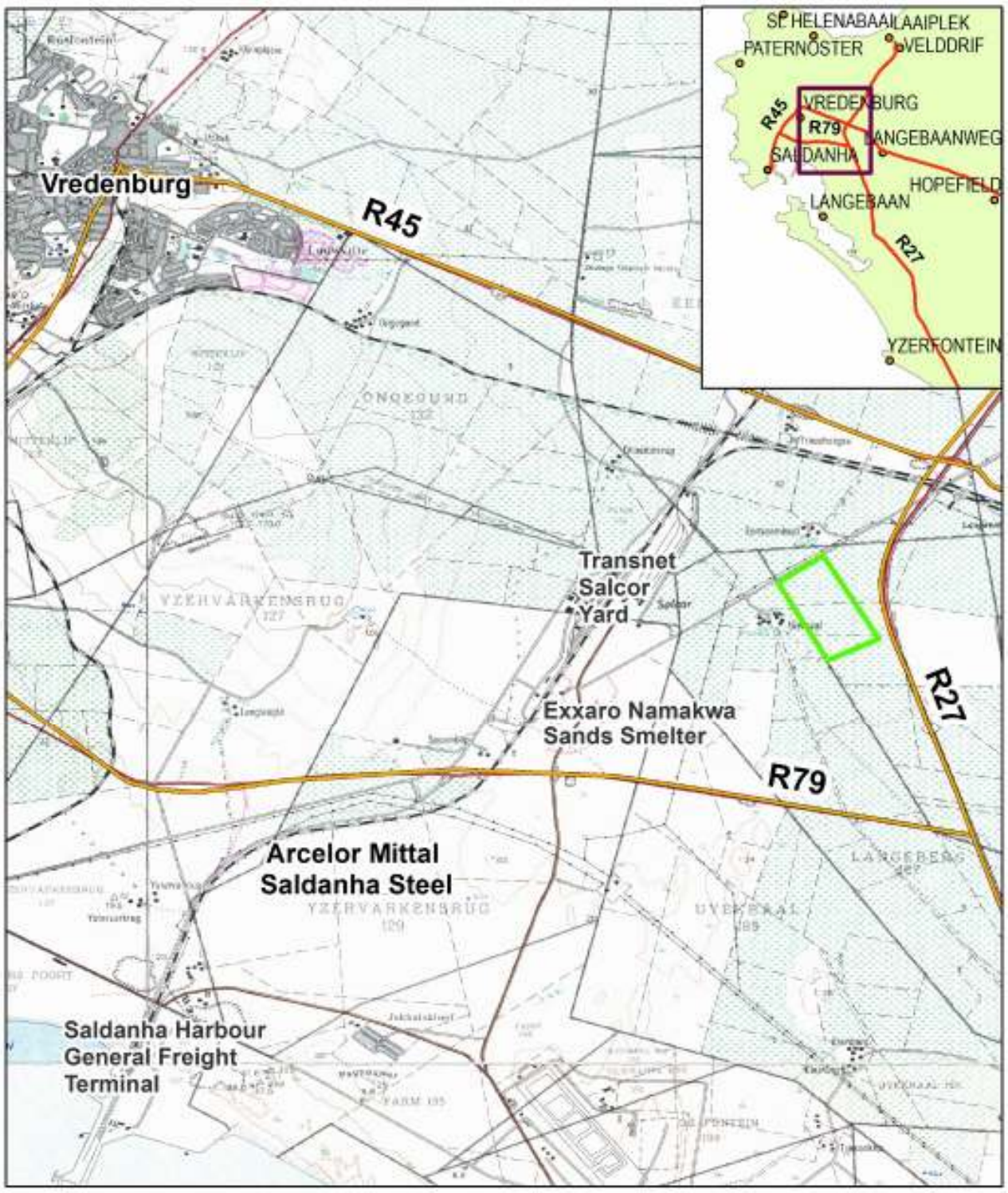


Figure 2 Site Topographical Locality Map

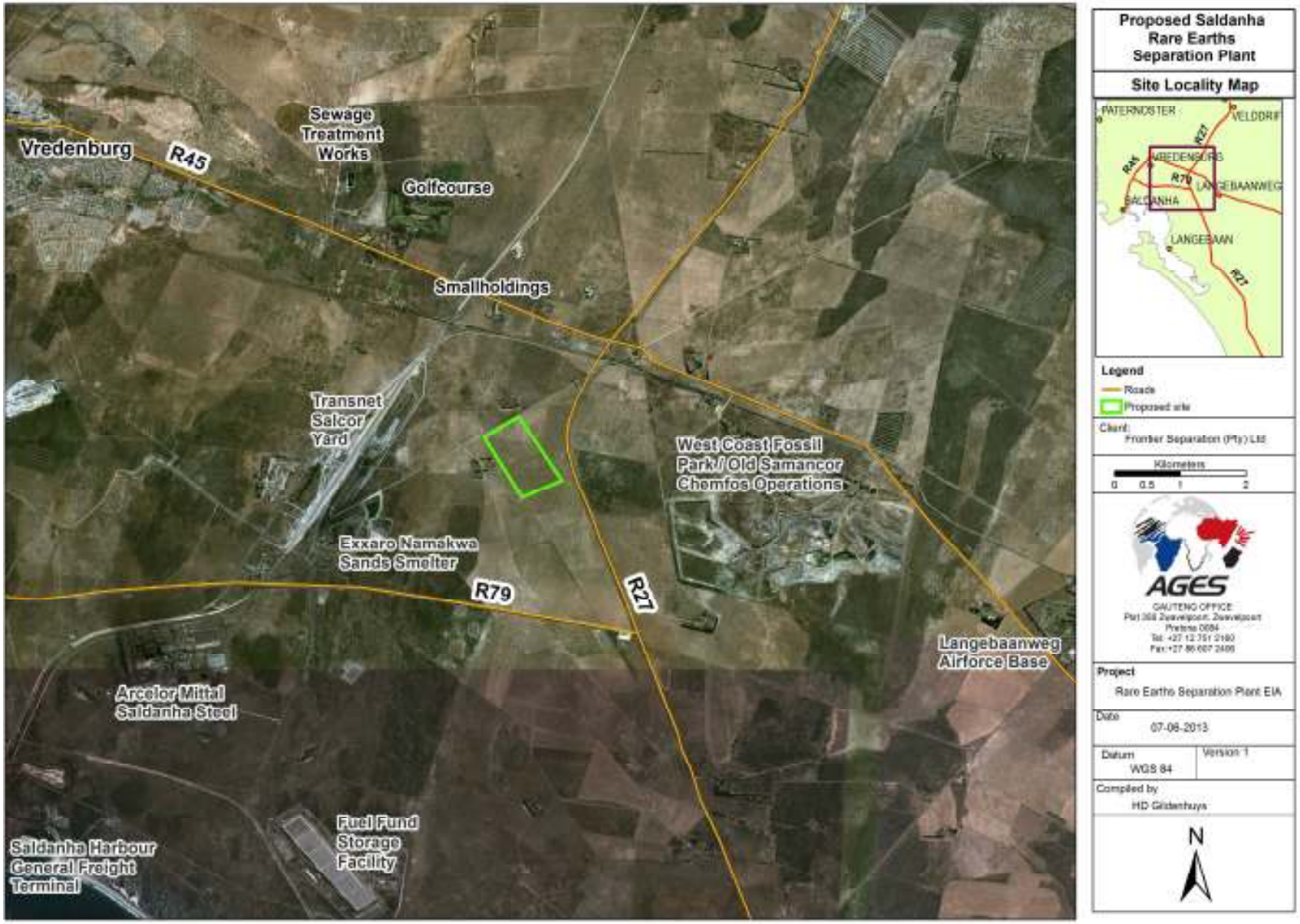


Figure 3 Site Aerial Locality Map

1.3 Contact details of applicant

The details of the applicant are listed below:

Details of the Applicant	
Full name of the applicant:	Frontier Separation (Pty) Ltd
Contact person:	Cyril Thomas
Telephone number:	021 4466040
Fax number:	021 4466050
Address:	PO Box 8399, Foreshore, Cape Town

1.4 Details of the environmental assessment practitioner

As per the requirements of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended and the Environmental Impact Assessment Regulations of 2010, the following information is pertinent with regards to the Environmental Assessment Practitioners (EAP) that has conducted the EIA for the proposed development:

EAP	Qualifications	Years' experience
Dr. JC Vivier	PhD Environmental Management	10 years
Mr Herman Gildenhuys	BSc Hons Wildlife Management (Pr.Sci.Nat)	7 years
Ms Chantal Smith	BHCS Hons Archaeology	6 years
Mrs Reneé Kruger	Masters in Environmental Management	6 years

Contact Details of Principal Environmental Assessment Practitioner:

Environmental Assessment Practitioner	
Company name:	Africa Geo-Environmental Services Gauteng (Pty) Ltd
Contact person: Address	Herman Gildenhuys Postnet 74, P/Bag X07, Arcadia, 0007
Telephone number:	012 751 2160
Fax number:	086 607 2406

2 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

An Environmental Impact Assessment (EIA) is an essential planning tool for any development. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way. To ensure that all requirements and processes in terms of the Acts mentioned under Section 3.1 are undertaken, the following tasks need to be conducted during the EIA process:

- **Environmental Scoping**: Initial investigation, communication, assessment and consideration of application and potential environmental impacts and submission of an Environmental Scoping Report and Plan of Study for Environmental Impact Assessment.

- **Environmental Impact Assessment:** After the approval of the Scoping Report and Plan of Study, further investigation of environmental impacts identified during the Scoping Phase will take place. An EIA Report and Environmental Management Report will then be submitted with these findings. .

The Scoping and EIA phases are explained in more detail below.

2.1 Scoping Phase (current phase)

The project is currently in the Scoping Phase. Scoping is the process of identifying the significant issues, alternatives and decision points that should be addressed in the EIA process. The aim of the Scoping Process is to support informed decision-making by providing information on the potential environmental effects of the development prior to decision-making.

The overall aim of the Scoping Phase is to identify the environmental issues and impacts associated with the proposed development that require further investigation. More specifically, the objectives of the Scoping Phase are to:

- Identify any additional stakeholders (besides those already registered) and inform all stakeholders of the proposed activity, alternatives and the EIA process;

- Provide stakeholders with the opportunity to participate effectively in the process and identify any issues and concerns associated with the proposed activity;

- Provide a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;

- Identify statutory requirements and guidelines;
- Identify any additional alternatives and screen out unsuitable alternatives;
- Identify any additional potential impacts and environmental issues that may require further investigation; and
- Ensure that the issues and concerns of stakeholders are accurately recorded and reflected in the Scoping Report. Significant issues will be addressed in the EIA phase of the project.

The Scoping process comprises two parallel and integrated processes:

- A technical process to identify environmental and social impacts; and
- A public participation process to provide interested and affected parties with the opportunity to raise their issues and concerns regarding the proposed project.

2.1.1 Scoping Technical Process

The technical process followed during the scoping process included:

- Specialist Scoping which involved:
    - Assessing previous environmental and technical studies and existing information;
    - Primary screening of the project area;
    - Scoping by specialists and baseline reporting; and
    - Interaction with the project team to identify critical issues.
- Compilation of a Draft Scoping Report. The Draft Scoping Report is based on available information and issues identified during the Scoping Phase. The report introduces the proposed activities and the background to the proposed project, identification of potential issues and terms of reference for specialist studies conducted during the impact assessment phase of the EIA. The Draft report is made available to interested and affected parties for comment.
- Submission of a Final Scoping Report. Further issues raised during public review of the Draft Scoping Report and on-going public participation will be addressed in the Final Scoping Report and subsequent EIA phase.

2.1.2 Public Participation Process

The principles of NEMA govern consultation with interested and affected parties (I&APs). These principles include the provision of sufficient and transparent information to I&APs on an on-going basis, to allow them to comment.

2.1.2.1 Identification of Interested and Affected Parties

The following process was undertaken to facilitate the public participation process for the proposed project:

2.1.2.1.1 Newspaper Advertisement

Advertisements, notifying the public of the Environmental Impact Assessment application and process, and requesting I&APs to register their comments with AGES, was placed in both English and Afrikaans in the Weslander on the 4th of July 2013. In addition an advertisement was also placed in English in the Cape Times on the 5th of July 2013. These advertisements were placed in accordance with regulation 54(2)(c) of the EIA Regulations of 2010 and Section 38 (3)(b) of the National Environment Management: Air Quality Act (Act 39 of 2004).

2.1.2.1.2 Site notice

In order to inform surrounding communities and adjacent landowners of the proposed development, notice boards in accordance with regulation 54(2)(a) and 54(3) of the EIA Regulations were erected at the following places on the 4th of July 2013:

Site notice number	Placement	Language
1	On site – facing the gravel road to the north	English and Afrikaans
2	Within close proximity to the site – at the Weskus Spens padstal, intersection of the R27 and the gravel road leading to the site (facing the R27)	English and Afrikaans
3	Within close proximity to the site – at the intersection of the R27 and R79 (facing the R27)	English and Afrikaans
4	Saldanha (municipal offices)	English and Afrikaans
5	Langebaan Primary School	English and Afrikaans
6	Vredenburg (municipal offices)	English and Afrikaans

2.1.2.1.3 Direct Notification of Identified I&APs

Key stakeholders, who included the following sectors, were informed by means of hand deliveries, emails, faxes or registered post of the proposed development:

- The owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;
- The owners and occupiers of land within 100 meters from the boundary of the site or alternative site who are or may be directly affected by the activity;
- West Coast District Municipality;
- Saldanha Bay Municipality;
- Department of Environmental Affairs: Branch Oceans & Coast;
- Department of Environmental Affairs and Development Planning (DEA&DP): Coastal Management;
- Department of Agriculture;
- Department of Water Affairs;
- Western Cape Department of Transport and Public Works;
- Western Cape Department of Economic Development and Tourism;
- South African Heritage Resources Agency (SAHRA);
- West Coast Biosphere Reserve;
- Cape Nature;
- West Coast Fossil Park;
- Eskom; and
- Transnet.

Please note that Public Participation process was started during the Scoping phase of the project, and will extend to the EIA Phase. A Final Comments and Response Report, detailing all comments from the I&APs will be included in the EIA.

2.1.2.1.4 Public Open day

An open day was held on the 10th of September 2013 at the Blue Bay Lodge to provide more information to I&APs regarding the proposed project.

2.1.2.1.5 Focus group meetings

A focus group meeting was held on the 11th of April 2013 with the Air Quality Officials from the WCDM in order to determine the applicable listed activities according to the National Environmental Management Air Quality Act (Act No. 39 of 2004), and to be informed of the Atmospheric Emission License Application Process.

A focus group meeting was also held on the 14th of June 2013 with the Department of Water Affairs and Department of Oceans & Coast in order to determine the way forward as well as to involve the Departments from the start of the process.

Key notes of these two meetings are attached as Appendix A to the Scoping report.

2.1.2.2 Raising of Issues for investigation by EIA Specialists

I&APs have had the opportunity to raise issues either in writing, by telephone or email, or at the focus group meetings and open day. All the issues raised by I&APs during the scoping process thus far have been captured in a Comment and Response Report (Appendix A) and I&APs received letters acknowledging their contributions.

2.1.3 Draft Scoping Report

The EIA Regulations specify that I&APs must have an opportunity to verify that their issues have been captured. A period of 30 days (27 August to 30 September 2013) was made available to allow for public comment on the Draft Scoping Report. The availability of the Draft Scoping Report was announced via personal notification letters, posters and/or sms to all the registered I&APs on the distribution list. The following methods were available for I&APs to access the reports:

- Published on the AGES website at www.ages-docs.co.za;
- Hard copies were made available at Blue Bay Lodge in Saldanha and the Vredenburg Public Library; and
- Electronic copies were distributed upon request.

2.1.4 Final Scoping Report

A Comments and Response report was prepared following comments on the Draft Scoping Report. The Draft Scoping Report was updated to accommodate all received comments. This Final Scoping Report will be placed on review for 21 days prior to submission to the DEADP. The Final Scoping Report will be made available as follows:

- Published on the AGES website at www.ages-docs.co.za;
- Hard copies will be made available at Blue Bay Lodge in Saldanha and the Vredenburg Public Library; and
- Electronic copies will be distributed upon request.

2.2 Environmental Impact Phase

2.2.1 Public Participation during the Impact Assessment Phase

Public participation during the Impact Assessment Phase of the EIA will revolve around a review of the findings of the EIA and inputs into the Environmental Management Plan (EMP). The findings will be presented in a Draft Environmental Impact Assessment Report, Specialist Studies and EMP.

Details of the public engagement process followed during the course of the assessment and an indication of how issues raised have been addressed will be included in the EIR as contemplated in regulation 31(2)(e) of the EIA Regulations.

3 STATUTORY FRAMEWORK AND REQUIREMENTS

There are a number of regulatory requirements at local, provincial and national level to which the proposed development will have to conform during the development phase and acquisition of authorisations. A brief summary of the different Acts which are relevant to this study are outlined below. Note that other legislative requirements may be relevant to the proposed development. However identification and interpretation of these will be considered in further detail as part of the EIA process.

The extensive description of the legislation applicable to the project has been included as Appendix F. The list provided is not intended to be definitive or exhaustive and serves to highlight key environmental legislation and obligations only.

3.1 Legislation applicable to the project

3.1.1 The National Environmental Management Act (107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations, 2010

The overarching principle of the National Environmental Management Act 1998 (Act 107 of 1998) (NEMA) is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations.

The Environmental Impact Assessment (EIA) process to be undertaken in respect of the authorisation process of the proposed plant is in compliance with the NEMA read with the Environmental Impact Assessment Regulations of 2010 (Government Notice No's R543, 544, 545 and 546 of 2010). The proposed plant development involves 'listed activities', as identified in terms of the NEMA and in terms of section 24(1). The potential consequences for, or impacts on the environment of *inter alia* listed activities must be considered, investigated, assessed and reported on to the competent authority, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of the NEMA.

As stated above, an environmental authorisation application in terms of section 24 of the NEMA has been submitted to the DEADP for consideration. The following activities as listed in GNR 544, 545 and 546 of 2010 were identified as applicable to the proposed plant operations (Table 1).

Table 1 Identification of Listed activities triggered under the 2010 EIA Regulations

Government Notice Activity No(s):	Describe the relevant Activity(ies)	The portion of the development as per the project description that relates to the applicable listed activity
GNR 545		
3	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	Combined capacity of the dangerous goods stored will exceed 500 cubic meters.
5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	Categories 4.1 and 4.2 of the NEM:AQA
15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; i. except where such physical alteration takes place for linear development activities; or ii. agriculture or afforestation where activity 16 in this Schedule will apply.	Footprint of the Separator plant will exceed 20ha
26	Commencing of an activity, which requires an atmospheric emission licence in terms of section 21 of the National Environmental Management Air Quality Act (Act no 39 of 2004), except where such commencement requires basic assessment in terms of Notice No. R 544 of 2010	Categories 4.1 and 4.2 of the NEM:AQA
GNR 546		
2	The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.	The water reservoirs will have a capacity of more than 250 m3.
4	The construction of a road wider than 4 metres with a reserve less than 13,5 metres	Wider than 4 m

3.1.2 National Water Act (Act No 36 of 1998) (NWA)

In terms of the National Water Act (NWA) all water uses listed according to Section 21 of the Act require a water use license. A person may only use water without a water use license under certain circumstances. A person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use), if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA.

As is set out below, water uses associated with the project will require water use licensing in terms of section 22 of the NWA. Section 21 of the NWA contains those water uses that are to be registered and licensed in accordance with the legal obligations contained in the NWA. Insofar as the undertaking of Section 21 water uses are concerned, it is to be anticipated that application for registration and water use licensing must be undertaken (Table 2). Of particular relevance within the context of waste disposal and water use and management the following use is applicable, as verified with DWA at the Focus Group Meeting on the 14th of June 2013 (refer to Appendix A5.1 for meeting minutes):

Table 2 Identification of Water Uses to be applied for in the Water use license application

Use	Definition	Description
21(g)	Disposing of waste in a manner which may detrimentally impact on a water resource	Sewage removed of site by Honey sucker and REE Carbonate (waste) in settling ponds

The mentioned uses will be applied for through an application for an Integrated Water Use Licence (IWUL).

3.1.3 National Environmental Management: Air Quality Act, 2003 (Act No. 39 of 2004) (NEMAQA)

In terms of section 22 no activity may be undertaken which is listed on the National list anywhere in the Republic or listed on a list applicable to a province without a provisional atmospheric emission license or an atmospheric emission license.

The Minister of Water and Environmental Affairs published a list of activities contemplated in section 21(1)(a) and the minimum emission standards for the listed activities as contemplated in section 21(3)(a) and (b) of the NEMAQA and read with GN

964 of 23 November 2012 (previously GN 248 of 31 March 2010).

A Focus Group Meeting was held on the 11th of April 2013 with the Air Quality Officials from the WCDM in order to determine the applicable listed activities according to the National Environmental Management Air Quality Act (Act No. 39 of 2004), and to be informed of the Atmospheric Emission License Application Process. Refer to Meeting Minutes attached as Appendix A5.1.

According to the process descriptions and with the input from the WCDM, the Listed Activities that are relevant to the proposed development include (Table 3):

Table 3 Identifications of Listed Activities to be applied for in the Atmospheric Emission Licence Application

Listed Activity Number	Category of Listed Activity	Sub-category of the Listed Activity	Name of the Listed Activity	Description of the Listed Activity
4.1	Metallurgical Industry	Drying	Drying	Drying of mineral solids including ore
4.2	Metallurgical Industry	Combustion installations	Calcining	Combustion installations not used for primarily for steam raising and electricity generation (except drying)

The mentioned listed activities were applied for through an application for an atmospheric emission license, and the following reference number was awarded for the AEL on the 22nd of May 2013: AEL Reference Number: 12/3/1/11(WC/WC/026).

3.1.4 National Environmental Management Waste Act (Act 59 of 2008) (NEMWA)

In terms of the current statutory framework with regards to waste management, a waste management licence is required for those waste management activities identified in the Schedule to GN 718. Certain of the waste management activities listed in the Schedule are governed by specific thresholds. Where any process or activity falls below or outside the thresholds stipulated, a waste management licence is not required.

The waste management activities as listed in GN 718 of 3 July 2009 which are applicable to the proposed operations, and for which a waste management license is required are listed below.

INDICATE THE NO. & DATE OF THE RELEVANT NOTICE:	ACTIVITY NUMBERS (AS LISTED IN THE WASTE MANAGEMENT ACTIVITY LIST) :	DESCRIBE EACH LISTED ACTIVITY:
GNR 718 Category A	2	**Listed Activity:** The storage including the temporary storage of hazardous waste at a facility that has the capacity

		to store in excess of 35 m^3 of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons. **Description of Activity:** Temporary Sewage storage on site, removal by honey sucker and transportation by truck to Vredenburg or Saldanha WWTW. Temporary storage of brine on site in a tank with a capacity of approximately 750 m³.
GNR 718 Category A	18	**Listed Activity:** The construction of facilities for activities listed in Category A (not in isolation to associated activity). **Description of Activity:** Construction of storage facilities on site for the storage of sewage.
GNR 718 Category B	1	**Listed Activity:** The storage including the temporary storage of hazardous waste in lagoons. **Description of Activity:** Temporary storage of Rare Earth Carbonates in a Waste Settling Pond on site. Size of Settling Pond approximately 1200m^3
GNR 718 Category B	7	**Listed Activity:** The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres or more. **Description of Activity:** Various disposal options for the waste brine solution are currently being assessed. Disposal to the sea, at Danger Bay, together with the brine return from the proposed WCDM's desalination plant, currently seems to be the most favourable option (environmentally and financially). According to this proposal the concentrated brine is proposed to be directed to a pipeline by the Saldanha Regional Marine Outfall Project. An EIA for this project has been initiated (EIA Reference no: 16/3/1/2/F4/17/3009/13). The Saldanha Regional Marine Outfall Project is proposed to service a number of industries in the area. It is therefore not only linked to the proposed SSP and hence a separate EIA is being conducted for this project. It should also be noted that various other brine disposal alternatives are also being investigated at present to ensure that the most feasible brine disposal option is chosen (refer to Section 6.2.2.2).
GNR 718 Category B	11	**Listed Activity:** The construction of facilities for activities listed in Category B (not in isolation to associated activity).

		Description of Activity: Construction of waste settling ponds for the temporary storage of rare earth carbonates. Construction of a reverse osmosis plant on site.

A Waste Management License (WML) Application has been submitted to the National Department of Environmental Affairs and the following reference number was awarded to the Application: 12/9/11/L1262/9.

3.2 Other relevant legislation

For a description of other legislation also relevant to the proposed project refer to Appendix F.

4 DESCRIPTION OF THE PROJECT

4.1 What are Rare Earths?

'Rare Earths' is a series of 15 chemically similar elements that occur and are recovered together. Distribution of the different Rare Earth Elements (REEs) varies from deposit to deposit.

Each element has a range of distinctive physical properties which allow them to be used in a variety of technological applications, including magnetic, optical, electrical, catalytic and metallurgical. Rare Earth Elements underpin the "green" technology economy, and are used in hybrid motor and battery technology; energy efficiency applications, wind power generation; consumer electronics; defence applications; and transport.

Most of these elements have no substitutes and are indispensable in many of the applications mentioned above and hereunder.

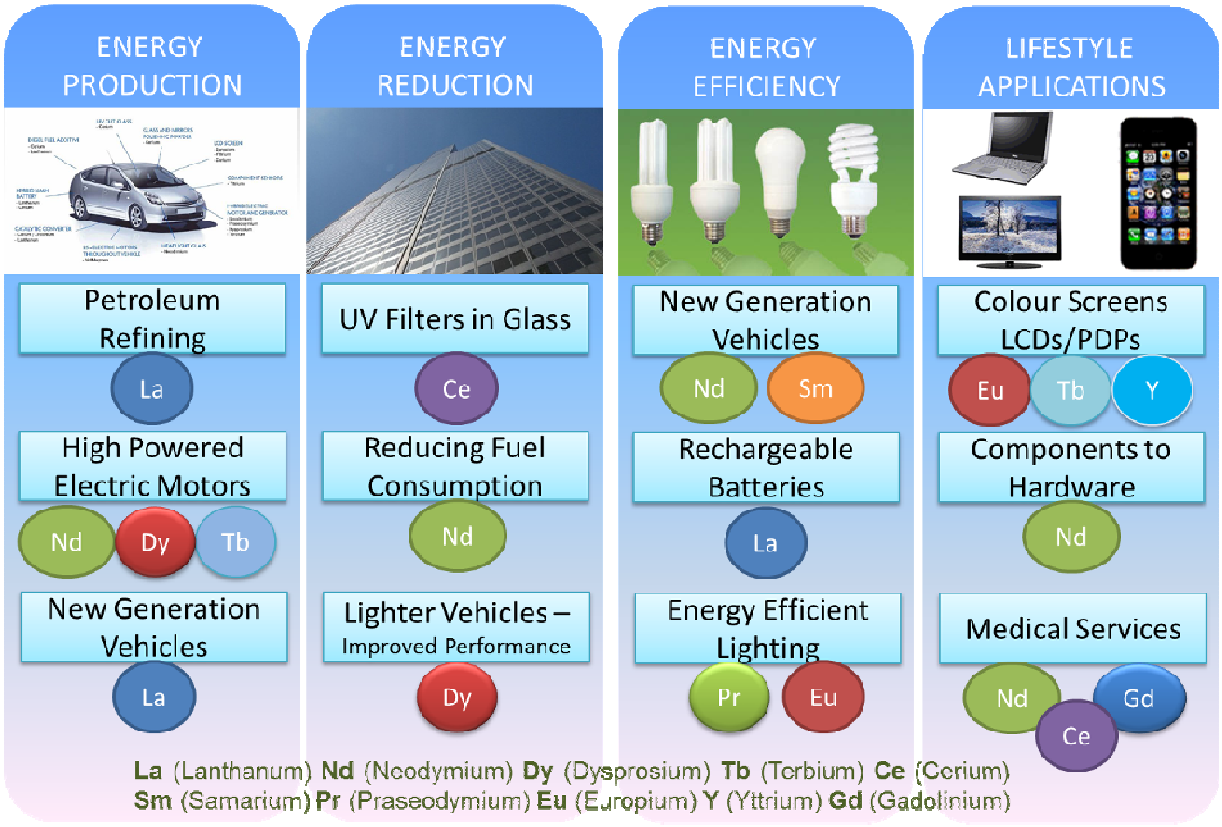


Figure 4 Uses of Rare Earth Elements (http://enercar2.wordpress.com/tag/rare-earth-elements)

4.2 REE Market Considerations

China produces 97% of the world's REEs. Increasing global demand and increased domestic demand leading to Chinese reductions in export quotas recently have raised international concerns about future supply shortages.

There is a widely forecasted supply deficit in REEs worldwide. This presents significant opportunities for new producers of separated rare earth oxides outside of China.

4.3 Process Description

4.3.1 Separation Plant

Bulk mixed rare earth salts from a rare earth mine site (currently the proposed Zandkopsdrift mine[1]) is proposed to be transported to the Saldanha Bay Separation Plant. The plant is intended to produce 20 000 tonnes per annum (tpa) of refined rare earth products. The currently saleable rare earth elements (REEs) will be separated either as rare earth oxides (REOs) or carbonates with a purity equal to or greater than 99%. The currently non-saleable or non-profitable elements will be precipitated as carbonates and then temporarily stored in a settling pond for 6 months prior to further disposal or possible future sales.

Major unit operations for the separation plant include the following:

- concentrates receiving;
- hydrochloric acid leaching and clarification;
- solvent extraction;
- precipitation;
- filtration/dewatering;
- drying/calcining; and
- product packaging.

Each of the steps is described in more detail below and is shown in the sections below. The preliminary layout of the plant is attached to Appendix E. An illustration of a typical

1 Please note: A separate environmental authorization process is currently taking place for this mine which is proposed to be located close to the town of Garies in the Northern Cape.

Rare Earth Separation Plant is provided below (Figure 5).

Figure 5 Picture of a typical Rare Earth Separation Plant

4.3.1.1 Concentrate Receiving

At the Zandkopsdrift mine near Garies in the Northern Cape, rare earth elements are precipitated in bulk to produce a mixture of rare earth salts, which will be moderately dried to approximately 10% moisture prior to being transported to the separation plant. Mixed rare earth salts are delivered in containers to the SSP.

An overhead crane, or alternatively container forklifts, will be utilized to offload full containers from trucks to the concentrate storage shed, which will be capable of storing up to one (1) week's feed without stacking or two (2) week's feed with containers double stacked. Empty containers will be sent back together with trucks to the mine site for further concentrate shipment. A weigh bridge beside the gate house will measure the weight of incoming and outgoing trucks.

4.3.1.2 Hydrochloric Acid Leaching and Clarification

Mixed rare earth salts dumped from the containers are transferred to leaching tanks by a belt or pan conveyor. The conveyor will be covered to prevent dust release to the atmosphere and avoid contamination from the foreign dust in the air. A dust collector is utilized to collect the dust generated during concentrate dumping, and the collected concentrate dust will be recycled to combine with the feed to the leaching tanks.

Concentrated (9N/±29%) hydrochloric acid (HCl) is proposed to be used to dissolve the rare earth salt mixture into an aqueous solution that is suitable to feed the downstream

solvent extraction circuits. It is assumed that any impurities will be removed at the Zandkopsdrift mine site operation.

The preferred source of HCl and NaOH to the plant is currently proposed to come from the directly adjacent chlor-alkali plant. The chlorine, caustic soda and HCl facility currently proposed by Chlor-Alkali Holdings (Pty) Ltd (CAH) is yet to be constructed and is currently in the process of applying for environmental authorization from the Western Cape Department of Environmental Affairs and Development Planning (Reference No: 16/3/1/2/F4/17/3053/12).The proposed Separation Plant is however not solely dependent on HCl and NAOH from the CAH plant and these substances can also be imported (bought from a different source) if necessary. The rare earth (RE) salt feed will be leached in agitated tanks, with approximately 98% of the dry feed assumed to be dissolved. After leaching, the slurry is pumped to a clarifier for solids removal. The underflow ("U/F") from the clarifier is further dewatered by a plate and frame filter prior to being temporarily stored in the settling ponds; the overflow solution from the clarifier is processed through sand filters or inline filters to achieve absolute clarity prior to being discharged to the solvent extraction circuits.

4.3.1.3 Solvent Extraction

Frontier requested that the separation plant process be based on two solvent extraction (SX) modules, each capable to separately produce 10 000 tpa REOs thereby achieving the overall intended capacity of 20,000 tpa.

In order to separate the mixed rare earth chloride solution into the desired products, the separation process of either solvent extraction module is composed of multiple solvent extraction circuits. Each circuit consists of four process steps, including loading, extraction, washing and stripping. The required number of stages for each process step within the extraction circuits varies according to the feed composition and product purities requirement; however, all mixers/settlers within a given separation circuit will be of the same size, regardless of their function. In order to separate the REEs at the specified purities, a total of 908 sets of mixers/settlers are required for one solvent extraction module, and 1816 sets for both modules.

Sodium hydroxide (NaOH), produced as by-product from the adjacently proposed chlor-alkali plant, or alternatively imported, is used to prepare the solvent to load the rare earth elements. A mixture of 50% P507 in a kerosene diluent is used as the extractant for most separations, except for yttrium extraction where 50% naphthenic acid in a kerosene diluent is used. HCl is used to strip the REEs from the organic phase. De-ionized water is added in the washing and stripping stages to dilute and adjust the reagent concentration.

4.3.1.4 Precipitation

The strip, or in some cases, raffinate solutions are pumped to feed the next stage of solvent extraction until purified solutions are obtained, at which time the solutions are pumped to the dedicated precipitation circuits. The individual precipitation stages are operated in a batch processing mode in order to permit control of particle size. There are three batch precipitation tanks to provide a continuous feed to each product dryer/calciner arrangement. One tank will be filled with fresh solution, the second will be in precipitation mode, and the third will empty the precipitated slurry to the drying/calcining stage. Altogether two precipitation modules, with either one designated to one solvent extraction module, are proposed to accommodate better process control and increase production flexibility.

Sodium carbonate (Na_2CO_3) is used to precipitate lanthanum, cerium, praseodymium and neodymium products as carbonates. A stream of mixed holmium, erbium, thulium, ytterbium and lutetium are also precipitated by Na_2CO_3 as carbonate slurry, but are not further processed and will be stored for 6 months as waste before being sold (if a market can be found), or disposed of to the tailings disposal facility of the Zandkopsdrift mine. Another alternative being considered is disposal at an appropriately licensed waste disposal facility.

Oxalic acid (H_2C2O_4) is utilized for precipitation of the rest of the rare earth elements, including samarium, europium, gadolinium, terbium, dysprosium and yttrium.

4.3.1.5 Filtration/Dewatering

The separated rare earth precipitates are pumped to filters where they are dewatered prior to discharging to the dryers. The filtrate is sent to water treatment for purification and recycling if feasible. A designated set of filtration/dewatering units are included for each separated REEs to avoid cross contamination.

For the REEs that are currently considered non-profitable, such as holmium, erbium, thulium, ytterbium and lutetium, the precipitated slurry will be sent to a high rate thickener (“HRT”) for thickening before being sent to wet storage at the settling pond for later disposal or potential sale.

4.3.1.6 Drying/Calcining

Cerium carbonate will be dried after filtration and dewatering and sold as a carbonate. Other saleable RE precipitates, including lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, terbium and dysprosium, will be dried and calcined to

produce highly purified rare earth oxides.

Each rare earth product will have a designated set of dryer/calciners, coolers and wet scrubbers to avoid cross contamination. An electric indirect-fired horizontal rotary dryer is utilized to produce cerium carbonate, and electric indirect-fired horizontal calciners are utilized to decompose the carbonate or oxalate components to produce a pure oxide for the market. Following calcining or drying, the products will be cooled and transferred to bins prior to feeding the packaging system.

4.3.1.7 Product Packaging and Storage

After drying/calcining, the cooled rare earth products are conveyed to the packaging units to continuously feed product containers. Holmium, erbium, thulium, ytterbium and lutetium mixed precipitates will be wet stored after thickening for future reprocessing or potential sales.

A flow diagram of the separation process is provided below in Figure 6. A more detailed diagram is attached to Appendix E.

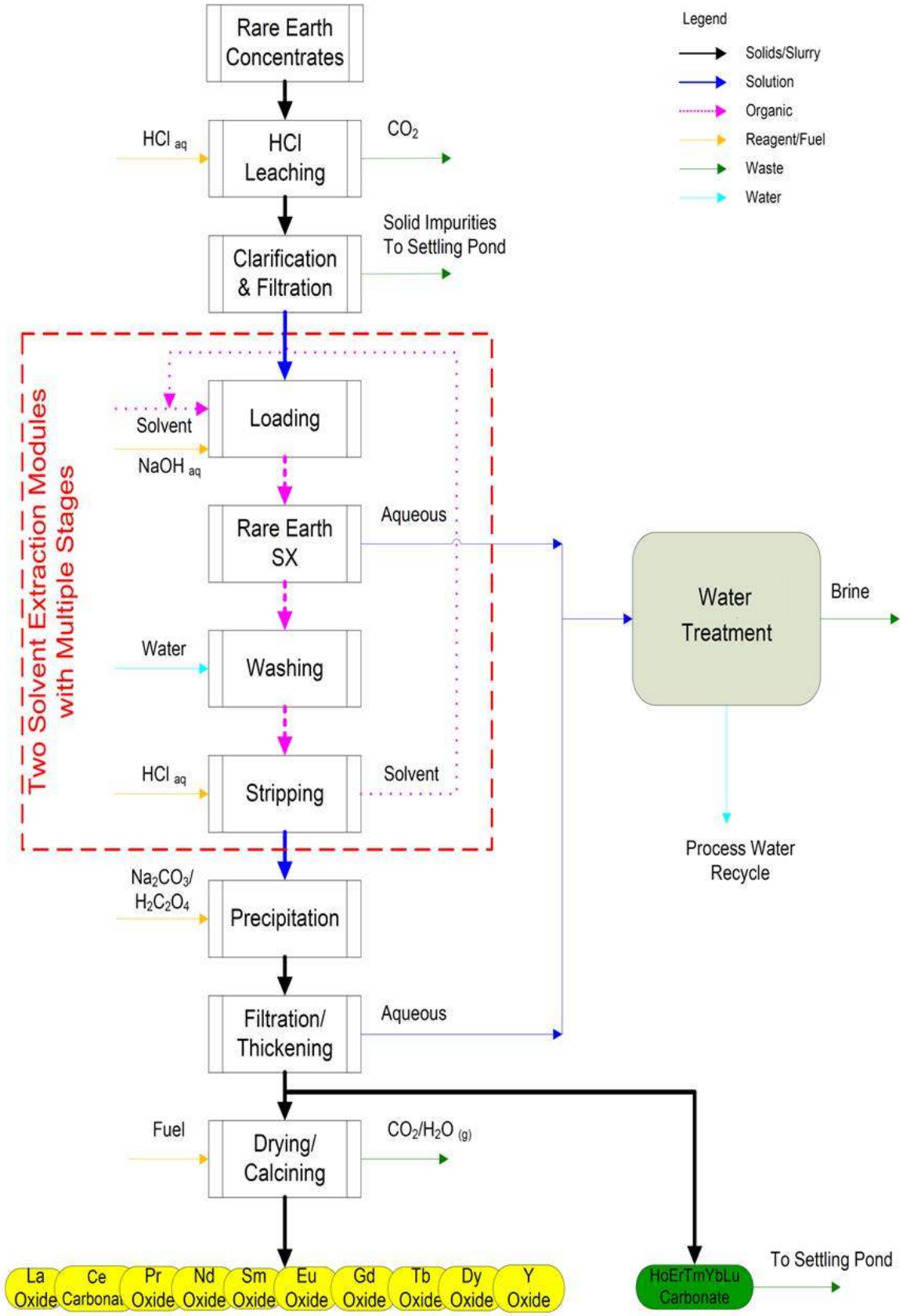


Figure 6 Flow diagram of the separation process

4.4 Other infrastructure on site

Other infrastructure on site includes:

- Main electrical substation;
- Waste disposal settling pond;
- Process water and fire water storage tanks;
- Water treatment plant and boiler building;
- Storm water storage pond;
- Main electrical sub-station;
- Control room and electrical rooms;
- Parking area;
- Reserved area for truck parking or empty container storage;
- Emergency back-up power generation;
- Fuel storage for genset and calciners;
- Waste Settling Pond (Ho-Lu and 2% insoluble MREC); and
- Storm Water Retention Pond.

It is estimated that the plant will require a steam generating capacity of 5t/h of steam at a pressure of 10 Bar. Two alternative fuel sources for the boiler are proposed namely coal and Liquid Petroleum Gas (LPG) and this will be taken into account as part of the AEL application. Also refer to Section 6.2 regarding alternatives considered for steam generation.

4.5 Services

The relevant service agreement letters are attached as Appendix F to this report. A description is provided in the sections below.

4.5.1 Water Supply

Domestic water as fresh water is proposed to come from the municipal facilities. Current figures indicate that the plant requires processing water to the amount of 1710 m^3/day

and potable water of 20 m³/day.

4.5.2 Electricity

A Budget Quotation was applied for to Eskom for a supply of 65 MVA power to the proposed SSP and Chlor Alkali Plant. The SSP will however only require 15 MVA with the Chlor Alkali Plant requiring the balance (50 MVA).

4.5.3 Roads

A 6m wide tar road access to the separation plant will be provided by others, with connection to internal tar roads inside the separation plant site. Easy truck manoeuvrability has been considered as part of the planning process for the internal road network.

A Traffic Impact Assessment is proposed to be undertaken as part of the EIA phase of the project.

4.5.4 Sewage

Sewage will, as a temporary measure, be disposed of in a sewage collection tank which will be pumped out by means of honey sucker truck and disposed of at the municipal sewage treatment works. The Vredenburg Municipality has confirmed capacity for the additional sewage (refer to Appendix F).

A regional Waste Water Treatment Works (WWTW) is proposed for the Saldanha Bay Local Municipality, which will service the proposed industrial area within which the SSP is proposed to be located. Once the regional WWTW is operational the sewage collection tank will not be utilised anymore and the sewage generated at the site will be directed to the municipal sewage treatment works.

4.5.5 Waste disposal

The following section provides an overview of waste disposal activities anticipated for the proposed plant. Detailed assessment with regards to waste disposal and alternatives in this regard will be undertaken during the EIA phase.

4.5.5.1 Aqueous Waste

Liquid effluents are sodium chloride brines and a number of alternatives have been considered for disposal of the liquid effluent. A brine pipeline that will discharge the liquid

effluent into the sea at Danger Bay, together with the brine proposed by the WCDM's desalination plant, is currently the preferred alternative for the disposal of liquid effluent. An Environmental Impact Assessment (EIA) is currently underway for the proposed construction and operation of this pipeline transfer system. Please note that this is a separate EIA and the following reference number was awarded to this project by the DEADP: 16/3/1/2/F4/17/3009/13.

An alternative trade off analysis for the brine effluent disposal is provided in Section 6.2 below and will be further investigated during the EIA phase.

4.5.5.2 Solid Waste

The solid waste settling pond provides temporary onsite waste storage for up to six months from the following two major feed sources besides precipitation:

- Insolvable solids contained in the SSP concentrate feed; and
- Mixed rare earth carbonates of Ho/Er/Tm/Yb/Lu.

Both the waste & storm water dams will be lined with a three layer lining (top layer, middle leak detection layer, and bottom layer). All the layers will be made of UV-light and heat stabilised pure high density polyethylene (HDPE). The top/primary liner layer will be a 1,50mm HDPE flexible membrane lining, the drainage/leakage detection Hi-Drain layer will be a 0,75mm (750u) HDPE flexible membrane lining and the bottom/secondary layer will be a 1,00mm HDPE flexible membrane lining.

The mixed rare earth carbonates of Ho/Er/Tm/Yb/Lu will be sold if a market can be found, or disposed of to the tailings storage facility at the Zandkopsdrift mine site or alternatively disposed of at an appropriately licensed waste disposal facility.

4.5.5.3 Organic Waste

Organic solvents will be re-circulated through the mixers and settlers. Incidental spillage, waste from laboratory tests and contamination are the primary causes to generate organic waste. The volume for organic waste is expected to be low. It will be collected and temporarily stored in a tank, and picked up on demand by external approved contractors for disposal.

4.5.5.4 Off Gas

Carbon dioxide is the primary component in the off gas. A significant amount of carbon dioxide will be generated during the leaching process. Trace amounts of evaporated HCl

and organic solvent might also be present. Off gas will be treated by a scrubber prior to being released to atmosphere. Emissions to the atmosphere will be further investigated during the EIA phase as part of the Air Quality Impact Assessment that will be undertaken.

4.5.5.5 Dust Control

All primary unit operations will be enclosed in a building. Depending on the outcome of feed characteristics, baghouses might be designed to capture the dust generated during the concentrate receiving and transferring. This collected dust would be returned to the process.

4.5.5.6 Domestic Waste

Domestic waste will be collected on site by an approved contractor and discharged to municipal facilities.

4.6 Project motivation

4.6.1 Mineral beneficiation

The Industrial Policy Action Plan (IPAP 2010 – 2014) constitutes a central tool in the New Growth Path (NGP) job-creation strategy for South Africa. It has been anticipated that the IPAP2[2] (2011/12- 2012/13 period) interventions could lead to 43 000 direct jobs and 86 000 indirect jobs, totalling 129 000 jobs across various sectors as identified within IPAP2. Downstream minerals beneficiation, such as is proposed at the SSP is identified as one such sector.

The Government of South Africa has identified the need to add value to raw materials mined within South Africa in order to realise the economic opportunities provided by the downstream processing of the raw materials. Through the “Amendment to the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry” (Department of Minerals and Energy, 2010), the South African Government encourages the downstream beneficiation of raw materials, by the mining industry.

The more stages of the production process that can be carried out on South African territory, the better the outcome in terms of revenue, added value and employment. It is therefore important that separation is handled in South Africa. Should the project be approved and the South African REE industry be further developed, the potential exists

2 Source: https://www.environment.gov.za/greeneconomysummit/docs/2011_2013ipap.pdf

for South Africa to become a regional hub for rare earth ores from other African countries that may not possess the necessary resources to separate ores (Jepson, 2012).

4.6.2 Saldanha Industrial Development Zone

The strategic location of Saldanha Bay and the availability of economic infrastructure in the form of a port, railway links and road networks created an opportunity for the development of the Industrial Development Zone (IDZ) in the area. The proposed Saldanha IDZ, once designated, will comprise of two key components, i.e. the oil and gas and marine repair cluster and the demarcation of a free zone which includes the port of Saldanha Bay.

The 2012/13 IPAP[3] identified Special Economic Zones (SEZs) as key levers in support of long-term industrial and economic development. The SEZs Programme was specifically developed to promote the creation of a regionally diversified industrial economy by establishing new industrial hubs in underdeveloped regions of the country. Saldanha is one such area which has been identified as the first key milestone in the roll out of the SEZs. The aim is to establish SEZs that can achieve the following:

- Increased foreign and domestic investment;
- Increased beneficiation of mineral and agricultural resources;
- Increased export of beneficiated products;
- World-class infrastructure;
- Increased job opportunities; and
- Regional industrial development.

3 Source: http://www.thedti.gov.za/news2013/ipap_2013-2016.pdf

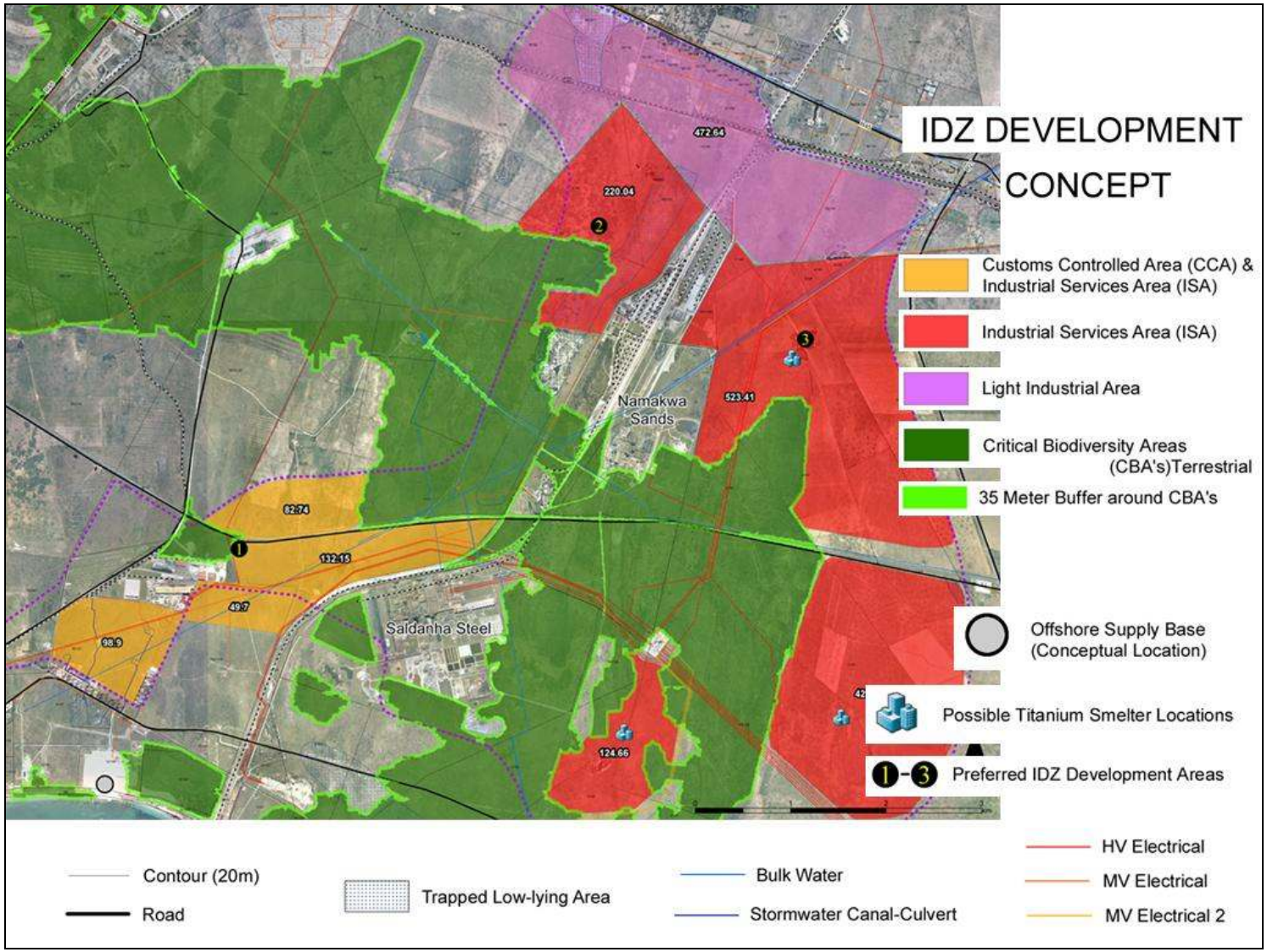


Figure 7 IDZ Development Concept Map (Stuivenberg; 2013)

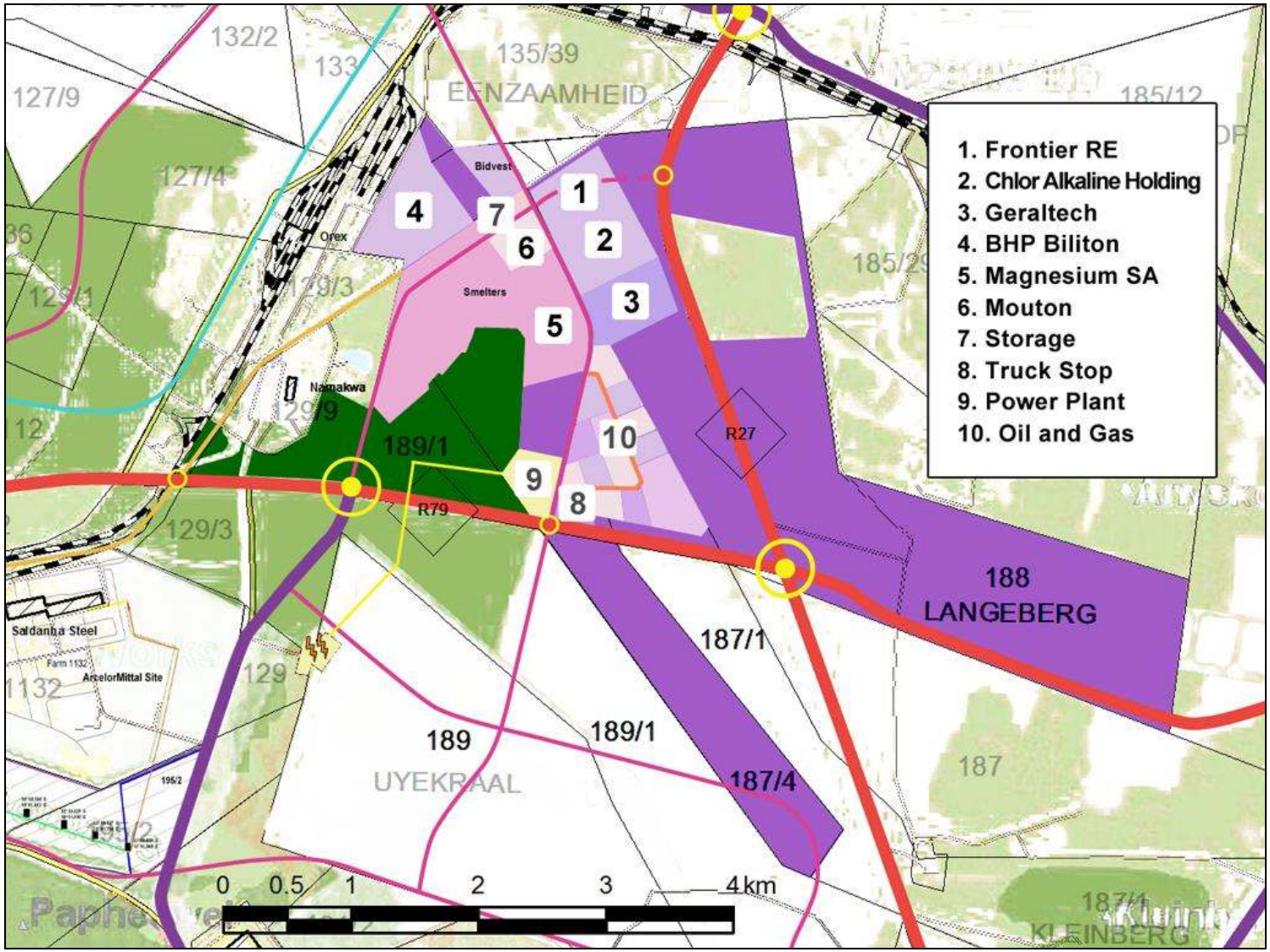


Figure 8 Proposed Saldanha Industrial Park Map (Stuivenberg; 2013)

5 ENVIRONMENTAL BASELINE DESCRIPTION

5.1 Geology and Soil

5.1.1 Regional Geology and Soil

Tertiary and Recent Deposits

The Saldanha area is mainly covered by Tertiary to recent deposits. Belts of alluvium are found parallel to large rivers. White to pink sandy soil covers extensive areas. Brackish calcareous soil near the coast represents an old elevated sea-floor.

Sand dunes along the coast usually contain small shell fragments but around Vredenburg considerable tracts of dunes consist largely of comminuted shell with a very high lime content. Gravel beds are present on raised beaches and along the large rivers. Silcrete, ferricrete and surface calcrete occur very commonly but are of limited extent. Beach-deposits of gravel, grit, sand and large quantities of shell are occasionally well consolidated.

Beneath the overburden of sandy soil are found unconsolidated to semi-consolidated sand and clay and locally also beach gravel. The limestone varies from a hard rock to unconsolidated lime-rich sand. It contains local layers of marine shells however shells of land snails also occur very commonly. Whenever the featureless and massive surface calcrete crust is absent, the limestone displays bedding.

The shallow water marine deposits were evidently also subject to Aeolian action. All these marine deposits are phosphatoic at some localities. The prolific marine fossils have not yet been dated.

Post Nama (Saldanha Langebaan Pluton)

A number of distinct Granite types are to be found in the Saldanha area. Three of these types occur near the proposed site area namely the Vredenburg Granite, the Saldanha Quart porphyry and the Hoedjiespunt Granite.

Vredenburg Granite

The Vredenburg granite is a quartz monzonite or amandellite. It is characterized by a reddish colour and is limited to a few outcrops such as Kleinberg. Vredenburg however is located on a large outcrop of this Amandallite or Granite. The granite is mainly coarse grained and porphyritic.

Saldanha Quartz Porphyry

The Saldanha Quartz Porphyry occurs near Saldanha and also in the direction towards Vredenburg from Saldanha. Quartz Porhyry is a hard, massive rock that weathers to the prominent boulders and bold outcrops. It is a chocolate-coloured rock without any conspicuous phenocrysts and consists of a fine - to medium-grained groundmass with scattered grains of quartz, feldspar and biotite.

Hoedjiespunt Granite

This coarse grained porhyritic granite occurs mainly in a narrow strip along the coast from Hoedjiespunt at Saldanha south to Langebaan

Refer to Figure 9 for a regional Geological Map.

5.1.2 Geology and soil at the proposed site

At the proposed Separation Plant Site calcrete is found to a depth of 8 metres. The calcrete does not form a layer that can be recognised as a uniform geology with a specific thickness. The presence of the calcrete is rather in blocks and boulders mixed with wind-blown sandy layers of different thickness and different limestone content.

Sand and clay with an expected thickness of 40 to 50 m follows. The sand and clay layers may contain gravel fine and very fine sands alternated with clay lenses.

A sandy layer consisting of black sand that may be peat is expected to be below the sand and clay layer before the Vredenburg Granite is to be found at an expected depth of 50 to 60 m.

5.2 Climate

5.2.1 Rainfall

The data from rainfall station 0060780 (Saldanha Bay Customs) was retrieved. The data was collected over a period of 116 years (1891 to 2007) and showed that Saldanha has a Mean Annual Precipitation (MAP) of 325 mm/annum. For average monthly rainfall figures refer to Figure 10.

The site is located in Evaporation Zone 23B which have a S-Pan Mean Annual Evaporation (MAE) of 1460 mm/a.

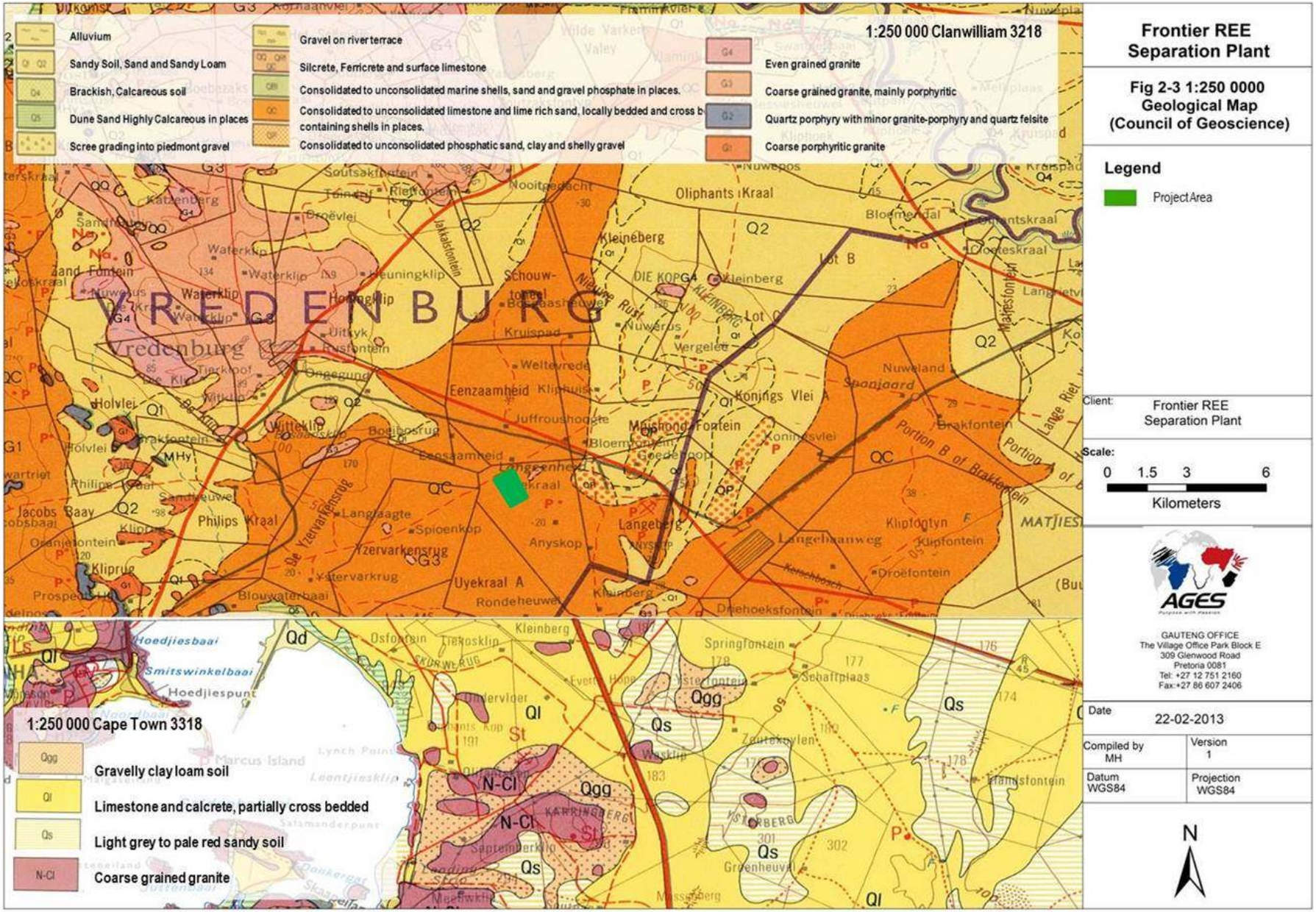


Figure 9 Regional Geology Map of Saldanha

Note that the two different geological maps Clanwilliam 3218 and Cape Town 3318 were combined for the image above. The geology was mapped to different levels for these maps .

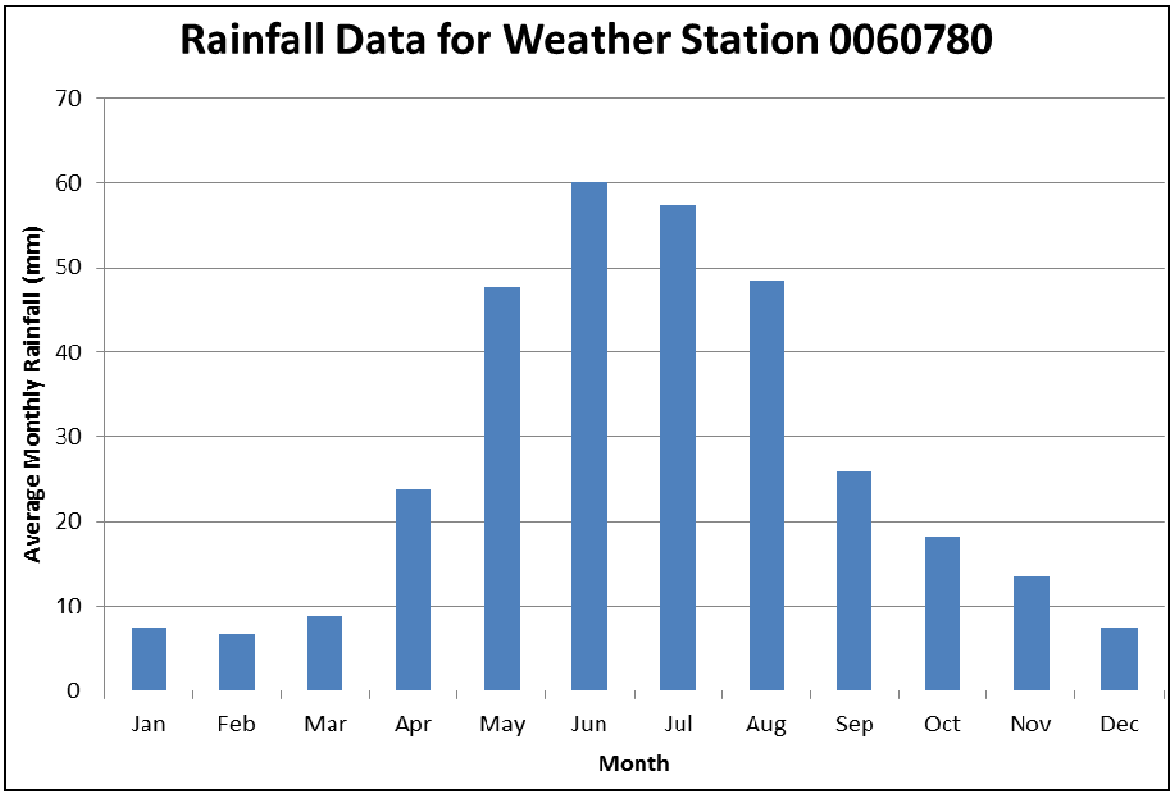


Figure 10 Average Monthly Rainfall figures for rainfall station 0060780 (Saldanha Bay Customs).

5.2.2 Temperature

Saldanha has a Mediterranean climate with highest temperatures occurring from December to March and the lowest between June and August. Data retrieved from the Langebaan Road Weather Station (1960 - 2000)[4] showed that the long-term average temperatures range from a minimum of 7ºC to a maximum of 18ºC in winter, while in summer the average minimum temperature is 15°C up to a maximum of 28ºC on average.

5.2.3 Wind

The wind field is fairly uniform with frequent southerly winds and occasional winds from the north. Calm conditions prevailed 10% of the time (Figure 11) with a period average wind speed of 3.8 m/s. During day-time the wind field is mostly characterised by wind from the south and south-southwest and 7% calm conditions. Wind speed decreases during the night, increasing the occurrence of calm conditions to 17%. A shift in the wind field to south-southeast is also noted during night-time hours. The highest wind speeds (more than 6 m/s) occur during summer time and are mostly from the south (Airshed, 2013).

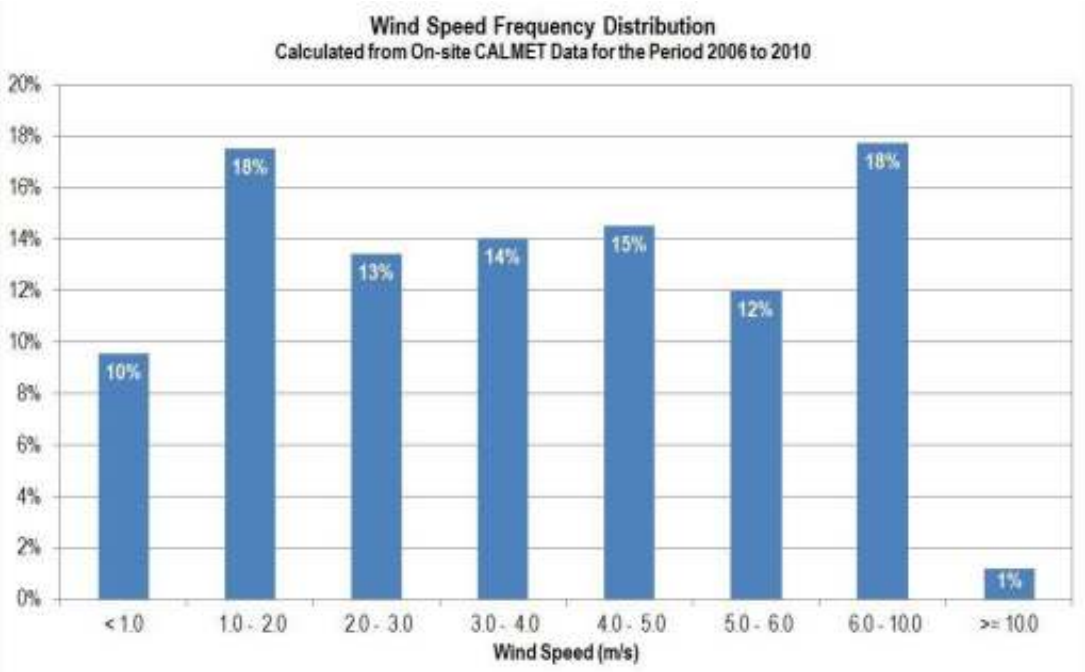


Figure 11 Wind speed frequency distribution (on-site CALMET data, 2006-2010) (Airshed, 2013).

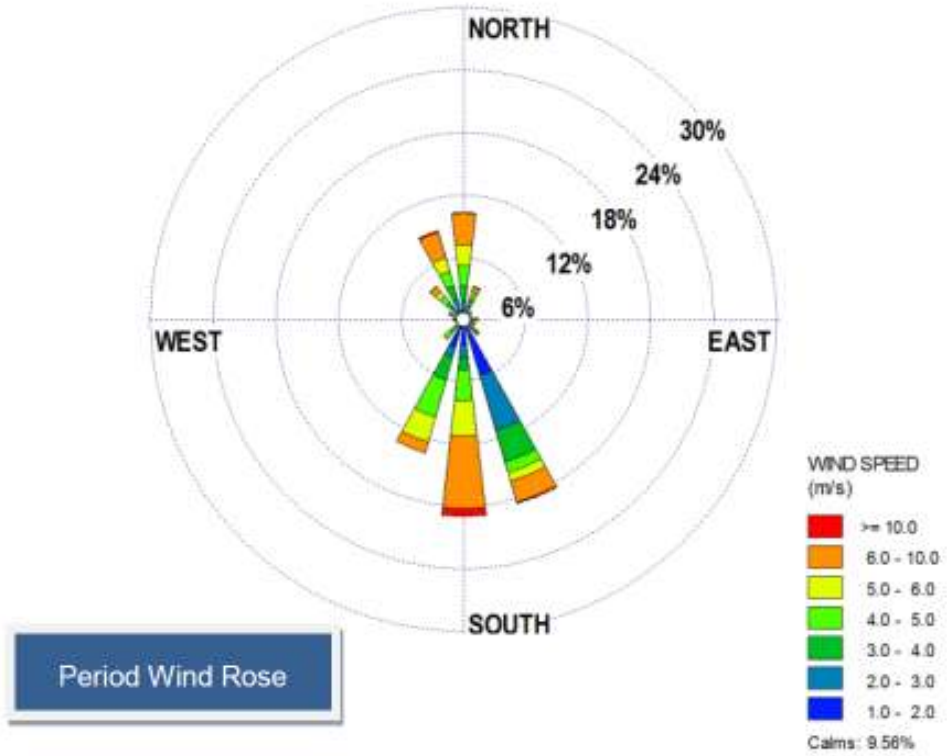
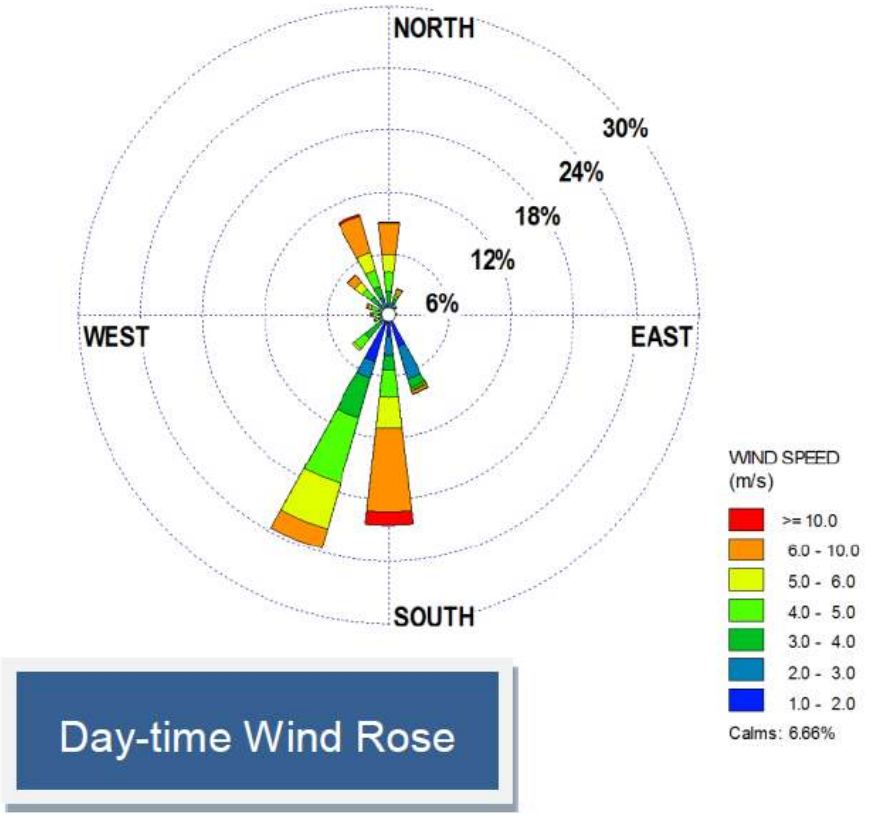


Figure 12 Period wind rose (on-site CALMET data, 2006-2010) (Airshed, 2013).

[4] Source: *South African Weather Service*



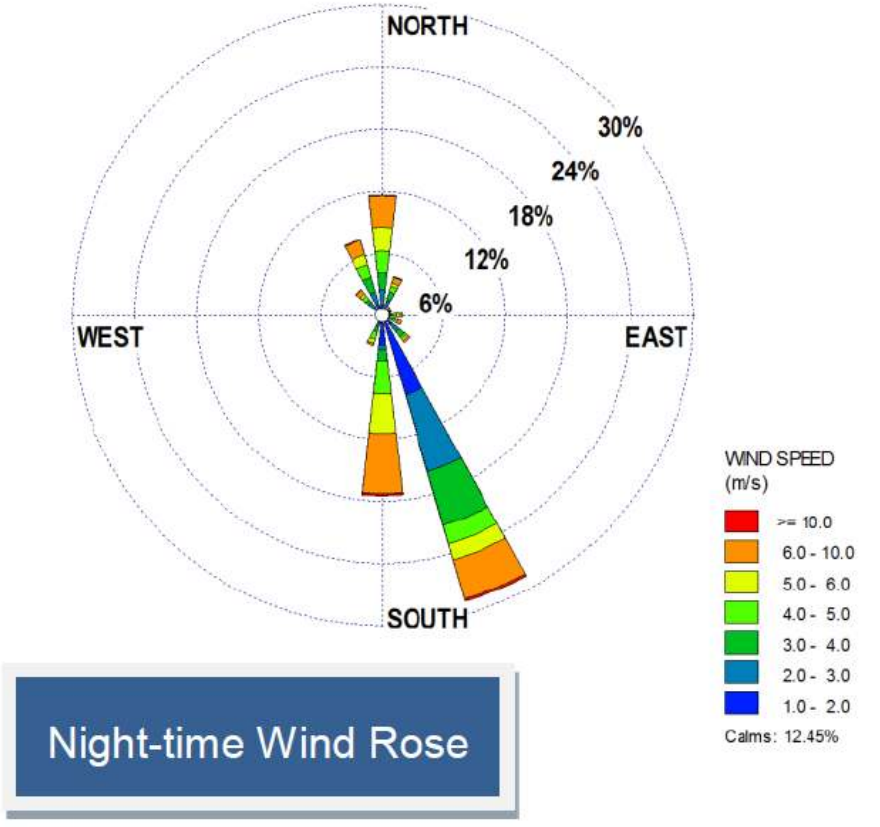


Figure 13 Diurnal wind roses rose (on-site CALMET data, 2006-2010) (Airshed, 2013).

5.3 Topography and Drainage

The study area is situated between about 27-29 meters above mean sea level (mamsl) within the Langebaanweg palaeo-embayment and is located on top of Langebaan Formation aeolianite and calcrete. The contours illustrate that the study area is relatively flat and slopes very gently to the south, with subdued aeolianite ridges in places. To the west is the aeolianite-covered, granite-cored hill of Besaansklip. To the immediate east an outcropping granite high (G3) is crossed by the R27 road.

No drainage lines occur on or adjacent to the site.

5.4 Natural Vegetation (Flora)

The study area lies within the Fynbos biome and the Cape Floristic Region (CFR). The CFR is one of only six floristic regions in the world, and is the only one confined to a single country. It is also by far the smallest floristic region, occupying only 0.1% of the world's land surface, and supporting about 9000 plant species - almost half of all the plant species in South Africa. At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Most of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. The latest data from the Red Data Book listing process undertaken for South Africa is that 67% of the rare or threatened plant species in the country occur only in the southwestern Cape, and these total over 1800 species (Raimondo *et al*, 2009).

The study area is part of the greater West Coast region, and lies within what could be termed the Saldanha Peninsula bioregion. This bioregion has a fairly distinct flora, and a particularly high number of locally and regionally endemic plant species, as well as plant Species of Conservation Concern (Helme & Koopman, 2007).

The study area falls within the planning domain of the Saldanha Fine Scale Conservation Plan (Pence 2008). This important reference indicates that there are no terrestrial or aquatic Critical Biodiversity Areas (CBAs) found in the study area, nor immediately adjacent (Figure 15). Critical Biodiversity Areas are regarded as essential areas for the achievement of regional conservation targets, and are designed to ensure minimum land take for maximum result (Maree & Vromans, 2010).

The entire study area has been previously cultivated and has a low botanical conservation value at a regional scale. This is due to the disturbed nature of the soils in this area, the low plant diversity, and the lack of any plant Species of Conservation

Concern. None of this area is a designated Critical Biodiversity Area (CBA). Conservation of this area in its current condition would contribute very little to either species or ecological process targets for the region (Helme, 2013).

Figure 14 The site has largely been disturbed due to agricultural activities.

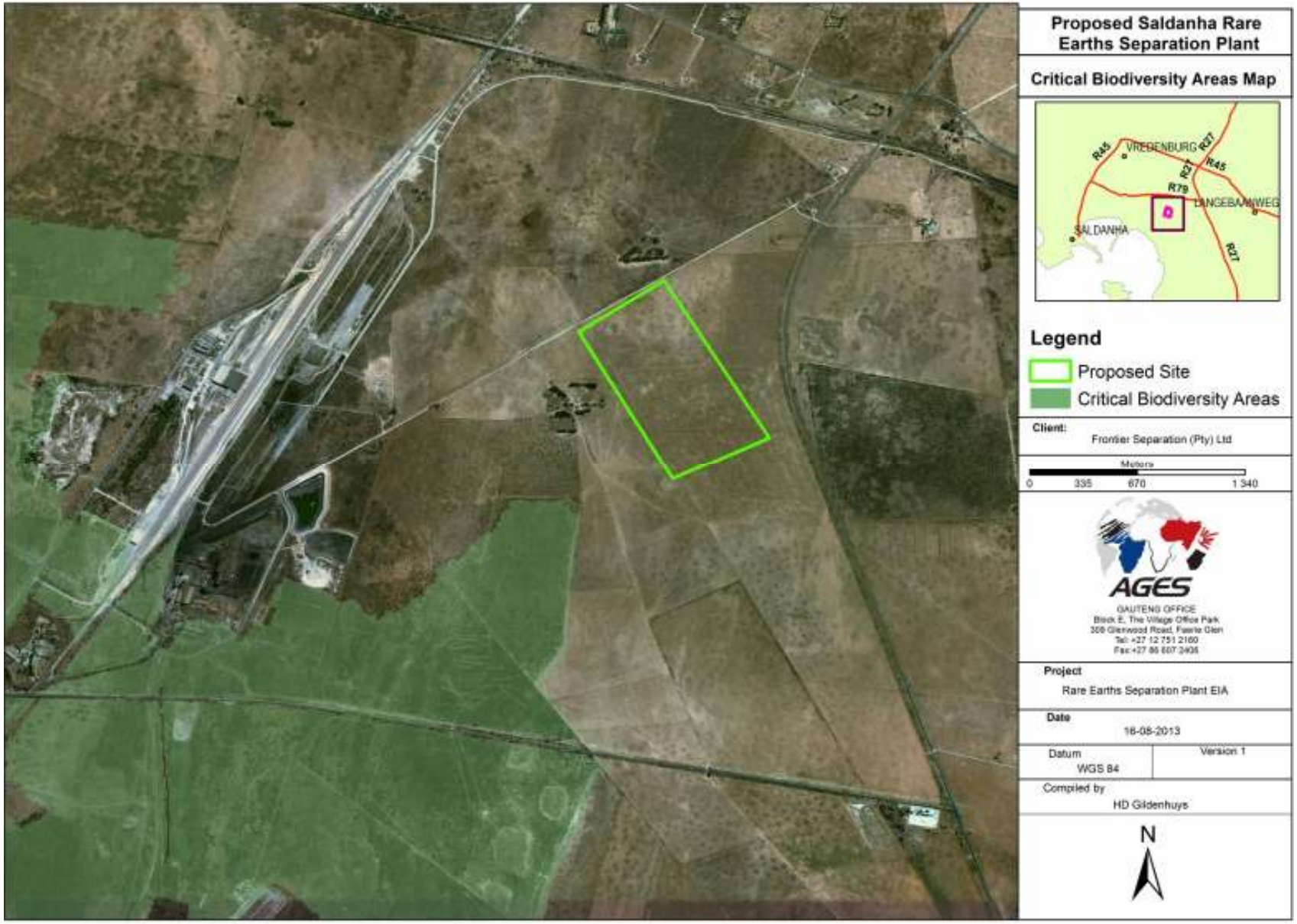


Figure 15 Extract of the Saldanha Municipality Fine Scale Conservation Plan (Pence 2008), showing the proposed site in relation to the identified Critical Biodiversity Areas according to the Saldanha Municipality Fine Scale Conservation Plan (Pence 2008).

5.5 Animal Life (Fauna)

The cultivated nature of the primary development area, and the associated loss of natural vegetation and habitat, means that the faunal diversity is much reduced in this area relative to intact, natural veld. The expansion of industrial development in the region is slowly forcing out many of the more disturbance sensitive species that were once present in the area, such as Bat eared Foxes (*Otocyon megalotis*), Korhaans and Harriers (Helme, 2013).

The avifauna is currently fairly typical of the agricultural landscape in this region, and two Species of Conservation Concern (SCC) have been recorded foraging in the vicinity of the study area, with another three passing overhead (Helme, 2013).

The avian SCC recorded foraging in the area are Black Harrier (*Circus maurus*; Near Threatened; Barnes 2000) and Blue Crane (*Anthropoides paradiseus*; Vulnerable), whilst Great White Pelican (*Pelecanus onocratalus*; Near Threatened), Lesser Flamingo (*Phoeniconaias minor*; Near Threatened) and Greater Flamingo (*Phoenicopterus roseus*; Near Threatened) have been observed flying nearby, presumably to and from the Langebaan Lagoon (to the south) and the Berg River estuary (to the north), both critically important wetlands on a national scale (Helme, 2013).

5.6 Ground and surface water

The Saldanha region is located in Water Management area number 19 (the Berg). The entire Saldanha region and the Separation Plant Site are located in quaternary drainage region G10M. The site itself is very flat with no drainage features near the site. The western side of the site is slightly elevated with an elevation that range from 25 to 26.5 mamsl.

On the northern side of the site a borrow pit was found which is at least 1 to 1.5 metres deep. This pit is at least 50 metres in diameter. This borrow pit does not seem to fill with water during rain events. The sand and calcrete surface material seem to have the ability to absorb all rainfall events. No forms of storm water erosion channels could be found during the field visits of the site.

5.6.1 Regional Aquifer

The Separation Plant site is located on the Langebaan Road Aquifer System (LRAS) which extend towards Vredenburg in the North-west, Velddrif in the north and Hopefield in the east. The LRAS consists of clay, sand and gravel deposits that are in the region of

50 meters thick. The LRAS stretch to the town Hopefield with the southern boundary formed between Langebaan and Hopefield.

The Elandsfontein Aquifer System (EAS) consists of a basal confined aquifer formed by sand and gravel of the Elandsfontein Formation, located below a thick sequence of clay and peat. The aquifer system is formed by a thick (90m) sequence of Cenozoic sediments deposited.

5.6.2 Hydrocensus

5.6.2.1 Information on existing boreholes

During the desk study, borehole related information could be retrieved from the National Groundwater Archive of the Department of Water Affairs. The data of 243 boreholes with useful information such as water level depths and lithology could be ascertained during the search.

Three field visits delivered useful hydrogeological information on 24 boreholes. During the month of June 2011, 5 boreholes of Arcelor Mittal on the farm Uyekraal were visited. During April 2012 and later in 2012, 19 boreholes were surveyed that is located specifically near the proposed Separation Plant site.

The borehole information mentioned above consisting of lithology and water level depth data was combined and used during the study to create a regional groundwater elevation map that also shows the hydrocensus positions of the boreholes used for the study (Figure 16 and Figure 17). This groundwater altitude map together with the hydrogeological cross section explains the lithology and groundwater movement in the groundwater regime of the LRAS.

Figure 16 Groundwater elevation contour and groundwater movement map.

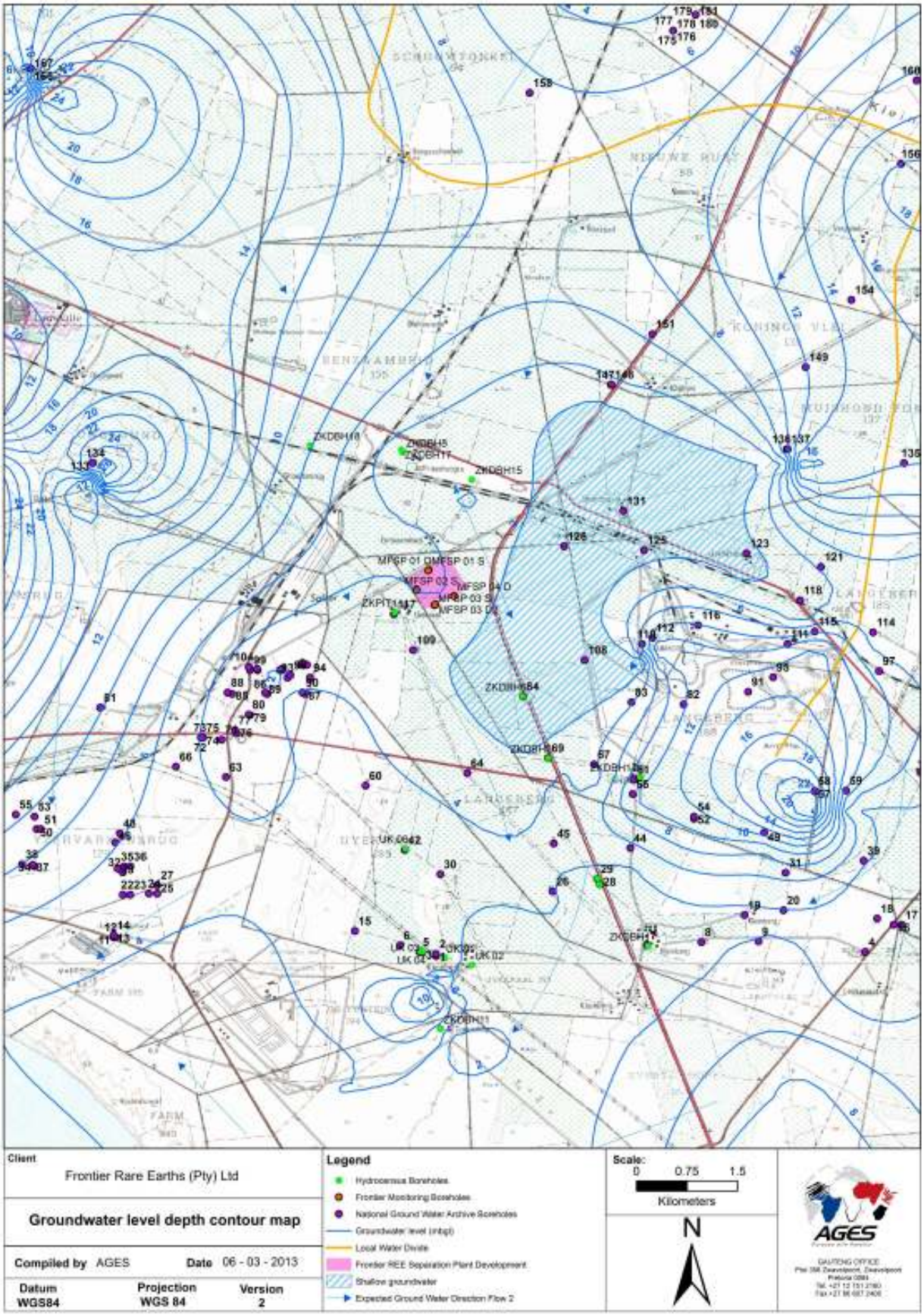


Figure 17 Hydrocensus and ground water level depth contour Map

5.6.2.2 Geophysical investigation and borehole drilling

The aim of the geophysical investigation was to examine the geology of the proposed Separation Plant site as well as to place permanent groundwater monitoring facilities on or very near to the site. A geophysical study could give more insight on the geology and could guide the placing of permanent groundwater monitoring facilities.

Two traverses were completed on the proposed development site by means of the Direct Current Continuous Vertical Electrical Soundings (DC CVES) method. This resistivity method requires the measurement of resistance of the soil substrata. This is usually done by injecting a current into the ground using two electrodes and measuring the resulting potential across another two electrodes. The exploration depth that the measurement applies to depend on the electrode separation, thus a picture of resistance with depth can be derived by systematically increasing the electrode separation. This process is known as a vertical electrode sounding. A series of such soundings adjacent to each other provides a continuous vertical electrical sounding or CVES.

Eight boreholes were established as long term monitoring facilities. It was decided to place the long term monitoring boreholes in positions where they will be safe in terms of future roads or buildings that will be established on site.

The monitoring boreholes that will serve as long term facilities were drilled on the four sides of the Separation Plant site. Two boreholes were drilled on each side of the site to be able to study the limestone aquifer conditions and the sand aquifer conditions that is located deeper.

The following borehole yield test information can be summarised from the information gathered:

- The average borehole depth is 7.47 metres below ground level;
- The average water level depth is 2.84;
- The average yield during the constant yield test was 1.73l/s;
- The average draw down during the constant yield test was 2.43 metres below static water level;
- The average early time Transmissivity value is 478 m^2/d;
- The average late time Transmissivity value is 176 m^2/d; and

- The average storativity is 0.00035

5.6.2.3 Site specific water level depths and groundwater altitudes

Water level depths on the proposed Separation Plant site are currently between 2.7 and 4.1 m below ground level. The water level depth on the northern side of the site is in the order of 4.1 metres below surface. On the southern side of the site the water level depth is in the order of 2.7 metres below ground level.

5.6.3 Water quality

Water samples were taken from 7 boreholes. The water was preserved and delivered to a water laboratory for macro and micro analyses. From the analyses the water is chemically very similar with only borehole MFSP 04D showing slightly elevated macro determinants elevated above the rest of the other samples (Table 4).

5.6.3.1 Chemical Parameters micro-determinants

The water from all the samples is in Class 1 level according the micro determinants. None of the elements measured for is elevated above Class 1 level.

5.6.3.2 Chemical Parameters macro-determinants

All samples show elevated levels of Electrical Conductivity (EC), Total Dissolved Solids (TDS), Sodium, Magnesium, Chloride which is above Class 2 level. All the samples also show elevated Calcium and Sulphate levels elevated to Class 2 water.

It is mainly the Sodium, Chloride and Magnesium levels that are elevated above acceptable limits which also elevate the TDS and EC levels.

5.6.3.3 Physical and organoleptic-parameters

The physical water quality properties refer to the aesthetic quality such as taste, odour and appearance of water. The TDS and electric conductivity levels of all the boreholes are elevated to above Class 2 levels.

The average TDS level is 7410 mg/l which is 5000mg above the maximum allowed which render the water from all the boreholes unsafe for domestic and animal use. The water is unpalatable and unusable for all farming activities.

Table 4 Water quality information and classification according SANS 241: 2006 Edition 6.1

	Unit	MFSP 01D	MFSP 02D	MFSP 02S	MFSP 03D1	MFSP 03D2	MFSP 03S	MFSP 04D	Class 1 Recommended	Class 2 (Max Allowed)	Class 2 (Water Consumption Period)	Average	Low	High	Standard Deviation
pH	-	7.71	7.48	7.61	7.62	7.55	7.56	7.48	5.0 – 9.5	4.0 – 10.5	No Limit	**7.57**	**7.48**	**7.71**	**0.082**
Electric conductivity (EC)	mS/m	1033	1054	919	1113	1181	1143	1852	<150	150 - 370	7 Years	**1185**	**919**	**1852**	**306.29**
Total dissolved solids (TDS)	mg/l	6291	6429	5411	7033	7360	7097	12254	<1000	1000 - 2400	7 Years	**7410**	**5411**	**12254**	**2232.99**
Orthophosphate	mg/l	0.034	0.055	0.063	0.051	0.064	0.043	0.027	n.s	n.s	n.s	**0.048**	**0.027**	**0.064**	**0.014**
Total hardness as CaCO3	mg/l	1377	1433	1193	1674	1653	1587	2700	n.s.	n.s.	n.s.	**1160**	**1193**	**2700**	**489.37**
Total alkalinity as CaCO3	mg/l	240	227	232	225	231	230	213	n.s.	n.s.	n.s.	**228**	**213**	**240**	**8.24**
Sodium	mg/l	1765	1784	1510	2017	2064	1932	3452	<200	200 - 400	7 Years	**2075**	**1510**	**2075**	**635.09**
Potassium	mg/l	26.4	24.5	22.6	30.6	30	29	26.5	<50	50 - 100	7 Years	**27.1**	**22.6**	**30.6**	**2.95**
Calcium	mg/l	207	227	183	253	248	239	416	<150	150 - 300	7 Years	**253**	**183**	**416**	**75.81**
Magnesium	mg/l	209	210	178	253	251	240	404	<70	70 - 100	7 Years	**249**	**178**	**404**	**73.36**
Chloride (CL)	mg/l	3392	3505	2893	3805	4070	3956	7058	<200	200 - 600	7 Years	**4097**	**2893**	**7058**	**1364.56**
Sulphate (SO4)	mg/l	547	538	481	538	556	560	769	<400	400 - 600	7 Years	**570**	**481**	**769**	**91.65**

Nitrate (NO3)	mg/l	0.967	2.93	3.91	1.91	2.05	1.65	0.773	<10	10 - 20	7 Years	**2.03**	**0.773**	**3.91**	**1.10**
Fluoride	**mg/l**	0.572	0.632	0.686	0.733	0.742	0.713	0.687	<1.0	1.0 – 1.5	1 Years	0.681	0.572	0.742	0.060
Ammonium Nitrate (NH4-N)	mg/l	0.108	0.094	0.079	0.08	0.142	0.102	0.816	---	---	---	0.203	0.079	0.816	0.271
Cadmium	ug/l	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	<5	5 - 10	6 Months	0.001	0.001	0.001	0
Iron	ug/l	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	<200	200 - 2000	7 Years	0.003	0.003	0.003	0
Manganese	ug/l	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	<100	100 - 1000	7 Years	0.001	0.001	0.001	0
Aluminium	ug/l	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	<300	300 - 500	1 Year	0.003	0.003	0.003	0
Copper	ug/l	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	<1000	1000 - 2000	1 Year	0.001	0.001	0.001	0
Zink	mg/l	0.097	0.054	0.005	0.024	0.252	0.039	0.033	<5	5.0 - 10	1 Year	0.072	0.005	0.252	0.0844

	Inside Class 1 requirements
	Inside Class 2 requirements
	Outside Class 2 requirements

5.6.4 Wetlands

A survey by Nick Helme did not find any evidence of seasonal or permanent wetlands on the proposed plant site (Helme, 2013).

5.7 Air quality

5.7.1 Air pollution sources in the study area

According to baseline information provided by Airshed Planning Professionals (the consultants that will be undertaking the Air Quality Impact Assessment and Atmospheric Emission Licence), the main sources of existing air pollution are from the following existing activities (Airshed, 2013):

- Industrial Activities:
    - Arcelor Mittal Saldanha Steel Works;
    - Tronox (previously Exxaro) Namakwa Sands Smelter;
    - Duferco;
    - Saldanha Iron Ore Handling Facility (IOHF);
    - Saldanha Bay Oil Storage;
    - Limestone Quarry;
    - Bluewater Bay Substation; and
    - Vredenburg Waste Water Treatment Plant.
- Transportation Activities:
    - Sishen Saldanha Railway Line;
    - Transnet Salcor Yard;
    - Ships;
    - Vehicle tailpipe emissions from public roads; and
    - Entrained dust emissions from public roads.

- Agricultural Activities; and
- Wind erosion.

Ambient air quality is currently measured at various locations in the Saldanha Bay area. These include stations owned by the Transnet Saldanha Port Terminal at Blouwater Bay and Vredenburg, a station at the Saldanha Steel Works of ArcelorMittal, a station at Tronox Namakwa Sands as well as a station at Vredenburg owned by the Provincial Government of the Western Cape (Airshed, 2013).

5.7.2 Ambient PM_{10} Concentrations

Ambient measurements indicate annual average PM10 concentrations of 19.6 µg/m³ and 24.1 µg/m³ at Vredenburg and Blouwater Bay respectively which comply with the National Ambient Air Quality Standards (NAAQS) (40 µg/m³). The observational data at the other privately owned monitoring stations are not publically available (Airshed, 2013).

5.7.3 Ambient NO_2 Concentrations

NO_2 is measured at the Provincial Government of the Western Cape (PGWC) Vredenburg ambient monitoring station. Observed NO_2 concentrations were low, viz. 5.2 to 6.6 µg/m³ (2008 to 2010), and less than 17% of annual NAAQS. The hourly NAAQS limit of 200 µg/m³ was also not exceeded (Airshed, 2013).

5.7.4 Measured Ambient SO_2 Concentrations

Ambient SO_2 concentrations are measured at ArcelorMittal's Saldanha Steel Works station and the PGWC Vredenburg station. SO_2 concentrations were low, viz. 4.0 to 8.8 µg/m³ (2008 to 2010), and less than 18% of annual NAAQS. The daily and hourly NAAQS limit values were also not exceeded (Airshed, 2013).

In summary, the desktop assessment revealed that (Airshed, 2013):

- Available ambient monitoring data indicate elevated PM_{10} concentrations in the immediate vicinity of existing industries in exceedence of NAAQS. Ambient PM_{10} levels at residential areas (Blouwater Bay and Vredenburg) are however low and compliant with NAAQS; and
- Ambient NO_2 and SO_2 concentrations are within NAAQS.

5.8 Noise

The site itself is currently used for agricultural purposes and is largely surrounded by agricultural land (a few smallholdings to the north). There is however a number of noise generating activities in the area mostly related to large industrial and transportation developments, as also mentioned in Section 5.7.1 above.

A noise consultant will be appointed during the EIA phase to establish the noise baseline, to identify the noise sources associated with the plant, as well as the impact on neighbouring properties.

5.9 Sites of palaeontological, archaeological and cultural interest

5.9.1 Palaeontology

A desktop assessment by Mr John Pether revealed that beneath a thin cover of sand, the project site is underlain by calcareous aeolianites (old dune sands) and calcretes ("surface limestones") of the Langebaan Formation. These strata do not appear to be very fossiliferous, but the fossils that have been found are of profound scientific value. The Langebaan Formation aeolianites have been a prime source of information on Quaternary faunas and archaeology. Notably, some fossil finds have been made in the nearby area. Deep excavations may encounter fossiliferous marine deposits of the Uyekraal Formation. Mitigation measures will be recommended during the EIA phase to limit impacts on palaeontological resources (Pether; 2012).

5.9.2 The Stone Age

The Agency for Cultural Resource Management (ACRM) conducted a field survey on the farm Langeberg in July and August 2007 (Kaplan, 1996). Note that this was a larger study area than the area proposed for the plant's construction. The ACRM survey located a small number of quartz artefacts and a piece of weathered ostrich eggshell in a wind-deflated hollow, in a block of a larger study site. Single Earlier Stone Age (ESA) quartzite lithics as well as a Middle Stone Age (MSA) flake in quartzite were also found on the steep west facing vegetated slopes. These archaeological occurrences were been rated as having low local significance (Kaplan; 1996).

However during the recent AGES archaeological assessment, which focussed on the proposed development area within Portion 6 of the farm Langeberg, no archaeological sites were identified. No Stone Age remains were observed on Portion 6 during the later AGES survey but surface calcrete occurrences were observed in the area. Stone Age material however occurs in the larger landscape and the remains of e.g. herder sites are

likely to be encountered in areas that have not been transformed by farming.

No Iron Age farmer, Historical / Colonial Period and recent times or grave sites where found during the survey (Kruger; 2013).

5.10 Socio-economic Environment

5.10.1 Demographics of the Project Area

5.10.1.1 Population

The Saldanha Bay Local Municipality (SBLM) has a population of 99 193. More than half of the population of the SBLM belongs to the Coloured population. This is proportionately less than on district level where about two thirds of the population belong to the Coloured population. Proportionately more people in the SBLM belong to the Black and White population groups than on district level. On a ward level about 60% of the population belong to the White population group (Census, 2011).

The gender distribution for the areas under investigation is fairly equal, with slightly more females on provincial, district and local level. Slightly more men are observed in Ward 5 which can be a result of the industrial activities in the town of Saldanha, which may in some instances favour males (Census, 2011).

Afrikaans is the dominant home language on provincial, district as well as local level, followed by IsiXhosa and English. Proportionately more people have Afrikaans as home language on district and local level. The site proposed for development falls within Ward 5. This ward has a higher incidence of people with English as home language than on local or district level.

In the SBLM 66.7% of the population is of economically active age.

5.10.1.2 Education

Figure 18 shows the education profiles for the areas under investigation for those aged 20 years or older. Compared to those on a provincial or local level, fewer people living within in the West Coast District Municipality have completed Grade 12 or higher. In Ward 5, almost 70% of the population older than 20 years have completed Grade 12 or higher. This suggests that relatively skilled labour may be available in the surrounding area.

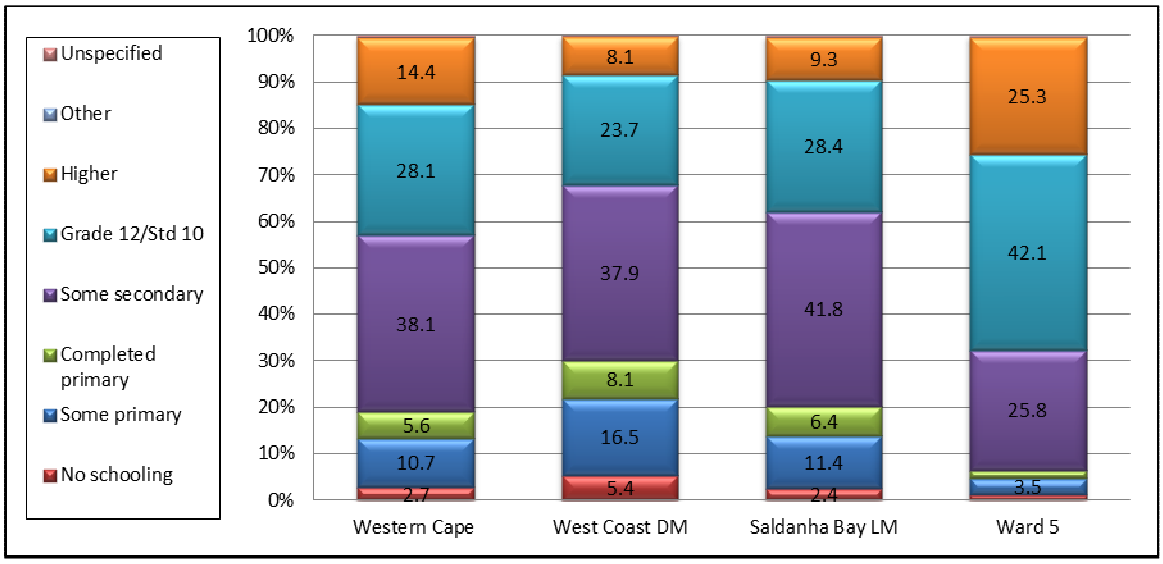


Figure 18: Education profiles (those aged 20 years or older, shown in percentage, source: Census 2011)

5.10.2 Employment status

Figure 19 shows that about half of the people of economically active age (aged between 15 years and 65 years) on provincial, district and local level are employed. In the Saldanha Bay Local Municipality there are proportionately slightly more people who have indicated that they are unemployed than on provincial or district level. This can be an indication that the area attracts opportunistic work seekers that don't find jobs, but do not have the means to return to the areas that they came from. Almost two thirds of the population of Ward 5 have indicated that they are employed; suggesting that in most households there is at least one person that is employed.

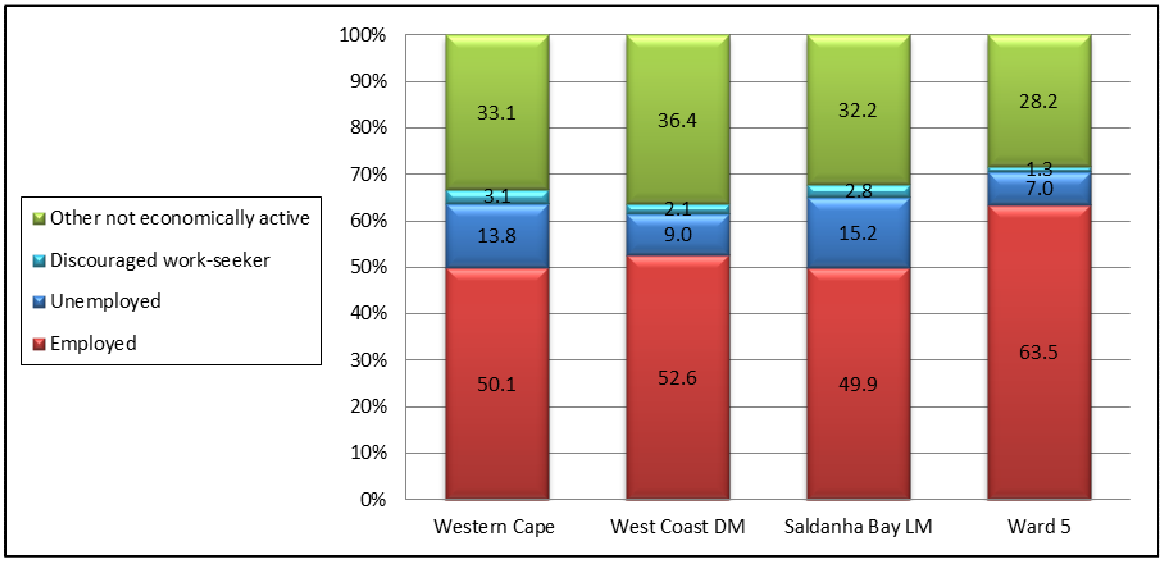


Figure 19 Labour status (those aged between 15 - 65 years, shown in percentage (Source: Census 2011).

5.10.3 Economic Profile

Saldanha Bay is a very important resource for the sustainable growth and development of the Western Cape. The deep-water port and surrounding infrastructure have already encouraged the development of major industries that contribute positively to local employment and regional and national Gross Domestic Product (GDP). The size of the Saldanha Bay economy was estimated at R4.6billion in 2010. (Saldanha Bay IDZ. 2011).

The economy of Saldanha Bay Local Municipality is largely dependent on tertiary sector activities that account for almost three quarters (73.9%) of the local Gross Domestic Products per Region (GDP-R) and create three out of four jobs in the local economy[5]. The finance and business services sector (36.9%) is the largest sector in the local economy that also provides 34% of all employment opportunities in the area. In terms of the value added created, it is followed by government services (17.7%), manufacturing (13.3%), and trade (10.1%). The transport sector generates 9.3% of the local economy's GDP-R. The general government services sector is also the second largest employer in the municipality; however, the third and the fourth position in terms of job opportunities created belong to the trade (14.2%) sector and the agricultural sector (10.6%).

The structure of the local economy has changed significantly over the past decade. While in 2000, the manufacturing sector was the largest contributor to the economy and accounted for 30.5% of the municipal GDP-R, its current contribution dropped to 13.3%. This was attributed to the sharp decline of the manufacturing sector's production post the 2008 financial crisis and a fast paced growth of the financial and businesses services industry in lieu of the development of the other economic sectors in the area, particularly general government services and the expanses of the activities at the port of Saldanha.

The proposed establishment of a large industrial area is expected to enhance the manufacturing base of the local economy. The same applies for the proposed Saldanha REE Separation Plant that could increase the production in the area and contribute to the diversification of the manufacturing base and the development of the sector in general (Urban-Econ, 2013).

5.10.4 Health Status

An estimated 5.6 million people were living with HIV and AIDS in South Africa in 2011 (www.avert.org), the highest number of people in any country. The estimated national prevalence for HIV in 2011 was 29.5% with the Western Cape Province having the

5 Quantec, 2013. Standardised Regional Database

second lowest HIV prevalence, following the Northern Cape Province with 18.2%. On a district level, the West Coast District has the second lowest prevalence of HIV after the Namaqua district with 9.9%.

According to the Western Cape's Provincial Strategic Plan (PSP) for HIV and AIDS, STI's and TB 2012-2016, addressing the social, economic and behavioural drivers of HIV includes addressing challenges posed by living in informal settlements, as well as rural and hard-to-reach areas; migration and mobility; and alcohol and substance abuse. It also includes interventions to address gender norms and gender-based violence; to reduce the vulnerability of young people to HIV infection by retaining them in schools as well as increasing access to post-school education and work opportunities; to reduce HIV-related stigma; to strengthen community systems to expand access to services; and to alleviate poverty and strengthen food security.

The Western Cape PSP has identified the following determinants of the HIV epidemic in the Western Cape:

- Sexual debut;
- Multiple sexual partners;
- Age-disparate sexual (intergenerational) relationships;
- Alcohol and substance abuse;
- Prevention knowledge and risk perception;
- Stigma and discrimination;
- Mother-to-child transmission;
- Male circumcision;
- Other sexually transmitted infections;
- Treatment as prevention;
- Mobility and migration;
- Gender roles and norms;
- Sexual abuse and intimate partner violence.

In 2012 a total of 77 health care facilities were located in the entire West Coast district,

with 14 of these being located in the Saldanha Bay LM. The primary health care facilities include 8 fixed clinics, one district hospital, two satellite clinics, one health post and two mobile clinics. One Anti-retroviral Treatment (ART) registered service point has been designated to specifically meet the needs of HIV/AIDS patients and all facilities cater for Tuberculosis (TB) treatment. Although an organisational policy for HIV/AIDS exists, the Saldanha Bay LM needs to develop a strategy for the municipal area. It can be anticipated that the strategy would be very much in line with that of the City of Cape Town. In order to mitigate the social, economic and human impact of HIV/AIDS the City of Cape Town has Multi-Sectoral Action Teams that are operational in each of its sub-districts (www.capetown.gov.za). These teams bring together local stakeholders involved in HIV/AIDS such as non-governmental organisations (NGO's), community-based organisations (CBO's), faith based organisations, local officials and the business sector so as to develop and drive a coordinated plan that addresses local needs.

6 ALTERNATIVES

6.1 Overview

Regulation 28(1)(j) of the NEMA Regulations (GNR 543) require that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, the Department requires that a number of possible proposals or alternatives for accomplishing the same objectives should be considered.

6.2 Process to assess alternatives

In the case of the proposed development, possible alternatives were identified through discussions with authorities, discussions with Interested and Affected Parties (I&APs), reviewing of existing environmental data, specialist inputs/studies and the Applicant.

6.2.1 Site Alternatives considered

Prior to the EIA application a Preliminary Environmental Assessment was undertaken in order to assess two different site alternatives. The study identified two possible sites for the proposed plant within the Saldanha Local Municipality:

- Portion 6 of the farm Langeberg 188 (Alternative Site 1); or
- Portion 0 of the Farm Uyekraal 189 (Alternative Site 2).

A map illustrating the localities of these two sites is shown in Figure 20. These two sites were visited by an Archaeologist and an Ecologist to assist with determining the best site option for the proposed plant.

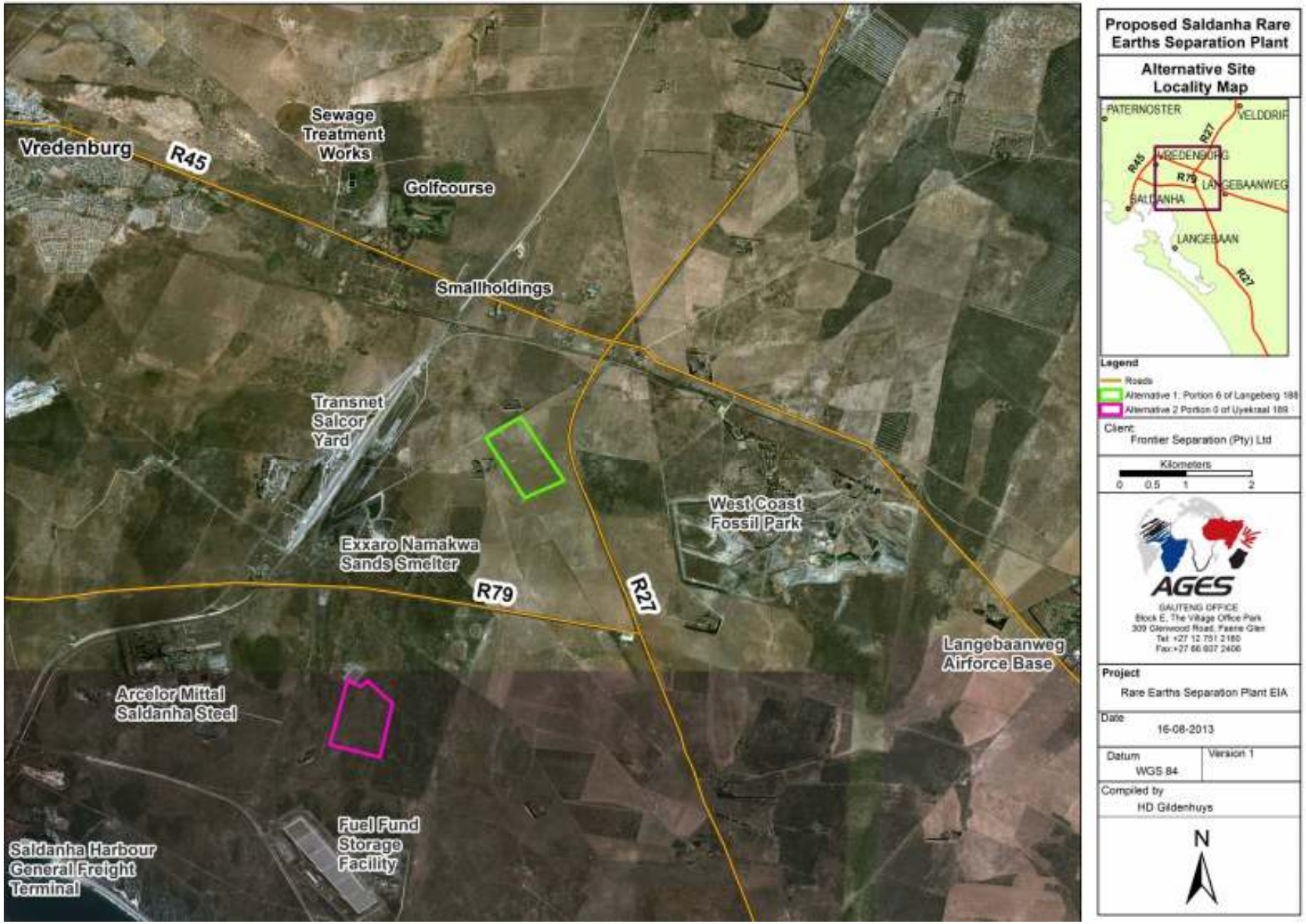


Figure 20 Alternative Site Localities considered as part of the Preliminary Environmental Assessment.

6.2.1.1 Portion 6 of Langeberg 188 (Alternative Site 1)

6.2.1.1.1 Heritage

As reported in Section 5.9 above, a site visit by an Archaeologist (Mr N. Kruger from AGES) did not identify any archaeological sites. No Stone Age, Iron Age farmer, Historical / Colonial Period and recent times or grave sites where found during the survey.

6.2.1.1.2 Ecology

As mentioned in Section 5.4 above, Alternative Site 1 will be located within an area of Low botanical conservation value, and no threatened plants are likely to be impacted.

The Saldanha Fine Scale Conservation Plan (Pence 2008) did not identify this area as important in terms of terrestrial or aquatic biodiversity as it falls outside any areas identified as Critical Biodiversity Areas (CBAs). No CBAs were also found immediately adjacent to the proposed site (refer to Figure 21).

6.2.1.1.3 Infrastructure

Alternative Site 1 can in future potentially provide access to rail infrastructure. Rail access could have a positive impact to alleviate road congestion in the area. A railway siding is being considered for the Industrial Area and therefore rail transport is seen as an alternative future transport method for the mixed rare earth salt from the Zandkopsdrift mine to Saldanha.

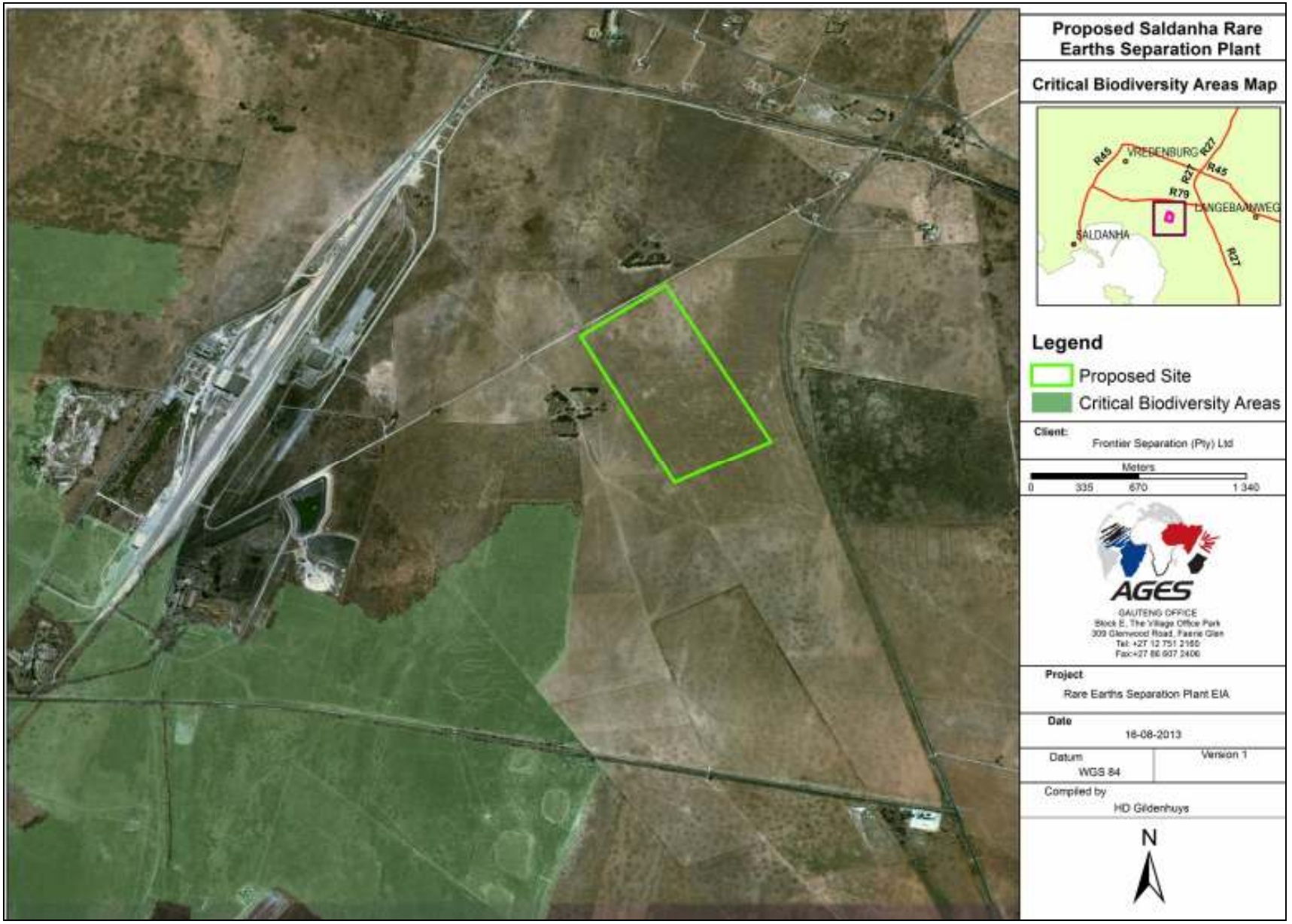


Figure 21 Alternative Site 1 in relation to the Saldanha Municipality Fine Scale Conservation Plan's Critical Biodiversity Areas (Pence 2008).

6.2.1.2 Portion 0 of Uyekraal 189 (Alternative Site 2)

6.2.1.2.1 Heritage

During the archaeological survey conducted by Mr Neels Kruger from AGES on Alternative Site 2 (Portion 0 of the farm Uyekraal 189), isolated Middle Stone Age (MSA) and Later Stone Age (LSA) material were documented, which included a few limestone and quartz MSA and LSA flakes randomly scattered across the property, and scattered ostrich eggshell fragments possibly related to other LSA material occurring in the area. Refer to Figure 22 below.

A Colonial period foundation structure and midden rich in material culture were located on the south-eastern boundary of Alternative Site 2 (Figure 23). The square stone foundation structure, measuring approximately 2m x 3m has been ruined and is dilapidated. A small household dump heap, measuring approximately 4m x 3m occurs directly north of the foundations structures. The midden, which contains glass fragments and glass objects, ceramic (porcelain) and faunal remains, seems to be largely intact and well preserved. The features might be associated with the early phases of settlement of the farm.

A number of large stone heaps are scattered across the property but the provenance and context of these features are not known (Figure 24). It is however unlikely that the heaps are archaeological or historical in nature (Kruger; 2013).

Refer to Figure 25 for a Heritage Sensitivity Map.

Figure 22 Artefacts observed at Uyekraal (from left to right): possible LSA Ostrich eggshell, LSA quarts flake, Colonial Period porcelain and glass and MSA limestone flake.

Figure 23 Stone foundation structure and midden (left).

Figure 24 Large stone heaps of unknown origin or context occurring widely in the survey area.

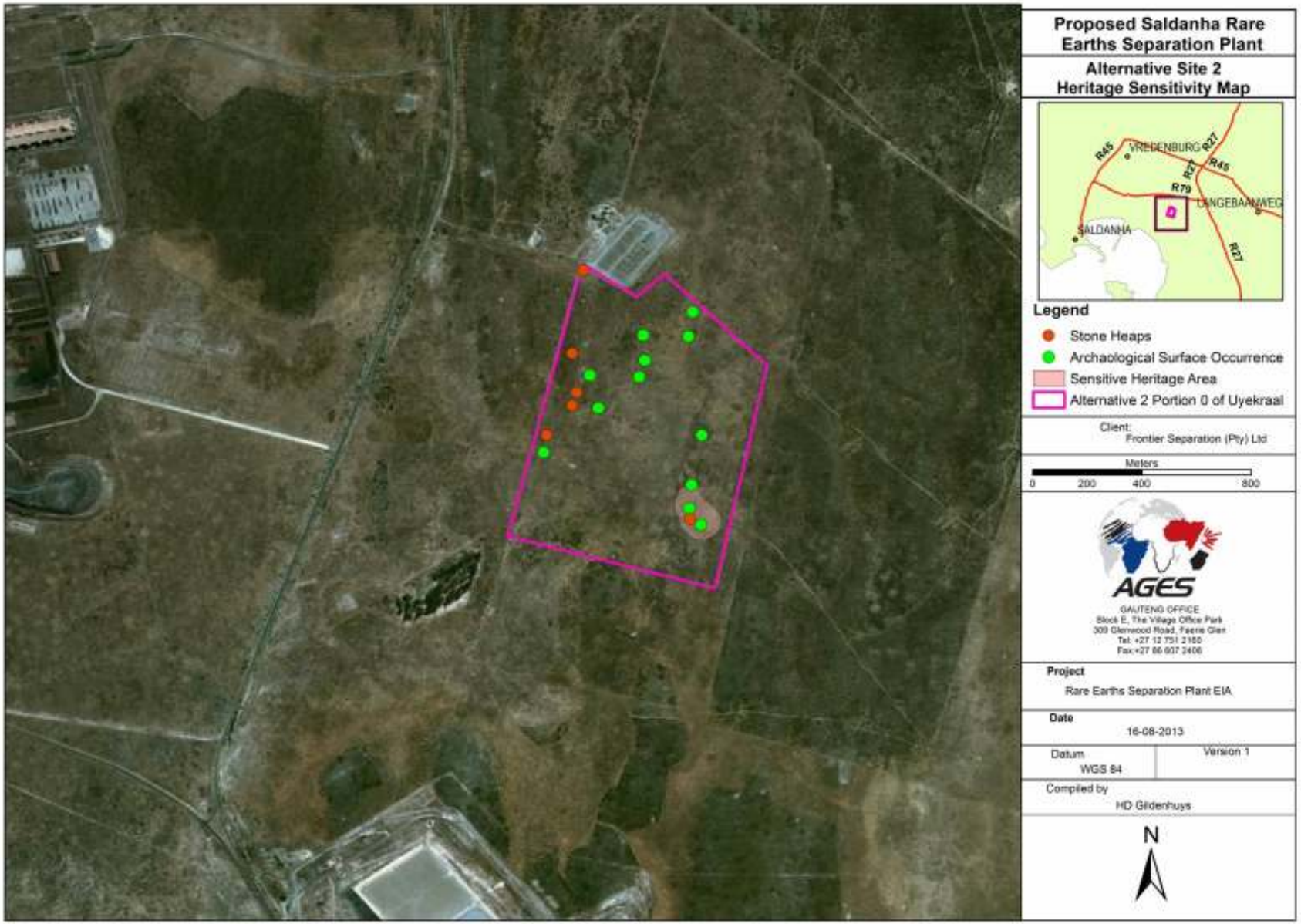


Figure 25 Heritage Sensitivity Map for Alternative Site 2.

A large number of archaeological sites have been recorded along the West Coast of South Africa, and it is a reflection of the palaeontological, archaeological and historical diversity of this area. From an archaeological perspective, the coastal zone is particularly sensitive due to the presence of Middle Stone Age sites that show evidence of early use of marine resources and archaeological and palaeontological sites that contain ancient human remains. Equally important are the palaeontological resources of the broader area and Colonial remains elucidating cultural contact and continuity on the Cape frontier in the last 500 years. Consequently, the Saldanha Bay area is likely to produce evidence of fossil faunas, and/or evidence for marine transgressions and regressions, and a range of other preserved remains. Therefore, the significance of sites located at Uyekraal should not be considered in isolation, but rather in terms of its position in this rich archaeological and historical landscape.

The Stone Age material at Uyekraal occurs in low densities in open contexts and their original positions have probably been lost due to agriculture activities which has altered large portions of the surface soil in the study area. These occurrences are therefore of low significance.

The Colonial Period midden and foundation can typically be related to early Colonial farming activities in the area. The site is of medium significance as it might potentially inform on a wider conception of a rich Western Cape Colonial history.

6.2.1.2.2 Ecology

A site visit was undertaken by Mr Helme from Nick Helme Botanical Surveys on 17 June 2011 and again on 15 August 2011. The study site, although covered with what could be termed indigenous vegetation, has been disturbed in the past, so that the vegetation present today is not pristine. The large piles of calcrete rocks visible in parts of the site are a clear indication that the site was at least ripped, probably about 30 or 40 years ago. The landowner at the time was probably trying to improve grazing for livestock, and presumably sowed the ripped area with a grazing grass, possibly *Cynodon dactylon* (fynkweek), which is still present on site. The site is currently heavily grazed by cattle. Overall botanical species diversity on site is Low – Moderate when compared to undisturbed adjacent areas of the same habitat type, and botanical sensitivity is also Low - Moderate at a regional scale.

Two plant Species of Conservation Concern (SCC) were recorded in the study area, and there is a Low to Moderate likelihood that one or two others may be present in the area. *Otholobium bolusii* (Fabaceae) is Red Listed as Near Threatened. *Afrolimon capense* (Plumbaginaceae) is Red Listed as Near Threatened (Raimondo *et al* 2009). This typical

limestone species is common on limestones (or calcretes) in the region.

The site is surrounded by areas delineated as Critical Biodiversity Areas (CBA) according to the Saldanha Municipality's Fine Scale Conservation Plan (Pence 2008). Furthermore the north-eastern section of the site falls within a CBA.

6.2.1.2.3 Infrastructure

Access to the railway line will be more difficult compared to Alternative Site 1 as the site is located further away from the existing railway line.

6.2.1.3 Overview of site selection

Site	Heritage	Ecology	Infrastructure
Langeberg (Alternative Site 1)	No archaeological sites were identified on this site.	The site is largely disturbed. No Critical Biodiversity Areas were found on or adjacent to the site.	Alternative Site 1 can in future potentially provide access to rail infrastructure as it is within close proximity to an existing railway line.
Uyekraal (Alternative Site 2)	Various artefacts were found on the site. A Phase 2 Archaeological Assessment will be required. Such measures should minimally include the sampling of cultural and other remains that will adequately allow the temporal, cultural and spatial classification of the site, the mapping of the site and further desktop studies in order to contextualize the site within the larger historical landscape.	Two plant Species of Conservation Concern (SCC) were recorded in the study area, and there is a possibility that one or two other such species may be present in the area. The site itself partly falls within a Critical Biodiversity Area, and is also largely surrounded by Critical Biodiversity Areas.	Rail access to the site will be more difficult as it is located further away from an existing railway line compared to Alternative Site 1.

When taking into consideration the ecological and heritage significance of the two alternative sites, as well as access to rail infrastructure, Alternative Site 1 is considered to be the preferred alternative.

This alternative site on Portion 6 of the farm Langeberg 188 was therefore taken further into the EIA process as the preferred alternative site.

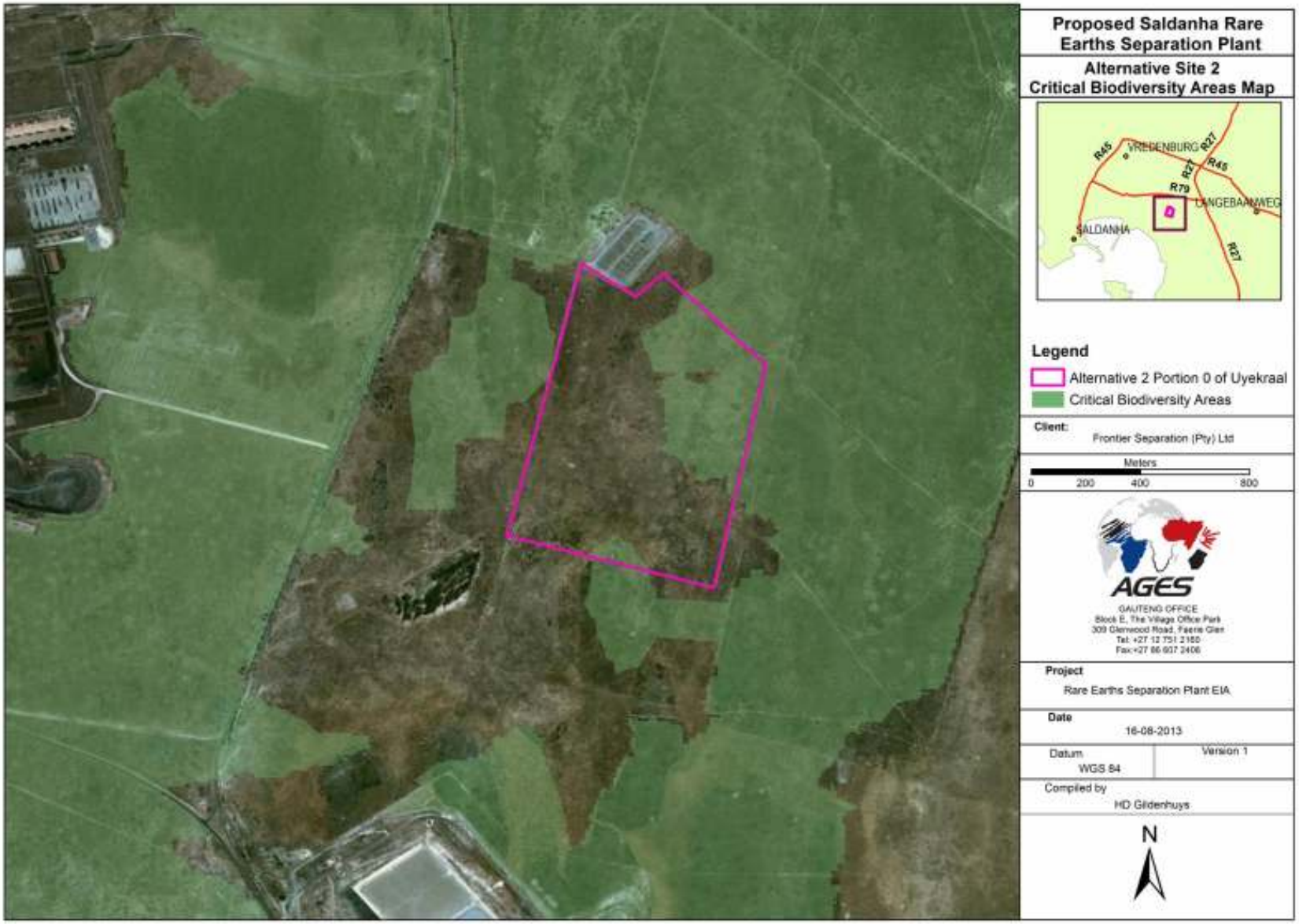


Figure 26 Alternative Site 2 in relation to the Saldanha Municipality Fine Scale Conservation Plan's Critical Biodiversity Areas (Pence 2008).

6.2.2 Technology alternatives

Various technology alternatives are in the process of being assessed. These relate to the following aspects:

5. Process water treatment alternatives;
6. Brine Disposal Alternatives;
7. Mixed Rare Earth Carbonate Waste Disposal Alternatives; and
8. Boiler Fuel Alternatives.

6.2.2.1 Process water treatment alternatives

Three alternatives of process water treatment are in the process of being investigated:

- Alternative 1: Full bleed of process brine (no process waste water recycling);
- Alternative 2: Reverse osmosis combined with thermal treatment with moderate process brine bleed (i.e., moderate water recycling); and
- Alternative 3: Reverse osmosis combined with thermal treatment of the full process waste water (i.e. maximum water recycling).

6.2.2.1.1 Process Water Treatment Alternative 1

For Alternative 1, the Reverse Osmosis (RO) system is comprised of four RO units, which are designated as RO #1, RO #2, RO #3 and RO #4 respectively. The four units are similar in design although vary in sizes and operational parameters such as feed pressure and recovery. An **evaporator/condenser is not required** since no recovery from process waste water is attempted via this approach.

Raw domestic water is treated by using RO #1 and RO #2 in series to produce high quality process water with a TDS of less than 5 mg/l. The concentrate from RO #1 feeds RO #3 following a pre-treatment. The product permeate from RO #3 is combined with RO #2 concentrate to feed a fourth unit – RO #4. The permeate from RO #4 (TDS ~ 5 mg/l) is directly recycled back to the process water tank. RO #4 concentrate (TDS ~ 740 mg/l) is recycled to mix with raw water and feed RO #1.

Full bleed of process waste water, combined with RO #3 concentrate, forms the final brine for disposal. As a result of this alternative, there is **no recycle of process waste**

water.

6.2.2.1.2 Process Water Treatment Alternative 2

For Alternative 2, in order to recover water from the process effluent brine, an **evaporator/condenser will be required** in addition to the four RO units and other supporting treatment.

Similar to Alternative 1, raw domestic water is treated using two RO units, RO #1 and RO #2, to produce the process water with the required quality of less than 5 mg/l TDS. The concentrate from RO #1 feeds RO #3 following pre-treatment. The product permeate from RO #3 is combined with RO #2 concentrate and the evaporator/condenser condensate to feed a fourth unit, RO #4. The permeate from RO #4 (TDS ~ 5 mg/l) is directly recycled back to the process water tank. RO #4 concentrate (TDS ~ 1600 mg/l) is recycled to mix with raw water and feed RO #1.

In contrast to Alternative 1, only a **moderate bleed of process waste water** is combined with RO #3 concentrate and the evaporator/condenser brine to form the final brine. The remaining amount of process waste water is pre-treated and then processed in the evaporator/condenser for recovery. As a result of this alternative, **moderate water recycling** is achieved.

6.2.2.1.3 Process Water Treatment Alternative 3

The process for Alternative 3 is very similar to that of Alternative 2, except that there is no bleed of process waste water. Alternatively full process waste water is **treated by** the **evaporator/condenser**, immediately following chemical and physical pre-treatment.

For this alternative, **water recycling** is close to if not **fully maximized**. Alternative 3 is attempting to achieve the maximum recovery possible by this combined treatment system and provides an indication of the **minimum amount of raw water supply** required based on similar assumptions, regardless of overall system cost.

The three water treatment alternatives will be further assessed in the EIA phase terms of water availability to the plant, as well as each alternative's financial feasibility.

6.2.2.2 Brine disposal alternatives

The liquid effluent emerging from the proposed separation plant will predominantly be a sodium chloride, salt brine, solution (i.e. a solution containing table salt) with trace levels of other elements. The following options have been identified for the potential treatment

and disposal of the salt effluent stream:

1. disposal to one or more of the existing local waste water treatment works ("WWTW");
2. constructing evaporation ponds to generate salt for responsible disposal;
3. evaporating and crystallising to generate salt for responsible disposal; or
4. sea disposal of the effluent (Regional Marine Outfall Project).

The following aspects are important to note in terms of the brine effluent that will be produced. The Saldanha Separation Plant (SSP) is proposed to produce 140 m^3/hour of effluent. The estimated density of the effluent is 1 050 kg/m^3 while the expected temperature will range between 18°C and 25°C. The pH is expected to vary between 5 and 8.5.

The effluent brine is made up of 104 g/l of sodium chloride with a maximum total of 1 g/l of all other impurities. The most significant other impurity is oxalate at 0.35 g/l. This chemical has a tendency to scale (a hard mineral coating that forms on the inside surfaces of heating equipment like boilers and kettles) and needs to be removed prior to evaporation. Similarly, calcium and magnesium also cause scaling.

Chlor Alkali Holdings (CAH) has indicated that they would be willing to utilize a moist salt at their proposed neighbouring plant, provided that impurities in the salt have been reduced to acceptable levels. CAH normally uses ion exchange for cleaning (polishing) brine and are currently testing the possibility of using nano-filtration in this regard.

These four brine disposal alternatives will be investigated further during the EIA process in terms of their practical, financial and environmental feasibility.

6.2.2.3 Mixed rare earth carbonate waste disposal alternatives

The solid waste settling pond provides temporary onsite waste storage for up to six months from the following two major feed sources besides precipitation:

- Insolvable solids contained in the SSP concentrate feed; and
- Mixed rare earth carbonates of Ho/Er/Tm/Yb/Lu.

The mixed rare earth carbonates of Ho/Er/Tm/Yb/Lu will be sold if a market can be found, or disposed of to the tailings storage facility at the Zandkopsdrift mine site or alternatively disposed of at an appropriately licensed waste disposal facility (e.g. Vissershok).

These alternatives will be investigated further in the EIA phase.

6.2.2.4 Boiler Fuel Alternatives

A Boiler System will be required at the SSP with a steam generating capacity of 5t/h of steam at a pressure of 10 Bar. Coal and Liquid Petroleum Gas (LPG) is currently being considered as fuel alternatives for the proposed boiler system. Electrical boilers were initially considered, but are not considered to be a feasible alternative due to the high cost of electricity as well as the limited electrical power capacity available in Saldanha Bay.

Capital and operational costs, as well as environmental considerations are currently being considered in the alternatives selection process and will be reported on during in the Environmental Impact Assessment Report (EIR).

6.2.3 No-Go Alternative

One of the options that will be considered as part of the EIR is that of the no development option. This would entail leaving the site in its present state and not developing the proposed Separation plant and associated infrastructure or any of the proposed Alternatives. This option will be evaluated during the EIA phase.

7 ASSESSMENT OF IMPACTS

The questions, issues and responses shown in Appendix A6: Comments and Response Report have been analysed using knowledge of the affected environment, available information and professional judgement, in order to identify key issues that require further assessment in the next phase of the environmental impact assessment – specialist studies and environmental impact assessment phase.

The reader should note that the classification of an issue as a key issue during the scoping phase does not necessarily implies that a significant impact will result. The significance of an impact can only be ascertained once a specialist study has been conducted.

The significance of the impacts that will be identified during the EIA phase will be assessed during the specialist studies and impact assessment phase using the criteria listed below.

7.1 Comments / Concerns received

The comments / concerns listed in the following section have been determined through the following avenues:

- Views of interested and affected parties;
- Legislation; and
- Professional understanding of the project team, environmental assessment practitioners and specialist consultants.

Further details associated with the construction and operation of the various activities as listed in the project description will be discussed in detail in the EIA Report. The EIA report will assess the impacts of each of the activities as well as ascertain the cumulative impacts of the development.

Assessing the comments/concerns received during the public participation process, it is evident that the main comments or concerns are with regards to:

- Biodiversity impacts
  - Negative impacts on naturally occurring fauna and flora
  - Rehabilitation of disturbed areas according to best practice

- Palaeontology and archaeology
  - Need for palaeontological and archaeological surface surveys prior to any earth moving activities
  - Availability of previously conducted archaeological and palaeontological reports
  - Provision for monitoring of subsurface activity
  - Rescuing of fossil material during excavations
- Air Quality Impacts
  - Air Pollution originating from the plant
  - The requirement for an Atmospheric Emissions Licence
  - Dust Pollution
- Soil pollution
- Noise Pollution
- Traffic Impacts
  - Increased heavy traffic impacting on the existing road infrastructure during the construction and operational phases
- Groundwater and surface water pollution and management
  - Impact on water users in the area
  - Pollution/contamination of groundwater resources
  - Lowering of the groundwater table due to abstraction of water
  - Poor storm water management that could lead to pollution of Saldanha Bay
- Visual Impact
- Material handling and storage
  - Usage and storage of hazardous chemicals
  - Management and disposal of solid and liquid waste
  - Processing and storage of Rare Earths
- Socio-Economic Impacts
  - Economic upliftment relating to local job creation and employment
  - Land use impacts
  - Impacts on farming of livestock, grain and bee keeping.
  - Safety and Security
  - Supply of building material

- Health Impacts
- Economic impacts related to:
  - Rare Earth supply and exporting
  - Rare Earth wastes and recovery of these wastes if possible
  - Separation of Rare Earths and resulting products
  - Beneficiation of South Africa's natural resources, including establishing downstream electronics industries in South Africa
- Waste impacts
  - Handling and testing of sludge
  - Lining of waste settling dams/evaporation ponds
  - Capacity of waste disposal facility
  - Storage of hazardous waste
  - Disposal of hazardous waste
  - Disposal on unused products
  - Storage of raw materials

7.2 Specialist Studies

As a result of the above-mentioned comments, the following specialist studies will be undertaken during the EIA phase of the project (the specialist consultants are provided in brackets):

- Air Quality Impact Assessment (Airshed Planning Professionals);
- Surface And Groundwater Impact Assessment (AGES Hydrogeology Unit);
- Stormwater Management (Rede Engineering and Management Solutions);
- Archaeological Impact Assessment (AGES);
- Health Impact Assessment (Envirosim);
- Social Impact Assessment (Equispectives Research & Consulting Services);
- Economic Impact Assessment (Urban Econ);
- Noise Assessment (Acusolv);
- Visual Impact Assessment (New World Associates);

- Heritage Impact Assessment (New World Associates);
- Ecological Assessment (Nick Helme);
- Palaeontological Impact Assessment (John Pether);
- Risk Assessment (ISHECON); and
- Traffic Impact Assessment (ITS)

7.3 Assessment Methodology

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. Assessment of impacts will be based on DEAT's (1998) Guideline Document: EIA Regulations. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability. This describes the likelihood of the impact actually occurring.

Improbable: The possibility of the impact occurring is very low, due to the circumstances, design or experience.

Probable: There is a probability that the impact will occur to the extent that provision must be made therefore.

Highly Probable: It is most likely that the impact will occur at some stage of the development.

Definite: The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.

Duration. The lifetime of the impact

Short term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.

Medium term: The impact will last up to the end of the phases, where after it will be negated.

Long term: The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.

Permanent: Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale. The physical and spatial size of the impact

Local: The impacted area extends only as far as the activity, e.g. footprint

Site: The impact could affect the whole, or a measurable portion of the above mentioned properties.

Regional: The impact could affect the area including the neighbouring residential areas.

Magnitude/ Severity. Does the impact destroy the environment, or alter its function.

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance. This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights will be assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	**Sum(Duration, Scale, Magnitude) x Probability**	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

The significance of each activity will be rated without mitigation measures and with

mitigation measures for both construction, operational and closure phases of the proposed development.

7.4 Impact Assessment

Impacts on the identified key issues will be assessed according to the following structure:

- *Source of the impact*: will be identified (e.g. initial vegetation clearance on site, establishment of construction camp, passage of vehicles on roads, etc).
- A *Description of the impact* will describe the interaction between the activity and the environment, i.e. how and why the impact occurs and how the activity changes the environment.
- *Significance*: an explanation of the significance rating of the impact with and without mitigation, with reference to the impact assessment criteria will be provided. Impacts will be rated as highly significant, or of low significance. Fatal flaws will additionally be identified. There are no mitigation measures which can be implemented to manage a fatal flaw.
- *Mitigation:* The mitigation measures that can be implemented to eliminate or minimise negative impacts or result in the optimization of positive benefits must, wherever possible, will be expressed as practical actions.

7.5 Plan of Study for EIA

As per the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and the Environmental Impact Assessment Regulations of 2010, a Plan of Study (PoS) for EIA is required. The PoS for environmental impact assessment sets out the proposed approach to the environmental impact assessment of the application. Refer to Appendix D for the Plan of Study for EIA.

8 CONCLUSION AND RECOMMENDATIONS

This Scoping Process has followed the correct and appropriate standards and procedure for this EIA application, as set out in the NEMA (amended), and the EIA Regulations of 2010. The Scoping Study includes an analysis of various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment during the EIA process.

Terms of Reference for specialist studies were formulated taking into consideration comments received during the public participation process to date. These terms of reference ensure that potential environmental impacts are adequately investigated during the detailed assessment phase of the EIA process and that any relevant shortcomings and/or gaps are addressed.

Impact significance will be assessed during the specialist studies and impact assessment phase using the criteria listed in section 7.

Public participation during the Impact Assessment Phase of the EIA will revolve around a review of the findings of the EIA and inputs into the Environmental Management Plan (EMP). The findings will be presented in a Draft Environmental Impact Assessment Report, Specialist Studies and EMP. AGES recommends that the project proceed into the EIA phase of the environmental process. The EIA report will address the key issues identified in the Scoping Report, at a level required to provide the public and the decision making authorities with sufficient information to deliver a final decision.

The anticipated way forward on the next phase of the EIA process is explained below in Section 8.1.

8.1 The Way Forward

1. **Final Scoping Report.** This Final Scoping will be submitted to the DEADP and public for consideration as contemplated in regulation 30 and 56 of the EIA Regulations.

2. **Appointment of Specialists**. All the identified specialists will be appointed to undertake the specialist studies as identified in this Scoping Report.

3. **Draft Environmental Impact Assessment Report**. The results of the specialist studies will be synthesized by the project team to provide a Draft Environmental

Impact Assessment Report (EIR).

4. **Draft EIR circulated**. The Draft EIR will be circulated to DEADP and registered I&APs for comment as contemplated in regulation 56(2) of the EIA Regulations.

5. **Comments Report**. Comments on the Draft EIR will be synthesised by the project team into a comments report, which will be appended to the Final EIR.

6. **Revision of Draft EIR**. The Draft EIR will be updated to include *inter alia* summary and copies of the comments received and issues raised by registered I&APs as contemplated in regulation 31(2)(e) and 56(4) of the EIA Regulations. Responses to the issues raised and comments received from I&APs will also be included in the EIR as contemplated in regulation 31(2)(e).

7. **Final EIR**. The Final EIR will be submitted to the DEADP and public for consideration as contemplated in regulation 34, 35 and 56 of the EIA Regulations.

9 REFERENCES

AIRSHED, 2013. Air Quality Baseline Assessment for the Proposed Rare Earth Extraction Separation Plant on Portion 6 of the Farm Langeberg 188, Saldanha Bay Local Municipality. Report No.: APP/12/AGE-02.

CENSUS 2011. Statistics South Africa.

DEPARTMENT OF TRADE AND INDUSTRY. 2005. Sector Development Strategy: Chemicals.

DEPARTMENT OF MINERALS AND ENERGY. 2010. Empowerment Charter, Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry Amendment.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM (DEAT). 2002. Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM (DEAT). 2004. Cumulative Effect Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEPARTMENT OF ENVIRONMENTAL AFFARIS AND TOURISM (DEAT). 2004. Environmental Impact Reporting, Integrated Environmental Management, Information Series 15, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM (DEAT). 2004. Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM (DEAT). 2004. Review in Environmental Impact Assessment, Integrated Environmental Management, Information Series 13, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

HELME, N. 2013. Baseline Botanical & Faunal Assessment Report for the Proposed Rare Earths Mineral Separation Plant, Saldanha, Western Cape. Nick Helme Botanical Surveys.

HELME, N. AND R. KOOPMAN. 2007. Vegetation report for CAPE Finescale Vegetation Mapping Project: Saldanha Peninsula. Report for CapeNature, as part of the CAPE program.

KAPLAN, J. 1996. Report on Archaeological Surface Collection and Test Excavation: Saldanha Steel Mini Mill. Cape Town: Agency for Cultural Resources Management.

KRUGER, N. 2013. Archaeological Impact Assessment of Portion 6 of the farm Langeberg 188 for the Proposed Frontier Separation (Pty) Ltd Saldanha Rare Earths Separation Plant, Saldanha, Western Cape Province.

MAREE, K. AND D. VROMANS. 2010. The Biodiversity Sector Plan for the Saldanha Bay, Bergrivier, Cederberg and Matzikama Municipalities. Supporting land-use planning and decision-making in Critical Biodiversity Areas and Ecological Support Areas. Produced by CapeNature as part of the C.A.P.E. Fine-scale Biodiversity Planning Project. SANBI, Kirstenbosch.

PENCE, G. 2008. Fine Scale Conservation Plan for the Saldanha Municipality. Report for CapeNature, as part of the C.A.P.E. programme.

PETHER, J. 2012. Palaeontological Assessment (Desktop Study) for the Proposed Rare Earths Separation Plant on Portion 6 of Langeberg 188, Saldanha Bay Local Municipality. Vredenburg Magisterial District

PLOMP, H. 2004. A process for assessing and evaluating environmental management risk and significance in a gold mining company. Conference Papers-Annual National Conference of the International Association for Impact Assessment: South African Affiliate.

RAIMONDO, D., VON STADEN, L., FODEN, W., VICTOR, J.E., HELME, N.A., TURNER, R.C., KAMUNDI, D.A., AND MANYAMA, P.A. (eds.) 2009. Red List of South African Plants 2009. Strelitzia 25. South African National Biodiversity Institute, Pretoria.

STUIVENBERG, P. 2013. Saldanha Industrial Park Masterplan Powerpoint Presentation, Saldanha, Western Cape Province.

10 APPENDIX A: PUBLIC PARTICIPATION

10.1 Appendix A1: Background Information Document

10.2 Appendix A2.1: Notification Letters

10.3 Appendix A2.2: Proof of Delivery – Notification Letters

10.4 Appendix A2.3: Correspondence to and from I&APs

10.5 Appendix A3.1: Site Notices

10.6 Appendix A3.2: Proof of Site Notices

10.7 Appendix A4.1: Newspaper Advertisements

10.8 Appendix A4.2: Proof of Newspaper Advertisements

10.9 Appendix A5.1: Focus Group Meetings

10.10 Appendix A5.2: Open Day

10.11 Appendix A6: Comments and Response Report

11 APPENDIX B: CORRESPONDENCE FROM DEADP

12 APPENDIX C: COMPANY PROFILE AND CV OF PROJECT TEAM

13 APPENDIX D: PLAN OF STUDY FOR EIA

14 APPENDIX E: PRELIMINARY PLANT LAYOUT AND PROCESS FLOW DIAGRAMS

15 APPENDIX F: OTHER LEGISLATIVE REQUIREMENTS

This appendix supports the information already contained in Chapter 3 of the main report and serves to add to the summary contained in the Scoping Report.

15.1 The Constitution of the Republic of South Africa (Act 108 of 1996)

Section 2 of the Constitution of the Republic of South Africa (Act 108 of 1996) (CA) states that: "This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled." Section 24 of the CA, states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

- prevent pollution and ecological degradation;
- promote conservation; and
- secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Section 24 guarantees the protection of the environment through reasonable legislative (and other measures) and such legislation is continuously in the process of being promulgated. Section 33(1) concerns administrative justice which includes the constitutional right to administrative action that is lawful, reasonable and procedurally fair.

15.2 The Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)

The purpose of the Promotion of Administrative Justice Act (PAJA) is principally to give effect to the constitutional right to administrative action that is lawful, reasonable and procedurally fair; and to the right to written reasons for administrative action as contemplated in section 33 of the Constitution; and to provide for matters incidental thereto.

Administrative law governs the relationships between public bodies, and between public and private bodies and/or individuals. Because so many activities which affect the environment require authorisation from a public body, and environmental conflicts usually arise from the exercise of administrative decision-making powers, administrative law principles are of particular relevance to environmental law generally, and specifically in the context of the environmental authorisation requirements stipulated by the provisions of section 24 of the NEMA read with its subordinate legislation regulating environmental

impact assessment (or EIA).

15.3 The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)

Closely linked to the notion of administrative justice is the right of access to information. Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or well-being or, for that matter, any other Constitutional right) has been infringed. The purpose of the Promotion of Access to Information Act ("PAIA") is to give effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith.

In addition to providing access to information, cognisance should be taken that PAIA also makes provision for the refusal of access to information that is deemed to be of a sensitive, confidential or classified nature. This is captured under Chapter 4 of part 2 and 3 of PAIA.

15.4 The National Environmental Management Act (107 of 1998) (NEMA)

Section 2 of NEMA (Act no 107 of 1989) provides for National Environmental Management Principles. These principles include:

- Environmental management must place people and their needs at the forefront of its concern.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
- Environmental justice must be pursued.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued.
- Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
- The participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted.

- Decisions must take into account the interests, needs and values of all I&APs.
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

15.5 National Environmental Management: Air Quality Act, 2003 (Act No. 39 of 2004) (NEMAQA)

Section 2 of the NEMAQA sets out what the objects of the Act are. It provides for the protection of the environment by stipulating that reasonable measures be taken for the protection and enhancement of the quality of the air in the Republic, the prevention of air pollution and ecological degradation and securing ecologically sustainable development while at the same time promoting justifiable economic and social development.

Section 21 deals with the listing of activities and states that the Minister or MEC must by notice in the Gazette publish a list of activities which result in atmospheric emissions and which he/she reasonably believes have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage, and when necessary amend the list.

15.6 National Environmental Management Waste Act (Act 59 of 2008) (NEMWA)

The NEMWA commenced on 1 July 2009, and as a result of its commencement the relevant provisions in the Environment Conservation Act 73 of 1989 (ECA) in respect of waste management, were repealed.

In accordance with section 19(3), the Schedule to GN 718 provides that a waste management licence is required for those activities listed therein prior to the commencement, undertaking or conducting of same. In addition, GN 718 differentiates

between Category A and Category B waste management activities. Category A waste management activities are those which require the conducting of a basic assessment process and Category B waste management activities are those that require the conducting of a scoping and environmental impact assessment process.

15.7 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEMBA) aims to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.

The NEMBA provides for the publishing of various lists of species and ecosystems by the Minister of Environmental Affairs and Tourism (now the Minister of Water and Environmental Affairs) as well as by a Member of the Executive Council responsible for the conservation of biodiversity of a province in relation to which certain activities may not be undertaken without a permit. In terms of Section 57 of the NEMBA, no person may carry out any restricted activity involving any species which has been identified by the Minister as "critically endangered species", "endangered species", "vulnerable species" or "protected species" without a permit. The NEMBA defines "restricted activity" in relation to such identified species so as to include, but not limited to, "hunting, catching, capturing, killing, gathering, collecting, plucking, picking parts of, cutting, chopping off, uprooting, damaging, destroying, having in possession, exercising physical control over, moving or translocating".

The Minister has made regulations in terms of section 97 of the NEMBA with regards to Threatened and Protected Species which came into effect on 1 June 2007. Furthermore, the Minister published lists of critically endangered, endangered, vulnerable and protected species in terms of section 56(1) of the NEMBA.

15.8 The Water Services Act (Act 108 of 1997)

The main objects of this Water Services Act, 108 of 1997 ("WSA") are to, inter alia, provide for the right of access to basic water supply and the right to basic sanitation necessary to secure sufficient water and an environment not harmful to human health or wellbeing.

Section 6 of the WSA provides for access to water services through a nominated water

services provider and section 6(1) states that subject to subsection (2), no person may use water services from a source other than a water services provider nominated by the water services authority having jurisdiction in the area in question, without the approval of that water services authority.

Section 7 pertains to the industrial use of water and section 7(1) states that subject to subsection (3), no person may obtain water for industrial use from any source other than the distribution system of a water services provider nominated by the water services authority having jurisdiction in the area in question, without the approval of that water services authority. Subsection (2) states that subject to subsection (3), no person may dispose of industrial effluent in any manner other than that approved by the water services provider nominated by the water services authority having jurisdiction in the area in question. Subsection (4) states that no approval given by a water services authority under this section relieves anyone from complying with any other law relating to the use and conservation of water and water resources or the disposal of effluent.

15.9 The National Heritage Resources Act (Act 25 of 1999) (NHRA)

The NHRA established the South African Heritage Resources Agency (SAHRA) as well as provincial heritage resources agencies. In terms of the NHRA, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

16 APPENDIX G CONFIRMATION OF THE AVAILABILITY OF SERVICES FROM SERVICE PROVIDERS

17 APPENDIX H PALAEONTOLOGICAL ASSESSMENT (DESKTOP STUDY) – JOHN PETHER

18 APPENDIX I ARCHAEOLOGICAL STUDY – JONATHAN KAPLAN