Final Scoping Report for the Proposed Acetylene Gas Production Facility in Gauteng

Air Products South Africa (Pty) Ltd

March 2014

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FINAL SCOPING REPORT

Environmental Impact Assessment for the Acetylene Gas Production Facility in Gauteng

Air Products South Africa (Pty) Ltd

Prepared by: Kasantha Moodley

March 2014

For and on behalf of
Environmental Resources Management

Approved by: Sue Posnik
Signed:

Position: Partner
Date: 18 March 2014

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TABLE OF CONTENTS

GLOSSARY OF TERMS

LIST OF ACRONYMS

UNITS OF MEASUREMENT

1 INTRODUCTION 1

1.1 PURPOSE OF THIS REPORT 1
1.2 PROJECT OVERVIEW 1
1.3 PROJECT LOCATION 2
1.4 PROJECT DEVELOPER 4
1.5 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) 4
1.6 ASSUMPTIONS AND LIMITATIONS 4
1.7 OPPORTUNITY TO COMMENT ON THIS FINAL SCOPING REPORT 5

2 ADMINISTRATIVE FRAMEWORK 6

2.1 NATIONAL AND LOCAL LEGISLATIVE REQUIREMENTS 6

2.1.1 National Environmental Management Act (Act No. 107 of 1998), as amended 6
2.1.2 National Heritage Resources Act (No. 25 of 1999) 8
2.1.3 National Environmental Management: Air Quality Act, 2008 (Act No. 39 of 2008) 9
2.1.4 National Water Act (Act No. 36 of 1998) 9
2.1.5 National Environmental Management: Biodiversity Act, 2008 (Act No. 10 of 2004) 10

2.1.6 National Environmental Management: Waste Act (Act No. 59 of 2008) 10

2.1.7 Midvaal Local Municipality Waste Management By Law (2009) 11
2.1.8 Integrated Legislative Processes 11

2.2 BROADER POLICY AND PLANNING CONTEXT 11

2.2.1 Gauteng Growth and Development Strategy (2005) 11
2.2.2 Sedibeng District Municipality Spatial Development Framework (2013) 12
2.2.3 Midvaal Local Municipality Spatial Development Framework (2011) 12
2.2.4 Sedibeng District Municipality Integrated Development Plan (2013-2014) 14
2.3 AIR PRODUCTS POLICY AND PROCEDURES 14

3 PUBLIC PARTICIPATION PROCESS 16

3.1 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS 16
3.2 PROJECT STAKEHOLDERS 17
3.3 SCOPING PUBLIC PARTICIPATION ACTIVITIES 18
3.4 PUBLIC PARTICIPATION DURING THE IMPACT ASSESSMENT PHASE 19
3.5 COMPETENT AUTHORITY’S DECISION 20

4 PROJECT DESCRIPTION 21
4.1 BACKGROUND 21
4.2 PROJECT COMPONENTS 21
4.2.1 Generator Vessel (1) 23
4.2.2 Filler Hoppers (2) and Hoist (3) 23
4.2.3 Heat Exchanger (4) 24
4.2.4 Low Pressure Dryer (5) 24
4.2.5 Ammonia Scrubber (7) 24
4.2.6 Acetylene Compressor Panel (8) 24
4.2.7 High Pressure Dryer (9) 24
4.2.8 Pre Inspection / High Pressure Filler (10) 24
4.2.9 Process Systems (11-20) and Piping 25
4.3 ASSOCIATED INFRASTRUCTURE 25
4.4 PROJECT SCHEDULE 26
4.5 PLANNING & DESIGN 26
4.6 CONSTRUCTION 29
4.6.1 Site Clearing 29
4.6.2 Construction Camp 29
4.6.3 Roads and Paved Areas 29
4.6.4 Site Services 30
4.6.5 Waste Management 30
4.7 OPERATION 31
4.7.1 Cylinder Distribution 31
4.7.2 Energy Supply and Substation 31
4.7.3 Water Supply System 32
4.7.4 Storm Water Management 32
4.7.5 Storage Facilities 33
4.7.6 Process By-Product 34
4.7.7 Waste Management 34
4.7.8 Emergency Planning 35
4.7.9 Control Room 35
4.7.10 Workshop and Maintenance Area 35
4.7.11 Administrative Offices and Change Facilities 35
4.7.12 Security Facilities 37
4.8 EMPLOYMENT 37
5 PROJECT ALTERNATIVES 38
5.1 LOCATION ALTERNATIVES 38
5.2 SITE LAYOUT ALTERNATIVES 44
5.3 TECHNOLOGY ALTERNATIVES 44
5.4 NO-GO ALTERNATIVE 45
6 RECEIVING ENVIRONMENT 46
6.1 CLIMATE 46
6.2 TOPOGRAPHY AND LANDSCAPE 46
6.3 SITE GEOLOGY AND SOILS 47
6.4 WATER RESOURCES 48
6.4.1 Surface Water 48
6.4.2 Groundwater 48
LIST OF FIGURES

Figure 1.1  Project Location 3
Figure 2.1  EIA Process 8
Figure 2.2  Location of Project Site and Development Node 13
Figure 3.1  Public Participation Process Phases 17
Figure 3.2  Open House Event 19
Figure 4.1  Schematic of a Typical Acetylene Gas Facility 22
Figure 4.2  Photograph of Generator Vessel and Filler Hoppers on top 23
Figure 4.3  Cylinder Filling 25
Figure 4.4  Conceptual layout plan 28
Figure 4.5  Buildings to be Removed 29
Figure 4.6  Tillet Road 30
Figure 4.7  Farmhouse to be used as Administrative Offices 36
Figure 4.8  Outbuilding to be used as Change Facilities 36
Figure 6.1  Photograph of Proposed Site (facing West) 47
Figure 6.2  Orange River Catchment 48
Figure 6.3  Administrative Levels 51
Figure 7.1  Potential Environmental Impacts of Acetylene Plants 56
Figure 8.1  Impact Significance 73

LIST OF TABLES

Table 1.1  ERM Core Project Team 4
Table 1.2  Final Scoping Report Viewing Locations 5
Table 2.1  Applicable Legislation and Policy 6
Table 2.2  Listed Activities in Terms of NEMA EIA Regulations 7
Table 2.3  Summary of Legislative Applications and Relevant Competent Authorities 11
Table 3.1  Public Participation Tasks: Scoping Phase 18
Table 4.1  List of Components included in a typical Acetylene Gas Facility 22
Table 4.2  Provisional Project Schedule 26
Table 4.3  Operational Waste 34
Table 5.1  Summary of Alternative Sites 40
Table 6.1  Socioeconomic Characteristics of Municipality 51
Table 7.1  Interaction between Project Activities and Receiving Environment 55
Table 7.2  Summary of Comments Raised by Key Authorities 57
Table 7.3  Summary of Key Issues Raised by I&APs 57
Table 8.1  EIA Specialist Team 63
Table 8.2  Impact Characteristics 69
Table 8.3  Definitions for Likelihood 70
Table 8.4  Biological and Species Value / Sensitivity Criteria 72
Table 8.5  Socioeconomic Sensitivity Criteria 73
Table 8.6  Mitigation Hierarchy 75
Table 8.7  Provisional EIA Schedule 76

LIST OF ANNEXURES

Annex A:  Site Locality Map and Site Plan
Annex B: GDARD Acknowledgment of Application
Annex C: Site Photograph Log
Annex D: Land Use Zoning Certificates
Annex E: Public Consultation Documentation

Annex E1: Background Information Document
Annex E2: Stakeholder Initial Notification
Annex E3: Proof of Site Notices and Newspaper Advertisements
Annex E4: Stakeholder Correspondence on Application
Annex E5: Stakeholder Correspondence on the Draft Scoping Report
Annex E6: Project Stakeholder Database
Annex E7: Comments and Responses Report
Annex E8: Key Authorities Meeting Minutes
Annex E9: Public Meeting Minutes
Annex E10: Stakeholder Notification of the Final Scoping Report
**GLOSSARY OF TERMS**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>alternative</td>
<td>In relation to a proposed activity/development, means different ways of meeting the general purpose and requirements of the activity, which may include alternatives to-&lt;br&gt; (a) the property on which, or location where the activity/development is proposed to be undertaken;&lt;br&gt; (b) the type of activity/development to be undertaken;&lt;br&gt; (c) the design or layout of the activity/development;&lt;br&gt; (d) the technology to be used for the activity/development;&lt;br&gt; (e) the operational aspects of the activity/development; and&lt;br&gt; (f) the option of not implementing the activity/development.</td>
</tr>
<tr>
<td>biodiversity</td>
<td>Biological diversity” (or “biodiversity”) means the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.</td>
</tr>
<tr>
<td>catchment</td>
<td>The area from which any rainfall will drain into the watercourse or watercourses or part of the water course, through surface flow to a common point or common points.</td>
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<tr>
<td>construction</td>
<td>Means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and exclude the reconstruction of the same facility in the same location, with the same capacity and footprint.</td>
</tr>
<tr>
<td>dirty area</td>
<td>An area that is likely to be impacted/contaminated/affected by an activity/development to a level that it could be deemed to require management or clean up.</td>
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<tr>
<td>environment</td>
<td>The surroundings within which humans exist and that are made up of:&lt;br&gt; i. the land, water and atmosphere of the earth;&lt;br&gt; ii. micro-organisms, plant and animal life;&lt;br&gt; iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and&lt;br&gt; iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. This includes the economic, social, cultural, historical and political circumstances, conditions and objects that affect the existence and development of an individual, organism or group.</td>
</tr>
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<td>environmental impact assessment (EIA)</td>
<td>Refers to the process of systematically identifying, predicting, assessing and reporting the potential positive and negative social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation or permission by law and which may significantly affect the environment. The EIA includes an evaluation of alternatives, as well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the Project and environmental management and monitoring measures.</td>
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<tr>
<td>formation</td>
<td>A general term used to describe a sequence of rock layers.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<td>--------------</td>
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<tr>
<td>impact</td>
<td>Any alteration of existing conditions, adverse or beneficial, caused directly or indirectly by the Project. (It is recognised that there will be some impacts that will definitely occur, and others that may or may not occur, depending on various factors. To avoid the attempt to incorporate a factor of probability (ie, that a given activity will certainly result in a given impact) into the EIA Process, the term “impact” will be used, as opposed to using “potential impact” some or all of the time depending on the specific impact in question.)</td>
</tr>
<tr>
<td>interested and affected parties (I&amp;APs)</td>
<td>Any person, group of persons, organisation or any organ of state that may have jurisdiction over any aspect of / or whose interests may be positively or negatively affected by the proposal or activity and / or who are concerned with a proposal or activity and its consequences.</td>
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<tr>
<td>natural habitat</td>
<td>Land and water areas where (i) the ecosystems' biological communities are formed largely by native plant and animal species, and (ii) human activity have not essentially modified the area’s primary ecological functions. All natural habitats have important biological, social, economic, and existence value.</td>
</tr>
<tr>
<td>mitigate</td>
<td>A feature, procedure or other action that the Project commits to implement to avoid or reduce the magnitude of an adverse impact, or to enhance the magnitude of a positive impact.</td>
</tr>
<tr>
<td>phased activities</td>
<td>Means an activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity through interconnected internal vehicular or pedestrian circulation, sharing of infrastructure, or the continuum of design, style or concept by the same proponent or his or her successors.</td>
</tr>
<tr>
<td>Project</td>
<td>The features and activities that are a necessary part of the Project Proponent’s development, including all associated facilities without which the Project cannot proceed. (The Project excludes activities which are prompted to occur by the Project but which are not essential to its development and are undertaken by others (ie, induced activities).) The Project is also typically the collection of features and activities for which consent, permission or other authorization is being sought.</td>
</tr>
<tr>
<td>public participation process</td>
<td>A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. The public participation process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.</td>
</tr>
<tr>
<td>reasonable measures</td>
<td>The measures that a reasonable person would regard necessary for the specific purpose. Reasonable person in this case would refer to a person with expertise in the specific field.</td>
</tr>
<tr>
<td>scoping</td>
<td>The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.</td>
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</table>
Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).

**stakeholder/interested and affected party**
A person, group or organization with the potential to affect or be affected by the process or outcome of the Project.
**LIST OF ACRONYMS**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEL</td>
<td>Air Emissions Licence</td>
</tr>
<tr>
<td>ALARP</td>
<td>As Low As Reasonably Possible</td>
</tr>
<tr>
<td>BID</td>
<td>Background Information Document</td>
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<tr>
<td>C2H2</td>
<td>Acetylene Gas</td>
</tr>
<tr>
<td>CaC2</td>
<td>Calcium Carbide</td>
</tr>
<tr>
<td>Ca(OH)2</td>
<td>Calcium Hydroxide</td>
</tr>
<tr>
<td>CRR</td>
<td>Comments and Responses Report</td>
</tr>
<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
</tr>
<tr>
<td>DSR</td>
<td>Draft Scoping Report</td>
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<tr>
<td>DWA</td>
<td>Department of Water Affairs</td>
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<tr>
<td>EAP</td>
<td>Environmental Assessment Practitioner</td>
</tr>
<tr>
<td>ECA</td>
<td>Environmental Conservation Act, 1989 (Act No. 73 of 1989)</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EIAR</td>
<td>Environmental Impact Assessment Report</td>
</tr>
<tr>
<td>EIGA</td>
<td>European International Gasses Association</td>
</tr>
<tr>
<td>EMPr</td>
<td>Environmental Management Programme</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>ERM</td>
<td>Environmental Resources Management Southern Africa (Pty) Ltd</td>
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<tr>
<td>EMPr</td>
<td>Environmental Management Programme</td>
</tr>
<tr>
<td>FSR</td>
<td>Final Scoping Report</td>
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<tr>
<td>GDARD</td>
<td>Gauteng Department of Agriculture and Rural Development</td>
</tr>
<tr>
<td>GN</td>
<td>Government Notice</td>
</tr>
<tr>
<td>GNR</td>
<td>Government Notice Regulation</td>
</tr>
<tr>
<td>GVA</td>
<td>Gross Value Added</td>
</tr>
<tr>
<td>Ha</td>
<td>Hectares</td>
</tr>
<tr>
<td>HIA</td>
<td>Heritage Impact Assessment</td>
</tr>
<tr>
<td>HSR</td>
<td>Heritage Statement Report</td>
</tr>
<tr>
<td>I&amp;AP's</td>
<td>Interested and Affected Parties</td>
</tr>
<tr>
<td>IDP</td>
<td>Integrated Development Plan</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organisation for Standardisation</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
</tr>
<tr>
<td>JSE</td>
<td>Johannesburg Stock Exchange</td>
</tr>
<tr>
<td>MHI</td>
<td>Major Hazardous Installation</td>
</tr>
<tr>
<td>NAAQS</td>
<td>National Ambient Air Quality Standard</td>
</tr>
<tr>
<td>NEM-BA</td>
<td>National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)</td>
</tr>
<tr>
<td>NFA</td>
<td>National Forest Act, 1998 (Act No. 84 of 1998)</td>
</tr>
<tr>
<td>NHRA</td>
<td>National Heritage Resources Act, 1999 (Act No 25 of 1999)</td>
</tr>
<tr>
<td>NID</td>
<td>Notice of Intent to Develop</td>
</tr>
<tr>
<td>NO2</td>
<td>Nitrogen Dioxide</td>
</tr>
<tr>
<td>NOSA</td>
<td>National Occupational Safety Association</td>
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<tr>
<td>PIA</td>
<td>Paleontological Impact Assessment</td>
</tr>
<tr>
<td>PM10</td>
<td>Particulate Matter &lt;10micron</td>
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<tr>
<td>PoS</td>
<td>Plan of Study Paleontological Impact Assessment</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Participation Process</td>
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<td>PSA</td>
<td>Pressure Swing Adsorption</td>
</tr>
<tr>
<td>Pty Ltd</td>
<td>Propriety Limited</td>
</tr>
<tr>
<td>PV</td>
<td>Photovoltaic</td>
</tr>
<tr>
<td>SA</td>
<td>South Africa</td>
</tr>
<tr>
<td>SAHRA</td>
<td>South African Heritage Resources Agency</td>
</tr>
<tr>
<td>SDF</td>
<td>Spatial Development Framework</td>
</tr>
<tr>
<td>ToR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>WML</td>
<td>Waste Management Licence</td>
</tr>
<tr>
<td>WULA</td>
<td>Water Use Licence Application</td>
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**UNITS OF MEASUREMENT**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>kPa</td>
<td>Kilopascals</td>
</tr>
<tr>
<td>kPag</td>
<td>Kilopascal Gauge</td>
</tr>
<tr>
<td>l</td>
<td>Litre</td>
</tr>
<tr>
<td>m³</td>
<td>Cubic metres</td>
</tr>
<tr>
<td>m³/day</td>
<td>Cubic metres per day</td>
</tr>
<tr>
<td>m²</td>
<td>Square metres</td>
</tr>
<tr>
<td>m</td>
<td>Metres</td>
</tr>
<tr>
<td>mm</td>
<td>Millimetres</td>
</tr>
<tr>
<td>m/s</td>
<td>Metres per second</td>
</tr>
<tr>
<td>MW</td>
<td>Megawatts</td>
</tr>
<tr>
<td>ppm</td>
<td>Parts per million</td>
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</tbody>
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1  INTRODUCTION

1.1  PURPOSE OF THIS REPORT

Air Products South Africa (Pty) Ltd (Air Products) has appointed Environmental Resources Management Southern Africa (Pty) Ltd (ERM), as the independent environmental consultants to undertake the Environmental Impact Assessment (EIA) process for the proposed new acetylene gas production facility, located in Daleside, south of Johannesburg in Gauteng (hereafter referred to as the Project). The acetylene gas produced will be stored in gas cylinders and distributed to various markets, including the petrochemical and automotive industries.

This Final Scoping Report (FSR) has been compiled as part of the EIA process in accordance with the regulatory requirements stipulated in the EIA Regulations (Government Notice R543) promulgated in terms of Section 24(5) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), as amended. The main objectives of this report are to:

• outline the proposed Project and regulatory process to be followed;
• identify all environmental and social impacts of the proposed Project;
• identify and address concerns raised by all interested and affected parties (I&APs);
• identify feasible alternatives of the proposed Project; and
• focus on significant environmental and social issues for further investigation during the EIA process.

All comments received on the Draft Scoping Report, which was made available for public review between 17 January 2014 and 26 February 2014 have been noted in this Final Scoping Report. Refer to Annex E7 for a detailed record of all comments received. These comments form a fundamental component of the EIA process will be used to help guide the planning and design phase of the Project. Section 1.7 provides further detail on how project stakeholders can comment on this Final Scoping Report.

1.2  PROJECT OVERVIEW

Acetylene gas (C$_2$H$_2$) is a chemical compound, which has no odour or colour in its purest form. It is used amongst various industrial sectors as a fuel or chemical building block. The key markets for acetylene gas include automotive, petrochemical, paper, steel and food and beverage industries.

The Project will produce acetylene gas from mixing calcium carbide (CaC$_2$) with water. This mixture results in an exothermic reaction, where acetylene gas is released.

The Project will be developed in a phased approach, with 2 defined phases:
• **Phase 1**: 1 generator vessel, 6 compressors and 2 filling halls with a total production capacity of 7200 m$^3$/day;
• **Phase 2**: 1 additional generator vessel with an additional 2 filling halls and 6 compressors with a production capacity of 7200 m$^3$/day

The Project will therefore produce a maximum of 14400 m$^3$ of acetylene gas per day and will comprise the following components:

- turn bins, used to store and feed the calcium carbide into the system;
- generator vessel, where the reaction takes place to produce the acetylene gas;
- heat exchanger to cool down the acetylene gas. Chilled water is used as the cooling medium;
- ammonia scrubber, to remove impurities from the acetylene gas.
- low pressure dryer to remove moisture from the acetylene gas;
- compressors are used to compress the gas to approximately 2400kPa;
- high pressure dryers to remove excess moisture in the gas before it is filled into cylinders; and
- storage vessels for the nitrogen and acetone.

Associated infrastructure required as part of the Project include an administration office, a workshop, a one-way ring road and sludge tanks and pits for the slurry of the calcium hydroxide (Ca(OH)$_2$), which is a by-product of the gas production process.

1.3 **PROJECT LOCATION**

The proposed acetylene gas production facility is planned to be situated in the Midvaal Local Municipality, which falls within the jurisdiction of the Sedibeng District Municipality in Gauteng.

The proposed development site is located on Stands 88 and 89 of Valley Settlements Agricultural Holdings at Daleside (the site). The site is approximately 7km north of Meyerton and situated between the M61 (Springbok Road) and the R 59. The site can be accessed via Tillet Road, just off the M61 (refer to Figure 1.1). The locality map below can also be viewed in Annex A. The total area of the site is 4.4 ha.

The site is largely undeveloped and is currently zoned for industrial purposes (Industrial 3) and is bound by Tillet Road to the east, a manufacturing facility to the north, vacant and undeveloped land to the west and another manufacturing facility to the south.
Figure 1.1  Project Location
1.4 **PROJECT DEVELOPER**

Air Products is registered as a private company on the basis of a 50/50 joint venture between Air Products, Chemicals INC and Metkor Group Holdings, a quoted company on the Johannesburg Stock Exchange (JSE).

The company manufactures, supplies and distributes a wide variety of industrial and specialty gas products and chemicals to the Southern African region. Products include hydrogen, chlorine, ammonia and methane. Air Products currently operates a total of 9 facilities across South Africa with headquarters in Kempton Park. The company is certified for quality, environmental and health and safety management systems (ie ISO 9000, ISO 14001 and ISO 22000) and is also rated 5 Star by the National Occupational Safety Association (NOSA).

1.5 **ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

ERM was appointed by Air Products to undertake the EIA for the proposed construction and operation of an acetylene gas production facility. ERM and appointed specialists have no financial ties to, nor are they a subsidiary, legally or financially, of Air Products. Remuneration for the services by the applicant (Air Products) in relation to this EIA is not linked to an approval by the decision-making authority. Furthermore, ERM has no secondary or downstream interest in the development.

ERM is a global environmental consulting organisation employing over 3 500 specialists in over 145 offices in more than 41 countries. ERM Southern Africa in turn is one of the largest environmental consulting firms in the African region, with extensive experience in South Africa particularly. A list of the EIA Project team is provided in Table 1.1 below, together with the associated qualifications and experience.

<table>
<thead>
<tr>
<th>Table 1.1 ERM Core Project Team</th>
</tr>
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</table>
| **Partner in Charge** Sue Posnik BA Hons (Geography)  
Over 25 years of relevant experience |
| **Project Manager** Kasantha Moodley Bsc Hons (Environmental Science)  
Over 6 years of relevant experience |

1.6 **ASSUMPTIONS AND LIMITATIONS**

During the compilation of this Final Scoping Report, the following limitations and assumptions were made.

- The scope of the EIA process is limited to the construction and operation of a new acetylene gas production facility and the associated
infrastructure (as described in Section 1.2).

- This report was prepared based on the most up to date project description provided by the applicant. The project description may change as the design for the acetylene gas production facility is developed in more detail.

### 1.7 OPPORTUNITY TO COMMENT ON THIS FINAL SCOPING REPORT

The public commenting period for this Final Scoping Report commences on **20 March 2014 and concludes on 10 April 2014.**

This Final Scoping Report has been placed at the following venues for public review:

<table>
<thead>
<tr>
<th>Location</th>
<th>Contact</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henley on Klip Public Library</td>
<td>Mary Walker</td>
<td>(016) 366 0112</td>
</tr>
<tr>
<td>Cnr of Regatta Road and Nuneham</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henley on Klip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Randvaal Public Library</td>
<td>Moira Frost</td>
<td>(016) 365 5093</td>
</tr>
<tr>
<td>Houtkapper Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Randvaal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Website:</td>
<td>Janet Mkhabela</td>
<td>(011) 798 4300</td>
</tr>
<tr>
<td><a href="http://www.erm.com/AirproductsEIA">http://www.erm.com/AirproductsEIA</a></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please remember to submit your comments on the Final Scoping Report by the **10 April 2014.** All comments must be forwarded to the following:

**ATTENTION: JANET MKHABELA**

**ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**

**POSTAL ADDRESS:** **POSTNET SUITE 624, PRIVATE BAG X29, GALLO MANOR, 2052**

**TEL:** **(011) 798 4300**

**FAX:** **(086) 688 2569**

**EMAIL:** **AIRPRODUCTSEIA@ERM.COM**
This chapter presents a summary of the administrative framework governing the development of the proposed acetylene gas production facility, which is subject to legislative and policy requirements at national, provincial and local level. It focuses on legal requirements related to environmental licensing of activities, as well as legal requirements for environmental protection such as: standards for environmental quality control and pollution, biodiversity protection, and cultural and historic heritage sites. The legal requirements pertaining to social aspects, public participation and socio-economic aspects are also adhered to through this EIA process.

A list of the relevant national, provincial and local legislation and policies that are relevant to the proposed development of the acetylene gas production facility has been provided in Table 2.1 below. A description of their applicability to the proposed Project is presented in the sections that follow.

<table>
<thead>
<tr>
<th>Title</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Environmental Management Act (as amended)</td>
<td>1998</td>
</tr>
<tr>
<td>Environmental Impact Assessment Regulations (GN R.543, 544, 545)</td>
<td>2010</td>
</tr>
<tr>
<td>National Heritage Resources Act</td>
<td>1999</td>
</tr>
<tr>
<td>National Environmental Management: Air Quality Act</td>
<td>2008</td>
</tr>
<tr>
<td>National Water Act</td>
<td>1996</td>
</tr>
<tr>
<td>National Environmental Management: Biodiversity Act</td>
<td>2004</td>
</tr>
<tr>
<td>National Environmental Management: Waste Management Act</td>
<td>2008</td>
</tr>
<tr>
<td>Midvaal Local Municipality Waste Management By Law</td>
<td>2009</td>
</tr>
<tr>
<td>Gauteng Growth and Development Strategy</td>
<td>2005</td>
</tr>
<tr>
<td>Sedibeng District Municipality Integrated Development Plan (IDP)</td>
<td>2013/2014</td>
</tr>
<tr>
<td>Sedibeng District Municipality Spatial Development Framework (SDF)</td>
<td>2013</td>
</tr>
<tr>
<td>Midvaal Local Municipality Spatial Development Framework</td>
<td>2011</td>
</tr>
</tbody>
</table>

2.1 NATIONAL AND LOCAL LEGISLATIVE REQUIREMENTS

2.1.1 National Environmental Management Act (Act No. 107 of 1998), as amended

The National Environmental Management Act (Act No. 107 of 1998), as amended (NEMA) requires that the potential impact on the environment, socio-economic conditions, and cultural heritage of activities that require authorisation or permission by law must be considered, investigated and assessed prior to implementation, and reported to the relevant authority.

An EIA Application was submitted to the Gauteng Department of Agriculture and Rural Development (GDARD), the competent authority to formally initiate the EIA process on 06 November 2013 (Reference Number: Gaut 002/13-14/E0239). The GDARD Acknowledgment of Receipt is attached as
Annex B. Also attached is GDARDs acknowledgement of the Draft Scoping Report.

The EIA Regulations (Government Notice R. 543) promulgated in terms of the NEMA, identifies a suite of activities, which “could have a substantial detrimental effect on the environment”. The listed activities identified require an environmental authorisation from the competent authority, ie GDARD, prior to commencement of the activity. The proposed acetylene gas manufacturing facility and associated infrastructure triggers a list of activities, tabulated in Table 2.2 below. Activities listed in terms of GN R. 544 require a Basic Assessment, while activities listed in GN R. 545 require a full Scoping and EIA process.

Table 2.2  Listed Activities in Terms of NEMA EIA Regulations

<table>
<thead>
<tr>
<th>Government Notice R. 545 of 2010 (Full Scoping and EIA)</th>
<th>Applicability to Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 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.</td>
<td>Calcium carbide, acetone and acetylene gas will be stored on site, with combined storage capacities greater than 500m³.</td>
</tr>
<tr>
<td>Activity 4: The construction of facilities or infrastructure for the refining, extraction or processing of gas, oil or petroleum products with an installed capacity of 50 cubic metres or more per day.</td>
<td>The production capacity of the Project is 14 400m³/day.</td>
</tr>
<tr>
<td>Activity 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.</td>
<td>The Project requires an Air Emissions Licence (AEL).</td>
</tr>
</tbody>
</table>

As the Project triggers activities listed in both GN R. 544 and GN R. 545, a Scoping and EIA process will thus be undertaken to meet the requirements in terms of NEMA. Figure 2.1 below defines each step of the regulatory EIA process.
2.1.2 National Heritage Resources Act (No. 25 of 1999)

The protection and management of South Africa’s heritage resources is controlled by the National Heritage Resources Act (NHRA), 1999 (Act No. 25 of 1999). The objective of the NHRA is to introduce an integrated system for the management of national heritage resources. The South African Heritage Resources Agency (SAHRA) is the responsible heritage resources administrator in the Gauteng region.
Section 38 of the NHRA requires that Heritage Impact Assessments (HIA’s) are required for certain kinds of development such as altering the character of a site greater than 5000 m².

A Notice of Intent to Develop (NID) and a Brief Heritage Survey Report has been submitted to the SAHRA informing them of the Project. In a Final Decision made on 19 February 2014, SAHRA had no objection to the proposed development and granted exemption from further heritage assessments; on condition that, if bedrock is to be affected by the proposed development, a palaeontological field assessment and protocol for finds must be conducted and submitted to SAHRA for comments prior to any development.

Please refer to Annex E5 for SAHRAs Decision Letter.

2.1.3 National Environmental Management: Air Quality Act, 2008 (Act No. 39 of 2008)

The aim of the National Environment Management: Air Quality Act (Act No. 39 of 2008) (NEM:AQA) is to govern the release of pollutants in order to manage air quality parameters, norms and standards within South Africa. GN R. 248 (2010) was promulgated in terms of NEM: AQA and lists activities resulting in atmospheric emissions which have or may have a significant detrimental effect on the environment. Subcategory 6.1 (Organic Chemical Manufacturing) is the activity triggered in terms of NEM: AQA, and therefore requires the submission of an Atmospheric Emissions License Application Form to the Sedibeng District Municipality.

The site is also located within the Vaal Triangle Air-Shed Priority Area, which is regulated by the Vaal Triangle Air-Shed Priority Area Air Quality Management Plan and associated implementation regulations.

2.1.4 National Water Act (Act No. 36 of 1998)

The National Water Act (Act No. 36 of 1998) (NWA) provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA. The Department of Water Affairs (DWA) is the delegated custodian of water resources in South Africa. Part of the DWA mandate is to enact and enforce the legal requirements outlined in the NWA.

In terms of Section 21 (ie Chapter 4), the NWA identifies a suite of water uses that either require Registration or Licensing before proceeding. Water uses include the abstraction or storage of water, as well as impeding or diverting the flow of a watercourse or discharging of waste into a watercourse.
Based on potential water uses, the NWA requires that a water user must undertake a full licensing process. There are two existing boreholes on the site, which may be used to supplement the Project’s water requirements. The Project may thus trigger Section 21 (a), taking water from a water source. A full Water Use License Application (WULA) process will be completed, should Air Products decide to utilize borehole water.

2.1.5 National Environmental Management: Biodiversity Act, 2008 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act, 2008 (Act No. 10 of 2004) (NEM: BA) serves to provide a framework for the management and conservation of South African biodiversity under the auspices of the NEMA. In terms of Section 56(1) of NEM: BA a person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit. These threatened and protected species have been listed in terms of GNR.151 of 2007: Publication of lists of critically endangered, endangered, vulnerable and protected species. A restricted activity in relation to a specimen of a listed threatened or protected species means hunting, catching, capturing, killing, having in possession or growing any living specimen of a listed threatened or protected species by any means, method or device whatsoever.

Should a project result in the loss of biodiversity identified in terms of GN 151 of 2010, a permit application will need to be submitted to the GDARD for approval, before proceeding with the activity. A specialist ecological impact assessment will be undertaken as part of the EIA phase of the Project. The applicability of the NEM: BA will be confirmed upon completion of the ecological investigation and if required, a permit will be submitted to the provincial authorities for review and decision making.

In addition to this permit requirement, should any person cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport or dispose of a protected tree, a licence is required in terms of the National Forests Act, No. 84 of 1998 (NFA), which deals with the protection of certain trees. Air Products wish to maintain all trees on site, to the extent possible, however, should a protected tree licence be required for the Project these will be obtained.

2.1.6 National Environmental Management: Waste Act (Act No. 59 of 2008)

The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) came into operation on 1 July 2009. This Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA) and introduced new provisions regarding the licensing of waste management activities. A list of waste management activities was published in GN R. 718 (2009) outlining activities that no person may commence with, undertake or conduct without a Waste Management Licence (WML).
The acetylene gas manufacturing process will not result in significant waste volumes and would therefore not trigger the requirement for a WML. Calcium hydroxide (lime) is produced as a by-product and will be sold for other uses.

### 2.1.7 Midvaal Local Municipality Waste Management By Law (2009)

The main objective of the Waste Management By-Law (2009) is to regulate the collection, disposal, treatment and recycling of waste within the Midvaal Local Municipality. Section 9 of the Waste Management By-Law provides for the obligations of waste generators. These obligations include the establishment of appropriate waste management facilities on site as well as proper storage of waste. Furthermore, waste generators are required to inform the Midvaal Local Municipality that the site is occupied and waste will be generated, prior to commencing with any activities on that site.

### 2.1.8 Integrated Legislative Processes

In order to meet the various legislative requirements, ERM intends to run a single integrated EIA process (where possible), which will also meet the requirements in terms of the following laws:

- NEMA;
- NEM:AQA

<table>
<thead>
<tr>
<th>Permit/ Application</th>
<th>Competent Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMA: Environmental Impact Assessment.</td>
<td>Gauteng Department of Agriculture and Rural Development</td>
</tr>
<tr>
<td>NEM:AQA: Atmospheric Emissions License</td>
<td>Sedibeng District Municipality</td>
</tr>
<tr>
<td>Application.</td>
<td></td>
</tr>
</tbody>
</table>

### 2.2 BROADER POLICY AND PLANNING CONTEXT

#### 2.2.1 Gauteng Growth and Development Strategy (2005)

The Gauteng Growth and Development Strategy (2005) seeks to achieve a shared vision, amongst all sectors of society, to improve the quality of life for citizens. The strategy focuses on integrated, holistic, sustainable and participatory development as being critical in addressing poverty and unemployment within the region. In particular, the two primary actions underlying the strategy include:

- identify roles of each sector of society in achieving socio-economic transformation; and
- implement principles of participatory democracy and good governance including accountability and transparency.

The strategy identifies the role that the private sector should play in achieving the vision. This is as follows:
• establish appropriate economic sector specific and multi-business consultation and coordination structures;
• actively participate in multi-stakeholder structures;
• invest in infrastructure and human resource development;
• develop meaningful partnerships with civil society organizations; and
• implement and maintain social responsibility programmes.

Through this Project, Air Products is encouraged to apply the above-mentioned philosophy by joining and participating in business forums such as the Daleside Business Forum as well as establishing corporate social responsibility programmes within the local area.

2.2.2 Sedibeng District Municipality Spatial Development Framework (2013)

According to the Sedibeng District Municipality Spatial Development Framework (2013) (SDF), the R59 has been identified as an economic development and provincial corridor. The land-uses which are supported along and around this corridor include industrial, manufacturing, warehousing, packaging, distribution centres, commercial, petrochemical, steel, agricultural processing and medium to higher density residential in areas defined by the Sedibeng District Municipality. The proposed site is located within the food processing, industrial and distribution node. The Project and proposed land-use thus complies with the planned use for this area. Please find the land-use zoning certificates for the proposed site in Annex D.

2.2.3 Midvaal Local Municipality Spatial Development Framework (2011)

The Midvaal Local Municipality SDF in line with the Sedibeng District Municipality SDF identifies the R59 as an important corridor for industrial and commercial development (Figure 2.2). The proposed site is also located within the urban development boundary.

Just across the railway line, to the north-east of the study area, there is a residential town (Witkop). This town is approximately 1km from the proposed site. However, there are pockets of residences located within the zone (purple) identified for industrial and commercial use.
Figure 2.2  Location of Project Site and Development Node

Source: Midvaal Local Municipality Spatial Development Framework (2011)
2.2.4 *Sedibeng District Municipality Integrated Development Plan (2013-2014)*

The Integrated Development Plan (IDP) is a strategic planning tool for the municipality. One of the key IDP performance areas of the Sedibeng District Municipality is reinventing the economy by consolidating existing sectors and exploring new sectors of growth.

It is estimated that industrial and commercial land has increased from 3920 hectares in 2004 to 4014 hectares in 2010 (0.8% to 0.9%), which is a small increase over 6 years (Sedibeng District IDP 2010/11). The new IDP strategy therefore focuses on promoting a diverse economy by reducing the cost of doing business and holding businesses responsible for social and environmental programmes within the region.

Should the Project proceed, an Air Products corporate fund will be set up to aid social and environmental programmes within the region.

2.3 *Air Products Policy and Procedures*

The Air Products Environment, Health and Safety Policy sets out the following basic principles, to which all projects shall adhere to:

- compliance with all applicable environmental, health, and safety laws and regulations;
- continual improvement in environmental, health and safety performance with the ultimate goal of zero injuries and zero emissions of toxic and hazardous materials;
- design and operation of plants and facilities in a manner that protects the environment and the health and safety of employees and the public;
- development and production of products that can be manufactured, distributed, used, and recycled or disposed of in a safe and environmentally sound manner;
- open discussion of our environmental, health, and safety practices and performance; and
- active participation in Responsible Care and similar initiatives in Southern Africa.

In addition, Air Products has in place a suite of environmental and health and safety procedures to guide the company’s activities with respect to the construction and operation of an acetylene gas production facility. The list below provides a few key environmental and health and safety procedures developed and implemented at existing facilities operated by Air Products and would also be applicable to the proposed Project:

- Design Standard for Acetylene Plants;
- Acetylene Plant Emergencies;
- Acetone Handling;
- Calcium Carbide Transfer and Handling;
• Requirements for Fire Prevention and Protection;
• Acetylene Cylinder Filling;
• Acetylene Cylinder Storage Areas;
• Waste Management; and
• Site Emergency Planning.
The public participation process (PPP) has been designed to comply with the regulatory requirements set out in the NEMA and NEM:AQA as well as international good practice. Public participation in an EIA is not only a statutory requirement in terms of the EIA Regulations (2010), but a process that is designed to provide I&APs with an opportunity to evaluate all aspects of the proposed development. I&APs represent relevant sectors of society and organs of state. The EIA process is seen as a tool to facilitate cooperative governance through informed consultation with a spectrum of stakeholders. The aim of which is to ensure that an informed decision making process is undertaken, which incorporates social, economic and environmental considerations.

This chapter provides an overview of the PPP and describes the engagement activities undertaken to date and the next steps in the public participation process.

3.1 **Objectives of the Public Participation Process**

The PPP has been designed to achieve the following objectives:

- ensure that stakeholders are well informed about the proposed development;
- provide a broad set of stakeholders sufficient opportunity to engage and provide input and suggestions on the Project;
- make draft and final reports available for public/stakeholder comment and input;
- verify that stakeholder issues have been accurately recorded;
- draw on local knowledge in the process of identifying environmental and social issues associated with the Project, and to involve stakeholders in identifying ways in which these can be addressed; and
- comply with the legal requirements and best practice.

The PPP has been designed in 4 phases within the EIA process, refer to *Figure 3.1.*
3.2 **PROJECT STAKEHOLDERS**

One of the key principles informing the PPP is that it should be an inclusive process. Stakeholders have been notified and invited to register as I&APs through a series of English and Afrikaans PPP notification materials as indicated in Table 3.1.

Stakeholders are grouped into the following categories:

- Government: National, Provincial, District and Local authorities;
- Landowners: Directly affected and surrounding landowners;
- Communities: Surrounding communities;
- Business: small medium enterprises and formal organisations; and
- Interest groups.
A stakeholder database has been compiled and will continue to be updated throughout the PPP. The existing full stakeholder database is appended as Annex E6.

### 3.3 Scoping Public Participation Activities

*Table 3.1 below provides details of the public participation activities undertaken as part of the Scoping Study.*

#### Table 3.1 Public Participation Tasks: Scoping Phase

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description and Purpose</th>
<th>Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of a preliminary stakeholder database</td>
<td>A preliminary database has been compiled of neighbouring landowners, authorities (local and provincial) and other key stakeholders. This database of registered I&amp;APs will be expanded during the ongoing EIA process.</td>
<td>Refer to Annex E6</td>
</tr>
<tr>
<td>Erection of site notices</td>
<td>On-site notices were placed at both site entrances, at the Randvaal Public Library and Cues Pool Pub. Photographs of the site notice s are included in Annex E3.</td>
<td>Refer to Annex E3</td>
</tr>
<tr>
<td>Newspaper advertisements published</td>
<td>The Project was advertised in the Midvaal Ster and The Star on 03 December 2013 in Afrikaans and English respectively. The advertisements informed the public of the Project and requested them to register as I&amp;APs if they would like to participate in the EIA process. I&amp;APs that responded to the advertisements were included on the Project stakeholder database.</td>
<td>Refer to Annex E3</td>
</tr>
<tr>
<td>Distribution of a Background Information Document (BID)</td>
<td>A BID was compiled in English and Afrikaans and distributed to I&amp;APs. The purpose of the BID was to convey information on this Project and to invite I&amp;APs to register their interest in the Project. BIDs were distributed to surrounding landowners and government departments. The BID is attached as Annex E1. A batch of BIDs were left at the Randvaal Public Library and at Cues Pool Pub.</td>
<td>Refer to Annex E1</td>
</tr>
<tr>
<td>Development of a Project Website</td>
<td>A project specific website has been established to allow I&amp;APs to easily refer to the relevant project documentation. Project documents such as the application form, BID, Scoping and EIA reports will be uploaded onto the Project website. This FSR will be uploaded to the Project website at <a href="http://www.erm.com/AirproductsEIA">http://www.erm.com/AirproductsEIA</a></td>
<td>Project Website</td>
</tr>
<tr>
<td>Release of the Draft Scoping Report for stakeholder comment</td>
<td>The Draft Scoping Report was made publically available at the Meyerton Municipal Library and at the Randvaal Public Library between 17 January - 26 February 2014. Furthermore, an electronic version of the DSR was made available on the project website (<a href="http://www.erm.com/AirproductsEIA">http://www.erm.com/AirproductsEIA</a>). A notification letter was sent to all registered and identified I&amp;APs to inform them of the release of the report and where the report could be reviewed. Furthermore, notices were erected at the Randvaal Public Library and at Cues Pool Pub regarding availability of the Draft Scoping Report.</td>
<td>Refer to Annex E5</td>
</tr>
</tbody>
</table>
### Activity | Description and Purpose | Further Information
--- | --- | ---
Key Authorities Meeting | A key authorities meeting was held on 12 February 2014 to provide the relevant authorities an opportunity to comment or raise any concerns on the Project. The Sedibeng District Municipality, Midvaal Local Municipality and the Local Ward Councillor attended the meeting, which was held at the Merchant Business Class Hotel. The minutes of this meeting, attendance register and presentation given have been appended to this Final Scoping Report. Comments from this meeting have been integrated into the Comments and Response Report. | Annex E8
Public Meetings | An open house and public meeting was held on 20 February 2014 to afford I&APs and the general public the opportunity to comment on the Project and engage with the EIA team on the Draft Scoping Report. The public meeting was held at the Japie Greyling Primary School in Daleside. The minutes of this meeting, attendance register and presentation given have been appended to this Final Scoping Report. Comments from this meeting have been integrated into the Comments and Response Report. | Annex E9
Preparation of an ongoing | Throughout the EIA process to date, issues and concerns raised by I&APs and authorities have been collected and recorded in a Comments and Response Report which has been appended to this report. | Refer to Annex E7
Comments and Response Report (CRR) | &nbsp; | &nbsp;
Preparation | I&APs will be notified of the availability of this Final Scoping Report, which will be made available for a period of 21 days. | Annex E10
and release of the Final Scoping Report | &nbsp; | &nbsp;

### 3.4 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 presented in the Draft EIA Report and associated Environmental Management Programme (EMP). The
Draft EIA Report and associated EMPr will be made available for a 40 day public commenting period during the second quarter of 2014.

I&APs will be advised timeously of the availability of these reports, how to obtain them, and the date and venue of the meetings where the content of the reports will be presented for comment. They will be encouraged to comment either in writing (mail or email), by attending the stakeholder meetings or by telephonic consultation. Ample notification of due dates will be provided.

3.5 **COMPETENT AUTHORITY’S DECISION**

Once the GDARD has taken a decision on the Project, the public participation consultant will immediately notify I&APs of this decision and of the opportunity to appeal. This notification will be provided as follows:

- A letter will be sent out to all registered I&APs, summarising the authority’s decision and explaining how to lodge an appeal should they wish to; and

- An advertisement to announce the Competent Authority’s decision will be published in the relevant newspapers.
4 PROJECT DESCRIPTION

4.1 BACKGROUND

Air Products currently operates a number of gas manufacturing facilities across South Africa. A few of these facilities have been steadily encroached upon by residential and industrial development. This encroachment increases the potential off-site risks due to the proximity of these surrounding land-users to the gas manufacturing facilities. Industrial development in particular poses a significant risk in terms of cumulative health and safety risks to surrounding land-users and communities. These risks may include fire or the release of potential pollutants.

To ensure that the proposed new facility is not encroached upon, Air Products have purchased 2 properties, adjacent to each another. The combined and total area of the two properties is 4.4 ha. The proposed facility is thus planned to be situated at the mid-point of both properties to reduce the potential off-site risks to surrounding land-users. This location is also considered preferable as the proposed site is located within a light industrial area, with the site itself zoned for industrial use. There are however, pockets of residences within the Project area, notably the Witkopdorp community is situated approximately 1 km north-east of the proposed site.

The Project will be developed in a phased approach, with 2 defined phases:

- **Phase 1**: 1 generator vessel, 6 compressors and 2 filling halls with a total production capacity of 7200 m$^3$/day; and
- **Phase 2**: 1 additional generator vessel with an additional 6 compressors and 2 filling halls with a production capacity of 7200 m$^3$/day.

This EIA addresses the biophysical and socioeconomic impacts associated with Phase 1 and Phase 2, covered under this Project.

4.2 PROJECT COMPONENTS

Acetylene gas ($\text{C}_2\text{H}_2$) is a chemical compound, which has no odour or colour in its purest form. It is used amongst various industrial sectors as a fuel or chemical building block. The Project will produce acetylene gas from mixing calcium carbide ($\text{CaC}_2$) with water. This mixture results in an exothermic reaction, where acetylene gas is released. Calcium Hydroxide ($\text{Ca(OH)}_2$) or lime is a by-product of the reaction, this is planned to be stored on site and sold for use in other sectors (ie agriculture, mining, roads).

The proposed acetylene production facility will comprise of the following key components:

- turnbins;
• generator vessel;
• heat exchanger;
• ammonia scrubber;
• low pressure dryer;
• compressors;
• high pressure dryers; and
• high pressure fillers.

These Project components are illustrated in Figure 4.1 and described further in the sections that follow.

**Figure 4.1 Schematic of a Typical Acetylene Gas Facility**

![Schematic of a Typical Acetylene Gas Facility](image)

**Table 4.1 List of Components included in a typical Acetylene Gas Facility**

<table>
<thead>
<tr>
<th>No.</th>
<th>No.</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Acetylene generator</td>
</tr>
<tr>
<td>2</td>
<td>Carbide filler hopper manifolds</td>
</tr>
<tr>
<td>3</td>
<td>Hoist</td>
</tr>
<tr>
<td>4</td>
<td>Heat Exchanger</td>
</tr>
<tr>
<td>5</td>
<td>Low pressure drier</td>
</tr>
<tr>
<td>6</td>
<td>Acetylene purifier</td>
</tr>
<tr>
<td>7</td>
<td>Scrubber</td>
</tr>
<tr>
<td>8</td>
<td>Acetylene compressor panel</td>
</tr>
<tr>
<td>9</td>
<td>High pressure driers</td>
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<td>10</td>
<td>High pressure filler</td>
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<td>11</td>
<td>Back pressure valve</td>
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<tr>
<td>12</td>
<td>Cylinder charging</td>
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<td>13</td>
<td>Scale</td>
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<td>Monitor</td>
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<td>Air compressor</td>
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<td>18</td>
<td>Master control</td>
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<td>19</td>
<td>Mercoid switch</td>
</tr>
<tr>
<td>20</td>
<td>Flame arrestor</td>
</tr>
</tbody>
</table>

Source: Air Products South Africa (Pty) Ltd (November 2013)
4.2.1 Generator Vessel (1)

The reaction between the calcium carbide and water will take place in a generator vessel to produce the acetylene gas. The generator vessel will be a closed system with a capacity of approximately 8m³. The generator is filled to a specific level with water in which the calcium carbide is added resulting in a reaction.

The working pressure of the generator vessel is 90 kPa with a temperature range of 58-62°C.

Initially, only one generator is proposed, which will be located at the centre of the proposed facility. An additional generator will be installed during Phase 2 of the Project. The maximum production rate of the Project, incorporating both generators is 14 400m³.

Figure 4.2 Photograph of Generator Vessel and Filler Hoppers on top

Source: Air Products South Africa (Pty) Ltd (February 2014)

4.2.2 Filler Hoppers (2) and Hoist (3)

Turnbins are storage containers that are used to transport and store and feed calcium carbide into the filler hoppers. The turnbins are weatherproofed to ensure that the calcium carbide is kept dry. Turnbins will be placed onto the filler hoppers on the generator vessel with a hoist.

Each turnbin will have a capacity of 1.5m³. Approximately 64 turnbins are required for Phase 1 of the Project with additional 64 turnbins required for
Phase 2. Turnbins filled with calcium carbide will be transported to site by a licensed service provider. These turnbins will be stored in a covered storage area (9mx12m) to prevent moisture from entering the turnbins. Once a turnbin has been emptied into the hopper, it will be stored in an open area until it is transported off-site to be re-filled by supplier.

4.2.3 Heat Exchanger (4)

The gas is fed through a cooler/condenser that provides heat exchange between the warm gas (54 - 63 °C) and cool water supplied from the cooling tower system.

4.2.4 Low Pressure Dryer (5)

The acetylene gas passes through a low pressure dryer, which is a pressure vessel charged with rasid rings which absorbs the moisture from the gas. When passing through the low pressure dryer, the acetylene gas has a pressure of 90 kpag.

4.2.5 Ammonia Scrubber (7)

The acetylene gas may contain certain impurities, such as ammonia. The facility will therefore include an ammonia scrubber, used to purify the acetylene gas. This process takes place in a sealed water bath vessel that strips any ammonia out of the process once in contact with water, this is less than <100 ppm.

4.2.6 Acetylene Compressor Panel (8)

The acetylene gas is compressed in multi three stage compressors. During compression a small quantity of acetylene emission is possible. It can be reduced by regular inspection and maintenance of the compressor equipment. The acetylene gas will be compressed to approximately 2400kPa.

4.2.7 High Pressure Dryer (9)

High pressure dryers using a molecular sieve to remove residual moisture in the gas, before it is filled into cylinders.

4.2.8 Pre Inspection / High Pressure Filler (10)

Prior to the cylinders being filled, it must be determined if they are suitable for service and can be safely filled. Cylinders that indicate evidence of damage, dents or faulty valves are rejected. After inspection cylinders are weighed to see if they require any additional acetone which is used to dissolve the acetylene gas into. Cylinders are then connected to a manifold for filling to take place, the maximum fill pressure is 2400Kpag (24 barg). A water spraying system is used to cool the cylinders during the filling process.
Figure 4.3 Cylinder Filling

Source: Air Products South Africa (Pty) (February 2014)

4.2.9 Process Systems (11-20) and Piping

11. **Back pressure valve**, to reduce the velocity of gas entering the high pressure dryers.
12. **Cylinder charging**, to accommodate multiple gas cylinders to be filled.
13. **Scale**, to ensure each cylinder is the correct weight.
14. **Area monitor alarms**, to check for acetylene in the atmosphere ie leaks.
15. **Acetone pump**, to charge cylinders with acetone prior to filling.
16. **Drainback manifold**, to recover acetylene gas back to the generator.
17. **Air compressor**, used for plant instrumentation and the hoist.
18. **Master control**, control system and annunciator (indicator lights).
19. **Mercoid switch**, generator pressure control
20. **Flame arrestor**, to prevent flash back of gas for plant, equipment and pipe reticulation system.

The proposed facility will also comprise of system piping between all the components described above. The piping system will be a closed loop system, whereby where a cylinder has been overfilled, this gas is allowed to return to the compressors for re-filling via the drain back manifold.

4.3 Associated Infrastructure

A suite of associated infrastructure is required for the daily operations of the proposed acetylene gas production facility. All associated infrastructure will be located within the proposed site and is described in further detail below. Infrastructure required as part of the Project, includes:
• roads and paved areas;
• energy supply and substation;
• water supply system and storage;
• chemical storage facilities;
• storm water management system;
• waste facilities;
• administrative offices;
• control rooms;
• maintenance and workshop areas;
• sanitation facilities; and
• security facilities.

4.4 PROJECT SCHEDULE

A provisional schedule for Project activities is outlined in Table 4.2. The commissioning/construction date of Phase 1 is expected to be between Quarter 4 of 2014 and Quarter 1 of 2015. The proposed facility is planned to be operational in Quarter 4 of 2015. Phase 2 of the Project is expected to commence in 2022 and be fully operational in 2024; however this would be subject to customer future demand for acetylene gas.

Phase 1 of the Project will operate for approximately 10 years.

<table>
<thead>
<tr>
<th>Project Activity</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction (Plant and Associated Infrastructure)</td>
<td>11 months</td>
<td>October 2014</td>
<td>August 2015</td>
</tr>
<tr>
<td>Plant Commissioning</td>
<td>40 days</td>
<td>August 2015</td>
<td>October 2015</td>
</tr>
<tr>
<td>Plant Optimisation</td>
<td>3 weeks</td>
<td>October 2015</td>
<td>October 2015</td>
</tr>
<tr>
<td>Plant Personnel Training</td>
<td>1 month</td>
<td>October 2015</td>
<td>November 2015</td>
</tr>
<tr>
<td>Phase 1 Completion</td>
<td>0 days</td>
<td>November 2015</td>
<td>November 2015</td>
</tr>
<tr>
<td>Phase 2 Commissioning</td>
<td>2 years</td>
<td>2022</td>
<td>2024</td>
</tr>
</tbody>
</table>

4.5 PLANNING & DESIGN

Air Products developed a conceptual site layout plan (refer to Figure 4.4) based on site conditions and technical feasibility. The black layout represents Phase 1, with the green layout representing Phase 2 of the Project. The site plan below can also be viewed in more detail, see Annex A.

However, as the layout plan is based on conceptual design, the suggested footprint will be subject to further investigation and refined based on the environmental and social sensitivities of the Project area. The conceptual layout plan has been presented to the EIA specialist team for consideration. As part of their specialist investigation, all specialists will be required to identify
site sensitivities, for which feasible alternatives must be considered. The revised layout plan (if required) and associated mitigation measures will be presented in the Draft EIA Report for public review and comment.
Figure 4.4 Conceptual layout plan

Source: Air Products South Africa (Pty) Ltd (November 2013)
4.6  **CONSTRUCTION**

4.6.1  **Site Clearing**

The initial stage of construction will involve clearing and grubbing, which will be restricted to the area required for the construction of the proposed acetylene gas production facility.

Site clearing will begin with the destruction and removal of 2 building structures, located on the northern portion of the site (*Figure 4.5*).

*Figure 4.5  Buildings to be Removed*

![Image of buildings to be removed](source: ERM Site Visit, 28 November 2013 (Photographer: Kasantha Moodley))

Clearing and grading will also involve removal of trees and debris from the construction area and the preparation of a level surface for construction equipment/laydown area. Topsoil and excavated material will be removed and stockpiled for reuse, with surplus material being placed and contoured around the proposed facility.

4.6.2  **Construction Camp**

The existing farmhouse, located on the southern portion of the site will be used as a contractor camp site. The farmhouse will be upgraded into administrative offices, which will be used during the construction and operational phases of the Project. The out building adjacent to the farmhouse will be used as change facilities by employees. Furthermore, all trees around the farmhouse will be maintained.

4.6.3  **Roads and Paved Areas**

The site will be accessed via Tillet Road, just off Springbok Road (*Figure 4.6*). Tillet Road will be graded/surfaced with concrete for use by heavy duty
vehicles. Within the site, a ring road will be provided from the main entrance for access to the facility. The ring road will be a concrete road of approximately 650 m in length and 7m wide. The facility itself and areas around the facility will be underlain by a concrete and brick paving surfaces.

Figure 4.6  Tillett Road

Source: ERM Site Visit, 28 November 2013 (Photographer: Kasantha Moodley)

4.6.4  Site Services

It is understood that services are available to the site and was part of the farmhouse developed on the southern portion of the site. These existing services will be utilised during the construction phase. A site services agreement will be signed with the Midvaal Local Municipality, prior to the Project commencing.

During construction, Air Products employees will utilise the existing sanitation facilities, provided in the farmhouse and outbuilding. Additional portable loos will be made available during the construction phase for contractors etc.

4.6.5  Waste Management

During construction, large quantities of rubble will be generated due to the destruction and removal of the 2 existing buildings, mentioned above. Furthermore, the proposed site is strewn with litter and rubble.
Air Products will manage the site clearance and construction wastes in accordance with Section 5.8.10 of their Waste Management Procedure (25-011202) of October 2008, which states that construction and demolition debris be managed as follows:

- All regulated wastes be removed by qualified workers and properly disposed of;
- Where practical, removed recyclable material from the waste (i.e. glass, wood, metal etc);
- Re-use clean fill on site, where possible; and
- Transport remaining wastes to an approved landfill site.

An Air Products approved contractor will be used to transport construction wastes off site. The Municipal Waste Services will be notified, prior to construction to ensure this material is disposed in an appropriate manner at a licence landfill site with the capacity to receive such wastes.

4.7 **OPERATION**

4.7.1 **Cylinder Distribution**

Acetylene gas cylinders will be transported off-site by trucks. These trucks are owned and operated by Air Products, therefore it is the responsibility of Air Products to regularly inspect and maintain vehicles for road-worthiness.

Cylinders are loaded and off-loaded by means of a fork lift trucks. One truck can transport 200 cylinders. It is expected that two trucks will be travelling to and from site per day.

The trucks will exist the site via Tillet Road and then travel onto the M61 (Springbok Road) and onto the R59 highway to various companies in the region, including Acelor Mittal, Rand Water and Eskom.

4.7.2 **Energy Supply and Substation**

Electricity will be supplied to operate the facility as well as to provide power to the associated buildings including the workshops and administrative offices. The Project will have a power requirement of < 0.75 MW and would provide for both phases of the Project. To meet this requirement, a substation is proposed to be constructed on site. The substation will be 4mx4m with a capacity of below 0.75MW as there is currently a 11kv supply on Tillet Road. Eskom services a large part of the Midvaal Local Municipality with electricity(1). A services agreement with Eskom will thus be required for the provision of electricity during the operation of the proposed facility.

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(1) Midvaal Local Municipality Spatial Development Framework (2011)
Air Products are currently investigating the possibility of installing solar photovoltaic (PV) panels to assist in generating power on site to operate the proposed facility.

4.7.3 Water Supply System

Rand Water is the main service authority for bulk water supply in the Midvaal area, with a main water pipeline (2300mm diameter). Bulk water to the rural areas is supplied mainly by the Daleside and Langerand reservoirs and pipeline systems of Rand Water. The site’s water supply is provided by the Daleside reservoir(1). The Midvaal Local Municipality is the water service provider for the proposed development and it has been confirmed that a water supply pipeline of approximately 75mm in diameter is in place to provide water to the proposed site.

The Phase 1 water requirement is approximately 216m$^3$ per twenty-four hour shift with the total for both phases being 432 m$^3$ per twenty-four hour shift. The plant operation is designed to recycle eighty to ninety percent of the water. Water that is used in the acetylene generator will be re-circulated after separation from lime(2). This water will be checked for quality.

Make up water will be stored in a process water tank, which is 9mx12m in size. A smaller sized water tank and cooling tower are located adjacent to the generator vessel. It is also planned that cooling water be re-used in certain processes as it would not contain any impurities.

Air Products plan on collecting stormwater run-off by sloping the site to the west and paving the surface around the proposed facility to direct all stormwater into 2 x 4500 m$^3$ water catchment pits. Water collected in these pits will be uses as fire water and to supplement the Project’s water requirements. These pits will be located on the western boundary of the site. Two pump houses will also be installed to pump water from the pits, the use of these pumps are strictly for fire water fighting only and therefore will not be used on-goingly.

Furthermore, there are two existing boreholes on site, which Air Products are proposing to utilise to supplement their water requirements and ultimately operate the proposed facility independent of municipal water.

4.7.4 Storm Water Management

Stormwater management is critical for the day to day management of the Project. The potential for contaminated stormwater run-off is minimal, and therefore stormwater infrastructure will be constructed to optimise re-use of stormwater. Separate stormwater channels will be constructed around the dirty areas (ie lime separation and storage area).

---

(1) Midvaal Local Municipality Spatial Development Framework (2011)
(2) Environmental Impacts of Acetylene Plants, EIGA, 2011
Stormwater run-off from clean areas will flow into the fire fighting water catchment pits to the west of the site. Stormwater run-off from dirty areas will be diverted to a recycled process water system for purification and reuse.

4.7.5 Storage Facilities

Specific storage facilities/areas have been provided for, for the storage of the required gases and materials.

Calcium Carbide

Turnbins containing calcium carbide (raw process material) will be stored in a covered storage facility to prevent moisture from entering the turnbins. This storage facility is approximately 96m³ with an area of 9mx12m. This storage area has been sized to accommodate both phases of the proposed development.

Nitrogen Storage

Nitrogen is utilised in the purging section of the plant for maintenance and fire protection purposes. In additional a small amount is use for blanketing of the acetone tank. A nitrogen storage tank will be installed adjacent to the calcium carbide storage facility. The capacity of the nitrogen tank will be 10m³.

Acetone Storage

When the cylinders are being filled with the acetylene gas, acetone is added prior to filling taken place filling to ensure that the cylinders are rid of any moisture. The acetone storage tank will be installed adjacent to the nitrogen tank and will have a capacity of 20m³.

Acetylene Gas Cylinder Storage

The acetylene gas cylinders will be stored on site for distribution. It is expected that 16 800 gas cylinders will be filled per month. At any one time, approximately 1 800 gas cylinders will be on site, 900 full and 900 empty. The total area of the full cylinder storage area is approximately 7740m³. These are stored and segregated into designated areas and considered rolling stock.

Fuel and Lubricants

Other fuels, lubricants and solvents used for the process equipment or other equipment will be stored on site. Materials also include diesel, oils and cleaning agents for maintenance activities. These chemicals will be stored in a bunded and secured area, within the stores, located adjacent to the maintenance and workshop facilities.
4.7.6 Process By-Product

Calcium Hydroxide (CaOH)\textsubscript{2} is a by-product of the manufacturing process. According to the European Industrial Gasses Association (EIGA, 2011), lime slurry is considered a by-product and not a waste, as it is possible to market lime for different uses including, use as a neutraliser in chemical processes, sewage water treatment, agriculture, building trade etc.

Air Products thus intend on installing two sludge separation pits during Phase 1 of the Project and a further 2 during Phase 2. These slurry holding areas will be watertight basins, each with a capacity of 245 m\textsuperscript{3}.

The lime from the lime pit can either be transferred to the filter press (10m\textsuperscript{3}/hr) for dry processing, bagging and storage or alternatively the lime slurry can be transferred to the sludge separation pits, where excess water is removed and slurry transferred to the Green Chem storage pit with a capacity of 90 m\textsuperscript{3}.

4.7.7 Waste Management

Waste management comprises all operational and maintenance activities that are involved in the handling, storage and disposal of wastes. The objective of waste management is to deal with hazardous and non-hazardous waste in a manner that protects human health and the environment. All wastes will be managed in accordance with the Air Products Waste Management Procedure (25-011202) of October 2008, which covers all waste streams.

The processes during maintenance and operations will involve the generation of wastes. A summary of the wastes generated is provided in Table 4.3.

<table>
<thead>
<tr>
<th>Waste Stream</th>
<th>Main Sources</th>
<th>Possible Environmental Constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrap metals</td>
<td>Used process equipments, tanks, empty drums, used tubular and casings</td>
<td>Heavy metals</td>
</tr>
<tr>
<td>Waste lubricants</td>
<td>Equipment lube oil changes</td>
<td>Organic, heavy metals</td>
</tr>
<tr>
<td>Process waste</td>
<td>Generator and Compressor</td>
<td>Acetone, acetylene gas purifier, scrubber waste</td>
</tr>
<tr>
<td>Fluorescent tubes</td>
<td>Infrastructure illumination</td>
<td>Mercury, Argon, tubes</td>
</tr>
<tr>
<td>Maintenance wastes</td>
<td>Sandblast, greases, fuel oil filters, acids</td>
<td>Heavy metals, hydrocarbons, solids, solvents</td>
</tr>
<tr>
<td>Refrigerants</td>
<td>Air conditioning/refrigerant units</td>
<td>Non-CFC refrigerants</td>
</tr>
<tr>
<td>Paint materials</td>
<td>Paints, thinners, coatings Instrumentation and operations</td>
<td>Heavy metals, solvent, hydrocarbon Mercury</td>
</tr>
<tr>
<td>Mercury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical wastes</td>
<td>Dressings, clinical materials, Spill/leaks</td>
<td>Pathogenic organisms, plastic glass, medicines, needles.</td>
</tr>
<tr>
<td>Contaminated soil</td>
<td></td>
<td>Hydrocarbons, heavy metals, salts, treating chemicals</td>
</tr>
</tbody>
</table>
### Waste Stream

<table>
<thead>
<tr>
<th>Waste Stream</th>
<th>Main Sources</th>
<th>Possible Environmental Constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>Cement mix water, cement returns</td>
<td>Heavy metals, viscosifiers, pH, salts</td>
</tr>
</tbody>
</table>

---

### 4.7.8 Emergency Planning

Air Products will plan for and manage all possible site emergencies according to their Site Emergency Planning Procedure (25-010802) of August 2009. Possible types of emergencies that will be planned for include, but are not limited to: fire, loss of containment, process emergencies, security incidents, gas and chemical releases, health related emergencies, failure of utilities and product integrity issues.

A site specific Emergency Plan will be developed for the proposed facility and will specify, responsible parties, types of emergencies, site evacuation requirements, an emergency alarm, emergency response and control procedures. All site employees will be training on the site Emergency Plan with training including emergency drill exercises.

The Emergency Plan will be reviewed and updated on an annual basis by the facility manager.

### 4.7.9 Control Room

A control room will be constructed to monitor the process and ensure standard operating conditions are met. The proposed control room will cover a total area of approximately 9mx7m.

### 4.7.10 Workshop and Maintenance Area

A cylinder maintenance and workshop facility will be established for on-going maintenance of all facility equipment. The total area of this facility is 18mx5m, including the stores area.

### 4.7.11 Administrative Offices and Change Facilities

The administrative offices will be situated within the existing farmhouse, located on the proposed site (Figure 4.7). The structure of the house will be maintained with internal upgrades, including the replacement of windows, removal of carpets and cupboards and installation of electrical and water facilities, that have been previously removed.

The outbuilding, adjacent to the farmhouse will be used by employees as change facilities (Figure 4.8). Sanitation facilities will be provided within the administrative office as well as within the facility area. This ablution/change facility will be 5mx8m in area.
Figure 4.7  Farmhouse to be used as Administrative Offices

Source: Digby Wells Site Visit, 28 November 2013 (Photographer: Natasha Higgit)

Figure 4.8  Outbuilding to be used as Change Facilities

Source: ERM Site Visit, 28 November 2013 (Photographer: Kasantha Moodley)
4.7.12 Security Facilities

A perimeter wall will be erected around the proposed facility; the wall top section will be electrified. There will be one entrance gate and one exit gate. A security post will be established at the main entrance gate, just off Tillet Road.

4.8 EMPLOYMENT

The establishment of the proposed acetylene gas production facility is expected to result in approximately 10 temporary jobs during construction and 20 permanent jobs during operation. During operation, jobs will be available in the form of plant operators, security and cleaners. No employees will be housed on the proposed site during construction or operation.
In terms of Section 28 of the EIA Regulations (2010), due consideration must be given to project alternatives during the EIA process is required. The 2010 EIA Regulations defines “alternatives” as:

“In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to”:

(a) The property on which or location where it is proposed to undertake the activity;
(b) The type of activity to be undertaken;
(c) The design or layout of the activity;
(d) The technology to be used in the activity;
(e) The operational aspects of the activity; and
(f) The option of not implementing the activity” (the ‘no-go’ option).

Section 31 (2) (g) of the EIA Regulations (2010) requires a description of feasible and reasonable alternatives to be considered in the EIA Report. In part, the purpose of the Scoping Report is to review and screen alternatives to determine reasonable and feasible alternatives that need to be assessed in further detail in the EIA Report. In essence, an alternative is a different means to meet the general purpose and need of an action. In terms of the EIA Regulation (2010), alternatives could include, amongst others, the following:

- Activity alternatives – also referred to as project alternatives. This requires a change in the nature of the proposed activity. This category of alternatives is most appropriate at a strategic decision-making level. This includes the ‘no-go’ option.
- Location alternatives – alternative locations for the Project, or for components of the Project proposal (i.e. on-site location alternatives).
- Process alternatives – also referred to as technological or equipment alternatives. The purpose of considering such alternatives is to include the option of achieving the same goal by using a different method or process.
- Site layout alternatives – site layout alternatives permit consideration of different spatial configurations of an activity on a particular site.

5.1 LOCATION ALTERNATIVES

As part of the site selection process a number of potential sites were investigated, through a desk-top analysis. The preferred site was identified based on a number of criteria, including:

- a site with an area of 3.5 ha or more;
- environmental constraints;
• water demand requirements, the proposed facility would require 900 kiloliters per month if both plants should be on line phase 1 and 2;
• electricity requirements, the plant requires approximately 0.75 megawatts (MW);
• easy access to major roads and highways; and
• a site with existing industrial rights.

The alternative sites highlighted in Table 5.1 below may have met the criteria above however there may have been other considerations such as financial feasibility/regulatory reasons, which resulted in the site not being selected.
Table 5.1  Summary of Alternative Sites

<table>
<thead>
<tr>
<th>Alternative Site Location</th>
<th>Map (indicating proposed layout)</th>
<th>Reasons for Scoping Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Name: Nigel</td>
<td><img src="image" alt="Map of Nigel Site" /></td>
<td>From a land-use perspective, this site was considered to be relatively dense with other industrial uses. Furthermore, the site is located approximately 390m west of the Nigel Dam. This site would have therefore required a Water Use Licence application for its proximity to the dam. There were also financial constraints regarding the procurement of the site.</td>
</tr>
<tr>
<td>Located on 1st Ave, off the R42</td>
<td>Site Coordinates: 26°24'17.54&quot;S 28°28'27.77&quot;E</td>
<td></td>
</tr>
</tbody>
</table>

Source: Google Imagery, AfriGIS (Pty) Ltd, 2011
<table>
<thead>
<tr>
<th>Alternative Site Location</th>
<th>Map (indicating proposed layout)</th>
<th>Reasons for Scoping Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heidelberg 1</td>
<td><img src="image" alt="Map of Heidelberg 1" /></td>
<td>There is a tributary/stream located 330m east of the proposed site. This site would have therefore required a Water Use Licence application for its proximity to this tributary.</td>
</tr>
<tr>
<td>Located at the corner of Loveday and Schuins Streets</td>
<td></td>
<td>There were also financial constraints regarding the procurement of the site.</td>
</tr>
<tr>
<td>Site Coordinates:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26°31'15.42&quot;S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28°21'41.49&quot;E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Google Imagery, AfriGIS (Pty) Ltd, 2011
<table>
<thead>
<tr>
<th>Alternative Site Location</th>
<th>Map (indicating proposed layout)</th>
<th>Reasons for Scoping Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daleside</td>
<td><img src="Google%20Imagery%2C%20AfriGIS%20(Pty)%20Ltd%2C%202011" alt="Map Image" /></td>
<td>The preferred site (further north) was chosen over this site due to accessibility to the major roads/highways. Site access to this property is away from the major road (ie M61), resulting in more traffic along the local and minor roads which cannot support heavy duty trucks. There were also financial constraints regarding the procurement of the site.</td>
</tr>
</tbody>
</table>

Daleside
Located along Graniet Road
Site Coordinates:
26°30'45.72"S
28°2'50.78"E

Source: Google Imagery, AfriGIS (Pty) Ltd, 2011
<table>
<thead>
<tr>
<th>Alternative Site Location</th>
<th>Map (indicating proposed layout)</th>
<th>Reasons for Scoping Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heidelberg 2</td>
<td><img src="source.png" alt="Alternative Site Location" /></td>
<td>The southern boundary of this site is located 20 m. According to the National Water Act (Act No. 36 of 1998), no development may take place within the 1:100 year floodline or within 500m of a stream/tributary without a Water Use Licence Application. If applied for, it would have been unlikely that the Department of Water Affairs would have approved such a development, especially because the site slopes south. Furthermore, this site is not considered to be easily accessible from the major roads./highways.</td>
</tr>
<tr>
<td>Located off Albert Street</td>
<td>Site Coordinates: 26°30'56.88&quot;S 28°21'48.50&quot;E</td>
<td></td>
</tr>
</tbody>
</table>

Source: Google Imagery, AfriGIS (Pty) Ltd, 2013
5.2 SITE LAYOUT ALTERNATIVES

The site layout is likely to undergo a number of iterations based on technical aspects of the Project such as construction conditions and the environmental and social considerations which will be explored during the EIA process. From a technical perspective, the final site layout will depend on a number of factors including the geotechnical features of the site; and the final dimensions and sizing of built structures to meet the required production capacity.

After initial field surveys undertaken by the EIA team, areas that pose environmental and/or social constraints will be fed back to the technical team in the form of a constraints map, to be generated during the EIA phase. The technical team will then generate a revised site layout taking these environmental and social constraints into consideration. The output of this iterative process will encompass the consideration of layout alternatives and will be used in the assessment of impacts in the EIA Report.

5.3 TECHNOLOGY ALTERNATIVES

In terms of the drying process, two technology alternatives have been proposed, namely the use of a high pressure dryer which requires silica gel as a drying agent or the use of molecular sieves in a Pressure Swing Adsorption (PSA) system which does not require the use of any drying agents.

The use of a high pressure dryer in the process requires a large quantity of silica gel (drying agent) which is only effective at room temperature (25ºC) or below. Whilst silica gel is considered to be a chemically inert material, the use of the gel would require regular maintenance of the process facility to remove residual materials from the drying process. Furthermore, silica gel is a high cost agent with its adsorption efficiency dependant on various factors such as temperature of the gas.

The PSA system is based on the process of adsorption instead of absorption. This system separates the acetylene gas from moisture (H₂O) using a set of molecular sieves that will capture molecules of Hydrogen and Oxygen and whilst the acetylene gas passes through the sieves. Once the sieves are saturated, these captured molecules are drawn out of the system at a low pressure. This moisture is returned to the generator tank for re-use. This is a two tank system, while one tank is releasing the captured molecules at low pressure, the other tank is adsorbing the molecules from the acetylene gas at a high pressure. Hence the name of the system, pressure swing adsorption. The benefits of this system is the higher efficiency rate and design flexibility as well as the lower costs related to lower maintenance requirements and no need for a drying agent.
5.4 **NO-GO ALTERNATIVE**

It must be noted that it is mandatory to consider the “no go” alternative as part of the EIA process. The “no-go” or “do nothing” option would entail maintaining the status quo. Although this option will not be explicitly assessed in the EIA Report, it should be noted that the assessment of all impacts is made relative to the existing environment viz. the status quo, and accordingly there is de facto consideration of the “no go” option.

Assuming that the Project would not be developed at the proposed site, the site would remain in its current state. The direct benefits associated with the both the construction and operational phases of the Project such as employment opportunities and associated economic benefits would not be realised, should the development not proceed.
6 RECEIVING ENVIRONMENT

6.1 CLIMATE

The Gauteng region has a mild climate, characterised by warm, moist summers and cool dry winters\(^1\). Mean annual temperature is approximately 16.0°C in the southern region of Gauteng. It is noted that there is a large variation between summer and winter temperatures, within the Gauteng region. The daily mean temperature in January is 21.2°C and in July, 9.8°C.

Rainfall occurs from October to March, with a mean annual precipitation of 668mm\(^2\). In the southern areas of the province, mean rainfall is 556mm. The occurrence of frost is common in the province. The wind direction in the area is primarily north-westerly, northerly and north-easterly with southerly winds predominating when cold fronts extend into the province during the winter months.

Winter atmospheric conditions cause temperature inversions, which keep polluted air close to the surface, resulting in poor air quality over the winter months\(^3\).

6.2 TOPOGRAPHY AND LANDSCAPE

The proposed site is generally flat and slopes slightly to the south. According to Mucina & Rutherford (2006) the greater study area is characterised as having slightly undulating plains, dissected by prominent rocky chert ridges. To the north of the proposed site is a brick manufacturing facility and a carpentry facility. To the east of the site, across Tillet Road, there are warehousing and truck/logistics companies. To the south, the proposed site is bound by a storage and maintenance facility for construction equipment. To the west, the proposed site is bound by vacant land. Refer to Annex C for photographs of the proposed site.

The R59 is 100m to the west of the proposed site, with the Metro Rail, 100m to the east of the proposed site, which links to the existing mining works, known as the Glen Douglas Mine. The mine is an open pit-mine (2 open pits) producing products comprising metallurgical dolomite, aggregate and agricultural lime. Exploration and development of the mine dates back to 1954, with mining operations having commenced in 1957.

It should be noted that even though the area of Daleside is characterised by light industrial activities, there are pockets of residences in the study area. Residences are located just off Graniet Road, Kalksteen Road and Law Road.

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\(^1\) Gauteng State of Environmental Report (2004)
The closest community to the proposed site is Witkopdorp, located about 1 km to the north-east.

**Figure 6.1 Photograph of Proposed Site (facing West)**

Source: ERM Site Visit, 28 November 2013 (Photographer: Kasantha Moodley)

6.3 **SITE GEOLOGY AND SOILS**

The proposed site is situated on the Malmani Subgroup of the Chuniespoort Group of the Transvaal Supergroup. The Transvaal Supergroup is an extensive geological sedimentary rock sequence extending across much of the northern part of South Africa and into Botswana.

The dominant geology underlying the study area is andesite of the Hekpoort Formation. There are exposed rock surfaces on the site.

The Malmani Subgroup may comprise dolomite. The dolomites are characterised by fossils of algae formations and contain high levels of calcium carbonate. Over a period of time, groundwater erodes away the calcium carbonate found within the dolomite layers, resulting in the occurrence of sinkholes. A geotechnical investigation will be undertaken to determine the presence and condition of dolomite underlying the site (if any).

The soils of the proposed site are considered well-drained, red, apedal soils of the Hutton form (Hu) overlying weathered and hard rock and various other unconsolidated materials.
6.4 WATER RESOURCES

6.4.1 Surface Water

The Klip River is approximately 2km to the east of the proposed site and drains into the Vaal River to the south. The Vaal River is considered one of the most important tributaries to the Orange River (Figure 6.2). Along the Klip River, water is used primarily for agricultural purposes\(^1\).

Whilst the proposed site is situated within the Klip River catchment, there are no freshwater systems (tributaries) on or near the proposed site.

Figure 6.2 Orange River Catchment

![Orange River Catchment Map](image1)

Source: Department of Water Affairs Website, 2012

6.4.2 Groundwater

Groundwater in the region is primarily used for irrigation for agricultural purposes. The quality and availability of groundwater in the study area will

\(^{1}\) Midvaal Spatial Development Framework (2011)
be determined through a hydrocensus, should Air Products decide on utilising groundwater for the Project.

6.5 **FLORA AND FAUNA**

The study site is located within the Grassland Biome as classified by Rutherford & Westfall (1994). The Grassland Biome is found primarily on the high central plateau of South Africa, the inland regions of KwaZulu-Natal and the Eastern Cape. The majority of plant species within grasslands are non-grassy herbs (forbs), most of which are perennial plants with large underground storage structures. Tree species are limited due to frost, fire and grazing which maintains the herbaceous grass and forb layer and ultimately prevents the establishment of tall woody plants (Tainton 1999). The Grassland Biome has an extremely high biodiversity, second only to the Fynbos Biome.

Furthermore, the majority of rare and threatened plant species in the summer rainfall regions of South Africa are restricted to high-rainfall grasslands, making this the vegetation type in most urgent need of conservation (60 percent destroyed and only 2.2 percent conserved).

Recent South African vegetation studies, such as the one conducted for the National Spatial Biodiversity Assessment by Mucina & Rutherford (2006), places the study site within the Endangered Soweto Highveld Grassland vegetation type. In addition to this, the region in which the proposed site is located falls within the South African National Biodiversity Institute’s (SANBI) Priority Area, known as the Bushveld Bankenveld region.

This short to medium-high grassland is comprised almost entirely of *Themeda triandra* but with some other grass species such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix* present as well.

Given the small size and high degree of land transformation within and surroundings, the site predisposes a low diversity of faunal species that are likely to occur. A total of 3 mammal, 22 bird, 2 reptile, 3 frog and 12 terrestrial macro-invertebrate species were detected during a site visit, undertaken in November 2013. Mammals identified include a common Mole Rat, Slender Mongoose and a Scrub Hare. Birds include the Black-shouldered Kite, Cape Turtle Dove, Rufous-naped Lark, Common Fiscal and the Yellow-crowned Bishop to name a few. Reptiles include the Cape Skink and the Montane Speckled Skink.

6.6 **CULTURAL HERITAGE**

The fossil heritage potential of the Malmani Subgroup geology indicates that the study area has Very High Sensitivity, based on the occurrence of dolomite rocks. However, based on a Paleontological Impact Assessment (PIA) undertaken in the study area, no Quaternary sinkhole and cave infill deposits
were found. In addition, the rock outcrops of the Transvaal Supergroup were also surveyed however at most places these outcrops were covered by thick soil and no fossils were found at the outcrops. Furthermore, satellite imagery surveys of the Project area showed that the area has been disturbed by development and industrial and commercial activities.

The existing farmhouse was built in approximately 1980 according to aerial imagery. This house has been changed and added to over the years. The dilapidated building located to the north of the farmhouse was built less than 10 years ago is currently in ruins. Both of identified structures and the stands on which they are situated are not older than sixty years and not considered to be in good condition.

### 6.7 SOCIO-ECONOMIC CONTEXT

The purpose of this section is to describe the socio-economic environment within which the proposed Project is located. The description provided in this section is based on publically available and high level secondary information of the Midvaal Local Municipality. A comprehensive description of the socioeconomic characteristics of the study area will be provided as part of the socioeconomic study for the EIA and will draw on primary data (ie interviews with relevant people) collected specifically for this Project.

#### 6.7.1 Administrative Structure

The Project is located within the Midvaal Local Municipality; situated within the Sedibeng District Municipality in Gauteng The Project is situated in Ward 5 of the Midvaal Local Municipality. *Figure 6.3* illustrates the administrative levels applicable to the Project and region.
Midvaal Local Municipality is one of three local municipalities within the Sedibeng District Municipality and covers the largest land area (41 percent, 1,722km²).

Ward 5 (Project affected administrative area) is comprised of four residential areas namely Sicelo (which is classified as an informal settlement); as well as Highbury Ext 1, Daleside (Witkopdorp), and Highbury (these settlements are classified as townships).

6.7.2 Socioeconomic Characteristics of the Midvaal Local Municipality

Midvaal Local Municipality has a relatively small population size with a slightly high population density for an area that is spatially defined as rural. The population comprises mainly Black/African and White ethnic groups; however the main language spoken in the area is Afrikaans followed by SeSotho. Further details on the socioeconomic characteristics of the municipal area are provided in Table 6.1 below.

Table 6.1 Socioeconomic Characteristics of Municipality

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Population Census Data (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Profile</td>
<td></td>
</tr>
<tr>
<td>Population Size</td>
<td>95,301</td>
</tr>
<tr>
<td>Population Growth</td>
<td>3.94%</td>
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<tr>
<td></td>
<td>(Growth since the 2001 Population Census)</td>
</tr>
</tbody>
</table>

(1) Midvaal Local Municipality IDP, 2013-2018
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Population Census Data (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Density</td>
<td>55.3/km²</td>
</tr>
<tr>
<td></td>
<td>Densely populated for an area with mining and commercial agriculture</td>
</tr>
</tbody>
</table>

**Ethnic Composition**

According to the IDP the Black/African ethnic group grew by 3.59 percent since the 2001 Population Census; which is highest compared to the other ethnic groups found in the area. This can be attributed to people moving into the area in search of employment opportunities in the agricultural holdings and mine(s) located within the Municipality.

**Education Levels of the Population**

Based on the above graph, a portion of the Municipality’s population has some primary schooling (36.9 percent), followed by those who have some secondary schooling (32.2 percent). There are limited numbers of people without schooling at 3.2 percent as well as people with high education at 3.1 percent.
Characteristic | Population Census Data (2011)
--- | ---
Employment and Unemployment Levels of the Population

Unemployment levels are slightly high at 13 percent and include an additional 3 percent of discouraged work seekers. Youth unemployment is said to be at 25.4 percent of the total unemployed persons. The reasons for the high unemployment amongst the youth are unknown. The youth unemployment is likely to have resulted in the increased dependency ratio in the Municipal area of 42.9 percent.

The number of Not Economically Active people is at 29 percent, this means that the population is characterised by a slightly higher number of young children, elderly, those who choose not to seek employment and disabled.

**Economic Activities**

There are four economic sectors that are regarded as the main economic drivers in the Municipality, namely:

- **Primary:** Agriculture at 1.34 percent and mining at 0.3 percent;
- **Secondary:** Manufacturing at 24.06 percent; and
- **Tertiary:** Government at 61.95 percent (1).

The IDP does not specify which other economic sectors contribute to the remaining eleven percent of the gross value added (GVA) of the Municipality.
SUMMARY OF KEY ISSUES

A key part of scoping is a preliminary analysis of the ways in which the Project may interact (positively and negatively) with environmental and socioeconomic resources or receptors. Based on the analysis of the affected environment presented above, together with preliminary comments received from stakeholders and members of public, key issues have been identified for further investigation during the impact assessment phase.

The proposed Project will result in construction, operational and decommissioning phase impacts. Furthermore, the “legacy” left behind upon decommissioning will also be included in the EIA process. Specialist studies will include an analysis and assessment for each of the different phases associated with the Project. Furthermore, cumulative impacts will also be identified and assessed, in light of current and reasonably foreseeable developments in the surrounding region. A mitigation hierarchy of avoidance, avoid, abate, remedy and compensate will be adopted for all specialist investigations.

7.1 DESCRIPTION OF POTENTIAL IMPACTS

The following is a comprehensive list of Project impacts that could result from the interaction of Project activities with environmental and social resources. Potential impacts were identified without consideration of mitigation and management actions that the developer will undertake (embedded controls). This was to be able to identify the full scope of potential impacts.

This list below will be further developed in terms of potential extent and magnitude through the EIA process. This will be followed by a detailed assessment. During the process, some impacts may be ‘scoped out’ and removed from the EIA process.

Table 7.1 provides an overview of likely aspects arising from each of the key Project activities and considers their likely interaction with socio-economic and environmental resources and receptors.
### Table 7.1 Interaction between Project Activities and Receiving Environment

<table>
<thead>
<tr>
<th>Project Activities</th>
<th>Receptor/Resource</th>
<th>Fauna (including Avifauna)</th>
<th>Flora</th>
<th>Geology and Soils</th>
<th>Water Resources</th>
<th>Traffic and Transport</th>
<th>Air Quality</th>
<th>Heritage/Archaeology/Palaeontology</th>
<th>Socio-economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-construction and Construction</td>
<td>Clearance of vegetation</td>
<td></td>
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<tr>
<td></td>
<td>Construction of access road and ring road</td>
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<td></td>
<td>Site levelling and grading</td>
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<td></td>
<td>Installation of required site services</td>
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<td></td>
<td>Installation of project components</td>
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<tr>
<td>Operation</td>
<td>Operation of proposed facility</td>
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<td></td>
<td>Presence of facility</td>
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<td></td>
<td>Import and storage of chemicals/ fuel</td>
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<td></td>
<td>Distribution of products by truck</td>
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<td></td>
<td>Presence of workers on site</td>
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<tr>
<td></td>
<td>Employment and procurement</td>
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<tr>
<td></td>
<td>Waste management</td>
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<td></td>
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<tr>
<td>Decommissioning</td>
<td>Removal of facility components</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Removal of foundations</td>
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<td></td>
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<tr>
<td></td>
<td>Site restoration &amp; rehabilitation</td>
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</tbody>
</table>

Note: This interactions matrix will be continually developed throughout the EIA process.
Key: Shaded box indicates potential interaction between the Project and resource or receptor.

Figure 7.1 illustrates the manufacturing process of the proposed acetylene manufacturing facility and depicts the associated emissions and wastes as a result of the manufacturing process, which may have a potential impact on the biophysical and socioeconomic environments. These potential impacts are described further in the sections that follow.
Figure 7.1   Potential Environmental Impacts of Acetylene Plants

7.2 COMMENTS RAISED BY KEY AUTHORITIES

A summary of comments raised during by key authorities are tabulated below. For the detailed comments and responses, please refer to Annex E7. All comments received from stakeholders have been attached as Annex E4 and E5.
### Table 7.2 Summary of Comments Raised by Key Authorities

<table>
<thead>
<tr>
<th>Key Authority</th>
<th>Comments raised</th>
</tr>
</thead>
</table>
| Local Ward Councillor            | • Ensure appropriate emergency control systems as well as operational systems are in place.  
                                 | • Employment of local people.                                                    |
|                                  | • Traffic routes to be used, Daleside Road should be avoided.                   |
|                                  | • Dust emissions.                                                                |
| Midvaal Local Municipality       | • Adherence to all relevant national and local legislation.                     |
|                                  | • Employment opportunities.                                                     |
|                                  | • Existing issue with water supply and water pressure in that area.             |
|                                  | • Power requirements and use of energy efficient mechanisms.                    |
|                                  | • Zoning and consolidation of properties.                                        |
|                                  | • Appropriate waste management.                                                 |
| Sedibeng Local Municipality      | • Submission of AEL application to ensure integration with the GDARD in the decision making process. |
| South African Heritage Resources Agency | • No further investigations/heritage impact assessments are required as part of the EIA. |

### 7.3 Key Concerns Raised by I&APs

A summary of key issues raised during consultation with project stakeholders are tabulated below. For the detailed comments and responses, please refer to Annex E7. All comments received from stakeholders have been attached as Annex E4 and E5.

### Table 7.3 Summary of Key Issues Raised by I&APs

<table>
<thead>
<tr>
<th>Category</th>
<th>Comments raised</th>
</tr>
</thead>
</table>
| Project specific     | • Concern of the potential risks associated with a gas manufacturing facility (ie fire and explosion).  
                                 | • Facility should be self reliant in terms of emergency situations like a fire, all emergency situations should be planned for.  
                                 | • Issue with the site location and consideration of other sites.  
                                 | • Water and power requirements for the facility.  
                                 | • Proposed timing of the project.  
                                 | • Misunderstanding between the Geln Douglas mining operations and the proposed Air Products facility. |
| Environmental Impact | • What emissions will the plant be releasing into the air?                       |
|                      | • The Daleside area has large quantities of dust from the mine and sand works (Glen Douglas Mine) as well as the rubber pyronegis plant. The Project will result in a cumulative impact.  
                                 | • Concern over the cumulative air quality impact.  
                                 | • Concern of the smell of products kept on site during operations.  
                                 | • Operational times of the facility and associated noise emissions.  
                                 | • Potential pollution of the Klip River in the event of flooding.  
                                 | • Use of local roads for the transportation of materials and products to and from site.  
<pre><code>                             | • Management of waste on site and off-site. |
</code></pre>
<table>
<thead>
<tr>
<th>Category</th>
<th>Comments raised</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIA process</td>
<td>• Ensure that the local councillor is involved.</td>
</tr>
<tr>
<td></td>
<td>• Relevant government stakeholders must be involved in the process and all relevant legislation adhered to.</td>
</tr>
<tr>
<td></td>
<td>• Use of appropriate means to notify all residents ie local newsletters, placement of notices, radio announcements etc.</td>
</tr>
<tr>
<td></td>
<td>• Inadequate notification to project stakeholders, hence the lack of interest.</td>
</tr>
<tr>
<td>Socio-economic development</td>
<td>• No objections to the Project, as it will likely attract other businesses to the area.</td>
</tr>
<tr>
<td></td>
<td>• Impact on property values.</td>
</tr>
<tr>
<td></td>
<td>• Air Products considered a good company to invest in the area and believed to bring positive development impacts to the local economy.</td>
</tr>
<tr>
<td></td>
<td>• How many jobs will be created by the Project?</td>
</tr>
<tr>
<td></td>
<td>• What types of jobs will be created and will these be permanent?</td>
</tr>
<tr>
<td></td>
<td>• Lifespan of the facility and the ongoing benefits for the local community.</td>
</tr>
</tbody>
</table>

### 7.4 POTENTIALLY SIGNIFICANT ISSUES

The following section describes potentially significant issues based on the initial site visit, discussions with the Project team, issues and concerns raised by I&APs during the initial notification process, and available information about the environmental effects of acetylene gas manufacturing plants. It is likely that many of these impacts can be adequately addressed through the implementation of appropriate mitigation and management measures. However, some require further specialist investigation as part of the EIA as indicated.

#### 7.4.1 Impacts to Soil and Geology

The potential effects on soils and geology from construction may include:

- the formation of sinkholes;
- the potential for soil properties at the site to be permanently altered due to site preparation (eg compaction of soil and soil contamination); and
- site preparation and vegetation clearance activities which could cause instability and increased erosion potential.

These impacts can be easily mitigated or managed through the implementation of various measures, including the appropriate foundations and engineering design. A geotechnical and dolomite stability investigation will be undertaken for the proposed development.

Erosion will be avoided during operations by the establishment of hardstanding around the proposed facility, all stormwater is planned to be collected into 2 fire fighting catchment pits.
The potential impacts discussed above and any further impacts identified during the EIA will be further investigated in the Draft EIA Report.

7.4.2 Impacts to Water Resources

With the Klip River situated approximately 2km east of the proposed site, the potential for surface water contamination is unlikely, also due to the fact that there are no drainage channels located on or around the proposed site.

The potential for groundwater contamination is associated with uncontrolled spills of fuels and lubricants during the construction and operational phases. Fuel storage on site will be limited to bunded areas. Basic precautions to prevent groundwater contamination will be identified in the draft EMPr developed during the EIA phase of the Project.

7.4.3 Impacts to Flora and Fauna

The development of the proposed acetylene gas manufacturing facility could result in impacts on flora and fauna due to disturbance, displacement or direct habitat loss. The disturbance associated with construction activities can also result in the introduction and rapid colonisation of alien (non-native) species. The following key potential impacts may result from the proposed development:

- Loss of habitat for floral and faunal species;
- Displacement of certain faunal species, temporarily or permanently from the establishment of the proposed development; and
- Fragmentation of habitat and faunal populations through the presence of security boundary fencing around the development.

An ecological specialist study will be undertaken during the EIA phase to assess the impact on terrestrial flora and fauna and the identification of appropriate mitigation and management measures to be included in the draft EMPr.

7.4.4 Impacts to Heritage, Archaeology and Palaeontology

Excavations required for the installation of proposed facility, road construction, as well as land clearing, could disturb or destroy features of cultural heritage value, if they exist on the site. A brief heritage survey indicated that there were no artefacts of heritage, archaeological or paleontological importance. No further investigations are required by SAHRA.
7.4.5 **Impacts to Air Quality**

The District is generally characterized by poor air quality, particularly within the Midvaal Local Municipality due to the current industrialisation. This has resulted in the Midvaal Local Municipality being declared as part of the first national priority area the Vaal Air-shed Priority Area. Particulate matter has been identified as a pollutant of concern within the region and the major contributors for particulate matter (PM$_{10}$) is both industrial sources and domestic sources especially in winter.

The construction, operation and decommissioning of the proposed facility will result in emissions to air. These emissions have the potential to adversely affect human health or result in nuisance to sensitive receptors. The key sources of emissions will result from construction activities, including site clearance activities (dust) and construction traffic resulting in the nitrogen dioxide (NO$_2$) and particulate matter (PM).

As depicted in Figure 7.1, the operation of the acetylene gas manufacturing facility will also result in air emissions. Emissions of acetylene gas will be released from the storage of calcium carbide, from the generator vessel, during cylinder filling and storage of lime. Furthermore, the increase in vehicle movements to and from the site on the local road network has the potential to adversely affect air quality at receptors close to the roadside.

To ensure environmental protection and for safety reasons, embedded controls will be implemented to reduce these air emissions, particularly considering the existing air quality of the region.

Emissions of exhaust gases arising from on-site mobile plant and non-mobile equipment such as generators will occur on a small scale and will be localised. On this basis, this source of emissions will be scoped out of the assessment.

7.4.6 **Waste Generation**

Waste management within the region has for many years occurred without consideration for future development. Landfill sites have generally been identified with limited planning (site location) or design to reduce impacts on the natural environment and currently pose a challenge in the region.

Waste generated during Project activities may arise from a range of sources including excavated material (eg rock, sand, vegetation, wood), general waste from construction workers, equipment, materials and vehicles; and general and limited hazardous wastes produced as a result of the production process. In particular, cylinder maintenance activities may result in scrap metals and scrap cylinders, including spent solvents/acids for cleaning purposes.

Specific requirements for waste management and disposal will be identified in the draft EMP developed during the EIA phase of the Project.
7.4.7 Impact on Traffic

There may be a minor increase in traffic during the construction and operation of the proposed acetylene gas manufacturing facility as a number of trucks will be required to transport infrastructure, equipment and construction materials onto site during the construction phase. During operations, transportation trucks will be travelling to and from the site to transport the acetylene gas cylinders to various consumers within and around the region. A site traffic assessment will be undertaken to provide further information regarding traffic levels and an assessment of significance will be provided in the EIR.

7.4.8 Noise and Vibration

The main sources of noise include manual handling, use of vehicles and compressors and pumps. Impacts are likely to be minimal due to the existing industrial landscape. Construction vehicles and distribution trucks however, will result in a slight increase in noise disturbance to sensitive receptors.

7.4.9 Employment

Employment has been an issue of significant interest to local stakeholders to date, and this is likely to continue. If managed well, it is the impact factor with the greatest potential to have a significant positive effect on the local area.

Employment opportunities will arise from the proposed development over the duration of the development, i.e. from the construction phase through to decommissioning. Air Products have constructed, operated and maintained a number of gas manufacturing facilities in South Africa and based on these experiences it is expected that 10 workers will be required during the construction phase, with a further 10 required during the operational phase. There will thus be 20 employees required during the operational phase. These aspects will be further considered during the EIA phase.

7.4.10 Unplanned Events

The main hazards associated with acetylene gas facilities include:

- the extremely high flammability of the gas;
- the possibility to form explosive mixtures with air; and
- its property of decomposition under various circumstances with the consequence of a fire or an explosion.

Other unplanned events include accidental releases of equipment fuels and oils during construction, improper disposal of waste and accidental release of hazardous substances used and stored on site.
To prevent such events, the proposed acetylene gas facility will be equipped with an emergency shut-down system to stop all electrical machinery. An emergency water deluge system will also be provided to cover the cylinder filling and indoor storage areas. Furthermore, employees and contractors will be made aware of the site emergency plans and trained on all emergency requirements.

A full Major Hazardous Installation (MHI) assessment will be undertaken as part of the EIA.
8 PLAN OF STUDY FOR EIA

8.1 PURPOSE OF PLAN OF STUDY

The Plan of Study (PoS) for the EIA has been compiled in line with Section 28 (1) (n) of the EIA Regulations 2010. The purpose of the PoS is to ensure that the Impact Assessment phase is undertaken in a manner that is consistent with the requirements outlined in the NEMA and associated EIA Regulations. The PoS for the proposed EIA process describes the tasks that are to be performed, indicates when the competent authority will be contacted, details the public participation process that will be required and provides specific information required by the competent authority.

An understanding of the Project description, sensitivity of affected environment and comments received from stakeholders during initial consultation has led to the identification of key issues of concerns (Section 6.1). To address these key issues, a number of specialist studies have been recommended and detailed Terms of Reference (ToR) developed as part of the PoS. These together with the remainder of the Impact Assessment process are described below.

8.2 PROPOSED SPECIALIST STUDIES

On completion of this scoping exercise, specialist studies have been identified to conduct detailed assessments to determine the significance of impacts associated with the Project (Section 6.2). Recognising the sensitivities associated with the region (based on a desktop literature review) as well as public comment received, the following specialist team has been appointed to undertake detailed investigations related to the Project. A list of the specialists studies proposed for the Impact Assessment phase is presented in Table 8.1 below.

Table 8.1 EIA Specialist Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natasha Higgit</td>
<td>Digby Wells and Associates</td>
<td>Heritage and Archaeology</td>
</tr>
<tr>
<td>Jaco Stolp</td>
<td>ITS Engineers</td>
<td>Traffic</td>
</tr>
<tr>
<td>MJ Van Der Walt</td>
<td>Company</td>
<td>Geotechnical and Dolomite Stability</td>
</tr>
<tr>
<td>Gary Mcfadden</td>
<td>ERM</td>
<td>Major Hazardous Installation</td>
</tr>
<tr>
<td>Nick Grobler</td>
<td>Airshed Planning Professionals</td>
<td>Air Quality</td>
</tr>
<tr>
<td>Susan Abell</td>
<td>Natural Scientific Services</td>
<td>Fauna and Flora</td>
</tr>
<tr>
<td>Janet Mkhabela</td>
<td>ERM</td>
<td>Stakeholder Engagement/Social</td>
</tr>
</tbody>
</table>
8.3 **SPECIALIST TERMS OF REFERENCE**

The Terms of Reference for each of the specialist studies are discussed below. All specialist assessments will take into account the applicable South African, provincial and local legislation and guidelines. Furthermore, each specialist assessment will consider the Project site as defined in Section 1.3.

8.3.1 **Heritage, Archaeology and Palaeontology Screening Survey**

*Literature Review*

Information sources will be reviewed with the objective of defining and describing the cultural landscape, providing a provisional Statement of Significance of the general landscape; and listing any significant heritage resources that have been previously recorded.

*Historical Layering*

Desktop study of available, existing and relevant cartographic information will be undertaken. These information sources shall assist in identifying historical heritage resources, areas where archaeological deposits may occur; and changes in land use.

*Heritage Screening Survey*

A screening field survey of the proposed site will be undertaken to visually record the current state of the cultural landscape and determine the potential of significant tangible heritage resources to occur. Select heritage resources that may have been identified during desktop data collection will also be verified or ground-truthed. The survey will focus on natural features in the landscape where heritage resources may be anticipated such as shelters, hills, pans and rivers and / or streams.

*Reporting*

A Heritage Statement Report (HSR) and Notice of Intent to Develop (NID) will be compiled and submitted directly to the SAHRA for their review and comment.

8.3.2 **Traffic Impact Assessment**

*Trip Generation*

Existing traffic volumes shall be determined, based on traffic counts to be conducted during the peak periods at relevant intersections in the vicinity of the proposed development. Reference will be made to available counts from the relevant role players in the area. The proposed new development will be evaluated, based on the number of trips expected to be generated. In the determination of the trip generation, reference will be made to typical rates from literature, as well as an analogy from similar developments. Based on these information sources, a suitable trip generation rate will be formulated.
Trip Distribution

Based on the envisaged utilisation of the various modes of transport (ie road), a transport mode choice scenario will be developed. In this regard, reference will be made to both, the existing patterns and the envisaged future transport mode choice characteristics. The trips will be distributed to the surrounding road network, with reference to the expected origins and destinations of users to and from the development.

Trip Assignment

- Establish whether the proposed site transport system is feasible.
- Establish if it is physically (in terms of infrastructure) possible to accommodate the proposed development traffic.

Impact Assessment and Mitigation

The impact of Project traffic on the existing traffic network will be identified and assessed. Furthermore, it will be determined whether the proposed site development or transportation facilities proposed for the development complies with the requirements of the local authorities. Recommendations will be made that will serve as input in addressing the impacts identified.

8.3.3 Air Quality Impact Assessment

Desktop Review

- Describe the regional climate and site-specific atmospheric conditions impacting on the dispersion potential of the study site based on available climatological and meteorological information and identify potentially sensitive receptors within the vicinity of the proposed development.
- Provide an overview of the legislation and regulatory context as it pertains to the regulation of atmospheric emissions including air pollutant concentrations.

Analysis

- Include an analysis of the baseline air quality, as measured by the Department of Environmental Affairs (DEA) monitoring stations in the Vaal Triangle, with specific reference to the one nearest to the site. The analysis shall also include a comparison of the air measurement with the National Ambient Air Quality Standards (NAAQS).
- Compile an emissions inventory for the proposed development including criteria pollutants as defined by the DEA and other pollutants assessed for completeness.
• Simulate ambient air pollutant concentrations occurring due to proposed processing facility only; and cumulatively with other existing facilities.

• Estimate construction emissions based on the available information. Operational emissions will be determined based on engineering design and emission factors, such as those developed by the United States Environmental Protection Agency (US-EPA).

• Evaluate predicted air pollutant concentrations on the basis of the NAAQS and international ‘good practice’ criteria (eg World Health Organisation (WHO) and the World Bank (WB)).

**Reporting**

Recommendation of mitigation and management measures as part of an air quality assessment report and management plan. Information gathered from this Air Quality Impact Assessment will be used to complete the Air Emissions Licence.

**8.3.4 Ecological Impact Assessment (Flora and Fauna)**

**Desktop Review**

An initial desktop review of available literature will be undertaken, including recent information from GDARD’s Conservation Department and Red Data floral and faunal listings as well as recent assessments conducted within the region. A description of the biophysical attributes of the site will be provided along with a list of any applicable legislation, guidelines, standards and criteria to be considered in project planning.

**Site Assessment**

A field visit will be undertaken during the summer months to identify the vegetation communities using approved vegetation sampling methods. A listing of the common/dominant plant and faunal species within the vegetation/habitat units will be identified. Any additional information will be recorded for any other features that may have ecological significance.

**Reporting**

An ecological assessment report will be compiled including an assessment of the site vegetation types and species of conservation concern, if any. Project impacts on the vegetation communities and faunal and floral species will be identified and assessed along with a description of any mitigation measures that will be required.

A number of provincial departments are concerned that ecological assessments are undertaken within 1 site visit and season as certain floral and faunal species may only be evident during specific seasons (ie species richness of an area is higher during the rainy season. The ecological impact assessment
will be undertaken during the rainy season (i.e., December 2013 to January 2014).

8.3.5 Social Baseline

The social baseline will be based on a desktop literature review and limited interviews. This will be accomplished through the use of secondary data and online sources. The secondary data sources will include:

- local Integrated Development Plan (IDP);
- Statistics South Africa 2010 Census; and
- other relevant sources identified.

In order to gather clear and more current information for the baseline and impact assessment, a field visit and telephone interviews will be undertaken. The planned field visit will be undertaken at the same time as the first public meeting. This will afford the social consultants the opportunity to engage with the relevant community members, authorities and to get a general sense of the stakeholder issues. The majority of the data that will be collected from the field visit will be from the following stakeholders:

- ward councillor;
- municipality;
- community development worker;
- health care workers; and
- neighbouring landowners.

8.4 Impact Assessment Methodology

The adequate assessment and evaluation of the potential impacts and benefits that will be associated with the proposed Project necessitates the development of a methodology that will reduce the subjectivity involved in making such evaluations. A clearly defined methodology is used in order to accurately determine the significance of the predicted impact on, or benefit to, the surrounding natural and/or social environment. For this the Project must be considered in the context of the area and the people that will be affected.

Nonetheless, an impact assessment will always contain a degree of subjectivity, as it is based on the value judgment of various specialists and EIA practitioners. The evaluation of significance is thus contingent upon values, professional judgment, and dependent upon the environmental and community context. Ultimately, impact significance involves a process of determining the acceptability of a predicted impact to society.

The purpose of impact assessment is to identify and evaluate the likely significance of the potential impacts on identified receptors and resources according to defined assessment criteria, to develop and describe measures that will be taken to avoid, minimize, reduce or compensate for any potential
adverse environmental effects, and to report the significance of the residual impacts that remain following mitigation. There are a number of ways that impacts may be described and quantified.

8.4.1 Impact Identification and Characterisation

An ‘impact’ is any change to a resource or receptor brought about by the presence of a project component or by a project-related activity. In this assessment, the impacts are described in terms of their characteristics, including the impact’s type and the impact’s spatial and temporal features (namely extent, duration, scale and frequency). While an impact assessment typically focuses on the negative impacts, an impact can also be positive. The definitions of these terms used in this EIA are described in Table 8.2.
An additional characteristic that pertains to unplanned events (eg incidents, spills) is likelihood (Table 8.3). The likelihood of an unplanned event occurring is determined qualitatively, or when data is available, semi-quantitatively. Likelihood is estimated on the basis of experience and/or evidence that such an outcome has previously occurred. It is also important to distinguish that likelihood is a measure of the degree to which the unplanned event is expected to occur, not the degree to which an impact or effect is expected to occur as a result of the unplanned event.
Table 8.3  Definitions for Likelihood

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlikely</td>
<td>The event is unlikely but may occur at some time during normal operating conditions.</td>
</tr>
<tr>
<td>Possible</td>
<td>The event is likely to occur at some time during normal operating conditions.</td>
</tr>
<tr>
<td>Likely</td>
<td>The event will occur during normal operating conditions (ie, it is essentially inevitable).</td>
</tr>
</tbody>
</table>

8.4.2  Determining Impact Magnitude

Once an impact’s characteristics are defined, the next step in the impact assessment phase is to assign each impact a ‘magnitude’. Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- extent
- duration
- scale
- frequency

Magnitude (from small to large) is in practice a continuum, and evaluation along the spectrum requires the exercise of professional judgement and experience. Each impact is evaluated on a case-by-case basis, and the rationale for each determination is noted. The universal magnitude designations, for negative effects, are: negligible, small, medium and large. The magnitude designations themselves are universally consistent, but the definition for the designations varies by issue. In the case of a positive impact, no magnitude designation has been assigned as it is considered sufficient for the purpose of the impact assessment to indicate that the Project is expected to result in a positive impact.

The magnitude of an impact takes into account the various dimensions of a particular impact in order to make a determination as to where the impact falls on the spectrum from negligible to large. Some impacts will result in changes to the environment that may be immeasurable, undetectable or within the range of normal natural variation. Such changes can be regarded as essentially having no impact, and are characterised as having a negligible magnitude.

In the case of impacts resulting from unplanned events, the same resource/receptor-specific approach to concluding a magnitude designation is utilised. The likelihood factor is also considered, together with the other impact characteristics, when assigning a magnitude designation.
Determining Magnitude for Biophysical Impacts

For biophysical impacts, the semi-quantitative definitions for the spatial and temporal dimension of the magnitude of impacts used in this assessment are provided below:

**High Magnitude Impact** affects an entire area, system (physical), aspect, population or species (biological) and at sufficient magnitude to cause a significant measurable numerical increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) or a decline in abundance and/or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations (physical and biological). A high magnitude impact may also adversely affect the integrity of a site, habitat or ecosystem.

**Moderate Magnitude Impact** affects a portion of an area, system, aspect (physical), population or species (biological) and at sufficient magnitude to cause a measurable numerical increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) and may bring about a change in abundance and/or distribution over one or more plant/animal generations, but does not threaten the integrity of that population or any population dependent on it (physical and biological). A moderate magnitude impact may also affect the ecological functioning of a site, habitat or ecosystem but without adversely affecting its overall integrity. The area affected may be local or regional.

**Low Magnitude Impact** affects a specific area, system, aspect (physical), group of localized individuals within a population (biological) and at sufficient magnitude to result in a small increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) over a short time period (one plant/animal generation or less, but does not affect other trophic levels or the population itself), and localized area.

Determining Magnitude for Socioeconomic Impacts

For socioeconomic impacts, the magnitude considers the perspective of those affected by taking into account the likely perceived importance of the impact, the ability of people to manage and adapt to change and the extent to which a human receptor gains or loses access to, or control over socio-economic resources resulting in a positive or negative effect on their well-being. The quantitative elements are included into the assessment through the designation and consideration of scale and extent of the impact.
8.4.3 Determining Receptor Sensitivity

In addition to characterising the magnitude of impact, the other principal step necessary to assign significance for a given impact is to define the sensitivity of the receptor. There are a range of factors to be taken into account when defining the sensitivity of the receptor, which may be physical, biological, cultural or human. Where the receptor is physical (for example, a water body) its current quality, sensitivity to change, and importance (on a local, national and international scale) are considered. Where the receptor is biological or cultural (for example, the marine environment or a coral reef), its importance (for example, its local, regional, national or international importance) and its sensitivity to the specific type of impact are considered. Where the receptor is human, the vulnerability of the individual, community or wider societal group is considered.

As in the case of magnitude, the sensitivity designations themselves are universally consistent, but the definitions for these designations will vary on a resource/receptor basis. The universal sensitivity of receptor is low, medium and high.

For ecological impacts, sensitivity is assigned as low, medium or high based on the conservation importance of habitats and species. For habitats, these are based on naturalness, extent, rarity, fragility, diversity and importance as a community resource. For the sensitivity of individual species, Table 8.4 presents the criteria for deciding on the value or sensitivity of individual species.

For socio-economic impacts, the degree of sensitivity of a receptor is defined as the level of resilience (or capacity to cope) with sudden social and economic changes. The sensitivity of a resource is based on its quality and value/importance, for example, by its local, regional, national or international designation, its importance to the local or wider community, or its economic value.

Table 8.4 and Table 8.5 present the criteria for deciding on the value or sensitivity of biological and socioeconomic receptors.

### Table 8.4 Biological and Species Value / Sensitivity Criteria

<table>
<thead>
<tr>
<th>Value / Sensitivity</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td>Not protected or listed as common / abundant; or not critical to other ecosystem functions (e.g. key prey species to other species).</td>
<td>Not protected or listed but may be a species common globally but rare in Nigeria with little resilience to ecosystem changes, important to ecosystem functions, or one under threat or population decline.</td>
<td>Specifically protected under Nigerian legislation and/or international conventions e.g. CITIES Listed as rare, threatened or endangered e.g. IUCN</td>
</tr>
</tbody>
</table>
Note: The above criteria should be applied with a degree of caution. Seasonal variations and species lifecycle stage should be taken into account when considering species sensitivity. For example, a population might be deemed as more sensitive during the breeding/spawning and nursery periods. This table uses listing of species (e.g. IUCN) or protection as an indication of the level of threat that this species experiences within the broader ecosystem (global, regional, local). This is used to provide a judgement of the importance of affecting this species in the context of project-level changes.

Table 8.5 Socioeconomic Sensitivity Criteria

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td>Those affected are able to adapt with relative ease and maintain pre-impact status.</td>
<td>Able to adapt with some difficulty and maintain pre-impact status but only with a degree of support.</td>
<td>Those affected will not be able to adapt to changes and continue to maintain-pre impact status.</td>
</tr>
</tbody>
</table>

8.4.4 Assessing Significance

Once magnitude of impact and sensitivity of a receptor have been characterised, the significance can be determined for each impact. The impact significance rating will be determined, using the matrix provided in Figure 8.1.

Figure 8.1 Impact Significance

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity/vulnerability/importance designations that enter into the matrix. Box 8.1 provides a context for what the various impact significance ratings signify.
Box 8.1  Context of Impact Significances

An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be ‘imperceptible’ or is indistinguishable from natural background variations.

An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/vulnerability/importance. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of IA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

8.4.5  Mitigation Potential and Residual Impacts

One of the key objectives of an EIA is to identify and define socially, environmentally and technically acceptable and cost effective measures to manage and mitigate potential impacts. Mitigation measures are developed to avoid, reduce, remedy or compensate for potential negative impacts, and to enhance potential environmental and social benefits.

In keeping with the mitigation hierarchy, the priority is to first apply mitigation measures to the source of the impact (ie to avoid or reduce the magnitude of the impact from the associated Project activity), and then to address the resultant effect to the resource/receptor via abatement or compensatory measures or offsets (ie to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude).

Once mitigation measures are declared, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation measures. The approach
taken to defining mitigation measures is based on a typical hierarchy of decisions and measures, as described in Table 8.6.

**Table 8.6 Mitigation Hierarchy**

<table>
<thead>
<tr>
<th>Avoid at Source; Reduce at Source: avoiding or reducing at source through the design of the Project (e.g. avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abate on Site: add something to the design to abate the impact (e.g. pollution control equipment).</td>
</tr>
<tr>
<td>Abate at Receptor: if an impact cannot be abated on-site then control measures can be implemented off-site (e.g. traffic measures).</td>
</tr>
<tr>
<td>Repair or Remedy: some impacts involve unavoidable damage to a resource (e.g. material storage areas) and these impacts require repair, restoration and reinstatement measures.</td>
</tr>
<tr>
<td>Compensate in Kind; Compensate Through Other Means where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g. financial compensation for degrading agricultural land and impacting crop yields).</td>
</tr>
</tbody>
</table>

**8.4.6 Cumulative Impacts**

A cumulative impact is one that arises from a result of an impact from the Project interacting with an impact from another activity to create an additional impact. How the impacts and effects are assessed is strongly influenced by the status of the other activities (e.g. already in existence, approved or proposed) and how much data is available to characterize the magnitude of their impacts.

The approach to assessing cumulative impacts is to screen potential interactions with other projects on the basis of:

- projects that are already in existence and are operating;
- projects that are approved but not as yet built or operating; and
- projects that are a realistic proposition but are not yet built.

**8.5 EIA PROJECT TIMING**

**Scoping Phase**

The Draft Scoping Report was distributed for a public comment period of 30 days. This Final Scoping Report will be finalised and re-submitted for public comment for a further 21 days and submitted to the GDARD. All comments received on the Final Scoping Report will be forwarded to the GDARD directly. The GDARD will then review the Final Scoping Report and
associated Plan of Study for the Impact Assessment phase and either reject, approve or request for further information.

**Impact Assessment Phase**

Upon approval of the Final Scoping Report, the required investigations and assessments will be undertaken; the Draft EIA Report will then be compiled and distributed for public and authority comment for a period of 40 days. The Draft EIA Report will contain the findings of all specialist studies, together with an EMPr which will outline measures to mitigate and manage potential impacts. At the end of the 40 day public commenting period, the Draft EIA Report will be finalised with comments received and re-submitted for public comment for a further 21 days. All comments received on the Final EIA Report will be forwarded to the GDARD directly, for decision making.

**Decision Making**

Upon completion of the 21 day public comment period on the Final EIA Report, the GDARD will first determine if there is sufficient information to make an informed decision. If there is sufficient information, the GDARD will accept the Final EIA Report and proceed with the decision making period. ERM will formally notify all registered I&APs and general public of the decision through letters of notification as well as advertisements in relevant newspapers.

The next steps and provisional EIA process schedule is presented in Table 8.7.

<table>
<thead>
<tr>
<th>Task</th>
<th>Provisional Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder Comment on Draft Scoping Report and Plan of Study for EIA (30 days)</td>
<td>January 2014 – February 2014</td>
</tr>
<tr>
<td>Finalise Scoping Report and Plan of Study for EIA and submit to GDARD</td>
<td>March 2014</td>
</tr>
<tr>
<td>Submit AEL Application Form to Sedibeng District Municipality</td>
<td>March 2014</td>
</tr>
<tr>
<td>Acceptance/Rejection/Amendment of Final Scoping Report received from GDARD*</td>
<td>May 2014</td>
</tr>
<tr>
<td>Specialist studies</td>
<td>February 2014-June 2014</td>
</tr>
<tr>
<td>Prepare Draft EIA Report and EMPr</td>
<td>May 2014-June 2014</td>
</tr>
<tr>
<td>Stakeholder Comment on Draft EIA Report and EMPr (40 days)</td>
<td>June 2014-July 2014</td>
</tr>
<tr>
<td>Finalise and submit Final EIA Report and EMPr to GDARD*</td>
<td>July 2014</td>
</tr>
</tbody>
</table>

* Timeframe dependant on the relevant authority

The Atmospheric Emissions License will be submitted separately to the Sedibeng District Municipality for their consideration.
CONCLUSION AND WAY FORWARD

9.1 CONCLUSION

The aim of the Final Scoping Report is to identify the key environmental and social risks and impacts associated with the proposed acetylene gas manufacturing facility and to focus the environmental assessment on important issues and ensure that these issues and reasonable alternatives are assessed in more detail. In addition, the identification of feasible alternatives to meet the objective of the Project will also be identified, during the scoping process.

The scoping process allows for Public Participation and a process of developing an understanding of the Project and affected environment which allows for the development of applicable Terms of References for specialist studies to be undertaken as part of the EIA.

Potential impacts have been identified and these will be assessed in the Impact Assessment Phase. Based on the initial investigation of potentially significant issues, it has been concluded that there are no clear environmental or social fatal flaws which could prevent the development of the proposed Project; however, the potential environmental and social sensitivities highlighted in this report will need to be further investigated and assessed during the EIA.

The EIA will present and describe the residual impacts of the proposed Project, together with their impact significance rating. This will result in the compilation of an EMPr (addressing environmental and social aspects) for key issues identified. The EMPr will outline requirements for on-site management of bio-physical and socio-economic aspects during the construction phase, and for the ongoing management and monitoring during the operational phase of the Project.

9.2 WAY FORWARD

The public commenting period for this Final Scoping Report commences on 20 March 2014 and concludes on 10 April 2014. All comments must be forwarded to the following:

ATTENTION: JANET MKHABELA
ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)
POSTAL ADDRESS: POSTNET SUITE 624, PRIVATE BAG X29,
GALLO MANOR, 2052
TEL: (011) 798 4300
FAX: (086) 688 2569
EMAIL: AIRPRODUCTSEIA@ERM.COM
PROJECT WEBSITE: http://www.erm.com/AirproductsEIA
REFERENCES

Air Products South Africa (Pty) Ltd. 21 November 2013 - Email

Digby Wells Environmental. December 2013. Heritage Statement for a Proposed Acetylene Gas Production Facility


Midvaal Local Municipality. 2013-2018. Integrated Development Plan


Sedibeng District Municipality. 2013-2014. Integrated Development Plan

Sedibeng District Municipality. 2013. Spatial Development Framework