ENVIRONMENTAL IMPACT ASSESSMENT: DEVELOPMENT OF A THERMAL POWER DUAL FUEL FACILITY TO FORM PART OF THE AUTHORISED HYPERION 1 & 2 SOLAR PV ENERGY FACILITIES, NEAR KATHU, NORTHERN CAPE PROVINCE

TRANSPORT IMPACT ASSESSMENT

February 2021
Final Issue

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SYNOPSIS

Preparation of a Transport Impact Assessment for the Development of a Thermal Power Dual Fuel Facility to form part of the authorised Hyperion 1 & 2 Solar PV Energy Facilities, near Kathu, Northern Cape Province, pertaining to all relevant traffic and transportation engineering aspects.

KEY WORDS:

Thermal Power Dual Fuel Facility, Solar PV, Environmental Impact Assessment, Transport Impact Assessment, EIA, TIA

QUALITY VERIFICATION

This report has been prepared under the controls established by a quality management system that meets the requirements of ISO 9001: 2015 which has been independently certified by DEKRA Certification.

Verification	Capacity	Name	Signature	Date
By Author	Senior Technologist	Adrian Johnson		08/02/2021
Checked by:	Associate	Iris Wink		08/02/2021
Authorised by:	Director	Harold Tiganis		08/02/2021

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SPECIALIST EXPERTISE

IRIS SIGRID WINK

Profession	Civil Engineer (Traffic & Transportation)
Position in Firm	Associate
Area of Specialisation	Manager: Traffic & Transportation Engineering
Qualifications	PrEng, MSc Eng (Civil & Transportation)
Years of Experience	18 Years
Years with Firm	8 Years

SUMMARY OF EXPERIENCE

Iris is a Professional Engineer registered with ECSA (20110156). She joined JG Afrika (Pty) Ltd. in 2012. Iris obtained a Master of Science degree in Civil Engineering in Germany and has more than 15 years of experience in a wide field of traffic and transport engineering projects. Iris left Germany in 2003 and has worked as a traffic and transport engineer in South Africa and Germany. She has technical and professional skills in traffic impact studies, public transport planning, non-motorised transport planning and design, design and development of transport systems, project planning and implementation for residential, commercial and industrial projects and providing conceptual designs for the abovementioned. She has also been involved with transport assessments for renewable energy projects and traffic safety audits.

PROFESSIONAL REGISTRATIONS & INSTITUTE MEMBERSHIPS

PrEng -Registered with the Engineering Council of South Africa No. 20110156
-Registered Mentor with ECSA for the Cape Town Office of JG Afrika
MSAICE -Member of the South African Institution of Civil Engineers
ITSSA -Member of ITS SA (Intelligent Transport Systems South Africa)
SAWEA -Member of the South African Wind Energy Association
SARF -South African Road Federation: Committee Member of Council
SARF WR - SARF Western Region Committee Member
SARF RSC - Road Safety Committee Member
IRF - Global Road Safety Audit Team Leader with the International Road Federation (IRF)

EDUCATION

1996 - Matric – Matric (Abitur) – Carl Friedrich Gauss Schule, Hemmingen, Germany
1998 - Diploma as Draughtsperson – Lower Saxonian State Office for Road and Bridge Engineering
2003 - MSc Eng (Civil and Transportation) – Leibniz Technical University of Hanover, Germany

SPECIFIC EXPERIENCE

JG Afrika (Pty) Ltd (Previously Jeffares & Green (Pty) Ltd)
2016 – Date
Position – Associate

- **Rondekop Windfarm** – Transport study for the proposed Kudusberg Windfarm near Sutherland, Northern Cape – Client: G7 Renewable Energies

- **Kudusberg Windfarm** – Transport study for the proposed Kudusberg Windfarm near Sutherland, Northern Cape – Client: G7 Renewable Energies
- **Multiple Traffic Impact and Route Assessment** for the proposed Solar PV Facilities in the Northern Cape – Client: Private Developer
- **Kuruman Windfarm –** Transport study for the proposed Kuruman Windfarm in Kuruman, Northern Cape – Client: Mulilo Renewable Project Developments
- **Coega West Windfarm** – Transportation and Traffic Management Plan for the proposed Coega Windfarm in Coega, Port Elizabeth – Client: Electrawinds Coega
- **Traffic and Parking Audits** for the Suburb of Groenvallei in Cape Town – Client: City of Cape Town Department of Property Management.
- **Road Safety Audit** for the Upgrade of N1 Section 4 Monument River – Client: Aurecon on behalf of SANRAL
- **Sonop Windfarm** – Traffic Impact Assessment for the proposed Sonop Windfarm, Coega, Port Elizabeth – Client: Founders Engineering
- **Universal Windfarm** - Traffic Impact Assessment for the proposed Universal Windfarm, Coega, Port Elizabeth – Client: Founders Engineering
- **Road Safety Audit** for the Upgrade of N2 Section 8 Knysna to Wittedrift – Client: SMEC on behalf of SANRAL
- **Road Safety Audit** for the Upgrade of N1 Section 16 Zandkraal to Winburg South – Client: SMEC on behalf of SANRAL
- **Traffic and Road Safety Studies** for the Improvement of N7 Section 2 and Section 3 (Rooidraai and Piekenierskloof Pass) – Client: SANRAL
- **Road Safety Appraisal**s for Northern Region of Cape Town – Client: Aurecon on behalf of City of Cape Town (TCT)
- **Traffic Engineering Services** for the Enkanini Informal Settlement, Kayamandi - Client: Stellenbosch Municipality
- **Lead Traffic Engineer** for the Upgrade of a 150km Section of the National Route N2 from Kangela to Pongola in KwaZulu-Natal, Client: SANRAL
- **Traffic Engineering Services** for the Kosovo Informal Settlement (which is part of the Southern Corridor Upgrade Programme), Client: Western Cape Government
- **Traffic and Road Safety Studies** for the proposed Kosovo Informal Housing Development (part of the Southern Corridor Upgrade Program), Client: Western Cape Government.
- **Road Safety Audit Stage 3** – Upgrade of the R573 Section 2 between Mpumalanga/Gauteng and Mpumalanga/Limpopo, Client: AECOM on behalf of SANRAL
- **Road Safety Audit Stage 1 and 3** – Upgrade of the N2 Section 5 between Lizmore and Heidelberg, Client: Aurecon on behalf of SANRAL
- **Traffic Safety Studies** for Roads Upgrades in Cofimvaba, Eastern Cape – Client: Cofimvaba Municipality
- **Road Safety Audit Stage 1 and 3** – Improvement of Intersections between Olifantshoek and Kathu, Northern Cape, Client: Nadeson/Gibb on behalf of SANRAL
- **Road Safety Audit Stage 3** – Upgrade of the Beacon Way Intersection on the N2 at Plettenberg Bay, Client: AECOM on behalf of SANRAL

- **Traffic Impact Assessment** for a proposed Primary School at Die Bos in Strand, Somerset West, Client: Edifice Consulting Engineers
- **Road Safety Audit** Stage 1 and 3 – Improvement of R75 between Port Elizabeth and Uitenhage, Eastern Cape, Client: SMEC on behalf of SANRAL

SPECIALIST DECLARATION

I, **IRIS WINK**, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant;
- Regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- All the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist: _____

Name of Specialist: IRIS WINK

Date: 08/02/2021

COMPLIANCE WITH THE APPENDIX 6 OF THE 2014 EIA REGULATIONS

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Yes. See attached CV
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Yes. See attached declaration
c) an indication of the scope of, and the purpose for which, the report was prepared;	Yes. See section 1.1
(cA) an indication of the quality and age of base data used for the specialist report;	n/a
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Yes. See Chapters 6 and 8
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	n/a
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Yes. See section 1.3
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Yes. Chapters 3 and 6
g) an identification of any areas to be avoided, including buffers;	n/a
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	n/a
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Yes. Section 1.4
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment or activities;	Yes. Chapters 3, 6, and 8
k) any mitigation measures for inclusion in the EMPr;	Yes. Chapter 9
l) any conditions for inclusion in the environmental authorisation;	n/a
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Yes. Chapter 9
n) a reasoned opinion- i. as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Yes. Chapter 6 and 8
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	n/a
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	n/a
q) any other information requested by the competent authority.	n/a
2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	n/a

EXECUTIVE SUMMARY

This Transport Impact Assessment (TIA) was commissioned to assess the potential impact of activities related to the development of a 75MW hybrid facility consisting of a fully dispatchable, dual fuel (liquid or gas) thermal generation plant that will work in combination with the authorised Hyperion PV Solar Energy Facility (SEF) complex.

The main potential traffic impacts will be during the construction and decommissioning phases where the delivery and decommissioning of the components of the proposed facility will generate significant traffic. The duration of these phases is short term, i.e. the impact of the traffic generated during the construction and decommissioning phases of the proposed facility on the surrounding road network is temporary. The operational phase of the proposed facility, which include the delivery of LPG to the site, will not add any significant traffic to the road network.

Potential traffic generated by the construction of the proposed facility will have a negative, albeit short-term, impact on the surrounding road network. Proposed mitigation measures during the construction phase include:

- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batch plants and quarries near the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods.
- A “dry run” of the preferred route.
- Design and maintenance of internal roads.
- If required, any low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved or avoided to accommodate the abnormal load vehicles.

The proposed site will be accessed via a new surfaced access road, an extension of the T26, located along the boundary of the Remainder of the Farm Lyndoch 432.

The proposed development of the facility and associated infrastructure is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.

The potential impacts associated with the proposed facility and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility can be authorised.

TRANSPORT IMPACT ASSESSMENT

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PROPOSED THERMAL POWER DUAL FUEL FACILITY, NORTHERN CAPE PROVINCE

1 INTRODUCTION AND METHODOLOGY

1.1 Scope and Objectives

Hyperion Solar Development (Pty) Ltd proposes the development of a 75MW hybrid facility consisting of a fully dispatchable, dual fuel (liquid or gas) thermal generation plant that will work in combination with the authorised Hyperion 1 and 2 PV Solar Energy Facility (SEF) complex. The power generated by the thermal facility and authorised Hyperion PV facility complex will connect via an overhead 132kV power line to the national grid. The Facility will be located on the Remainder of the Farm Lyndoch 432, located north of Kathu in the Northern Cape Province, as shown in **Figure 1-1** below.

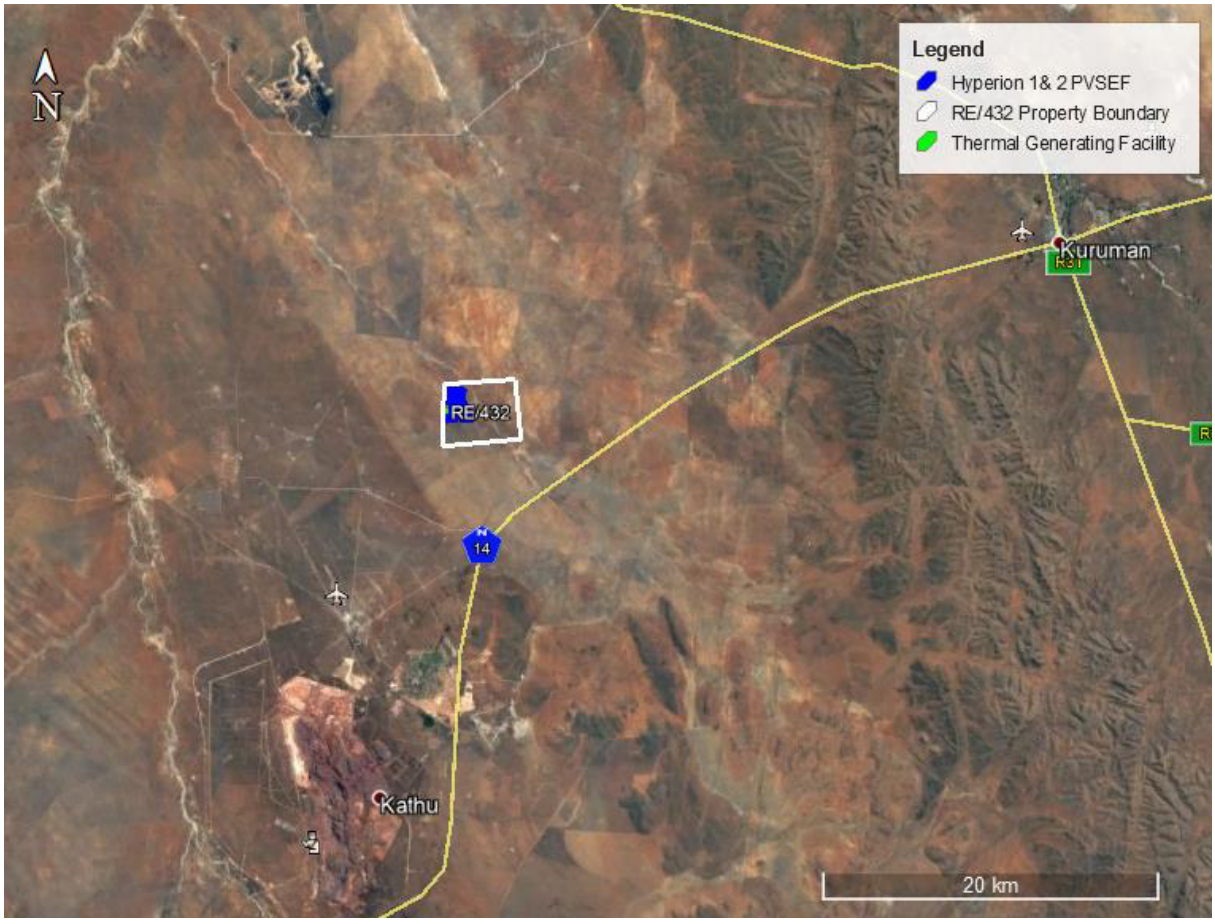

Figure 1-1: Location of the Proposed Facility

As part of the environmental impact processes, the services of a Transportation Specialist are required to conduct a Transport Impact Assessment for the proposed facility.

The following two main transportation activities will be investigated:

- Abnormal load vehicles transporting components to the site; and
- The transportation of construction materials, equipment and people to and from the site/facility.

The transport study will aim to provide the following objectives:

- Assess activities related to traffic movement for the construction and operation (maintenance) phases of the facility;
- Recommend a preliminary route for the transportation of the components to the proposed site;
- Recommend a preliminary transportation route for the transportation of materials, equipment and people to site; and
- Recommend alternative or secondary routes where possible.

1.2 Terms of Reference

The Terms of Reference for this Transport Impact Assessment include the following:

General:

- A description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed project;
- A description and evaluation of environmental issues and potential impacts (including direct, indirect, cumulative impacts and residual risks) that have been identified;
- Direct, indirect, cumulative impacts and residual risks of the identified issues must be evaluated within the Scoping Report in terms of the following criteria:
    - the nature, which shall include a description of what causes the effect, what will be affected and how it will be affected, for each impact anticipated;
    - the extent, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development), regional, national, or international.
- A statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts;
- A comparative evaluation of the identified feasible alternatives and nomination of a preferred alternative for consideration in the EIA phase;
- Identification of potentially significant impacts to be assessed within the EIA phase and details of the methodology to be adopted in assessing these impacts. This should be detailed enough to include within the Plan of Study for EIA and must include a description of the proposed method of assessing the potential environmental impacts associated with the project. This must also include any gaps in knowledge at this point of the study and further recommendations for the EIA Phase. Consideration of areas that would constitute “acceptable and defendable loss” should be included in this discussion.

Specific:

- Extent of the transport study and study area;
- The proposed development;
- Trip generation for the facility during construction and operation;
- Traffic impact on external road network;
- Accessibility and turning requirements;
- National and local haulage routes;
- Assessment of internal roads and site access;
- Assessment of freight requirements and permitting needed for abnormal loads; and
- Traffic accommodation during construction.

1.3 Approach and Methodology

The report deals with the traffic impact on the surrounding road network in the vicinity of the site during:

- The construction of the access roads;
- The construction of the facility;
- The operation and maintenance during the operational phase; and
- The decommissioning phase.

This study was informed by the following:

Project Assessment

- Overview of project background information including location maps, component specifications and any possible resulting abnormal loads to be transported; and
- Research of all available documentation and information relevant to the proposed facility.

The study considered and assessed the following:

Traffic and Haulage Route Assessment

- Estimation of trip generation;
- Discussion on potential traffic impacts;
- Assessment of possible haul routes; and
- Vehicle trips related to the construction, operational (maintenance) and decommissioning phases of the project.

Site layout, Access Points and Internal Roads Assessment per Site

- Description of the surrounding road network;
- Description of site layout;
- Assessment of the proposed access points; and
- Assessment of the proposed internal roads on site.

The findings of the transport assessment are detailed in this report, prepared as part of the environmental impact assessment process for the proposed facility.

1.4 Assumptions and Limitations

The following assumptions and limitations apply:

- This study is based on the project information provided by the Client;
- According to the Eskom Specifications for Power Transformers (Eskom Power Series, Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers), the following dimensional limitations need to be kept when transporting the transformer – total maximum height 5 000mm, total maximum width 4 300 mm and total maximum length 10 500 mm;
- Maximum vertical height clearances along the haulage route is 5.2 m for abnormal loads;
- Imported elements will be transported from the most feasible port of entry, which is deemed to be the Port of Saldanha;
- If any elements are manufactured within South Africa, these will be transported from their respective manufacturing centers, which would be either in the greater Johannesburg or Pinetown/Durban;

- All haulage trips will occur on either surfaced national and provincial roads or existing gravel roads; and
- Material for the construction of internal access roads will be sourced locally as far as possible.

1.5 Source of Information

Information used in a transport study includes:

- Project Information provided by the Client;
- Google Earth.kmz provided by the Client;
- Google Earth Satellite Imagery;
- Information gathered during the site visit; and
- Project research of all available information.

2 DESCRIPTION OF PROJECT ASPECTS RELEVANT TO THE STUDY

2.1 Port of Entry

It is assumed that components will be imported to South Africa via the Port of Saldanha or the Port of Cape Town, which are both located in the Western Cape.

The Port of Cape Town is the port of the City of Cape Town, located in the Table Bay. Due to its position along one of the world's busiest trade routes, it is one of the busiest ports in South Africa, handling the largest amount of fresh fruit and second only to Durban as a container port. The Port also has significant repair and maintenance facilities that are used by several large fishing fleets and parts of the West African oil industry. Due to the many tourist attractions offered by Cape Town and its surrounding region, many cruise ships also berth in the Port.

The Port of Saldanha is the largest and deepest natural port in the Southern Hemisphere, able to accommodate vessels with a draft of up to 21.5 meters. The Port covers a land and sea surface of just over 19,300 hectares within a circumference of 91 kilometer with maximum water depths of 23.7 meters. Unique to the Port is a purpose-built rail link directly connected to a jetty bulk loading facility for the shipment of iron ore. The Port is operated by Transnet National Ports Authority.

Due to the potential traffic congestion on the routes leading to and from the Port of Cape Town, the Port of Saldanha is considered the preferred port of entry. It should however be noted that the Port of Cape Town can still be considered as an alternative.

Alternatively, components can be imported via the Port of Ngqura in the Eastern Cape. The Port of Ngqura is a world-class deep-water transshipment hub offering an integrated, efficient and competitive port service for containers on transit. The Port forms part of the Coega Industrial Development Zone (CIDZ) and is operated by Transnet National Ports Authority.

2.2 Abnormal Load Considerations

It is expected that certain components will be transported with an abnormal load vehicle. Abnormal permits are required for vehicles exceeding the following permissible maximum dimensions on road freight transport in terms of the Road Traffic Act (Act No. 93 of 1996) and the National Road Traffic Regulations, 2000:

- Length of 22 m for an interlink, 18.5 m for truck and trailer and 13.5 m for a single unit truck;
- Width of 2.6 m;
- Height of 4.3 m measured from the ground;
- Possible height of load being 2.7 m;
- Weight of gross vehicle mass of 56 t resulting in a payload of approximately 30t;
- Axle unit limitations are 18 t for dual and 24 t for triple-axle units; and
- Axle load limitations are 7.7 t on the front axle and 9 t on the single or rear axles.

Any dimension / mass outside the above will be classified as an Abnormal Load and will necessitate an application to the Department of Transport and Public Works for a permit that will give authorisation for the conveyance of said load. A permit is required for each Province that the haulage route traverses.

2.3 Liquefied Petroleum Gas (LPG) Standard and Regulations

The transportation of dangerous goods is regulated by the National Road Traffic Act (Act No. 93 of 1996). The Act requires compliance to a National Standard, namely SANS 1518:2011 Edition 4 – "Transport of dangerous goods — Design, construction, testing, approval and maintenance of road vehicles and portable tanks". In addition, the SANS 10087 (Part 1 – Part 10) series sets out the requirements for the LPG industry with regards to the LPG handling, installation, distribution, transportation, maintenance and storage.

2.4 Further Guideline Documentation

The Technical Recommendations for Highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outlines the rules and conditions that apply to the transport of abnormal loads and vehicles on public roads. Within the guidelines, the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges and culverts.

The general conditions, limitations and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power / mass ratio, mass distribution and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the Road Traffic Act and the relevant regulations.

2.5 Permitting – General Rules

The limits recommended in TRH 11 are intended to serve as a guide to the Permit Issuing Authorities. It must be noted that each Administration has the right to refuse a permit application or to modify the conditions under which a permit is granted. It is understood that:

a) A permit is issued at the sole discretion of the Issuing Authority. The permit may be refused because of the condition of the road, the culverts and bridges, the nature of other traffic on the road, abnormally heavy traffic during certain periods or for any other reason.
b) A permit can be withdrawn if the vehicle upon inspection is found in any way not fit to be operated.
c) During certain periods, such as school holidays or long weekends an embargo may be placed on the issuing or permits. Embargo lists are compiled annually and are obtainable from the Issuing Authorities.

2.6 Load Limitations

The maximum load that a road vehicle or combination of vehicles will be allowed to carry legally under permit on a public road is limited by:

- the capacity of the vehicles as rated by the manufacturer;
- the load which may be carried by the tyres;
- the damaging effect on pavements;
- the structural capacity on bridges and culverts;
- the power of the prime mover(s);
- the load imposed by the driving axles; and
- the load imposed by the steering axles.

2.7 Dimensional Limitations

A load of abnormal dimensions may cause an obstruction and danger to other traffic. For this reason, all loads must, as far as possible, conform to the legal dimensions. Permits will only be considered for indivisible loads, i.e. loads that cannot, without disproportionate effort, expense or risk of damage, be divided into two or more loads for the purpose of transport on public roads. For each of the characteristics below there is a legally permissible limit and what is allowed under permit:

- Width;
- Height;
- Length;
- Front Overhang;
- Rear Overhang;
- Front Load Projection;
- Rear Load Projection;
- Wheelbase;
- Turning Radius; and
- Stability of Loaded Vehicles.

2.8 Transporting Other Plant, Material and Equipment

In addition to transporting the specialised equipment, the normal Civil Engineering construction materials, plant and equipment will need to be transported to the site (e.g. sand, stone, cement, gravel, water, compaction equipment, concrete mixers, etc.). Other components, such as electrical cables and substation transformers, will also be transported to site during construction. The transport of these items will generally be conducted with normal heavy loads vehicles. Abnormal loads will be required for components exceeding the load and dimensional limitations.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Description of the site

The hybrid thermal power facility is located approximately 15km north of Kathu within in the Gamagara Local Municipality which falls within jurisdiction of the John Taolo Gaetsewe District Municipality, Northern Cape Province on the following property (shown in **Figure 3-1**Figure 1-1):

Proposed Thermal Power Dual Fuel Facility

- Remainder of the Farm Lyndoch 432

The proposed access road to the facility is the existing T26 gravel road which intersects with the N14.

The facility will be a hybrid facility consisting of a fully dispatchable, dual fuel (liquid or gas) thermal generation plant in combination with a solar plant. There will be a single point of connection to the utility (Eskom). The facility will aim to meet, in combination with the authorised Hyperion 1 & 2 PV Solar Energy Facilities, the bid requirement of being 100% dispatchable between the hours of 05h00 and 21h30. Where possible and where available, solar power will be utilised to meet the demand however where solar power is not available (typically between the hours of 5h00 and 07h00 and again between 18h00 and 21h30), thermal generation will be utilised. It is currently estimated that between 50 – 65% of the demand will be met utilising solar power with the remaining 35 – 50 % being met with thermal generation. The facility will be controlled by a joint controller that will have the capability of assessing the demand and regulating the power supply from the solar and thermal facilities accordingly.

The thermal generation plant will include the following infrastructure:

- Reciprocating Engines
- Access road
- Truck entrance and parking facility
- Regasification plant and fuel preparation plant
- Dry cooling system for operating oils/chemicals
- Fuel off-loading facility
- Fuel storage facility
- Water demineralisation plant
- Cabling, O&M building, fencing, warehouses and workshops

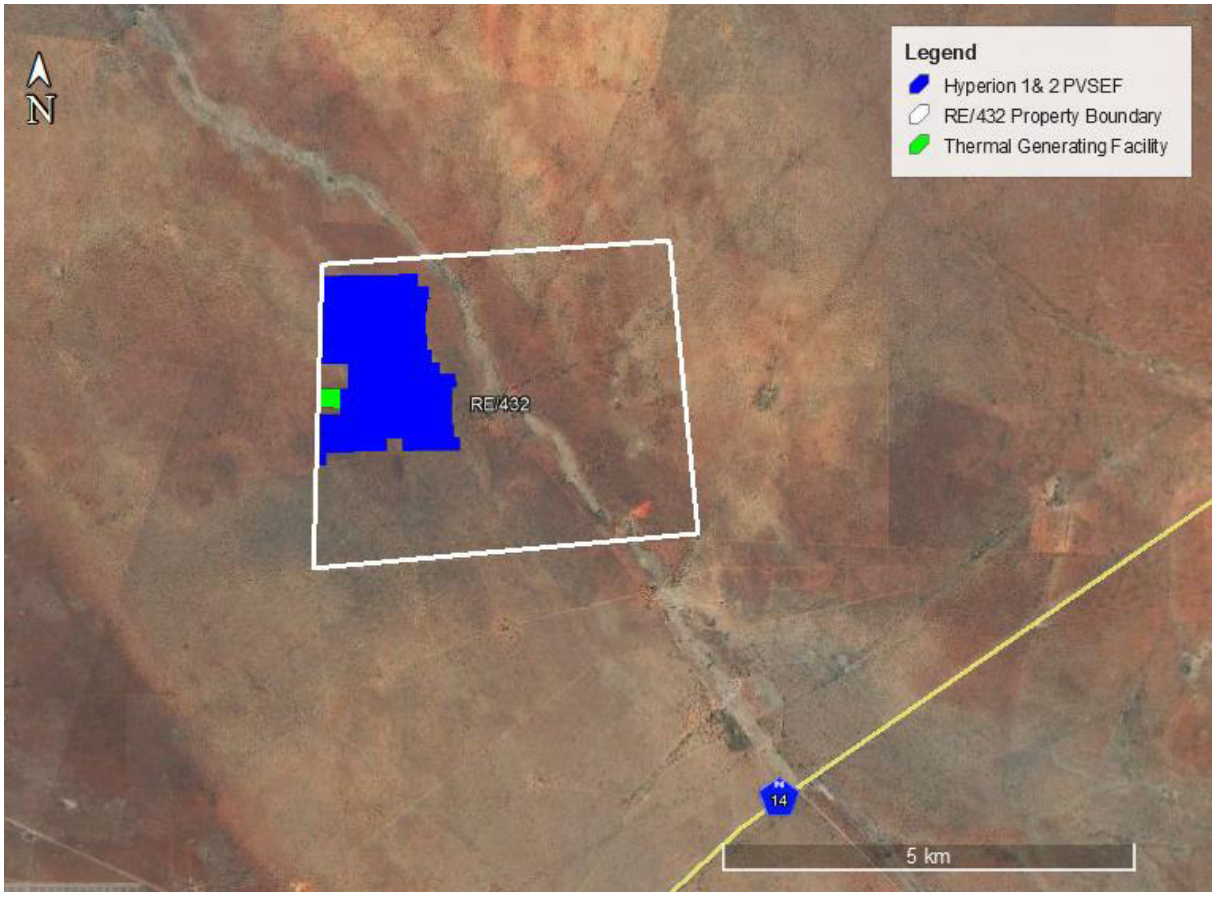

Figure 3-1: Aerial View of Proposed Site

3.2 National Route to Site for Imported Components

There are three viable options for the port of entry for imported components - the Port of Saldanha and the Port of Cape Town in the Western Cape and the Port of Ngqura in Port Elizabeth. The Port of Saldanha is the preferred port of entry, however, the Port of Cape Town and the Port of Ngqura can be used as alternatives should the Port of Saldanha not be available.

The preferred route from the preferred point of entry is shown in orange in the Figure below and is approximately 1030km in length. The route starts at the port of Saldanha, heading east on the R45 towards Moorreesburg, where it heads north on the N7. The route passes Clanwilliam and Vanrhynsdorp, then heads east on the R27 towards Keimoes. At Keimoes, the route follows the N14 to the proposed site.

The alternative route from the Port of Cape Town is approximately 1060km in length and is shown in red in the Figure below. The route would follow the N1 from the Port to the N7, where the route heads north to Moorreesburg. From this point it would continue on the same route as the preferred route.

The alternative route from the Port of Ngqura, shown in green in the Figure below, is approximately 948km in length and will start at the Port of Ngqura, heading north on the N10 passing Middelburg, Hanover, De Aar, Britstown, Prieska, Griekwastad, Postmasburg en route to the N14 at Kathu. From the N14 at Kathu, the vehicles will travel on gravel roads leading to the proposed site.

An alternative route, shown in cyan in the Figure below, is 967km in length and follows the same route as the preferred route up to Middelburg, where it connects to the N9 towards Kimberley, passing the towns of Colesberg, Phillippolis, Fauresmith and Koffiefontein. From Kimberley, the haulage vehicles will follow the R31 past Barkly West, turning onto the R31 at Danielskuil, turn left onto the N14 at Kuruman and access the gravel roads leading to the proposed site.

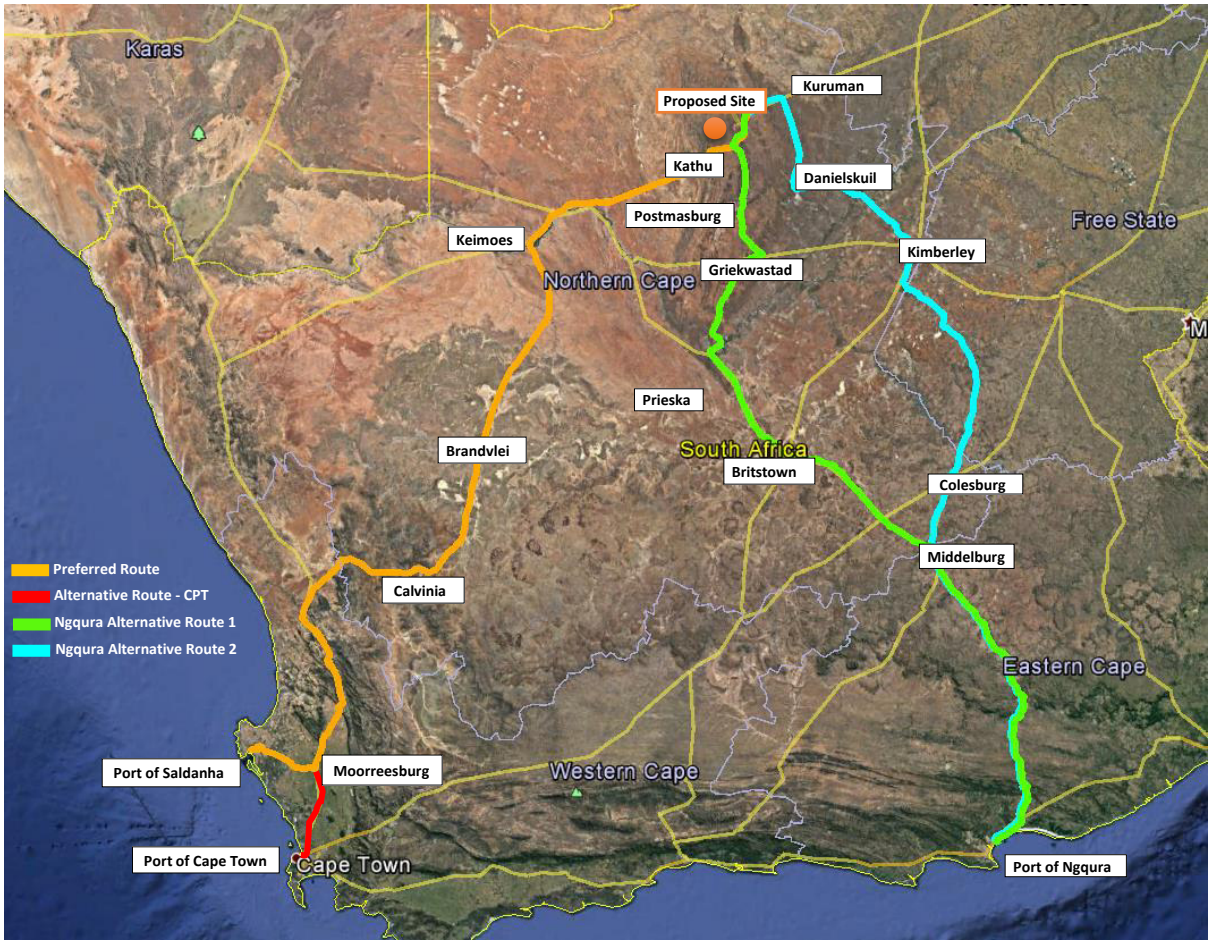

Figure 3-2: Haulage Routes from Port to the Proposed Site

It is critical to ensure that the abnormal load vehicle will be able to move safely and without obstruction along the preferred route. The preferred route should be surveyed prior to construction to identify any problem areas, e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that the delivery will occur without disruptions.

It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.

3.3 Route for Components manufactured within South Africa

It is anticipated that elements manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg and Pinetown/Durban areas. Components will be transported to site

using appropriate National and Provincial routes. At this stage, only a high-level assessment can be undertaken as no information of the exact location of the manufacturer is known and all road structures (such as bridges and culverts) need to be confirmed for their load bearing by SANRAL or the respective Roads Authority.

For any abnormal loads, it is critical to ensure that the vehicle will be able to move safely and without obstruction along the preferred route. The preferred route should be surveyed prior to construction to identify any problem areas, e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. After the road modifications have been implemented, it is recommended to undertake a “dry-run” with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that the delivery will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the Contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that gravel sections (if any) of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.

There are several bridges and culverts along the National and Provincial routes, which need to be confirmed for load bearing capacity and height clearances. However, there are alternative routes which can be investigated if the selected route or sections of the route should not be feasible.

Any low hanging overhead lines (lower than 5.1m), e.g. Eskom and Telkom lines, along the proposed routes will have to be moved temporarily or avoided to accommodate the abnormal load vehicles.

3.3.1 Route from Cape Town to the Proposed Site

The travel distance is around 1 020km and no road limitations are expected on this route for normal loads vehicles as it will mainly follow national and provincial roads. The route is shown in the Figure below.

Figure 3-3: Route from Cape Town to the Proposed Site

3.3.2 Route from Johannesburg to the Proposed Site

The travel distance is around 570km and no road limitations are expected on this route for normal loads vehicles as it will mainly follow national and provincial roads. The route is shown in the Figure below.

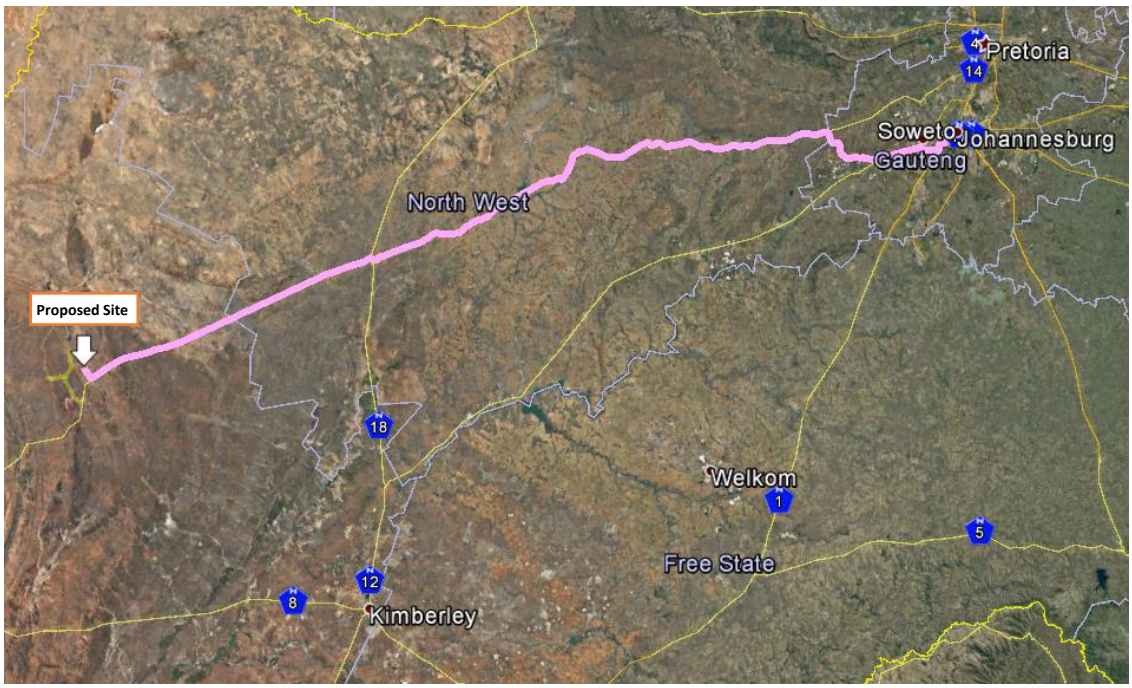

Figure 3-4: Route from Johannesburg to the Proposed Site

3.3.3 Route from Pinetown / Durban to the Proposed Site

The travel distance is around 1 000km and no road limitations are expected on this route for normal loads vehicles as it will mainly follow national and provincial roads. The route is shown in the Figure below.

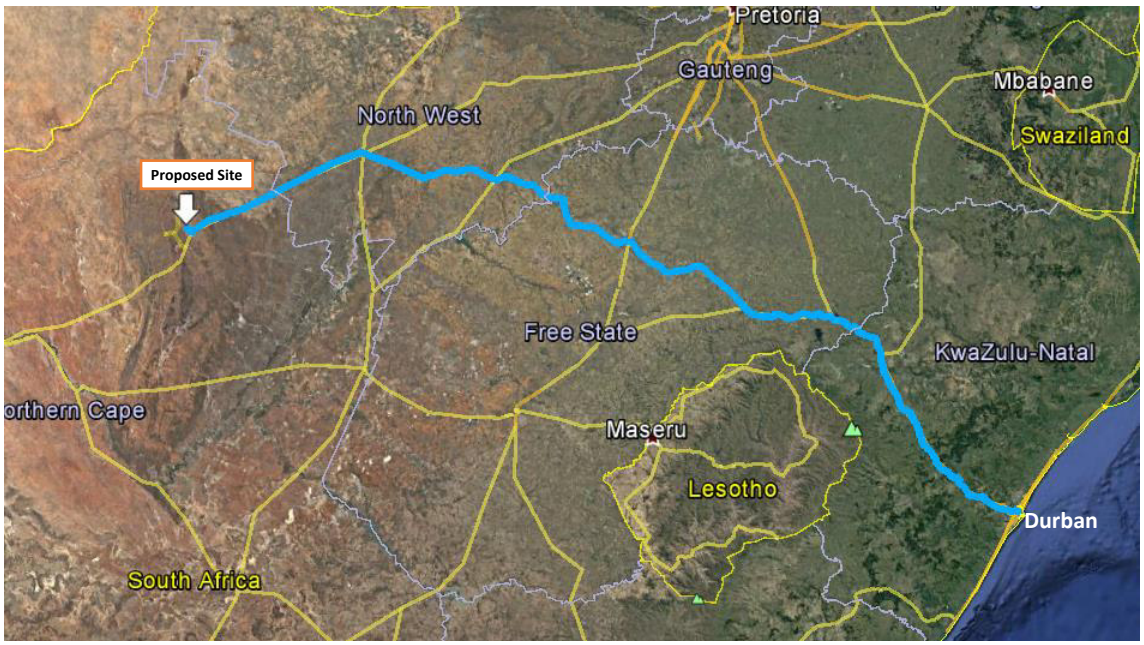

Figure 3-5: Route from Durban to the Proposed Site

3.3.4 Proposed Access Road to the Proposed Development

The proposed route to the site will be via the N14 and the T26 gravel road. The proposed site will be accessed via a new access road, an extension of the T26, located along the boundary of the Remainder of the Farm Lyndoch 432, as shown in Figure below. The proposed access to the site entails the establishment of a new access road approximately 4.9km in length along the cadastral boundaries of the Remainder of the Farm Lyndoch 432 and the upgrade of approximately 3.8km of the existing T26 gravel road. The width of the existing T26 varies between 7m and 12m.

It is proposed that the entire access road be surfaced (widths not to exceed 15m). It should be noted that a geometric design engineer should be appointed to design the road according to design standards. The engineer will also ensure that all road markings and road signs for the surfaced road are in accordance with the South African Road Traffic Signs Manual (SARTSM).

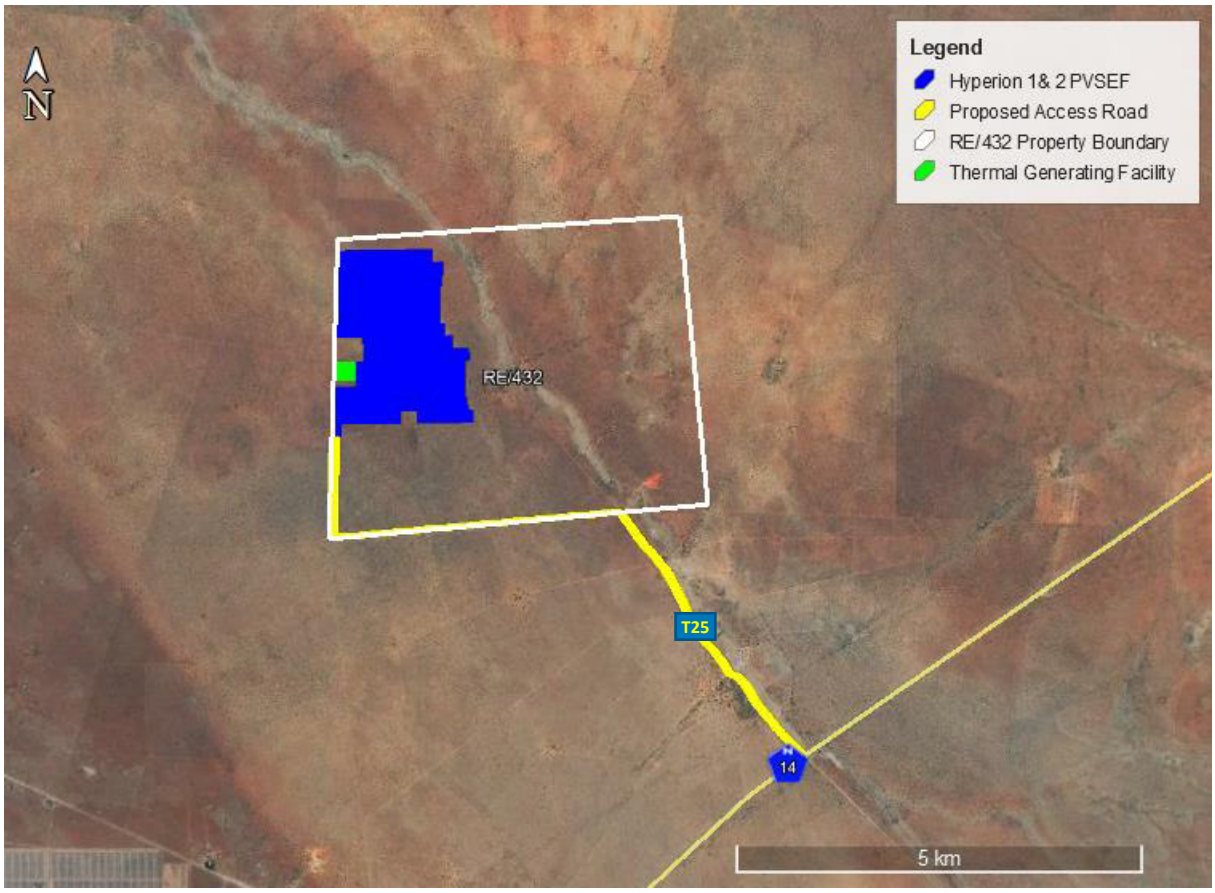

Figure 3-6: Proposed Access Route to the Proposed Site

The proposed access point to the site will need to be upgraded to cater for the construction vehicles and abnormal load vehicles. Generally, the road width at the access point needs to be a minimum of 8m and the access roads on site a minimum of 5m. The radius at the access point needs to be large enough to allow for all construction vehicles to turn safely. It is recommended that the access point be surfaced and the internal access roads on site can remain gravel.

It is recommended that the site access be controlled via a boom and gatehouse. It is also recommended that security staff be stationed on site at the access booms during construction. A minimum stacking distance of 25m should be provided between the road edge of the external road and the boom.

3.3.5 Internal Roads

The internal road geometric design and layout needs to be established at detailed design stage. Existing structures and services, such as drainage structures, signage, street lighting and pipelines will need to be evaluated if impacting on the roads. It needs to be ensured that any gravel sections remain in good condition and will need to be maintained during the additional loading of the construction phase and then reinstated after construction is completed. The gravel roads will require grading with a grader to obtain a flat even surface.

3.4 Main Route for the Transportation of Materials, Plant and People to the proposed site

The nearest towns in relation to the proposed site are Kathu, Deben and Kuruman. It is envisaged that most of the materials, plant and labour will be sourced from these towns.

Concrete batch plants and quarries in the vicinity could be contracted to supply materials and concrete during the construction phase, which would reduce the impact on traffic on the surrounding road network. Alternatively, mobile concrete batch plants and temporary construction material stockpile yards could be commissioned on vacant land near the proposed site. Delivery of materials to the mobile batch plant and the stockpile yard could be staggered to minimise traffic disruptions.

It is envisaged that most materials, water, plant, services and people will be procured within a 50 km radius from the proposed site.

4 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

Key legal requirements pertaining to the transport requirements for the proposed development are:

- Abnormal load permits (Section 81 of the National Road Traffic Act (Act 93 of 1996) and National Road Traffic Regulations, 2000),
- Port permit (Guidelines for Agreements, Licenses and Permits in terms of the National Ports Act No. 12 of 2005),
- Transportation of dangerous goods (National Road Traffic Act (Act 93 of 1996), SANS 1518 and SANS 10087), and
- Authorisation from Road Authorities to modify the road reserve to accommodate turning movements of abnormal loads at intersections.

5 IDENTIFICATION OF KEY ISSUES

5.1 Identification of Potential Impacts

The potential transport related impacts are described below.

5.1.1 Construction Phase

Potential impact

- Congestion due to construction related traffic.
- The construction traffic would also lead to noise and dust pollution, which could affect the health of residents in affected communities.
- Increase in construction traffic could have an impact on the safety of the surrounding community's road users.
- This phase also includes the construction of roads, excavations, trenching and ancillary construction works that will temporarily generate the most traffic.

5.1.2 Operation Phase

- During operation, it is expected that a 20 permanent staff will be based at the facility and security will periodically visit the facility. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.
- The transportation of fuel to the facility will generate approximately 20 trips per day.

5.1.3 Decommissioning Phase

This phase will result in the same impact as the Construction Phase as similar trips are expected.

5.1.4 Cumulative Impacts

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

6 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

6.1 Potential Impact (Construction Phase)

Nature of the impact

- Potential traffic congestion and delays on the surrounding road network and associated noise and dust pollution.

Significance of impact without mitigation measures

- Traffic generated by the construction of the facility will have a significant impact on the surrounding road network. The exact number of trips generated during construction will be determined by the contractor and the haulage company transporting the components to site, the staff requirements and where equipment is sourced from.

It is expected that the delivery of the components to the site during the construction phase will not result in a significant increase in traffic.

Construction traffic will include vehicles for deliveries, removal of materials and construction staff. Construction activities such as delivery of material or removal of soil can also be staggered or transported in off-peak hours.

Staggered delivery and transporting components outside of the peak traffic periods (peak traffic periods for rural areas are assumed to be 6:30am – 8am and 4pm-6pm) will assist in mitigating the impact on the surrounding road network.

Trips generated by construction site staff have been assumed to be less than 40 trips in the AM peak hour. This is based on an average of 350 workers on site per day. It is assumed that trips will include taxi trips, bus trips and private vehicle trips. It is also assumed that ridesharing will occur i.e. drivers of trucks and bakkies will collect workers. The impact of the staff traffic is deemed to be acceptable as the trips do not exceed 50 vehicles per hour (A full traffic impact assessment is required when a development generates more than 50 trips per hour (TMH16)). The table below shows an estimation of the possible number of trips required when the maximum number of workers are expected on site.

Table 6-1: Estimation of staff trips

Vehicle Type	Capacity	Total Trips	Total Workers
Bus	60	2	120
Minibus Taxi	15	12	180
Car/Bakkie (single passenger)	1	10	10
Car (Shared trips)	4	5	20
Bakkie (Shared trips)	4	5	20
Total		**34**	**350**

It is assumed that water required during the construction and operation phases will be obtained from the municipality. Should this water be transported to site, a significant number of trips will be generated.

The significance of the transport impact without mitigation measures during the construction phase can be rated as medium. However, considering that this is temporary and short term in nature, the impact can be mitigated to an acceptable level.

Proposed mitigation measures

- The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- Dust suppression of gravel roads during the construction phase, as required.
- Regular maintenance of gravel roads by the Contractor during the construction phase and by the Owner/Facility Manager during the operation phase.
- The use of mobile batch plants and quarries near the site would decrease the traffic impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- Consider scheduling shift changes to occur outside peak hours to concentrate staff trips in off peak periods.
- If required, low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved temporarily or avoided to accommodate the abnormal load vehicles.
- The preferred route should be surveyed to identify problem areas (e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification). After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that delivery will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.
- Design and maintenance of internal roads. Any internal gravel roads will require grading with a grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional.

Significance of impact with mitigation measures

The proposed mitigation measures for the construction traffic will result in a reduction of the impact on the surrounding road network, but the impact on the local traffic will remain moderate. The dust suppression, however, will result in significantly reducing the impact.

6.2 Potential Impact (Operational Phase)

Nature of the impact

- Potential traffic congestion and delays on the surrounding road network and associated noise pollution.

Significance of impact without mitigation measures

- Traffic during the operation phase will include occasional maintenance requirements, staff trips (assumed at 20 permanent staff) and Fuel deliveries.
- A maximum of 20 truck deliveries will occur over a 24-hour operational period. This amounts to 1 truck delivery per hour or 2 truck trips per hour over a 12-hour period.

Based on the above, the operational trips generated will be low and will have a negligible impact on the external road network as trips will not exceed 50 vehicles per hour (TMH16).

Proposed mitigation measures

- The fuel deliveries, staff trips and trips for maintenance requirements can be staggered or scheduled to occur outside of peak traffic periods.
- Consider scheduling shift changes to occur outside peak hours to concentrate staff trips in off peak periods.
- A larger LPG delivery vehicle could be considered to reduce the number of daily trips.
- Adherence and compliance to LPG transportation requirements as per the National Road Traffic Act, SANS 1518 and SANS 10087.

7 NO-GO ALTERNATIVE

The no-go alternative implies that the proposed development does not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network. However, this would also mean that there would be no socio-economic benefits to the surrounding communities, and it will not assist the government in meeting energy demands. **Hence, the no-go alternative is not a preferred alternative.**

8 IMPACT ASSESSMENT SUMMARY

The assessment of impacts and recommendation of mitigation measures as discussed above are collated in the tables below. The assessment methodology is attached as **Annexure A**.

8.1 Construction Phase

Table 8-1: Impact Rating - Construction Phase – Traffic Congestion

Nature: **Traffic congestion due to an increase in traffic caused by the transportation of equipment, material and staff to site**		
	Without mitigation	**With mitigation**
Extent	Low (1)	Low (1)
Duration	Short (2)	Short (3)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Probable (3)
Significance	**Medium (45)**	**Low (24)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: • *Stagger component delivery to site.* • *Reduce the construction period.* • *The use of mobile batch plants and quarries in close proximity to the site.* • *Staff and general trips should occur outside of peak traffic periods.* • *Consider scheduling shift changes to occur outside peak hours to concentrate staff trips in off peak periods* • *Regular maintenance of gravel roads by the Contractor during the construction phase and by Client/Facility Manager during operation phase.*		
Residual Impacts: *The proposed mitigation measures for the construction traffic will result in a reduction of the impact on the surrounding road network, but the impact on the local traffic will remain moderate. Traffic will return to normal levels after construction is completed.*		

Table 8-2: Impact Rating - Construction Phase – Dust Pollution

Nature: **Construction traffic on roads will generate dust. Local air quality will be affected by dust pollution**		
	Without mitigation	**With mitigation**
Extent	Low (1)	Low (1)
Duration	Short (2)	Short (3)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	**Medium (36)**	**Low (24)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: • *Dust Suppression of gravel roads during the construction phase, as required.* • *Regular maintenance of gravel roads by the Contractor during the construction phase and by Client/Facility Manager during operation phase.*		
Residual Impacts: *Dust pollution during the construction phase cannot be completely mitigated but mitigation measures will significantly reduce the impact. Dust pollution is limited to the construction period.*		

Table 8-3: Impact Rating - Construction Phase – Noise Pollution

Nature: **Construction traffic on roads will generate noise i.e. Noise pollution due to increased traffic**		
	Without mitigation	**With mitigation**
Extent	Low (1)	Low (1)
Duration	Short (2)	Short (3)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	**Medium (36)**	**Low (24)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: • *Stagger component delivery to site* • *Reduce the construction period* • *The use of mobile batch plants and quarries in close proximity to the site* • *Staff and general trips should occur outside of peak traffic periods*		
Residual Impacts: *Noise pollution during the construction phase cannot be completely mitigated but mitigation measures will significantly reduce the impact. Noise pollution is limited to the construction period.*		

8.2 Operational Phase

Table 8-4: Impact Rating - Operation Phase – Traffic Congestion

Nature: **Traffic congestion due to an increase in traffic caused by the LPG deliveries, staff trips and trips for maintenance requirements**		
	Without mitigation	**With mitigation**
Extent	Low (2)	Low (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (3)	Small (0)
Probability	Probable (3)	very improbable (1)
Significance	**Low (27)**	**Low (4)**
Status (positive or negative)	Negative	Negative
Reversibility	High	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: • *LPG deliveries, staff trips and trips for maintenance requirements could be staggered or scheduled to occur outside of peak traffic periods.* • *Consider scheduling shift changes to occur outside peak hours to concentrate staff trips in off peak periods* • *A larger LPG delivery vehicle could be considered to reduce the number of daily trips.*		
Residual Impacts: *The proposed mitigation measures for the operations traffic will result in a reduction of the impact on the surrounding road network, but the impact on the local traffic will remain moderate. The mitigation measures will significantly reduce the trips and associated impact on the surrounding road network.*		

Table 8-5: Impact Rating - Operation Phase – Noise Pollution

Nature: **Traffic on roads will generate noise i.e. Noise pollution due to increased traffic**		
	Without mitigation	**With mitigation**
Extent	Low (1)	Low (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (3)	Small (0)
Probability	Probable (3)	very improbable (1)
Significance	**Low (24)**	**Low (5)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: • *LPG deliveries, staff trips and trips for maintenance requirements could be staggered or scheduled to occur outside of peak traffic periods.* • *A larger LPG delivery vehicle could be considered to reduce the number of daily trips.*		
Residual Impacts: *Noise pollution cannot be completely mitigated but mitigation measures will significantly reduce the impact.*		

8.3 Decommissioning Phase

Table 8-6: Impact Rating - Decommissioning Phase

IMPACT TABLE – DECOMMISSIONING PHASE
This phase will have a similar impact as the Construction Phase i.e. traffic congestion, air pollution and noise pollution, as similar trips/movements are expected.

9 CUMULATIVE IMPACTS

The construction and decommissioning phases are the only significant traffic generators. The duration of these phases is short term (i.e. the impact of the generated traffic on the surrounding road network is temporary and facility, when operational, do not add any significant traffic to the road network). Even if all similar projects within the area are constructed at the same time, the respective roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.

The assessments of cumulative impacts are collated in **Table 9-1** below.

Table 9-1: Cumulative Impact

Nature: **Traffic congestion and the associated noise and dust pollution.**		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Low (1)	High (5)
Duration	Short (2)	Medium (3)
Magnitude	Moderate (6)	Moderate (6)
Probability	Definite (5)	Improbable (2)
Significance	**Medium (45)**	**Low (28)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: • *Stagger component delivery to site* • *Dust suppression* • *Reduce the construction period* • *The use of mobile batch plants and quarries in close proximity to the site* • *Staff and general trips should occur outside of peak traffic periods*		

10 ENVIRONMENTAL MANAGEMENT PROGRAM INPUTS

It is recommended that dust suppression and maintenance of gravel roads form part of the EMPr. This would be required during the Construction phase, where an increase in vehicle trips can be expected, and during the Operational Phase, where LPG deliveries will occur.

Table 10-1: EMPr Input – Construction Phase

Impact	**Mitigation/Management Objectives**	**Mitigation/Management Actions**	**Monitoring**		
			Methodology	***Frequency***	***Responsibility***
A. CONSTRUCTION PHASE					
A.1. TRAFFIC IMPACTS					
Dust and noise pollution due to construction traffic.	Minimize impacts on road network and surrounding area.	▪ Stagger component delivery to site. ▪ The use of mobile batch plants and quarries near the site would decrease the impact on the surrounding road network. ▪ Dust suppression ▪ Reduce the construction period as far as possible. ▪ Maintenance of gravel roads. ▪ Apply for abnormal load permits prior to	▪ Regular monitoring of road surface quality. ▪ Apply for required permits prior to commencement of construction.	▪ Before construction commences and regularly during construction phase.	▪ Holder of the EA.

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		commencement of delivery via abnormal loads. ▪ Assess the preferred route and undertake a 'dry run' to test. ▪ Staff and general trips should occur outside of peak traffic periods as far as possible. ▪ Consider scheduling shift changes to occur outside peak hours to concentrate staff trips in off peak periods ▪ Any low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved temporarily or avoided to accommodate the abnormal load vehicles, if required.			

Table 10-2: Table 9 1: EMPr Input – Operational Phase

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
B. OPERATIONAL PHASE					
A.1. TRAFFIC IMPACTS					
Dust and noise pollution due to operational trips.	Minimize impacts on road network and surrounding area.	▪ The fuel deliveries, staff trips and trips for maintenance requirements can be staggered or scheduled to occur outside of peak traffic periods. ▪ Consider scheduling shift changes to occur outside peak hours to concentrate staff trips in off peak periods. ▪ A larger LPG delivery vehicle could be considered to reduce the number of daily trips. ▪ Adherence and compliance to LPG transportation requirements as per the National Road Traffic Act, SANS 1518 and SANS 10087.	▪ Regular monitoring of road surface quality.	▪ regularly during operational phase.	▪ Holder of the EA.

11 CONCLUSION AND RECOMMENDATIONS

The potential transport related impacts for the construction and operation phases for the proposed 75MW Thermal Power Dual Fuel Facility were assessed.

- The construction phase traffic, although significant, will be temporary and impacts are considered to have a medium significance without mitigation measures and low with mitigation measures.
- The traffic generated during the operational phase will be minimal and will not have a significant impact on the surrounding road network.

The potential mitigation measures mentioned in the construction phase are:

- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batch plants and quarries near the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods.
- A “dry run” of the preferred route.
- Design and maintenance of internal roads.
- If required, any low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved temporarily or avoided to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a development are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of the phases is short term, i.e. the impact of the traffic on the surrounding road network is temporary and the facility, when operational, will not add any significant traffic to the surrounding road network.

The proposed site will be accessed via a new surfaced access road, an extension of the T26, located along the boundary of the Remainder of the Farm Lyndoch 432.

The development is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.

The impacts associated with the Thermal Power Dual Fuel Facility are acceptable with the implementation of the recommended mitigation measures and can therefore be authorised.

12 REFERENCES

- Google Earth Pro
- SANS 10280/NRS 041-1:2008 - Overhead Power Lines for Conditions Prevailing in South Africa
- SANS 1518:2011 Edition 4 – "Transport of dangerous goods — Design, construction, testing, approval and maintenance of road vehicles and portable tanks"
- SANS 10087:2011 Edition 4 - The handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial and industrial installations
- South African Road Traffic Signs Manual (SARTSM).
- National Road Traffic Act (Act No. 93 of 1996)
- National Road Traffic Regulations, 2000
- The Technical Recommendations for Highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads
- TMH16, Volume 1 - South African Traffic Impact and Site Traffic Assessment Manual, August 2012

Annexure A - ASSESSMENT METHODOLOGY

ASSESSMENT METHODOLOGY

Direct, indirect and cumulative impacts associated with the projects were assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.

- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).

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

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

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

- the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be *mitigated.*

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M)P

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

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

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).